City of Buellton
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 City of Buellton (City) 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 City. The LHMP was last comprehensively updated in 2017 as an annex to the 2017 MJHMP. Since 2017, the City has:

- Incorporated the LHMP goals, objectives, and mitigation actions into its local plans and processes, including the General Plan Safety Element by reference and specific hazard planning efforts (e.g., Stormwater Management Program).
- Used the LHMP's assessment of capabilities, hazards, and vulnerabilities to inform planning, capital improvements, programs, decision-makers, and the public.
- Implemented mitigation actions through the City's general plan, capital improvement program, maintenance programs, grant programming, community outreach, and budget process.
- Reviewed and evaluated mitigation actions before and after disasters, including the Alisal Fire.

This 2022 update to the LHMP builds on and refines the MJHMP's assessment of hazards and vulnerabilities countywide to develop a mitigation plan for the City. The City participated in the 2022 MJHMP Mitigation Advisory Committee (MAC) and Local Planning Team (LPT), reviewed all portions of the MJHMP pertaining to the City, 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 City is a participating agency in the County's MJHMP update.

The City'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 City. Vulnerability assessments summarize the identified hazards' impact on the City. 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 City's 2022 LHMP.

[INSERT CITY RESOLUTION(S) ADOPTING PLAN UPDATE]

[INSERT CITY 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 City'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 Mitigation Advisory Committee (MAC) and the second is the Local Planning Team (LPT).

All eight incorporated cities and the six special districts joined the County as participating agencies in the preparation of the MJHMP update, including the 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 Santa Maria Valley Water Conservation District (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 City participated as a MAC member to prepare this LHMP as an annex to the 2022 MJHMP. The City was represented by Andrea Keefer, Planning Director, 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	**MAC Meeting #1 (virtual)** 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	**MAC Meeting #2 (virtual)** 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	**MAC Meeting #3 (virtual)** 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	**MAC Meeting #4 (virtual)** Collected feedback on 2017 mitigation strategies Conducted interactive exercise on mitigation strategies for key hazards unaddressed in

Date	Purpose
	previous MJHMP Discussed annex updates
January 2022	**MAC Meeting #5 (virtual)** Presented draft plan Discussed key MAC/LPT review needs and key issues Discussed annex updates to dovetail with plan update
March 2022	**MAC Meeting #6 (virtual)** Review and discuss public comments received on the draft plan Recommend a revised draft plan to decision-makers Review annex updates for review and approval

3.3 LOCAL PLANNING TEAM (LPT)

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

Table 3-2. City of Buellton Local Planning Team 2022

Department	Name	Title
City Administration	Scott Wolfe	City Manager/Emergency Services Manager
City Administration	Linda Reid	City Clerk/Emergency Services Coordinator
Planning	Andrea Keefer	Planning Director
Planning	Cara Miralles	Assistant Planner
Public Works	Rose Hess	Public Works Director/City Engineer
Finance	Shannel Zamora	Finance Director

The Buellton LPT members worked directly with the Santa Barbara 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 City 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 (12/14/22) to discuss LHMP priorities and mitigation approaches.

Meeting Dates	Summary of Activity
January and March 2022	Reviewed new maps and local vulnerabilities. Provided input on the status of 2017 LHMP mitigation strategies. Reviewed draft mitigation strategies and provide feedback. Reviewed and finalized 2022 LHMP

3.4 PUBLIC OUTREACH AND ENGAGEMENT

As a participating agency in the 2022 MJHMP update, the City 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 City'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.

Emergency preparedness information is also regularly distributed to the residents and businesses via the City's website.

In April 2022, the LHMP was completed and made available for public review, concurrent with review by FEMA and CalOES. In addition, the opportunity for the community to be heard was permitted during the City Council meeting before the adoption of this plan.

4.0 CAPABILITY ASSESSMENT

The City identified current capabilities and mechanisms available for implementing hazard mitigation activities. This section presents a discussion of the roles of key departments, administrative and technical capacity, fiscal resources, and summaries of relevant planning mechanisms, codes, and ordinances.

4.1 DEVELOPMENT TRENDS AND DEMOGRAPHICS

Buellton is located on US Highway 101 in the Santa Ynez Valley, 40 miles northwest of Santa Barbara and 360 feet above sea level. The City of Buellton was incorporated on February 1, 1992. Buellton enjoys a Mediterranean coastal climate with mild, dry summers and cool, wet winters. Buellton is transitioning from a crossroads commercial center for automobile travelers to a unique community offering full services to its residents and visitors. Located within commuting

distance to the more populous coastal areas, Buellton is home to many commuters. It is also expected to grow, but only within its current City Limits due to an adopted Urban Growth Boundary.

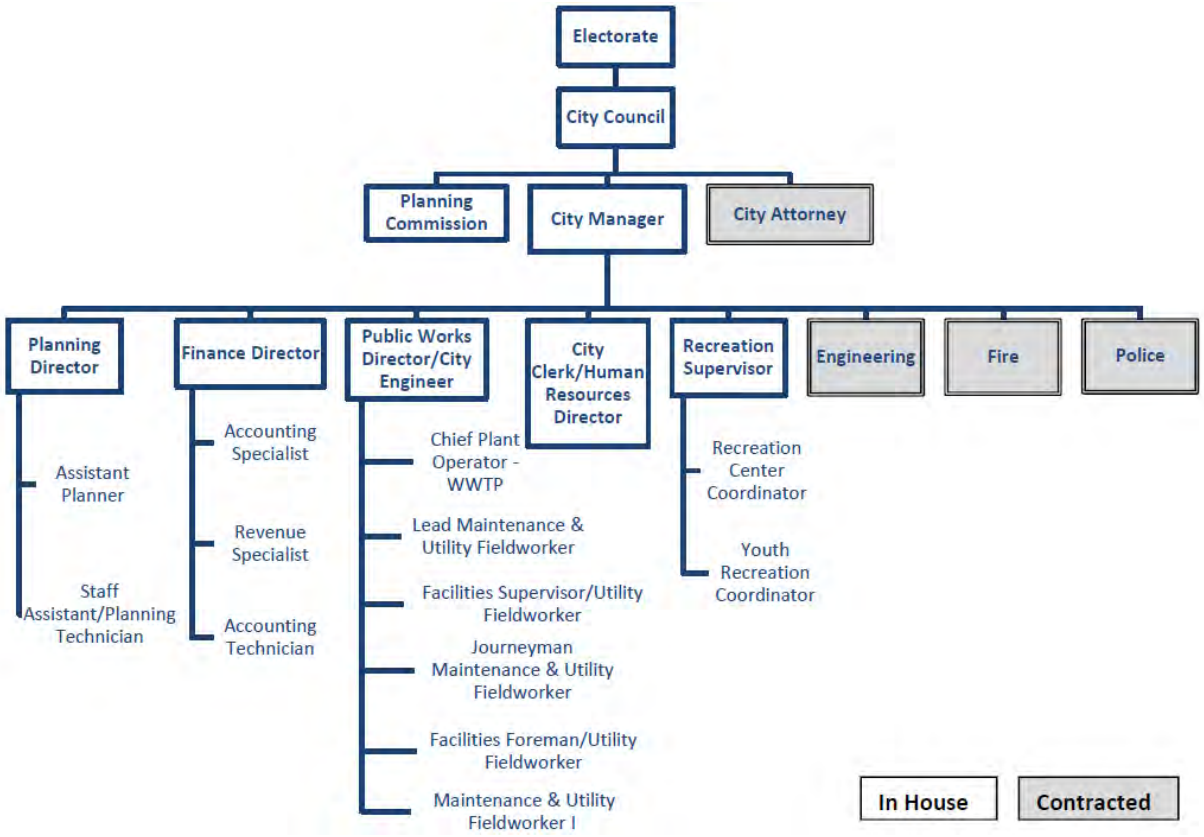
According to 2019 U.S. Census Bureau data, the City is home to 5,441 residents. This population is projected to grow to 6,525 residents by 2050 (SBCAG 2018). The average household size in the City is 2.75 and the median household income is $97,996. Approximately 63.3 percent of City of Buellton residents identify as White, 32.4 percent identify as Hispanic, and 4.0 percent identify as Asian, Black, Mixed, or Other (US Census Bureau 2019).

4.2 KEY DEPARTMENTS

Buellton utilizes the Council-Manager form of local governance, which includes both elected officials and an appointed City Manager. Buellton has five council members, which includes an elected mayor and an annually appointed vice mayor and council members.

The City Council is Buellton's legislative body, setting policy, approving budgets, and setting tax rates. Members also hire the City Manager, who is responsible for the day-to-day administration of Buellton and serves as the Council's chief advisor. The City Manager prepares a recommended budget and carries out the Council's policies. While the City Manager may recommend policy decisions, he is ultimately bound by the actions of the Council. The Council appoints the City Attorney. Buellton's organizational chart is listed below.

City of Buellton Organizational Chart



Departments involved in activities related to Hazard Mitigation include:

- **Fire Protection Services** (Buellton contracts with Santa Barbara County for Fire Protection Services)
  - Administration: Develop, implement and monitor policies, procedures, budgets, fees, automatic aid agreements, mutual aid agreements, and liaison with other City departments and outside agencies.
  - Fire Prevention Bureau: Coordinate adoption of codes and ordinances, review site and building plans for fire code compliance, and develop and present public education programs.
  - Emergency Medical Services: Manage the department's paramedic and EMT programs, respond to medical emergencies and other calls for service, and participate with other community and regional health care providers to reduce public illness and injury.
  - Suppression Division: Maintain the department's personnel, apparatus, equipment, and fire stations in a state of readiness to respond to the community's needs, develop and implement standard operating procedures for various types of emergency responses, respond to all types of emergencies, and train and interact with neighboring jurisdictions and regional agencies.
- **Building & Safety Department** (Buellton contracts with Santa Barbara County for Building & Safety)
  - Coordinate adoption of building, plumbing, electrical, and mechanical codes. Develop building ordinances.
  - Review site and building plans for compliance with building codes and ordinances.
  - Damage assessment of structures from multiple causes to facilitate the repair and future occupancy.
- **Buellton City Manager/Planning Department**
  - Emergency Management: Coordinate Buellton's Disaster Preparedness Program, liaison with all City departments and divisions, as well as other public and private organizations, develop, coordinate and implement the EOP, and maintain the operational readiness of Buellton's Emergency Management Team, the EOC, and other key elements.
  - Develop and maintain Buellton's general plan, zoning ordinances, and development standards.
  - Oversee Buellton's development process assuring compliance with zoning and general plan, including environmental impact reports, design review, historic preservation, landscape review, habitat conservation, floodway prohibitions, and floodplain development standards.
  - Through the code enforcement program, manages Buellton's weed abatement program along with County Fire.

- **Buellton Public Works Department**
  - Maintains Buellton's infrastructure (assets) ranging from streets to parks to City owned-buildings, water and sewer utilities, and vehicle fleet.
  - Responds to Buellton's emergencies, including EOC response in disasters and assisting police and fire departments with hazardous materials clean up, debris removal, traffic, and perimeter control efforts, traffic accident clean up, and evacuation routing.
  - Operates, maintains, and enhances both the water treatment/distribution and sewer collection/treatment systems within Buellton.
  - Responsible for planning and implementation associated with the following plans:
    - Bradbury Dam Emergency Action Plan
    - Water Quality Emergency Notification Plan
    - Water Division Emergency Response Plan
    - Sewer Overflow Response & Prevention Plan
- **Engineering Department** (Buellton contracts for Engineering Services)
  - Reviews engineering on private and public grading, floodways, retention basins, transportation infrastructure, and structures to assure compliance with Federal, State, and local ordinances on seismic and structural stability.
  - Develops engineering ordinances and policies that help protect and preserve Buellton's infrastructure.
  - Evaluates all circulation elements for projected traffic impacts.
  - Determines needed infrastructure improvements, water system, and water/sewer treatment capabilities.
  - Provides response personnel for evaluation of damaged infrastructure.
  - Provides support as necessary to Buellton's EOC Team.
  - Coordinates other response agencies assisting with damage assessment and assists with cost estimates for damage assessment.
- **Police Department** (Buellton contracts with Santa Barbara County Sheriff's Department for Police Services)
  - Responds to safety concerns involving threats and/or damage to life or property. Acts as the enforcement entity for violations of State and local laws and ordinances.
  - Primary emergency responders to acts of civil disobedience and public disorders and terrorism. Support personnel for emergency rescue and management.
  - Investigative services for criminal acts that result in personal injury/death and the destruction of property.
  - Develops and implements emergency response plans and policies, focusing on evacuation procedures and traffic control.

- Primary responders to acts of terrorism, focusing on suspect intervention and facility and staff protection.

4.3 ADMINISTRATIVE AND TECHNICAL CAPACITY

The administrative and technical capabilities of the City, as shown in Table 4-1, include staff, personnel, and department resources available to implement the actions identified in Section 7.0, *Mitigation Strategy* of this LHMP. 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, floodplain managers, surveyors, personnel with GIS skills and scientists familiar with hazards in the community. Equipment and supplies are maintained by the Public Works Director.

Table 4-1. City of Buellton Administrative and Technical Capacity

Personnel Resources	Yes/No	Department/Position
Planner/engineer with knowledge of land development/land management practices	Yes	Planning/Planning Director
Engineer/professional trained in construction practices related to buildings and/or infrastructure	Yes	Engineering, Public Works & County Building Departments / Public Works Director & County Building Official Supplemented with Contract Services
Planner/engineer/scientist with an understanding of natural hazards	Yes	Planning & Engineering/ Planning Director & City Engineer
Personnel skilled in GIS	Yes	Public Works & Planning/ City Engineer & Planning Director
Full-time building official	Yes	SB County Building Department - Contract w/ SB County Building Department
Floodplain manager	Yes	Public Works/City Engineer
Emergency manager	Yes	City Manager
Grant writer	Yes	Planning/Assistant Planner
Other personnel		
GIS Data Resources (Hazard areas, critical facilities, land use, building footprints, etc.)	Yes	Public Works/ City Engineer Supplemented with Contract services

Personnel Resources	Yes/No	Department/Position
Warning Systems/Services (Reverse 9-11, cable override, outdoor warning signals)	Yes	Santa Barbara County Sheriff Contract w/SB County Sheriff Department Reverse 9-11
Other	N/A	

4.4 LEGAL AND REGULATORY CAPABILITIES

The legal and regulatory capabilities of the City are shown in Table 4-2, including existing ordinances and codes that affect the physical or built environment of Buellton. Examples of legal and/or regulatory capabilities can include the City's 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. City of Buellton: Legal and Regulatory Capability

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

4.5 GIS, COMPUTER AND COMMUNICATION TECHNOLOGY

The City has a basic GIS system used by the Public Works and Planning Departments. Currently, parcels, zoning, and flood hazards have been mapped, including water, sewer, storm drain, and citywide striping. Hazard layers created for this plan can be incorporated into that system for future planning and updates. In the event it is needed, the GIS system is fully functional and can be used to provide the State of California Office of Emergency Services with preliminary damage assessments.

Through the Santa Barbara County Sheriff's Department, Buellton has a fully functional 911 emergency telephone system, dispatch capabilities, and a reverse 911 system to issue warnings in advance of disasters. The City participates in the County's emergency services notification system.

Buellton has a website, which will be used to assist with communication necessary for the implementation and future updates of this plan. Buellton also has a satellite phone for emergency communications located in the City Clerk's office.

4.6 FINANCIAL RESOURCES

Buellton's financial worth has steadily grown over the years. The Finance Department confirms that Buellton has 2,164 properties with a total taxable value of approximately $1,132,844,695.

The General Fund balance is an important element that can show Buellton's financial strengths or weaknesses. For Fiscal Year 2021-2022 (FY 21-22), Buellton's operating budget has been set at approximately $8,122,500. The revenue budget for Buellton contains more than 50 line items representing different sources, each governed by a distinct set of conditions particular to that revenue source. The largest revenue factor and the core of the resource base that enables Buellton's provision of community services is the local revenue portion of Buellton's General Fund. Buellton's revenue base is determined by different community conditions such as the current population, employment and income, economic activity within Buellton, and the growth of invested value from residential and commercial construction, business investment in plant and equipment, and demand for local real property. National, State, and regional economic conditions can also affect Buellton's revenue base by creating demand for community goods and services produced within Buellton. The primary revenue sources for the City are sales tax, property tax, and transient occupancy tax. The majority of expenditures are for operation and maintenance and employee salaries and benefits.

Buellton's major economic drivers for its revenue base are sales tax, transient occupancy tax, population growth, employment, construction, property values, and commercial activities.

Buellton's long-term financial and programmatic policies to be achieved over the next few years demonstrate its dedication to protecting the life and property of Buellton residents and businesses include:

- Continued development of the storm water management system and continued qualitative drainage measures.
- Provide support in public safety to maintain current response time and professionalism, to limit injury, loss of life, and property.

- Funding of emergency preparedness training, including CERT.

Overall, Buellton has indirectly referenced mitigation and hazard reduction principles throughout many of the aforementioned documents, plans, and policies. Integrating more direct language referencing mitigation and hazard reduction will help to reinforce Buellton's commitment to these principles. The indirect references can also indicate that the responsibility for hazard reduction is shared among numerous departments within Buellton, making it a challenge to identify a particular department to take the lead in these efforts.

Table 4-3 shows specific financial and budgetary tools available to the City such as community development block grants; capital improvements project funding; authority to levy taxes for specific purposes; fees for water, sewer, gas, or electric services; ability to incur debt through general obligations bonds; and withholding spending in hazard-prone areas.

Table 4-3. City of Buellton Fiscal Capability

Financial Resources	Accessible or Eligible to Use (Yes/No)	Has This Been Used for Mitigation in the Past?	Comments
Community Development Block Grants (CDBG)	Yes	No	
Capital improvements project funding	Yes	Yes	
Authority to levy taxes for specific purposes	Yes	No	Vote required
Fees for water and sewer service	Yes	No	
Incur debt through general obligation bonds	Yes	No	
Incur debt through special tax bonds	Yes	No	Vote required
Incur debt through private activity bonds	No	No	
Federal Grant Programs (Hazard Mitigation Grant Program)	Yes	No	Not by the City of Buellton to date

4.7 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 City can capitalize on its existing educational capacities, even non-hazard related such as school partnerships, 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 City.

- **City Facebook page**
  - The City regularly utilizes its Facebook page as a way to inform the community. The City will utilize the Facebook page to educate and inform the community on hazard-related topics pertaining to Buellton.
- **Buellton Buzz**
  - The City publishes a bi-monthly newsletter in water customer water bills. The newsletter covers a variety of topics. When available, hazard-related information can be inserted into this publication as needed.
- **City website**
  - The City has a website which contains a broad range of information about the various City departments and activities. The City will include hazard-related information in an appropriate location on the website for the public to view.
- **CERT Training**
  - The City periodically organizes CERT training for community members.

4.8 RELEVANT PLANS, POLICIES, AND ORDINANCES

Buellton has a range of guidance documents and plans for each of its departments. These include a General Plan and Safety Element, Public Works Water/Sewer Plans, Capital Improvement Plans, Storm Water Management Program, Parks & Recreation Master Plan, and Standardized Emergency Management Plan. Buellton uses building codes, zoning ordinances, subdivision ordinances, and various planning strategies to address how and where development occurs. One of the essential ways Buellton guides its future is through policies laid out in the General Plan. The LHMP directly informs these plans and is used to evaluate the need for adjustments or updates to existing plans and programs. The City considers the LHMP's assessment of capabilities, hazards,

and vulnerabilities to inform planning, capital improvements, programs, decision-makers, and the public. The City also implements mitigation actions through the City's general plan, capital improvement program, maintenance programs, grant programming, community outreach, and budget process.

4.8.1 City of Buellton General Plan

Safety Element

The purpose of the Safety Element of the City's General Plan is to reduce deaths, injuries, property damage, and economic and social dislocation resulting from natural hazards including flooding, mud slides, soil creep, tsunamis and seiches, land subsidence, earthquakes, avalanches, other geologic phenomena, levee or dam failure, urban and wildland fires, and building collapse. This portion of the General Plan identifies the hazards that the City must consider when making land use decisions. The LHMP is incorporated by reference in the Safety Element.

Flooding is one natural hazard that the City of Buellton is susceptible to, mainly because it is located on an alluvial terrace of the Santa Ynez River. The Santa Ynez River, Zaca Creek, and Thumbelina Creek all produce 100-year storm flood damage. The greatest flood damage from these waterways occurred during heavy rainstorms in February 1993 and February 1998.

Flood damage also occurs from dam inundation. The Bradbury Dam on Lake Cachuma is located twelve miles east of Buellton. If this dam were to fail, a large portion of the City would be inundated with flood waters. The areas that would be the most affected by dam inundation would be the Thumbelina neighborhood and areas south of Highway 246.

To reduce the damages from flooding, new structures must be set back at least 200 feet from the bank of the Santa Ynez River. Structures must also be set back at least 50 feet from the top of the banks of creeks, including Zaca Creek and Thumbelina Creek, except where culverted. Development that is mapped in flood-prone areas is subject to FEMA requirements and any new development must minimize flood problems that are identified by the National Flood Insurance Rate Program. To prevent dam inundation, evacuations plans should be in place.

Buellton also experiences seismic and geologic hazards. The San Andreas Fault is located 50 miles northwest of the City and the Santa Ynez Fault is located approximately six miles to the south. The San Andreas would generate a very large earthquake which would cause some groundshaking in Buellton; however, the damage from such an earthquake would not be severe. A major earthquake on this fault is considered likely within the next 30 years. The likelihood of an earthquake on the Santa Ynez Fault is low by comparison. Although this fault is active, estimates place the likelihood of a major earthquake on this fault at once in several hundred to a thousand years.

The most serious direct earthquake hazard is the damage or collapse of buildings caused by ground shaking, which can cause property damage, injury, or death. It is the primary seismic concern for Buellton. The areas within or immediately adjacent to the Santa Ynez River floodplains are located on alluvial deposits, which can increase the potential for ground shaking damage and can result in greater structural damage. Certain types of construction materials perform better in earthquakes than others. Modern structures made with wooden and steel

frames, or reinforced concrete blocks, will typically withstand moderate to strong earthquake ground shaking with a small threat of building failure or major damage. In comparison, buildings made with unreinforced masonry typically provide little earthquake resistance. The City of Buellton does not contain any unreinforced masonry buildings. Many of Buellton's buildings are one or two stories high and made with wood frame construction, which is considered relatively resistant to earthquake damage.

Groundshaking can also cause liquefaction, subsidence, lurch cracking, and lateral spreading. Although there is potential for these hazards to occur in Buellton, no areas of abnormally high risk have been identified within the City.

Liquefaction, when solid soils and sediment are temporarily transformed from a solid to a liquid from increased pressure, can occur in Buellton during a major earthquake. The liquefaction potential is highest in areas with sandy, alluvial soil and shallow groundwater, such as areas of the City nearest the Santa Ynez River and Zaca Creek. A major portion of the City can be considered as having low to moderate liquefaction potential. Liquefaction hazards can be avoided with proper foundation engineering based on an analysis of the soils on a given building site.

Subsidence is the compaction of soils and alluvium caused by groundshaking. In Buellton, the potential for subsidence is greatest in areas underlain by alluvium or other soft water-saturated soils. However, no substantial subsidence problems have been identified in the City.

Lurch cracking refers to fractures, cracks, and fissures produced by groundshaking. Lateral spreading is the horizontal movement of soils toward an open face of a stream bank or the side of a levee. The potential for these hazards is greatest on steep-sided alluvial soils where the groundwater table is high. In the City, this would include areas adjacent to the Santa Ynez River.

Landslides and erosion can occur in Buellton along the bank of the Santa Ynez River if structures are built close to the edge. The City requires all structures to be at least 200 feet from the bank of the river so these hazards are less likely to occur.

Policies have been developed by the City to reduce the risk of seismic hazards. All new development must adhere to the California Building Code regarding seismic safety. Geologic studies must be conducted for new development to be constructed on slopes greater than 10%, and in areas mapped by the Natural Resource Conservation Service as having moderate or high-risk liquefaction, subsidence, and/or expansive soils. Similarly, evaluation reports must be conducted by engineers for all new development proposals for subdivisions or structures for human occupancy. New development must also minimize erosion hazards by incorporating features such as additional landscaped areas, parking lots with bio-infiltration systems, permeable paving designs, and storm water detention basins. The development of critical facilities is restricted in areas determined to be high-risk geologic hazard zones.

Aside from flooding and seismic hazards, Buellton faces two types of fire hazards, urban and wildland fires. The outbreak and spread of wildland fires outside the City is a potential danger, particularly during the dry summer and fall months. Wildland fires can result in the loss of natural vegetation, loss of crops, and soil erosion.

Urban fires can occur in any part of the City. Over the years, development standards have become more stringent to reduce the frequency and severity of such events. Building codes require fire walls for adjacent structures and local ordinances often prohibit the use of fire-prone materials, such as shake-shingle roofs. Electrical standards have also changed to reduce the fire risk inside structures and smoke detectors are now commonly required. Urban fire hazards are greatest in areas containing older buildings that do not meet the current building code, despite the City requiring that such buildings be brought up to code. Utility facilities also present a potential urban fire hazard. Earthquakes or floods may rupture buried gas lines, while high winds or accidents could cause overhead electric lines to break. While Buellton has had urban fires, most have been relatively small and easily contained. No catastrophic fires have been recorded in recent history, particularly since emergency response and building codes have been improved.

Hazardous materials, such as household products, asbestos, lead-based paint, and aerially-deposited lead, can be found in the City. To reduce the negative effects of household products, Buellton hosts a quarterly Household Hazardous Waste Round-up, when such materials are accepted free of charge at the Buellton Wastewater Treatment Plant property (run by MarBorg Industries). Santa Barbara County also has a hazardous waste management plan.

In addition to hazardous material and hazardous waste hazards, Buellton is susceptible to other man-made hazards such as highway accidents. To reduce the number of traffic accidents, the City will work with the California Department of Transportation (Caltrans) to require all transportation of hazardous materials to follow Caltrans-approved routes. The City's operations do not include hazardous materials, particularly any which creates a potential hazard. However, the City incorporates risk management measures, operating procedures, training requirements, equipment maintenance and inspection practices, and emergency planning and response methods for the water and wastewater treatment facilities.

Buellton has adopted development standards and standard conditions of approval for new mixed-use development projects to ensure commercial and industrial uses do not pose substantial health risks to residential components. Similarly, the City requires hazardous materials assessments for soil and groundwater contamination for new construction within a quarter-mile of commercial and industrial uses. The land must be remediated if contamination is identified.

The City of Buellton has adopted California's Standardized Emergency Management System, which meets the objectives of the National Incident Management System (NIMS), a nationwide approach for federal, state, local, and tribal governments to work together more effectively and efficiently to prevent, prepare for, respond to and recover from disasters. The City adopted Resolution No. 06-25 in 2006, designed to integrate NIMS into their emergency management system, and all department heads have taken the required NIMS courses.

Land Use Element

The Land Use Element of the General Plan suggests that the City of Buellton would like to concentrate development within the City limits and the Urban Growth Boundary line. Its Sphere of Influence is coterminous with the City Limits and Urban Growth Boundary. Therefore, growth patterns in the near future would be infill. The preference of not expanding the Sphere of Influence is mandated in the General Plan so that agricultural, watershed and open space lands are not prematurely or unnecessarily converted to other non-agricultural or non-open space uses

without public debate and a vote of the people. The protection of such lands not only ensures the continued viability of agriculture, but also contributes to flood control and protection of wildlife, environmentally sensitive areas, and irreplaceable natural resources.

Since the last update of the City's LHMP in 2017, land use and population in the City have not substantially changed. Modest development has occurred consistent with the adopted Land Use Element and has primarily comprised infill development and redevelopment within the City limits. There has been no expansion of the City boundary or its Sphere of Influence (SOI) and no comprehensive changes to the Land Use Element that would result in substantial densification. Further, City population has not substantially changed. As a result, the City's level of vulnerability to hazards analyzed in Section 6.0, *Vulnerability Assessment*, has not substantially changed due to land use, development, or population growth since the last update of the LHMP.

The Land Use Element contains several policies that promote hazard mitigation in Buellton. New development is restricted from areas where natural conditions are likely to pose a substantial threat to public safety or produce excessive maintenance costs. To ensure all residents do not lack necessary utilities, all new development is not allowed unless adequate public services are available to serve the development. The City will also investigate the potential for changing land use designations and zoning districts for properties subject to flooding and with limited access to open space upon the next Land Use Element Update in 2025.

Housing Element

Based on the Buellton General Plan 2025, the City has an adequate water and sewer capacity to meet the expected build-out in 2025 (an approximate population of 6,100). This population increase equals an additional 500 dwelling units (2.8 persons per dwelling unit). Dry utilities, such as power and gas, should be available to all designated sites.

Development in the City of Buellton is subject to a Zoning Ordinance and the California Building Code that establishes minimum standards for all classes of construction.

One housing program that mitigates the potential for housing damage during the event of a disaster involves the City promoting the repair, rehabilitation, and improvement of mobile homes and residential structures that are substandard or in disrepair. Blighted conditions and unsafe structures should be abated and tenants will be afforded protection if they need to be displaced from their residence. Field surveys conducted at the end of 2008 and updated in 2013 suggest that Buellton's overall housing rehabilitation needs are modest, with less than five percent of the City's housing deemed substandard.

The City plans to adopt an updated Housing Element by February 2023 for the 2023-2031 planning period, which will re-evaluate expected buildout potential, utility capacity, and effectiveness of previous housing programs such as the mobile home rehabilitation program.

Public Facilities and Services Element

A shortage of critical materials, such as a clean water supply, is a hazard that jurisdictions strive to avoid. In Buellton, water is supplied by the City of Buellton Public Works Department. As stated above, the City has an adequate water and sewer capacity to meet the expected build-out forecasted for 2025. The water and sewer infrastructure varies in age. Fire flows were last reviewed in 2017, which showed that fire flow is adequate. Water and Sewer Master Plans are

scheduled to be updated to evaluate recent growth and recommend appropriate capital improvement projects for any necessary upgrades. Both water and sewer facilities undergo regular maintenance activities to ensure the systems are operational.

Another hazard that jurisdictions strive to avoid is a utility mishap. The General Plan indicates that natural gas, electricity, and telephone are all provided within the City. All new development is required to underground all utilities. The undergrounding of utility cables can prevent a power/utility service outage in Buellton during flooding, high winds, and earthquakes.

Fire and police protection is also a concern of Buellton, as ensuring the capabilities of these departments helps aid hazard mitigation. The General Plan indicates that the Santa Barbara County Fire Department provides fire protection for the City. The City also has a mutual aid agreement with every fire protection agency in Santa Barbara County. The fire department is equipped to deal with such hazards as wildland fires, urban fires, medical emergencies, and hazardous materials incidents. The City will continue to refer development plans to the Fire Department to assure the adequacy of structural fire protection, access for firefighting, water supply, and vegetation clearance. Police services within the City of Buellton are provided by the Santa Barbara County Sheriff's Department.

4.8.2 Zoning and Subdivision Ordinances

The State of California has empowered all cities and counties to adopt zoning ordinances. Buellton's original Zoning Ordinance was adopted on July 22, 1993, and has been amended several times. It is codified in Title 19 of the Municipal Code. Buellton adopted a Subdivision Ordinance on November 10, 1994, reference Buellton Municipal Code Title 18.

Buellton has a five-member Planning Commission, which is an advisory body to the City Council. The Commission was established under State law to provide relief in special cases where the exact application of the terms of the ordinance would be unduly restrictive and cause hardship, in addition to generally reviewing zoning and subdivision proposals. The Planning Commission hears and decides upon the interpretation and the application of the provisions of the Zoning and Subdivision Ordinances. Although the Commission has certain discretionary powers in making its decisions, the Commission must always abide by and comply with the powers granted to it by the local Zoning and Subdivision Ordinances and the State's enabling acts. Additionally, the Planning Commission may recommend actions to the City Council and the Planning Commission's actions may be appealed to the City Council.

4.8.3 Building Codes

The State of California has adopted the most recent California Building Codes, which is enforced in Buellton, through its contracting agency, Santa Barbara County Building & Safety.

Buellton contracts with the County of Santa Barbara (County) and the County's Inspections Department is principally responsible for enforcing State, City, and County Codes for building residential and commercial structures, enforcing environmental codes, and guidelines for maintaining existing structures.

The ISO is an insurer-supported organization that provides advisory insurance underwriting and rating information to insurers. The ISO uses a rating scale of 1 to 10 with 1 to 3 being the highest rating given. The County's evaluation can be used as a basis for providing rating credits to individual property insurance policies.

4.8.4 Floodplain Management Ordinance

Buellton has a Floodplain Ordinance requiring all habitable floors to be built a minimum of two feet above the 100-year floodplain and the special flood hazard areas. However, many parts of Buellton were built before incorporation and floodplain requirements.

Buellton sustained flood damage in February 1993 and February 1998 following heavy rainstorms. A Local Emergency was declared on February 5, 1998, following substantial storm flooding. Following the 1998 storm, Buellton had significant flooding on La Pita Place, Irelan Drive, and Second Street due to an overflowing flood control basin in the area. Thumbelina Creek overflowed its banks onto Kendale Road and there was significant foothill flooding on Via Corona Drive and Calor Drive with two feet of mud in this residential area. Buellton completed a Drainage Master Plan in 2017 that identifies areas that need improvements for flood control purposes. In addition, the City annually cleans all storm drain inlets and catch basins in the fall and Santa Barbara County Flood Control cleans flood basins, streams, and flood channels within the city limits annually to ensure facilities can handle storm flow.

The FIRMs are developed through the NFIP and were last updated in December 2012 and made available in GIS format as Digital Flood Insurance Rate Maps. Also on file with the Santa Barbara Operational Area Office of Emergency Services, County Flood Control, and the Santa Barbara City Public Library are maps that identify floodplains, along with evacuation routes and locations of public shelters. They are used by both the public and private sectors to determine flood insurance requirements and rates and to administer Buellton's Floodplain Management Ordinance (Title 17, Chapter 17.04 of the Buellton Municipal Code).

Floodplain districts identified in the FIRMs include the following flood hazard zones and definitions:

- **Zone A** is the flood insurance rate zone that corresponds to the 100-year floodplains that are determined in the Flood Insurance Study (FIS) by approximate methods. Because detailed hydraulic analysis is not performed for such areas, no Base Flood Elevations or flood hazard factors are determined.
- **Zone AO** is the flood insurance rate zone that corresponds to areas of 100-year shallow flooding where depths are between one (1) and three (3) feet; average depths of inundation are shown, but no flood hazard factors are determined.
- **Zone A1-A30** is the flood insurance rate zone that corresponds to areas of 100-year flood; base flood elevations and flood hazard factors are determined.
- **Zone B** is the flood insurance rate zone that corresponds to areas between limits of the 100-year flood and 500-year flood, or certain areas subject to 100-year flooding with average depths less than one (1) foot or where the contributing drainage area is less than one square mile; or areas protected by levees from the base flood.

- **Zone C** is the flood insurance rate zone that corresponds to areas of minimal flooding.

4.8.5 National Flood Insurance Program (NFIP) and Repetitive Loss (RL) Properties

The City is part of the National Flood Insurance Program (NFIP). The NFIP aims to reduce the impact of flooding on private and public structures. It does so by providing affordable insurance to property owners and by encouraging communities to adopt and enforce floodplain management regulations. These efforts help mitigate the effects of flooding on new and improved structures. Repetitive Loss Properties are defined as property that is insured under the NFIP that has filed two or more claims above $1,000 each within any consecutive 10-year period since 1978. There are no Repetitive Loss Properties within the City of Buellton.

4.8.6 City of Buellton Storm Water Management Program

In California, the State Water Resources Control Board (SWRCB) has determined that urban runoff is a leading cause of pollution throughout the state, with impacts on both human health and aquatic ecosystems. The SWRCB identified the City of Buellton as a small municipal separate system requiring coverage under the National Pollutant Discharge Elimination System (NPDES) *General Permit for Storm Water Discharges from Small Municipal Separate Storm Sewer Systems (MS4s)*, Water Quality Order No. 2003-0005-DWQ (General Permit). A requirement of the General Permit is the development of a Storm Water Management Program (SWMP) to reduce the discharge of pollutants.

The General Permit also requires the development and implementation of Best Management Practices (BMPs) to address six Minimum Control Measures (MCMs). This includes the following:

1. Public Education and Outreach on Storm Water Impacts;
2. Public Involvement and Participation;
3. Illicit Discharge Detection and Elimination;
4. Construction Site Storm Water Runoff Control;
5. Post-Construction Storm Water Management in New Development and Redevelopment; and
6. Pollution Prevention/Good Housekeeping for Municipal Operations.

The Storm Water Management Plan has been prepared by the City of Buellton and describes the City's program necessary to comply with the General Permit. It also serves as a framework for identifying, assigning, and implementing control measures and BMPs intended to reduce the discharge of pollutants and protect downstream water quality.

Its purpose is to serve as a planning and guidance document to be used by the City's regulatory body; to define techniques and measurable goals for measuring BMP effectiveness, and to define a five-year schedule for SWMP implementation to comply with the General Permit requirements.

Following a description of the City of Buellton, the document comprehensively describes the Minimum Control Measures. They comprise the most substantive section of the Storm Water Management Program:

1. Public Outreach and Education

This measure is intended to ensure greater public support and compliance for the storm water management program. Specifically, they teach the public the importance of protecting stormwater quality. The City has already begun and will continue to partner with other local municipalities, such as the County of Santa Barbara and the Cities of Lompoc, Santa Maria, Solvang, Goleta, Santa Barbara, and Carpinteria to develop materials and host civic events.

The City also implements BMPs, including the use of 1) Brochures; 2) Web Pages; 3) Events; 4) Educational programs for children; 5) Storm Drain Markings; 6) Stormwater Hotlines; 7) Direct Mail/Media campaigns; 8) Business outreach programs; 9) Botanical garden exhibits; 10) Public surveys; and 11) Ongoing assessments of social marketing strategies. The SWMP also includes effectiveness measures and measurable goals for each respective BMP.

2. Public Participation and Involvement

The goal is to foster active community support for the SWMP. The City implements BMPs, including 1) Regular public meetings; 2) Regular coordination efforts among local agencies/stakeholders; 3) Community clean-ups; 4) Water quality hotlines; 5) and Lists of interested parties. The SWMP also includes effectiveness measures and measurable goals for each respective BMP. Its purpose is to assure that the program will be supported by City residents and will provide input to guide the development of the program in the future.

3. Illicit Discharge Detection and Elimination

The City will enhance its current system to identify and eliminate illicit discharges throughout the permit area. A map identifying "trouble spots and potential illegal dumping areas" in the City has been developed and will be updated as needed.

The City implements BMPs, including 1) Maps of the storm drain system; 2) Storm water ordinances; 3) Education and outreach programs; 4) Education/Training of municipal employees; 5) Identification and elimination of illicit discharge sources; 6) Drain filters for commercial connections; 7) Wastewater programs; and 8) Pet waste disposal program. The City intends to maintain ongoing efforts to control illicit discharge at current levels by implementing these BMPs. The SWMP also includes effectiveness measures and measurable goals for each respective practice.

4. Construction Site Runoff Control

The purpose of construction site runoff controls is to prevent soil and construction waste from entering the storm water. The City will review its current Excavation and Grading Code and standard practices for compliance with the minimum requirements – according to the USEPA. It will also require all construction projects to collect construction waste and materials on-site and dispose of them legally and properly.

The City implements BMPs, including 1) Construction Site Enforcement, Inspections; 2) Development of construction site inspection and enforcement procedures; 3) Development of procedures for review of grading/erosion control/construction site plans; 4) Discretionary projects – conditions of approval; 5) Staff training; 6) Construction workshop; 7) Construction site stormwater control ordinance; and 8) Procedures for receipt and consideration of information from the public. The SWMP also includes effectiveness measures and measurable goals for each respective BMP.

5. Post-Construction Runoff Control

This minimum control measure focuses on site planning and design considerations, which are most effective when addressed in the early stages of project development. The goal of the program is to integrate basic and practical storm water management techniques into new development to protect water quality.

The City adopted and is implementing/applying water quality protection policies related to hydromodification control criteria (post-construction requirements – PCRs) to new development and redevelopment projects. The City has adopted/developed guidance for PCRs, including design, monitoring, maintenance, and inspection requirements and guidance to assist developers in the selection, design, and maintenance of hydromodification control measures.

The City implements BMPs, including 1) Review of regulations; 2) Staff training; 3) Plan review; 4) inspection of post-construction stormwater BMPs; 5) Long-term monitoring of post-construction stormwater BMPs; 6) Master drainage plan; 7) Long-term watershed protection and plan; 8) Use of low impact development in project design; 9) Adoption of hydromodification control criteria; and10) Education and outreach efforts. The SWMP also includes effective measurable goals for each respective practice.

6. Pollution Prevention Control and Good Housekeeping for Municipal Operations

The purpose of this minimum control measure for Municipal Operations/Good Housekeeping Practices is to assure that the City's delivery of public services occurs in a manner protective of storm water quality to the maximum extent practical and protect overall water quality. In this way, the City may serve as a model to the community.

The City implements BMPs, including 1) Training of employees on stormwater pollution prevention; 2) Street sweeping; 3) Storm drain cleaning; and 4) Trash, green waste, and recycling. Data collected for each measurable goal will be compiled, reviewed, and summarized as a part annual report to the Regional Water Quality Control Board (RWQCB).

Monitoring and Reporting Requirements. The purpose of monitoring and reporting is to document the successful implementation of the SWMP and determine the program's effectiveness at reducing pollutants to the MEP and protecting water quality. The General Permit requires that annual reports be submitted annually upon approval of the City's SWMP. The City intends these annual reports to cover the fiscal year immediately before the reporting period.

4.8.7 City of Buellton Wastewater Treatment Plant

The City of Buellton is located in northern Santa Barbara County and operates a publicly owned treatment works facility whose discharge influences the Santa Ynez River. In recognition of this important asset, the City has regularly reviews and updates its Wastewater Facilities Master Plan.

Its scope includes a forecast of demographic and planning development until the year 2030 and an estimation of the respective wastewater flow characteristics; an evaluation of the WWTP's overall performance; an evaluation of the entire treatment process; and an array of recommendations for expansion or modifications to accommodate future needs.

Land Use and Population

The City of Buellton is likely to continue its growing population trend over the next 40 years. Based on the 2020 Census, its population is 5,161 persons and the average density was 2.6 persons per household. The City's population in 2040 is expected to reach 7,400 persons, based on SBCAG's Regional Growth Forecast for 2010-2040. Since one-third of the City's area is categorized as low-density residential, the forecasted population increase is not expected to reach full build-out until between 2040 and 2050.

Wastewater Flows and Characteristics

Existing wastewater characteristics form the basis for defining and projecting future wastewater characteristics. The findings and observations are summarized as follows:

- Wastewater flows per capita are 88 gpcd, compared to the expected range of 70 to 80 gpcd for a California city. This may be attributed to an increased number of hotels/tourism, contributions from wineries, and it may indicate the potential for water conservation measures.

Future wastewater characteristics are planned for a 20-year horizon and use the 2027 estimated population of 6,260 people with a per capita wastewater flow of 80 gpcd. Using this scenario, organic loading is expected to increase from approximately 1,100 lb/day in 2007 to 1,500 lb/day in 2027. It is noted that projected demands for flow and organic loading are based on current loadings, which include a combination of residential and commercial/industrial sources. If future components of commercial/industrial development occur, it is recommended that the City project organic and flow demands carefully as part of the development approval process.

Regulatory Review

Wastewater discharge requirements are not anticipated to change through the planning period. Nevertheless, a few items are addressed:

- Effluent nitrogen sampling suggests down-gradient impacts to water quality in the area of percolation ponds. This impacts the groundwater and should be addressed to comply with the current Waste Discharge Requirements (WDRs).
- The City should ensure that all aspects of the effluent monitoring and reporting program comply with the revised monitoring program of March 2006.
- The City should consider refining its groundwater monitoring program to include off-site wells where practical and should survey wells to determine flow gradients of groundwater in and around the site.

Wastewater Treatment Plant Improvements

Based on the current assessment of the wastewater treatment plant, –and the following recommendations are included:

- *Standby Power*: It is inadequate to meet current and future needs.
- *Headwork Influent Channel Improvement:* To accommodate peak and build-out flows.
- *Pre-Aeration Basin Improvements:* Update mixer efficiency and baffle curtains.

- *Extended Aeration Basin Improvements:* Blower upgrades, extended basins, bypass improvements.
- Clarifier RAS Pump Improvements: pump and piping upgrades.

The City is currently evaluating the WWTP Master Plan.

4.8.8 City of Buellton Emergency Operations Plan

The 2018 Emergency Management Plan (EMP) for the City of Buellton addresses the planned response to emergencies associated with natural disasters, technological incidents, and national security emergencies that occur within or affect the City. The plan does not address normal day-to-day emergencies. The Plan:

- establishes the emergency management organization required to respond to and mitigate any significant emergency or disaster affecting the City;
- identifies the policies, responsibilities, and procedures required to protect the health and safety of the city community, public and private property, and the environmental effects of natural and technological emergencies and disasters; and
- establishes the operational concepts and procedures associated with field response to emergencies, the City's Emergency Operations Center (EOC) activities, and the recovery process.

It establishes the framework for implementation of the California Standardized Emergency Management System (SEMS) and the National Incident Management System (NIMS) in the City of Buellton. The document is a concept of operations guide, intended to facilitate multi-agency and multi-jurisdictional coordination in emergency operations, particularly between the City of Buellton, Special Districts, and the Santa Barbara County Operational Area.

The scope presented in the EMP applies to all elements of the City's Emergency Organization during all phases of emergency management. Its primary audience is intended for emergency management staff from the city and other interested parties (e.g. the Federal government, other State or local governments, and volunteer agencies).

The EMP is organized into three sections.

- **Part One - Basic Plan**. Overall organizational and operational concepts relative to response and recovery, as well as an overview of potential hazards, are described in this section. Its intended audience is the Emergency Operations Center (EOC) Management Team.
- **Part Two - Emergency Organization Functions**. It is a description of the emergency response organization and emergency action checklists. The intended audience is EOC staff.
- **Part Three – Supporting Documents.** These documents identify both SEMS and NIMS compliance information, as well as other required State information.

Hazard mitigation is discussed in *Part One- Basic Plan* and includes a series of programs and best management practices to efficiently minimize the risks to natural hazards. They are:

1. Enhance public awareness and understanding;

2. Create a decision tool for management;
3. Promote compliance with State and Federal program requirements;
4. Enhance local policies for hazard mitigation capability;
5. Provide inter-jurisdictional coordination of mitigation-related programming;
6. Achieve regulatory compliance.

Through the use of these practices and the acknowledgment of Federal and State Hazard Mitigation Programs, the City of Buellton is cognizant of the resources available and the method by which to leverage them -- before, during, and after an event.

4.8.9 SEMS Multi-Hazard Functional Plan

Buellton's most recent Standardized Emergency Management System (SEMS) Multi-Hazard Functional Plan was last adopted on September 13, 2018. The Plan discusses mitigation in the form of training and exercises, which are essential at all levels of government to make emergency operations personnel operationally ready. All emergency plans should include provisions for training. The objective is to train and educate public officials, emergency response personnel, and the public. The best method for training staff to manage emergency operations is through exercises. Exercises are conducted regularly to maintain the readiness of operational procedures. Exercises provide personnel with an opportunity to become thoroughly familiar with the procedures, facilities, and systems that will be used in emergencies. There are several forms of exercises:

- Tabletop exercises provide a convenient and low-cost method designed to evaluate policy, plans, and procedures and resolve coordination and responsibilities. Such exercises are a good way to see if policies and procedures exist to handle certain issues.
- Functional exercises are designed to test and evaluate the capability of an individual function such as evacuation, medical, communications, or public information.
- Full-scale exercises simulate an actual emergency. They typically involve complete emergency management staff and are designed to evaluate the operational capability of the emergency management system.

The SEMS Multi-Hazard Functional Plan will be updated to reflect the current hazard risk assessment and mitigation activities identified in this hazard mitigation plan annex.

4.9 OPPORTUNITIES FOR MITIGATION CAPABILITY IMPROVEMENTS

The City 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 City 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 City to expand or improve on these policies and programs to further protect the community:

- **Regulatory Opportunities**: As part of this update, the City will comply with AB 2140 by amending its Safety Element to incorporate the LHMP by reference. The City will consider the

LHMP in policy, land use plans, and programs, including floodplain management and planning.

- **Administrative/Technical Opportunities**: The City could improve its resilience to ensure emergency response operations are sustained during a hazardous event, including improvements to public safety facilities and planning. The City aims to purchase a backup generator for City Hall that will be utilized in the event of an emergency to ensure there is power available for the EOC. Enhancements to hazard training for staff in partnership with the County and other agencies or stakeholders would improve the City's ability to mitigate hazards with the latest knowledge and resources.
- **Outreach Opportunities**: Enhanced community outreach, emergency notifications, and trainings would further enhance the City's capabilities to respond to and recover from hazards. The City will seek opportunities to include information on our various outreach platforms related to hazards and emergency response. The City could expand outreach through digital tools such as social media, participate in the Great California ShakeOut, and increase FireWise outreach events and media coverage.
- **Fiscal Opportunities**: The City can update its CIP to include hazard mitigation actions from the LHMP and related documents such as the Emergency Operations Plan and SEMS Multi-Hazard Functional Plan. The City will continue to seek grants (e.g., HMGP, BRIC) to fund these CIP projects and related projects in the City's mitigation strategy. The City can seek opportunities to partner with the County and/or other stakeholder agencies in grant applications to address regional hazards more effectively. The City could also consider expanding its fiscal capabilities through its annual budget process and other revenue measures (e.g., raising taxes, property assessments, bonds).

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 City of Buellton LHMP. The intent is to confirm and update the description, location and extent, and history of hazards facing the City now and in the future. This assessment also considers the potential exacerbating effects of climate change. The City of Buellton is not located along the coast so sea level rise associated with climate change would not occur. However, storms with increased severity could exacerbate flooding impacts within the City as well as increase fire hazards. Drought is also associated with 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 City.

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 City LPT refined the list of hazards applicable to the City 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 City'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. Applicable hazard information from the City's 2017 LHMP was incorporated during the development of this section. A comprehensive treatment of hazards and their descriptions may be found in Chapter 5.0 of the Santa Barbara County 2022 MJHMP.

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

Table 5-1. City of Buellton Local Priority Hazards

Hazard Type and Ranking	Score	Planning Consideration Based on Hazard Level
Earthquake	5	Significant
Wildfire	2	Significant
Flooding	2	Significant
Landslide	1	Moderate
Drought/Water Shortage	1	Limited
Power Outage/Energy Shortage	1	Limited
Dam/Levee Failure	1	Limited
Pandemic/Public Health Emergency	1	Limited

To continue compliance with the DMA of 2000, the City 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 City in subsections below. The City's LPT acknowledged the following hazards are either not a threat, are highly unlikely within the City limits, or are adequately addressed by the 2022 MJHMP and do not require additional information to be relevant to the City's hazard setting; therefore, these hazards are not addressed further in the

City's LHMP: extreme heat, erosion/coastal erosion, sea level rise, severe weather/storm, windstorm, hurricane, tornado, tsunami, utility failure, oil spill, natural gas pipeline rupture and storage facilities, hydraulic fracturing and well stimulation, radiological and nuclear accidents, levee failure, aircraft crash, and train accidents, cyber threats, agricultural pests and invasive species, terrorism, and civil unrest. These additional hazards are being addressed in the more comprehensive 2022 MJHMP.

5.3 EARTHQUAKE & LIQUEFACTION

A more complete description of the earthquake and liquefaction hazards is found in Chapter 5.0, *Hazard Assessment* of the 2022 MJHMP.

The City is located in the Santa Ynez Valley, a wedge-shaped topographic depression bounded by the Santa Ynez Mountains on the south, the San Rafael Mountains to the east and north, and the Purisima Hills on the west. It is a down-dropped structural block between two major faults. On the south, the east-west trending Santa Ynez Fault forms the base of the uplifted Santa Ynez Mountains and extends from Ventura County across the entire width of Santa Barbara County.

The City is located in Seismic Zone 4, which is the highest potential status for earthquake activity in the state of California. Buellton's fault lines and liquefaction zones are mapped (see Section 5.0, *Hazard Assessment* of the MJHMP). The City, in conjunction with County Building and Safety, has examined all structures within the City limits and determined that Buellton has no un-reinforced masonry buildings located within Buellton. All of Buellton's water reservoirs are located underground and following the 6.5 San Simeon Earthquake in December 2003, Buellton's Public Works Department determined that all water reservoirs were unaffected and continued to operate normally. Reservoirs 1 and 2 have been completely reconstructed and upgraded as of 2015/2016.

5.4 WILDFIRE

The threat of a wildland fire affecting Buellton is high due to the presence of dense, flammable vegetative fuels on land surrounding the City adjacent to the City's wildland-urban interface and especially in the hills surrounding the City. The wildland-urban interface is where structures and other human development meet or intermingle with wildland or vegetative fuels. The threat is particularly significant during dry summer months and when there are strong Santa Ana winds. The fire season extends approximately 5 to 6 months, from late spring through fall.

Buellton contracts with Santa Barbara County for Fire Protection Services. All high fire zones within Buellton are mapped. The Fire Department, as well as Santa Barbara County Building & Safety, requires that all commercial development over 5,000 square feet install indoor sprinklers and use fire-resistant building materials. Within the unincorporated areas surrounding Buellton, the Fire Department has a vegetative management program that annually inspects all lots in early spring and advises property owners that all brush must be removed by July 1. Within the City Limits, the Buellton Code Enforcement Officer and County Fire undertake a weed abatement program in the Spring.

5.5 FLOOD

In Buellton, hazardous flooding events are most commonly associated with the Santa Ynez River. On July 22, 1993, Buellton adopted a Floodplain Ordinance, (Ordinance No. 17.04). Buellton's Floodplain Ordinance requires all new buildings to be built at least 200 feet from the top of the bank of the Santa Ynez River and all new buildings are constructed 2 feet above the flood zone. When new projects go through Buellton's approval process, the Planning Commission, City Council, and City Engineer ensure the wastewater treatment plant is protected from flooding inundation.

5.6 LANDSLIDE

Though some areas of the City lie within mapped landslide hazard areas, Buellton has never had a hazard involving landslides; see also, Section 6.2, *Landslide* below for an analysis of vulnerabilities within the City. Coastal erosion is not a concern to the City of Buellton as it is located inland from the coast.

5.7 DROUGHT & WATER STORAGE

At this time, the City's primary water source is groundwater from the Santa Ynez River Underflow and the Buellton Uplands. Water supply is supplemented by the State Water Project. Groundwater supply is currently not in danger of overdraft and can adequately supply the City's water. However, to ensure the sustainability of the City's water supply, the City implements water conservation measures in its operations and maintenance as well as provides and participates in water conservation programs.

The City has 3 in-ground concrete reservoirs for storage, ranging from 180,000 gallons to 850,000 gallons and original construction in 1958. The reservoirs do not serve as long-term storage, but rather have fairly fast turnover rates due to community usage.

The City continues to regularly coordinate with local and regional agencies to review its policies and programs for the city operations and the local community regarding water and resource conservation.

Currently, the City funds a landscape rebate program, operates the Buellton Green Scene Program (a community resource sustainability program and outreach), and participates in the Regional Water Efficiency Program, the County's Green Business Program, and the Integrated Regional Water Management Plan.

5.8 ENERGY SHORTAGE & RESILIENCE

Energy access is one of the key impacts of disasters that mitigation actions can have a significant influence on resiliency. Any event that disrupts power for more than a day, can cause significant social disruption, energy, and potential deaths. The current reliance on relatively few power production stations with a power distribution grid spreading over thousands of miles of terrain with the myriad of threats and hazards that the distribution system is subject to makes the normal

operation of the system seem miraculous. The City of Buellton receives all of its commercial power from Pacific Gas and Electric (PG&E).

The City has limited ability to affect resiliency in the power distribution system. It actively participates in reducing its power usage and partners with PG&E, the State of California, and Federal energy conservation programs.

The City has entered into a five-year contract with PG&E from August 2020 through August 2025 to allow use of one of the City parks, River View Park, as a Community Resource Center during a Public Safety Power Shutoff (PSPS) event. The Community Resource Center will provide temporary power and other facilities and services in order to limit disruption to Buellton and Santa Barbara County residents of their access to power during one of these events.

In 2022, the City installed solar panels at city facilities, including the wastewater treatment plant, Well 7, and the McMurray pump station. This will provide an alternative power source in case of disruption.

5.9 DAM/LEVEE FAILURE

Buellton lies approximately 15 miles west of the Bradbury Dam and sits along the Santa Ynez River. If the dam were to fail, Buellton could sustain substantial flooding via the Santa Ynez River. It has been established that the Bradbury Dam has been mapped for inundation. Flooding associated with dam failure on one of the local or upstream dams has a low probability for occurrence. A significant seismic retrofit of Bradbury Dam was completed in 2006 which brought the dam up to federal standards for seismic safety.

5.10 PANDEMIC/PUBLIC HEALTH EMERGENCY

The City, as well as the county, state, nation, and the entire world, is vulnerable to outbreaks, epidemics, and pandemics caused by either newly emerging or existing diseases spread person to person, through a vector such as a mosquito, or both. A significant public health emergency can have a considerable impact on the population, the economy, and essential public services (e.g., fire and police protection, medical services, etc.). Populations identified by the county as especially vulnerable to human health hazards include undocumented persons, senior citizens, senior citizens living alone, persons with existing chronic health conditions, persons experiencing houselessness, overcrowded households and neighborhoods, low-resourced ethnic minorities people of color, households in poverty, communities with a high-pollution burden, and those without health insurance. Undocumented or non-English speaking individuals may be less able to understand such pandemic-related instructions or receptive to responding to government outreach, while lower-income households may lack the means to comply with the direction. Trends of the COVID-19 pandemic further revealed vulnerable groups within Santa Barbara County population, including residents of Buellton.

Residents' health care needs are met by medical resources in Buellton, and regionally in the City of Santa Maria and the City of Santa Barbara. As demonstrated by the COVID-19 pandemic, health care resources were strained throughout the county. Further, hospitality, retail, tourism, and hospitality industries have been adversely affected economically through reduced activity and a

limited workforce, including business in the City. The City relies on the Federal, State, and County Health and Human Services systems to monitor and mitigate potential catastrophic disease outbreaks.

Buellton's limited population and location within the relatively sparsely populated Santa Ynez Valley would tend to mitigate some of the risks associated with a pandemic or other public health emergency, as the recent COVID-19 pandemic has shown. However, there is still the potential for considerable risk to the health and safety of residents and visitors, as well as an even greater potential for economic impacts due to measures that may need to be taken to respond to such an event.

6.0 VULNERABILITY ASSESSMENT

The vulnerability assessment builds on the hazard assessment provided in Section 5.0 to estimate losses where data is available and consider a specific list of critical facilities identified within the City of Buellton. The City identified 19 critical facilities to be included in the Vulnerability Assessment portion of the LHMP. These facilities primarily included wastewater treatment facilities, fire stations, and government structures. Of the available data, it was shown that these buildings are worth approximately $3,502,993 in total value (Table 6-1).

Table 6-1. Critical Facilities in the City of Buellton

Type	Name	Address	Total Building Value
Wastewater Treatment Plant	Buellton Wastewater Treatment Facility	79 Industrial Way	$1,060,000
Water Treatment Plant	McMurray Road Water Treatment Facility		$318,427
Water Treatment Plant	Highway 246 Water Treatment Facility		$228,047
EMS Station	SANTA BARBARA COUNTY FIRE DEPARTMENT STATION 31	168 WEST STATE HIGHWAY 246	-
EMS Station	AMERICAN MEDICAL RESPONSE - SANTA BARBARA COUNTY	240 EAST STATE HIGHWAY 246	-
Senior Center	BUELLTON SENIOR CNTR	164 W HWY 246	$352,273
Education	Oak Valley School	595 2nd St	-
Education	Jonata School	301 2nd St	-
Fire Station	FIRE STATION #31	168 W HWY 246	$1,059,702
Fire Station	FIRE DEPT. OPERATIONS OFFICE	166 W HWY 246	$422,273
Government	STORAGE BUILDING # 2	164 W HWY 246	$33,501
Highway Patrol	CALIFORNIA HIGHWAY PATROL - BUELLTON	166 INDUSTRIAL WAY	-
Sheriff	BUELLTON SHERIFF'S OFFICE	140 W HWY 246	$28,770
Bridge - Non Scour Fair Condition	Bridge	'AVE OF THE FLAGS' / 'ZACA CREEK'	-
Bridge - Non Scour Good Condition	Bridge	'U.S. HIGHWAY 101' / 'ZACA CREEK'	-
Bridge - Non Scour Good Condition	Bridge	'STATE ROUTE 246' / 'ZACA CREEK'	-
Bridge - Non Scour Good Condition	Bridge	'STATE ROUTE 246' / 'US HIGHWAY 101'	-
Bridge - Non Scour Good Condition	Bridge	'DAMASSA ST' / 'US HIGHWAY 101'	-
Bridge - Non Scour Good Condition	Bridge	'MCMURRAY RD' / 'ZACA CREEK'	-

No values were able to be obtained for many major facilities, so the actual value may be much more than this amount. Additionally, building values are estimated and are likely below the actual replacement cost.

Using a GIS and the mapped extents of the hazards affecting the City, it was determined which critical facilities are exposed to which hazards depending on whether they fall within the mapped hazard area. The results of the exposure analysis are included in this section. A further description of the threats and methodologies used in this analysis is provided in Chapter 6.0, *Vulnerability Assessment* of the 2022 MJHMP. As the City continues to assess its vulnerability, the collection of better and more complete data will help to improve the risk assessment process to direct planning and mitigation decisions.

Table 6-2. Summary of Potential Impacts on Critical Facilities

Hazard Type	Specific Risk	Count	% of Critical Facilities Impacted	Exposure ($)
Flood	FEMA 1% Chance Flood Zone	8	42%	$1,288,047
Dam Inundation/Levee Failure	Bradbury Dam Failure	14	74%	$3,502,993
Wildfire	Moderate Wildfire Threat	1	5%	$-
	Very High Wildfire Threat	1	5%	$228,047
Earthquake	High Liquefaction Potential	19	100%	$3,502,993
	Regional Ground Shaking	19	100%	$3,502,993
Landslide	Class 7 Landslide Hazard Zone	1	5%	$-

6.1 EARTHQUAKE & LIQUEFACTION

Chapter 6.0, *Vulnerabilities Assessment* of the 2022 MJHMP addresses regional seismicity under two scenarios that include the City of Buellton. The 2,500-year scenario considers general seismicity from multiple faults in the region and a 7.0 magnitude event. The methodology utilizes probabilistic seismic hazard contour maps developed by the U.S. Geological Survey (USGS) for the 2018 update of the National Seismic Hazard Maps that are included with Hazus-MH. A deterministic scenario was also prepared to predict the outcome of a specific earthquake event. The deterministic scenarios used USGS provided ShakeMap datasets to model a Magnitude 7.2 earthquake of the San Luis Range would generate in terms of damages and losses for the chosen area of interest (i.e., northern and central Santa Barbara County, including the City). Figure 6-1 is the ShakeMap produced for this scenario.

As described in the MJHMP, regional losses to people and property would include the City. As shown in the San Luis Range ShakeMap scenario, the north and central parts of the county would perceive much stronger shaking and would likely receive the most severe damage when compared to the rest of the county. The entire City would perceive severe to extreme shaking and would likely receive moderate/heavy to very heavy damage. Direct effects of ground shaking could damage buildings and create dangerous debris and unstable structures. Displaced residents would likely seek shelter in the City, including residents from outside the City. Further, fires often occur after an earthquake. Because of the number of fires and the lack of water to fight the fires, they can often burn out of control.

Unreinforced masonry building type structures consist of buildings made of unreinforced concrete and brick, hollow concrete blocks, clay tiles, and adobe. Buildings constructed of these materials are heavy and brittle and typically provide little earthquake resistance. In small earthquakes, unreinforced buildings can crack, and in strong earthquakes, they tend to collapse. The City does not have any known unreinforced masonry buildings.

The City lies in an area with a high, moderate, and low liquefaction severity classes. Regional earthquakes could cause liquefaction in the City, which could damage buildings and utilities when soils become unstable. Based on the GIS analysis conducted for the 2022 MJHMP, the City has 1,689 improved parcels valued at over $1 billion in the liquefaction severity zone. Based on this analysis, which accounts for residents only and not workers, 4,180 residents are living in this hazard zone within the City. While liquefaction would not likely affect all areas uniformly during an earthquake, this analysis indicates the extent and scale of vulnerabilities to liquefaction during a large earthquake.

Table 6-3. City of Buellton at Risk to Liquefaction Hazard by Property Type

Property Type	Improved Parcel Count	Total Value	Population
High Liquefaction Hazard			
Agricultural	1	$31,648	
Commercial	89	$136,177,292	
Exempt	5	$4,215,864	
Industrial	36	$106,806,743	
Mixed Use	1	$107,218	3
Residential	1,444	$636,606,050	3,971
Improved Vacant	0	$0	
Total High Liquefaction	**1,576**	**$883,944,814**	**3,974**
Moderate Liquefaction Hazard			
Agricultural	2	$876,498	
Commercial	4	$8,228,094	
Exempt	2	$2,428,260	
Industrial	29	$104,980,530	
Mixed Use	0	$0	0
Residential	17	$23,047,542	47
Improved Vacant	0	$0	
Total Moderate Liquefaction	**54**	**$139,560,924**	**47**
Low Liquefaction Hazard			
Agricultural	0	$0	
Commercial	0	$0	
Exempt	0	$0	
Industrial	0	$0	
Mixed Use	0	$0	0
Residential	58	$29,845,356	160

Property Type	Improved Parcel Count	Total Value	Population
Improved Vacant	1	$76,552	
Total Low Liquefaction	**59**	**$29,921,908**	**160**
Total Liquefaction Hazard	**1,689**	**$1,053,427,646**	**4,180**

As listed in Table 6-4, all critical facilities in the City would be vulnerable to damage or destruction from ground shaking and liquefaction during a significant regional earthquake (see also, Section 6.2.1, *Earthquake (Groundshaking)* and Section 6.3.3, *Liquefaction (Earthquake)* of the 2022 MJHMP).

Table 6-4. City of Buellton Critical Facilities Vulnerable to Groundshaking & Liquefaction

Type	Name	Address	Total Building Value
Wastewater Treatment Plant	Buellton Wastewater Treatment Facility	79 Industrial Way	$1,060,000
Water Treatment Plant	McMurray Road Water Treatment Facility		$318,427
Water Treatment Plant	Highway 246 Water Treatment Facility		$228,047
EMS Station	SANTA BARBARA COUNTY FIRE DEPARTMENT STATION 31	168 WEST STATE HIGHWAY 246	-
EMS Station	AMERICAN MEDICAL RESPONSE - SANTA BARBARA COUNTY	240 EAST STATE HIGHWAY 246	-
Senior Center	BUELLTON SENIOR CNTR	164 W HWY 246	$352,273
Education	Oak Valley School	595 2nd St	-
Education	Jonata School	301 2nd St	-
Fire Station	FIRE STATION #31	168 W HWY 246	$1,059,702
Fire Station	FIRE DEPT. OPERATIONS OFFICE	166 W HWY 246	$422,273
Government	STORAGE BUILDING # 2	164 W HWY 246	$33,501
Highway Patrol	CALIFORNIA HIGHWAY PATROL - BUELLTON	166 INDUSTRIAL WAY	-
Sheriff	BUELLTON SHERIFF'S OFFICE	140 W HWY 246	$28,770
Bridge - Non Scour Fair Condition	Bridge	'AVE OF THE FLAGS' / 'ZACA CREEK'	-
Bridge - Non Scour Good Condition	Bridge	'U.S. HIGHWAY 101' / 'ZACA CREEK'	-
Bridge - Non Scour Good Condition	Bridge	'STATE ROUTE 246' / 'ZACA CREEK'	-
Bridge - Non Scour Good Condition	Bridge	'STATE ROUTE 246' / 'US HIGHWAY 101'	-
Bridge - Non Scour Good Condition	Bridge	'DAMASSA ST' / 'US HIGHWAY 101'	-
Bridge - Non Scour Good Condition	Bridge	'MCMURRAY RD' / 'ZACA CREEK'	-

Figure 6-1. City of Buellton Critical Facilities and Earthquake Groundshaking Potential (San Luis Range 7.2 Magnitude ShakeMap)

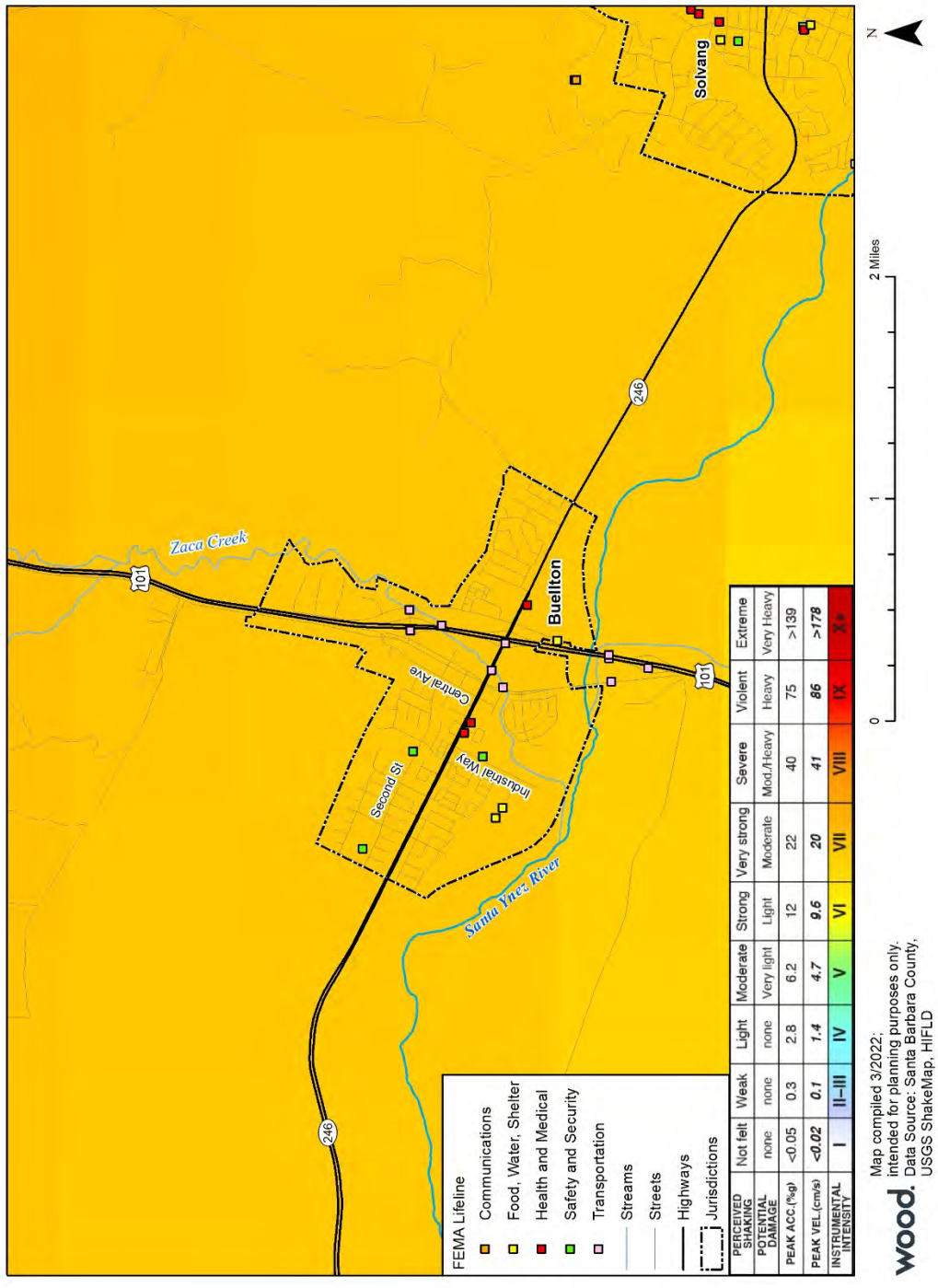
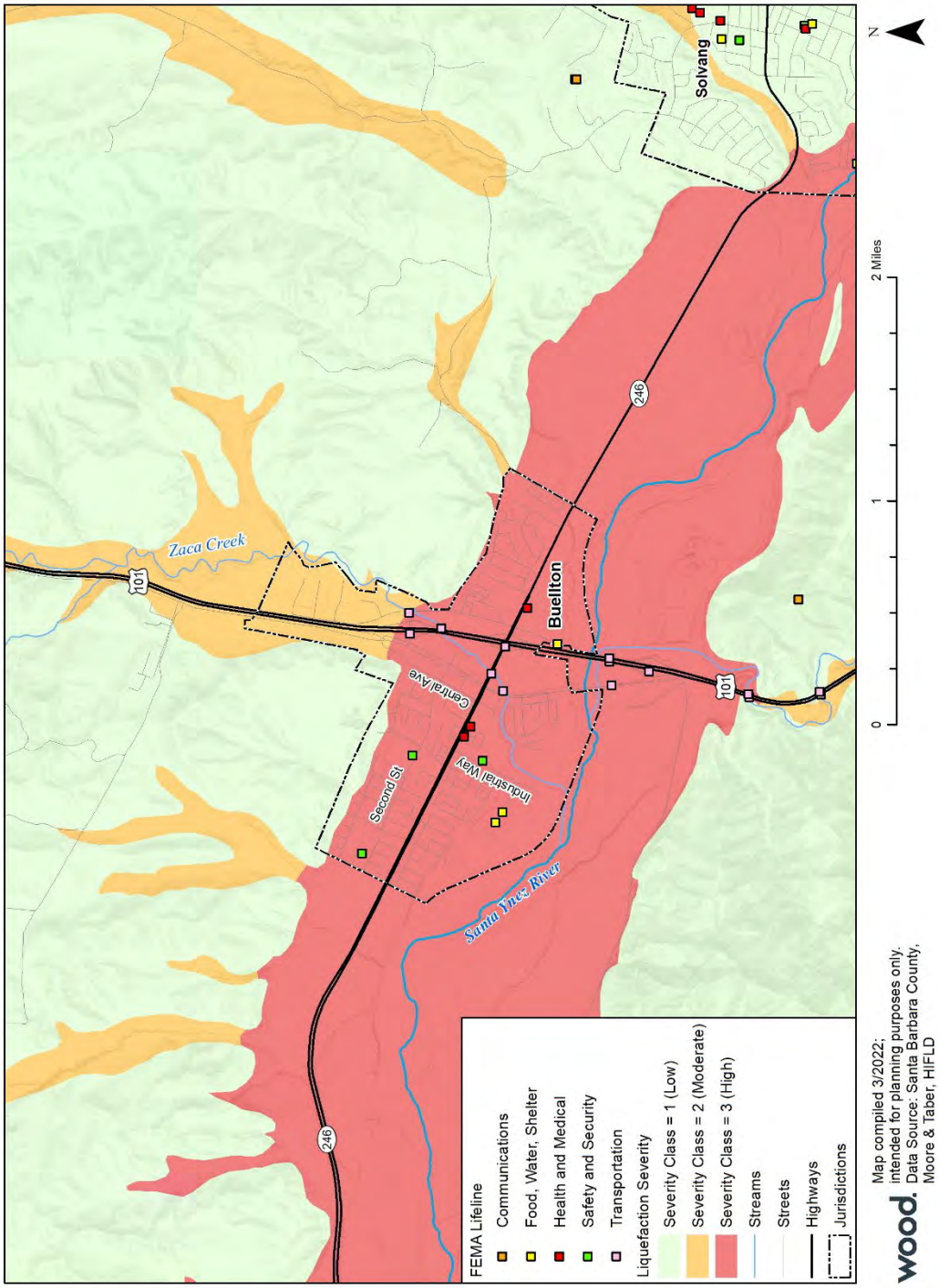


Figure 6-2. City of Buellton Critical Facilities and Liquefaction Potential



6.2 WILDFIRE

The county has extensive areas within mapped Fire Hazard Severity Zones and Wildland-Urban Interface (WUI) areas. These hazard areas generate vulnerability for life and structures, including critical facilities, throughout the county, but most severely within rural foothills areas where dry vegetation, steep slopes, and difficult access combine to create a high probability of wildfire. The City is surrounded by wildland vegetation and the eastern slopes of the Santa Ynez Mountains. The entire City of Buellton is within the Wildland Urban Interface area and has therefore been designated as a WUI community at risk. Based on these maps, the City has 9 acres (0.9 percent) within Very High Wildfire Threat areas, 63 acres (6.1 percent) within High Fire Wildfire Threat areas, 77 acres (7.5 percent) within Moderate Wildfire Threat areas, and 99 acres (9.6 percent) within Low Wildfire Threat areas. Most of these areas are residential with limited vulnerabilities in industrial, commercial, and agricultural areas.

Based on the GIS analysis conducted for the 2022 MJHMP, in Buellton, 199 improved properties with a total value of $254 million are vulnerable to wildfire. In Buellton, approximately 487 residents live in high, moderate, or low wildfire threat areas. This information is summarized in Table 6-5 below.

Table 6-5. City of Buellton at Risk to Wildfire Threat

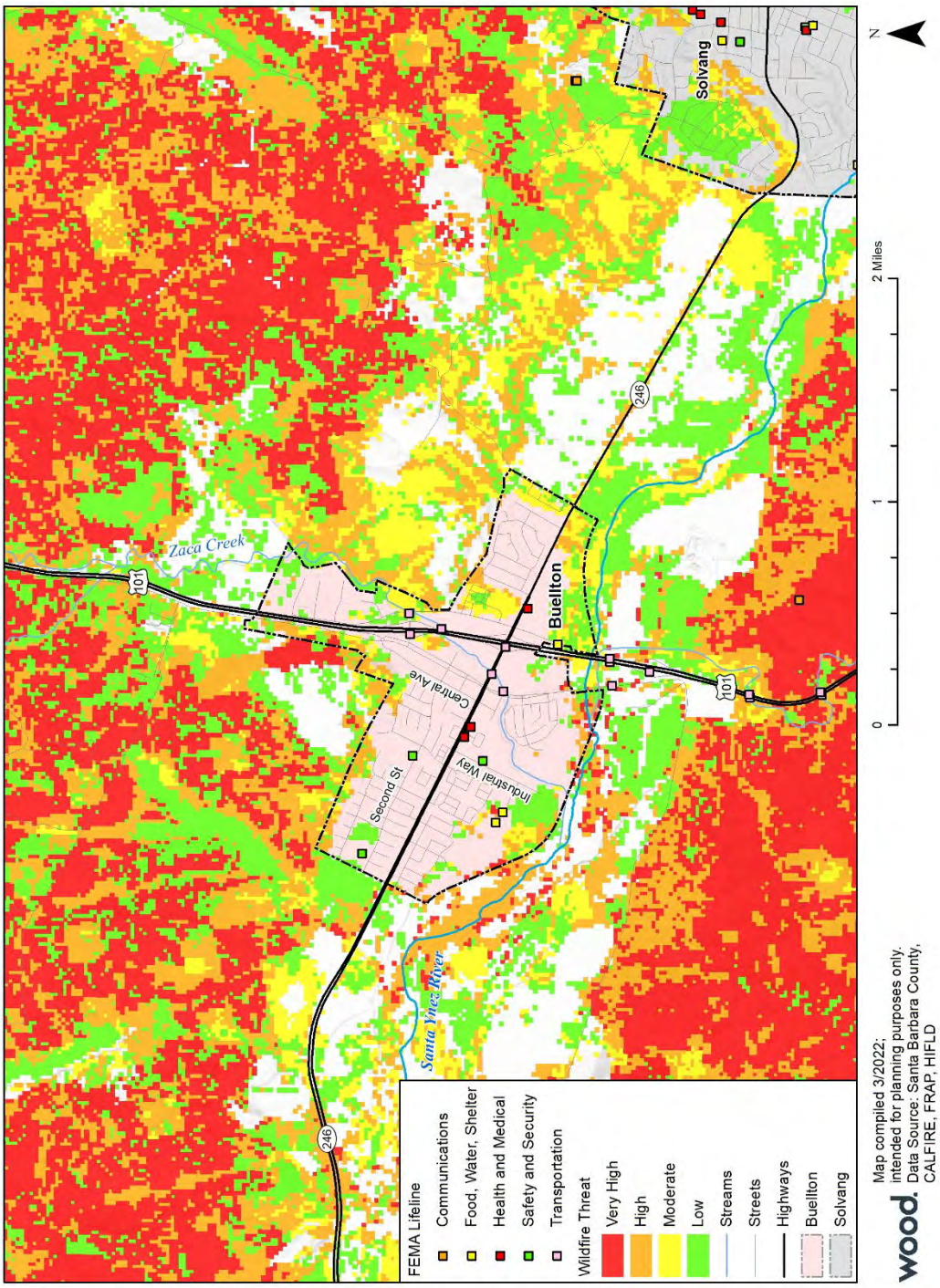
Property Type	Improved Parcel Count by Wildfire Threat Level						Total Value	Population
	Extreme	Very High	High	Moderate	Low	Total		
Agricultural	0	0	0	1	0	1	$31,648	
Commercial	0	0	0	5	3	8	$20,234,206	
Exempt	0	0	0	1	0	1	$3,030	
Industrial	0	0	0	3	9	12	$68,976,330	
Mixed Use	0	0	0	0	0	0	$0	0
Residential	0	0	0	115	62	177	$165,242,040	487
Improved Vacant	0	0	0	0	0	0	$0	
Total	**0**	**0**	**0**	**125**	**74**	**199**	**$254,487,254**	**487**

Two of the City's critical facilities fall within Very High or Moderate wildfire threat areas, as listed in Table 6-6 (see also, Section 6.3.1, *Wildfire* of the 2022 MJHMP).

Table 6-6. City of Buellton Critical Facilities Vulnerable to Wildfire

Type	Critical Facility	Hazard Source/Type	Total Building Value
Water Treatment Plant	Highway 246 Water Treatment Facility	Very High	$228,047
Bridge - Non Scour Good Condition	Bridge	Moderate	-

Figure 6-3. City of Buellton Critical Facilities within Wildfire Threat Zones



6.3 FLOOD

The geographical location, climate, and topography of the Santa Ynez Valley make some areas of the City prone to flooding particularly related to the seasonal flows of the Santa Ynez River. Flooding presents a hazard to development in floodplains. In addition to the damage to properties, flooding can also cut off access to utilities, emergency services, and may impact the overall economic well-being of an area. Emergency response can be interrupted by damaged roads and infrastructure. Fire can break out as a result of dysfunctional electrical equipment. Hazardous materials can also get into floodways, causing health concerns and polluted water supplies. During a flood, the drinking water supply can be contaminated. Climate change is expected to increase the frequency and intensity of heavy rainstorms that cause riverine flooding.

Based on the GIS analysis conducted for the 2022 MJHMP, the City has 44 improved parcels valued at over $129 million in the 1-percent annual chance floodplain. Based on this analysis, which accounts for residents only and not workers, 36 residents are living in the 1-percent annual chance floodplain throughout the City. An additional 102 improved parcels and over $89 million in value fall within the 0.2-percent annual chance floodplain. Areas of the City vulnerable to the 0.2-percent annual chance riverine flood are home to 217 residents. Development in the 0.2-percent annual chance floodplain is typically not regulated, thus a large flood event could be extremely damaging in the City. This information is summarized in Table 6-7 below.

Table 6-7. City of Buellton FEMA Floodplain Exposure and Loss

Property Type	Improved Parcel Count	Total Value	Estimated Loss	Population
Riverine 1% Annual Chance Floodplain Exposure and Loss				
Agricultural	1	$31,648	$7,912	
Commercial	13	$11,356,392	$2,839,098	
Exempt	2	$865,680	$216,420	
Industrial	19	$79,241,263	$19,810,316	
Residential	13	$38,136,522	$9,534,131	
Total	**48**	**$129,631,505**	**$32,407,876**	36
Riverine 0.2% Annual Chance Floodplain Exposure and Loss				
Agricultural	2	$876,498	$219,125	
Commercial	15	$27,161,698	$6,790,425	
Industrial	6	$20,507,248	$5,126,812	
Residential	79	$41,015,978	$10,253,994	
Total	**102**	**$89,561,421**	**$22,390,355**	217

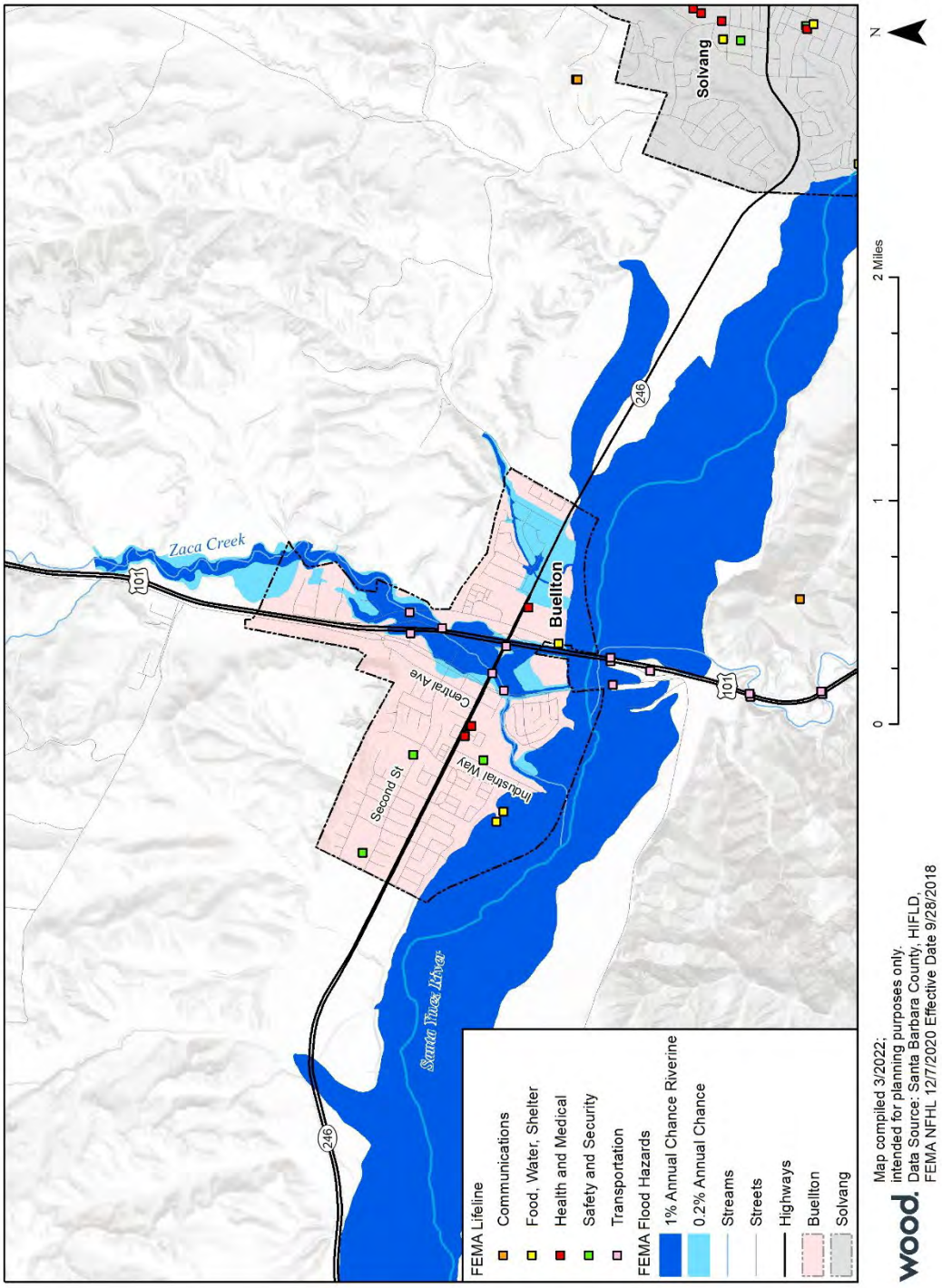
As listed in Table 6-8, 8 critical facilities in the City with a total value of $1,288,047would be vulnerable to damage or destruction from 1-percent or 0.2-percent annual chance flood (Figure 6-4; see also, Section 6.3.3, *Flood* of the 2022 MJHMP).

Table 6-8. City of Buellton Critical Facilities at Risk to Flood Hazard

Type	Critical Facility	FEMA Flood	Total Value

Type	Critical Facility	FEMA Flood	Total Value
Wastewater Treatment Plant	Buellton Wastewater Treatment Facility	1% Chance	$-
Water Treatment Plant	Highway 246 Water Treatment Facility	1% Chance	$1,060,000
Bridge - Non Scour Fair Condition	Bridge	1% Chance	$228,047
Bridge - Non Scour Good Condition	Bridge	1% Chance	-
Bridge - Non Scour Good Condition	Bridge	1% Chance	-
Bridge - Non Scour Good Condition	Bridge	1% Chance	-
Bridge - Non Scour Good Condition	Bridge	1% Chance	-
Bridge - Non Scour Good Condition	Bridge	1% Chance	-

Figure 6-4. City of Buellton Critical Facilities in FEMA Flood Hazard Zones



6.4 LANDSLIDE

The Landslide Incidence and Susceptibility data shown below and used for this exposure analysis were developed on a national scale. Although it shows some areas of the City and some Buellton critical facilities within a landslide incidence area, local geography indicates otherwise. If mapped at a more local scale, it would be clear that these facilities are not near sloping topography. Therefore, Buellton has determined that no critical facilities are susceptible to landslide hazards. Nevertheless, this data is presented consistent with the 2022 MJHMP.

The City has 236 improved parcels that lie within Class 7, 9, or 10 landslide hazard zone, amounting to $228 million, and home to 1,682 residents. However, the City is a gently sloping area in a riverine flood plain where the risk of landslide is generally low. An increase in risk related to landslides would be man-made through excavation or other soil disturbance. While not a concern for the City, data related to areas within the landslide hazard zone is included to be consistent with the 2022 MJHMP.

Table 6-9. City of Buellton Improved Properties at Risk to Landslide Summary

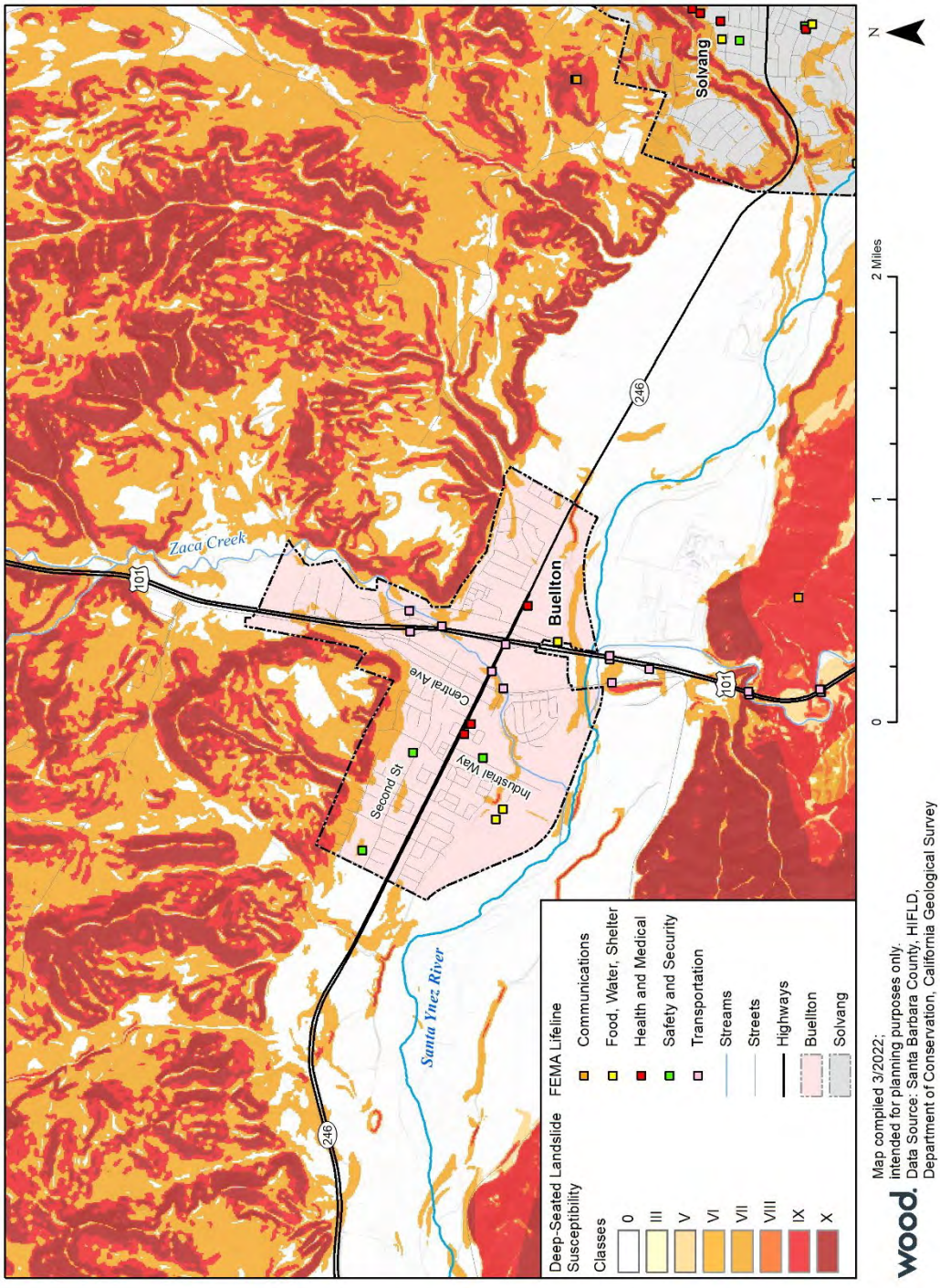
Class 7 Parcel Count	Class 9 Parcel Count	Class 10 Parcel Count	Total Improved Parcel Count	Total Value	Population
192	26	18	236	$141,204,429	611

Further, as listed in Table 6-10, 2 critical facilities with an unknown value in the City would be vulnerable to damage or destruction from landslides (see also, Section 6.3.7, *Landslide* of the 2022 MJHMP).

Table 6-10. City of Buellton Critical Facilities Vulnerable to Landslide

Type	Name	Landslide Class Zone	Total Value
Education	Oak Valley School	7	$-
Bridge - Non Scour Good Condition	Bridge	7	$-

Figure 6-5. City of Buellton Critical Facilities within Landslide Susceptibility Zones



6.5 DAM/LEVEE FAILURE

Bradbury Dam is of the largest concern to the City of Buellton. Failure of Bradbury Dam would inundate portions of the cities of Buellton and Solvang with relatively little evacuation time. Based on the GIS analysis conducted for the 2022 MJHMP, in Buellton, 837 properties with a total value of $530 million are vulnerable to the catastrophic flooding that would occur if the Bradbury Dam failed. In Buellton, approximately 2,032 residents within the inundation zone may need to be evacuated, cared for, and possibly permanently relocated. This information is summarized in Table 6-11 below.

Table 6-11. City of Buellton at Risk to Dam Inundation Hazard

Property Type	Improved Parcel Count	Total Value	Population
Agricultural	1	$31,648	
Commercial	61	$116,632,962	
Exempt	2	$3,030	
Industrial	34	$106,655,630	
Residential	739	$307,055,745	2,032
Total	**837**	**$530,379,015**	**2,032**

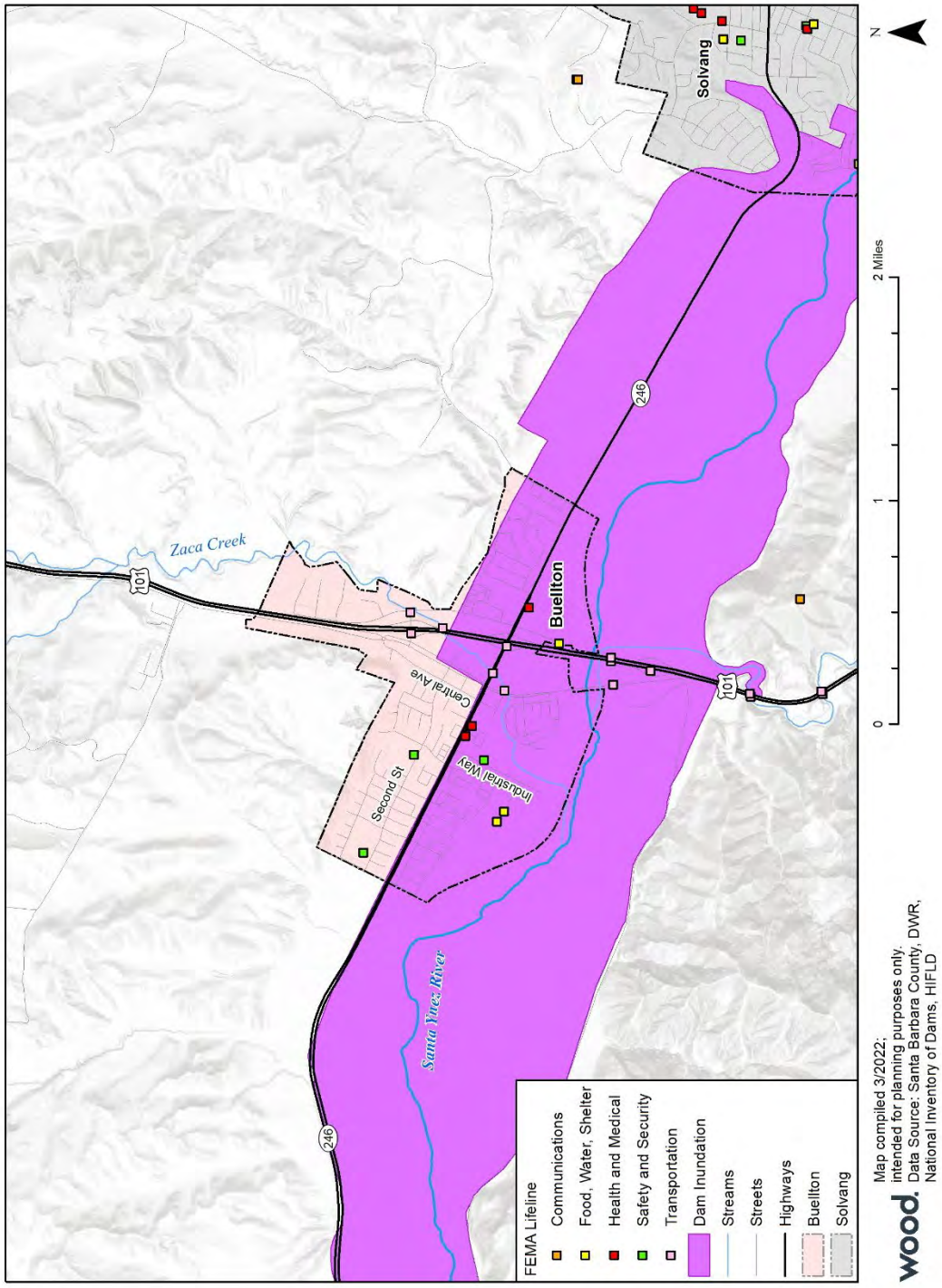
Further, as listed in Table 6-12, 14 critical facilities with a value of $3,502,993 in the City would be vulnerable to damage or destruction from flooding due to dam and levee failure (see also, Section 6.6.3, *Dam Failure* and Section 6.6.8, *Levee Failure* of the 2022 MJHMP).

Table 6-12. City of Buellton Critical Facilities Vulnerable to Inundation from Dam/Levee Failure

Type	Name	Dam Name	Total Value
Utilities	Wastewater Treatment Plant	Buellton Wastewater Treatment Facility	$1,060,000
Utilities	Water Treatment Plant	McMurray Road Water Treatment Facility	$318,427
Utilities	Water Treatment Plant	Highway 246 Water Treatment Facility	$228,047
Utilities	EMS Station	SANTA BARBARA COUNTY FIRE DEPARTMENT STATION 31	-
Utilities	EMS Station	AMERICAN MEDICAL RESPONSE - SANTA BARBARA COUNTY	-
Utilities	Senior Center	BUELLTON SENIOR CNTR	$352,273
Utilities	Fire Station	FIRE STATION #31	$1,059,702
Wastewater Treatment Plant	Fire Station	FIRE DEPT. OPERATIONS OFFICE	$422,273
Wastewater Treatment Plant	Government	STORAGE BUILDING # 2	$33,501

Type	Name	Dam Name	Total Value
Wastewater Treatment Plant	Highway Patrol	CALIFORNIA HIGHWAY PATROL - BUELLTON	-
Wastewater Treatment Plant	Sheriff	BUELLTON SHERIFF'S OFFICE	$28,770
Wastewater Treatment Plant	Bridge - Non Scour Fair Condition	Bridge	-
Wastewater Treatment Plant	Bridge - Non Scour Good Condition	Bridge	-
Bridge - Non Scour Poor Condition	Bridge - Non Scour Good Condition	Bridge	-

Figure 6-6. City of Buellton Critical Facilities in Dam Inundation Zone



7.0 MITIGATION STRATEGY

In preparation for the 2022 LHMP update, the City's LPT made no revisions to the countywide goals and objectives because they continue to reflect the needs of the City; see also, Chapter 7.0, *Mitigation Plan* of the 2022 MJHMP. This section contains the City's updated and most current mitigation strategy as of 2022.

7.1 MITIGATION PRIORITIES

After review of the hazard identification and risk assessment and capabilities assessment, the LPT conducted meetings in 2020 and 2021 to discuss the results of the hazard identification and risk assessments, review mitigation goals and alternatives based on the priority areas and hazard types, discuss community strengths and weaknesses, and begin developing the mitigation strategy. The following strengths, weaknesses, and priorities were identified.

7.1.1 General Observations — Strengths

- Several policies exist that have hazard mitigation elements or effects such as development and building code regulations, the Floodplain Ordinance, the Zoning Ordinance, the General Plan, and other codes and plans discussed in more detail in this section.
- The General Plan has been updated in 2005/2007 with updated policies and programs for hazard mitigation.
- A revised Housing Element was adopted in 2014. The 2015 Housing Element is currently being updated, and is anticipated to be adopted in early 2023.
- Existing codes will ensure that new development (including tear down and rebuild projects) will be built to modern standards, including the Floodplain Ordinance, which exceeds minimum standards. With the current trend of replacing existing substandard buildings with new ones, through attrition a safer community will be constructed.
- Housing improvement funds and programs exist, furthering the strength of the preceding statement.
- GIS, communication technology, and trained staff are available to implement a mitigation program.
- Better mapping of floodplains and other hazard areas is now available.
- The Bradbury Dam has been mapped for inundation.
- Area fault lines and liquefaction zones have been mapped.
- All flooding areas have been mapped.
- All high fire areas have been mapped.
- Buellton has no unreinforced masonry buildings within the City limits.
- The County Fire Department has a vegetative program whereby all lots are inspected in the spring and property owners are required to cut vegetation by July 1 for unincorporated areas surrounding the City. Buellton's Code Enforcement Program and County Fire handle weed abatement within the City Limits in the Spring.

- The City, in conjunction with County Fire, conducts Community Emergency Response Team (CERT) training for its citizens and has funded additional CERT classes each year.
- Ranch Club Mobile Home Park has developed an internal CERT team.

7.1.2 General Observations — Weaknesses

- Because Buellton is located next to the Santa Ynez River, just downstream of the Bradbury Dam, Buellton could sustain substantial flooding in the event of a dam failure.
- Buellton is surrounded by mountains with steep terrain that is covered with brush and trees. During fire season, Buellton is susceptible to wildfire damage.
- Buellton is located in Zone 4, which is the highest potential status for earthquake activity in the state of California.
- Evacuation remains an issue, particularly as Buellton and surrounding localities grow. Tourist swell in the summer combined with the possible disruption caused by flooding or landslides of major egress and access points is a principal concern.

7.1.3 General Observations — Priorities

During the presentation of findings for the hazard identification and risk assessment and capabilities assessment, the LPT provided preliminary input and ideas for mitigation strategies. In formulating goals, the following priorities were identified:

- Top priorities for Buellton are public safety, public education, and reducing the potential economic impacts of disasters.
- Experiences from past disasters should be built upon.
- Outreach and training should be a major component, including Community Emergency Response Team Training (CERT) and early warning & evacuation plans.
- Create defensible space around high fire areas by strategically managing vegetation to decrease the fuel available for fires adjacent to the structures. This is relatively inexpensive, accomplished quickly, and is effective as long as the vegetation is managed.
- Recent disasters have resulted from flooding. A Drainage Master Plan was prepared in 2017 in order to prepare for and minimize potential flooding.

Goals and Objectives

The City'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. These preliminary goals, objectives, and actions were developed to represent a vision of long-term hazard reduction or enhancement of capabilities. To help further the development of these goals and objectives, the LPT compiled and reviewed current jurisdictional sources including Buellton's planning documents, codes, and ordinances, and specifically discussed hazard-related goals, objectives, and actions as they related to the overall LHMP.

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

Since 2017, the City has incorporated the LHMP goals, objectives, and mitigation actions into its local plans and processes, including the General Plan Safety Element by reference, specific hazard planning efforts (e.g., Stormwater Management Program), the City's grant pursuits, and capital improvement planning. Ongoing monitoring and evaluation of the LHMP by the City ensured mitigations are implemented and tracked. Key mitigation actions completed since 2017 include completing a citywide drainage study and drainage master plan and an early warning and evacuation plan. The City is also underway in increasing effective emergency notifications to the public.

The City's LPT reviewed the mitigation actions listed in the 2017 LHMP to determine the status of each action. The following table includes only the actions that have been completed or were underway as of January 2022. Once reviewed, deferred projects from 2017 were renumbered to reflect 2022 updates (see Table 7-1).

Table 7-1. Status of City of Buellton Previous Mitigation Actions

Mitigation Action No.	Mitigation Action Description	Status	Comments	In 2022 Update?
2017 LHMP				
2016-1	Continue to implement hazard mitigation training for all residents to include Community	Ongoing	Training ongoing; second CERT trailer	X

Mitigation Action No.	Mitigation Action Description	Status	Comments	In 2022 Update?
	Emergency Response Training (CERT). Purchase a second CERT trailer.		purchased in 2017. CERT training continues to be provided in conjunction with County Fire.	
2016-2	Complete Citywide Drainage Study and Drainage Master Plan to minimize flooding hazards	Completed	Completed in 2017	
2016-3	Disseminate Effective Emergency Notifications and Communications to the Public	In progress	Worked with County OEM and County Sheriff on notification protocols; maintained emergency preparedness information on City's Website and Facebook page	X
2016-4	Disaster Early Warning and Evacuation Plan in the event of a major earthquake and/or dam failure	Completed		

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 City'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. CERT Training

Continue to implement hazard mitigation training for all residents, including Community Emergency Response Team (CERT).

Mitigation Priority and Performance	
Priority	High
Hazards Mitigated	Earthquake, Landslides, Wildfire, Flood, Dam Failure, Energy Shortage & Resiliency
Estimated Timeline	Ongoing
Estimated Cost/Funding Source	$10,000/ City's Emergency Coordinator, City budget line item for CERT courses and CERT trailer, County Fire Department
Responsible Agency/Department	City Manager
Comments	This project was adapted from 2016-1 included as part of the 2017 LHMP. The goal is to have at least one CERT course held each year in Buellton. Consistent course scheduling will support continued increase in community preparedness. With Buellton's location within Seismic Zone 4 and a high proportion of residents living in liquefaction hazard zones, many are likely to encounter debris and unstable structures in the aftermath of a strong earthquake. Training through CERT programs will prepare the public on navigating these conditions more safely. Transportation corridors vulnerable to damage from ground shaking and liquefaction, wildfires, flooding could render the City cut off from emergency services and utilities. Hazard mitigation training enables the public to be more prepared to deal with ruptures in service. CERT capabilities generally help prevent and reduce damaging effects of hazards. For example, CERT participants can assist with certain tasks such as clearing storm drains to drainage and reduce flooding. A population prepared with education about local hazards and organizational tools will be able to act with reduced response time and in a more effective manner. The City's continued outreach efforts extend awareness of existing resources and build capacity for more effective response.

2022-2. Emergency Notifications

Disseminate Effective Emergency Notifications and Communications to the Public.

Mitigation Priority and Performance	
Priority	High
Hazards Mitigated	Earthquake, Landslides, Wildfire, Flood, Dam Failure, Energy Shortage & Resilience, Pandemic/Public Health Emergency, Drought/Water Storage
Estimated Timeline	Ongoing
Estimated Cost/Funding Source	$N/A/ HMP funds, and other Federal and State infrastructure grants and funds, local staffing from County OEM, County Sheriff, City staff
Responsible Agency/Department	Planning Department, County OEM, County Sheriff

Mitigation Priority and Performance	
Comments	This project was adapted from 2016-3 included as part of the 2017 LHMP. In coordination with County OEM and County Sherriff, emergency preparedness information is disseminated through the City's website, Buellton Buzz newsletter, and Facebook page, and emergency notifications are disseminated through the City's Facebook page and County notification system. Preparedness information and emergency notifications may be regarding earthquakes, landslides, wildfire, floods, dam failure, energy shortage & resilience, public health emergencies, drought or water storages. Notification in advance or during an emergency enables those affected to make decisions and take action for personal safety and property protection.

2022-3. Backup Generator at City Hall

The City is pursuing funding for a backup generator for City Hall to support City functions during energy outages.

Mitigation Priority and Performance	
Priority	High
Hazards Mitigated	Energy Shortage & Resilience
Estimated Timeline	2027
Estimated Cost/Funding Source	$100,000/ HMP funds, and other Federal and State infrastructure grants and funds
Responsible Agency/Department	Planning Department, City Administrator, Public Works
Comments	A backup generator will enable the City to perform response duties in the event of impacts to normal energy supply. Interruptions to normal energy supply could be caused by earthquakes, landslides, wildfire, or floods which occur within City limits as well as beyond. In the event of EOC standup, power from the backup generator could be used to establish communication with other agencies and response teams as well as access and utilize City resources.

2022-4. Water-Wise Public Outreach

Inform and educate residents about water conservation programs and rebates to reduce water usage, and increase water efficiency.

Mitigation Priority and Performance	
Priority	Moderate
Hazards Mitigated	Drought & Water Storage
Estimated Timeline	Ongoing
Estimated Cost/Funding Source	$10,000 / General Fund/Water Fund
Responsible Agency/Department	Public Works Department
Comments	Periodic inclusion of information about water conservation in ongoing public announcements on the City's Facebook page and in the Buellton Buzz, The City's bi-monthly newsletter in water customer water bills.

2022-5. Santa Ynez River Flood Hazard Assessment- Zaca Creek Golf Course

Risk assessment for flood hazard vulnerabilities at the Zaca Creek Golf Course along the Santa Ynez River.

Mitigation Priority and Performance	
Priority	Moderate
Hazards Mitigated	Flooding
Estimated Timeline	2023-2024
Estimated Cost/Funding Source	$10,000/ General Fund/ HMGP
Responsible Agency/Department	Public Works Department
Comments	Recent winter storms have resulted in flooding at the City-owned Zaca Creek Golf Course. Vulnerabilities and mitigation strategies to protect the property will be assessed. Phased improvement measures will be provided.

2022-6. Drainage System Assessment and Improvements- Jonata Road

Improvements to minimize flood hazard impacts to Jonata Park Road.

Mitigation Priority and Performance	
Priority	High
Hazards Mitigated	Flooding, Earthquake
Estimated Timeline	2023- 2025
Estimated Cost/Funding Source	$50,000/ General Fund/ BRIC/ HMGP Flood Risk Reduction Project
Responsible Agency/Department	Public Works Department
Comments	Past winter storms and irrigation run-off from adjacent farmland have created mudslides with debris deposited onto Jonata Road. To protect the public, use the road is currently blocked off during significant rainfall. The slope and impacted areas border City limits and include private and City-owned property. Mitigation strategies for erosion control will be assessed and implemented.

2022-7. Drainage System Assessment and Improvements- La Pita Place

Improvements to minimize flood hazard vulnerabilities present in the area surrounding drainage basins on La Pita Place.

Mitigation Priority and Performance	
Priority	High
Hazards Mitigated	Flooding
Estimated Timeline	2023- 2025
Estimated Cost/Funding Source	$20,000/ General Fund/ BRIC/ HMGP Flood Risk Reduction Project
Responsible Agency/Department	Public Works Department
Comments	Past winter storms and irrigation run-off from adjacent farmland have created mudslides with debris deposited onto La Pita Place. The slope and impacted areas border City limits and include private and City-owned property. Engage Engineering consultant to determine the feasibility of any flood mitigation efforts.

2022-8. Safety Element Update

Update to the Safety Element of the General Plan.

Mitigation Priority and Performance	
Priority	High
Hazards Mitigated	Earthquake, Landslides, Wildfire, Flood, Dam Failure, Energy Shortage & Resilience, Pandemic/Public Health Emergency, Drought/Water Storage
Estimated Timeline	2023
Estimated Cost/Funding Source	$5,000/ REAP
Responsible Agency/Department	Planning Department
Comments	The purpose of the Safety Element is to reduce deaths, injuries, property damage, and economic and social dislocation resulting from natural hazards. It is the primary vehicle for identifying the hazards that municipalities must consider when making land use decisions.

2022-9. Buellton Beautiful Landscape Rebate Program

A program for residential and business owners to improve landscape and hardscape with drought tolerant plants.

Mitigation Priority and Performance	
Priority	High
Hazards Mitigated	Drought & Water Storage
Estimated Timeline	Ongoing
Estimated Cost/Funding Source	$25,000 annually allocated
Responsible Agency/Department	Planning Department
Comments	Applicants receive up to $1,000 grants for eligible projects. At least 50% of the landscaped area must use drought tolerant plants. Properties are inspected before and after landscape improvements.

8.0 PLAN MAINTENANCE

8.1 MONITORING, EVALUATING, AND UPDATING THE PLAN

Since the last LHMP in 2017, there has not been an official monitoring or maintenance program set in place for the City of Buellton. Instead, the LPT discusses emergency hazard mitigation at its twice-monthly staff meetings as needed. Even so, the City of Buellton was very successful in implementing the 2017 mitigation actions as noted in Table 7-1. The two remaining mitigation actions outlined in the 2017 LHMP are ongoing at the time of this 2022 update.

The City of Buellton City Manager will be responsible for ensuring that this annex is monitored, evaluated, and updated as needed on an ongoing basis. The City of Buellton will continue to participate in the countywide MAC and attend the annual meeting organized by the County Office of Emergency Management 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 City's LHMP will be forwarded to the County Office of Emergency Management for inclusion in further updates to the MJHMP.

Major disasters affecting the City of Buellton's community, legal changes, notices from Santa Barbara County (lead agency for the MJHMP), and other significant events may trigger revisions to this plan or the convening of the LPT. The City LPT, in collaboration with the County Office of Emergency Management, 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 City is committed to revising the plan at a minimum of every five years. The City Manager or the City'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, similar to the process described in Section 3.0, *Planning Process* and subject to changing conditions at the time of the update. The jurisdictions within Santa Barbara County will continue to work together on updating the multi-jurisdictional plan, including this annex.

8.2 IMPLEMENTATION THROUGH EXISTING PLANS AND PROGRAMS

The City 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., General Plan, building codes, floodplain management ordinance). The General Plan and the LHMP annex are complementary documents that work together to achieve the goal of reducing risk exposure to the City's citizens. An update to a general plan 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 City incorporates the LHMP by reference into its General Plan Safety Element. Under AB 2140, the City may adopt its current, FEMA-approved LHMP into the Safety Element of the General Plan. This adoption makes the City eligible to be considered for part or all of its local-share costs on eligible Public Assistance funding to be provided by the state through the California Disaster Assistance Act (CDAA) (see Section 2.0, *Plan Purpose and Authority* for the adopting resolutions). The LHMP has also been prepared to support the City's Emergency Operations Plan and Stormwater Management Plan. The Floodplain Management Ordinance applies in concert with the City's zoning ordinance and building codes to reduce flooding hazards from land use. The LHMP includes several mitigations addressing emergency notification, training,

and resiliency that will be integrated into the City existing budget and administrative planning processes.

The information contained within this LHMP, including results from the Vulnerability Assessment and the Mitigation Strategy, is used by the City to help inform updates and the development of local plans, programs, and policies. The City may utilize the hazard information when developing and implementing the City's capital improvement programs and the Planning and Building Divisions may utilize the hazard information when reviewing a site plan or other type of development applications.

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 City 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 City 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 Scott Wolfe, City Manager & Emergency Services Manager, using the following information:

Scott Wolfe, City Manager
City of Buellton
P.O. Box 1819
Buellton, CA 93427
scott@cityofbuellton.com
(805) 688-5177

City of Carpinteria
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 demonstrated that it is less expensive to mitigate 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 City of Carpinteria (City) recognizes the consequences of disasters and the need to reduce the impacts of all hazards, natural and human-caused. The City's 2022 Local Hazard Mitigation Plan (LHMP) update tiers from and refines the County of Santa Barbara (County) 2022 Multi-Jurisdictional Hazard Mitigation Plan (MJHMP) Update in order to comprehensively identify, evaluate, and mitigate the known hazards that the City may face.

The LHMP was last comprehensively updated in 2017 as an annex to the 2017 MJHMP. Since 2017, the City has:

- Incorporated the LHMP goals, objectives, and mitigation actions into its local plans and processes, including the General Plan Safety Element by reference and specific hazard planning efforts (e.g., General Plan/Coastal Land Use Plan Update, Sea Level Rise Vulnerability Assessment and Adaptation Plan).
- Used the LHMP's assessment of capabilities, hazards, and vulnerabilities to inform planning, capital improvements, programs, decision-makers, and the public.
- Implemented mitigation actions through the City's general plan, capital improvement program, maintenance programs, grant programming, community outreach, and budget process.
- Reviewed and evaluated mitigation actions before and after disasters, including the Thomas Fire and Montecito debris flow.

The 2022 MJHMP Update was prepared and formulated with input and coordination from each of the 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 (Cal OES) and the Federal Emergency Management Agency (FEMA). The process to update the MJHMP included over a year of coordination with representatives from all participating agencies and County representatives which comprised the Mitigation Advisory Committee (MAC) (described further in Section 3.2 below). The City is a participating agency in the County's 2022 MJHMP Update.

The City's LHMP is used by local emergency management teams, decision-makers, and agency staff to implement needed mitigation to address known hazards. The LHMP 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 in order to identify and evaluate natural and human-caused hazards that could negatively impact the Carpinteria community. The LHMP describes historical hazard events, the future probability of these hazards, and their impact on the Carpinteria community. Vulnerability assessments summarize the identified hazards' impact on critical infrastructure, populations, and future development. 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 Chapter 8).

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," 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 Multi-Jurisdictional Hazard Mitigation Plan (MJHMP) is written to meet the statutory requirements of DMA 2000 (Public Law 106-390), enacted October 30, 2000, and 44 Code of Federal Regulations (CFR) Part 201 – Mitigation Planning, Interim Final Rule, published February 26, 2002. The Hazard Mitigation Assistance grants include the HMGP, Pre-Disaster Mitigation program, and the Flood Mitigation Assistance (FMA) program. Additional FEMA mitigation funds include the HMGP Post Fire funding associated with Fire Management Assistance Grant declarations and the Building Resilient Infrastructure and Communities funding associated with the 2018 Disaster Recovery Reform Act.

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. Throughout the 2022 update of the Plan, 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. As such, the Local Hazard Mitigation Plan (LHMP) was prepared as an annex to the County's MHHMP.

The following pages show the resolutions that adopt the City's 2022 LHMP.

[INSERT CITY RESOLUTION(S) ADOPTING PLAN UPDATE]

[INSERT CITY RESOLUTION(S) ADOPTING PLAN UPDATE]

3.0 PLANNING PROCESS

3.1 OVERVIEW

The planning process implemented for the County's 2022 Multi-Jurisdictional Hazard Mitigation Plan (MJHMP) Update, including the City's Local Hazard Mitigation Plan (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 Mitigation Advisory Committee (MAC), and the second is the Local Planning Team (LPT).

All eight incorporated cities and the six special districts joined the County as participating agencies in the preparation of the 2022 MJHMP Update, including cities of Buellton, Carpinteria, Goleta, Guadalupe, Lompoc, Santa Barbara, Santa Maria, and Solvang; and special districts Cachuma Operation and Maintenance Board, Carpinteria Valley Water District (CVWD), Goleta Water District, Montecito Fire Protection District, Montecito Water District, and Santa Maria Valley Water Conservation District. 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 Federal Emergency Management Agency (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 for the County's MJHMP 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)

MAC Members

The MAC is a standing committee that works together throughout the year to discuss and provide input on a variety of activities. The City participated as a MAC member to prepare this LHMP as an annex to the 2022 MJHMP. The City was represented by Olivia Uribe-Mutal, Emergency Services Program Manager 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	**MAC Meeting #1 (virtual)** 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	**MAC Meeting #2 (virtual)** 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	**MAC Meeting #3 (virtual)** 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

Date	Purpose
	Conducted interactive exercise on potential mitigation goals and strategies
October 2021	**MAC Meeting #4 (virtual)** Collected feedback on 2017 mitigation strategies Conducted interactive exercise on mitigation strategies for key hazards unaddressed in previous MJHMP Discussed annex updates
January 2022	**MAC Meeting #5 (virtual)** Presented draft plan Discussed key MAC/LPT review needs and key issues Discussed annex updates to dovetail with plan update
March 2022	**MAC Meeting #6 (virtual)** Reviewed and discussed public comments received on the draft plan Discussed coordination of LHMP annex updates

3.2.1 Local Planning Team (LPT)

Local Planning Team Planning Process

While the MAC provided feedback and guidance for the MJHMP, the LPT was crucial for reviewing data, informing the update of the annexes, and working towards local adoption. The MAC served as a liaison between the County and the LPTs for each participating agency, and then the LPTs of each participating agency would work independently on their local annexes and mitigation strategies. The team was created from key management and supervisory staff. The LPT is integrated into the development review process within the City. LPT members are responsible for sharing information for incorporation into the MJHMP and LHMP updates, as well as ensuring the LHMP is incorporated into other plans and planning efforts (e.g., General Plan, Capital Improvement Plans, etc.). The LPT reviewed the previous *Mitigation Strategy* and reported on progress made in implementing the listed actions. In addition, based on updates to the hazard identification, profiles, vulnerability assessment, and capability assessment, new mitigation actions were identified.

Local Planning Team Members

Table 3-2 lists the members of the Carpinteria LPT. These individuals collaborated to identify/validate the City's critical facilities, provide relevant information/material (i.e., plans), review/update sections, report on progress, and suggest new mitigation actions.

Table 3-2. City of Carpinteria Local Planning Team 2022

Department	Name	Title
General Government	Dave Durflinger	City Manager/Director of Emergency Services
General Government	Michael Ramirez	Assistant City Manager
General Government	Olivia Uribe Mutal	Program Manager
Community Development	Steve Goggia	Community Development Director
Community Development	Nick Bobroff	Principal Planner
Community Development	Dan Chepley	Chief Building Inspector and Plans Examiner
Public Works	John Ilasin	Public Works Director/City Engineer

Department	Name	Title
Public Works	Robert Howard	Public Works Supervisor
Public Works	Erin Maker	Environmental Program Manager
Parks, Recreation, and Public Facilities	Matt Roberts	Parks, Recreation, and Public Facilities Director
Law Enforcement	Ugo "Butch" Arnoldi	Police Chief, Santa Barbara County Sheriff's Department
Fire	Greg Fish	Fire Chief, Carpinteria-Summerland Fire Protection District
Utility, Potable Water	Robert McDonald	General Manager, Carpinteria Valley Water District
Utility, Wastewater	Craig Murray	General Manager/District Engineer, Carpinteria Sanitary District
Administrative Services	Licette Maldonado	Administrative Services Director

Overview of Local Planning Team Efforts

The Carpinteria LPT members worked directly with the County Office of Emergency Management (OEM) and the consultant team in order to provide data, recommended changes, and continually work on the MJHMP and LHMP updates throughout the planning process. The Carpinteria LPT met as needed during the planning process to discuss data needs and organize data collection. Table 1-4 below outlines a timeline of the Carpinteria 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
January to March 2022	Reviewed new maps, discussed local vulnerabilities. Developed data for new or expanded hazards, including debris flows, pandemics, and sea level rise. Provided input on the status of 2017 LHMP mitigation strategies. Reviewed draft mitigation strategies and provide feedback.

3.2.2 Public Outreach and Engagement

County OEM, the City, and the consultant worked together on public outreach throughout 2021 and early 2022. In addition to the outreach program undertaken by the County for the 2022 MJHMP update, the City also performed targeted local updates to stakeholders and City residents. The Public Outreach Plan (POP) employed a diversity of tools to maximize notification and participation from individuals throughout the Carpinteria community. 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 the project and opportunities to participate. All written notices were made available in English and Spanish. Throughout the process, emails were sent to the OEM's master contact list, which includes federal, state, and local government representatives, interested members of the public, neighboring counties, and relevant local organizations, all of whom were made aware of the survey and public workshops.

The 2022 LHMP update built on the County and City's existing techniques and adapted to the limitations imposed by the COVID-19 pandemic. 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.

The City's MAC and LPT members also participated in public outreach efforts for the MJHMP and LHMP update planning process by distributing notices for the County's 6-month-long community hazards survey (refer to Section 3.4.1 of the MJHMP) and three public workshops (refer to Section 3.4.4 of the MJHMP). The first MJHMP public workshop was hosted on April 7, 2021, focusing on hazard identification. The presenters provided an overview of the project and process for updating the MJHMP, and then provided time for the public to comment on hazard prioritization. The second MJHMP public workshop was hosted on November 4, 2021, focusing on mitigation strategies. During the workshop, the presenters summarized the results of the public survey, provided an overview of the hazards and vulnerability analysis, and then provided an overview of how the team would prepare the mitigation chapter. Presenters showed the draft mitigation goals and provided example mitigation strategies for each one. Then, the team used the interactive tool Slido to collect feedback from the audience about what mitigation strategies they would support. A third MJHMP public workshop was hosted in January 2022 to present the draft plan.

In January 2022, the City conducted additional outreach with a stakeholder meeting and a separate public workshop for the City. The stakeholder meeting was hosted on Thursday, January 27, 2022, with representatives from the City of Carpinteria, Carpinteria Valley Water District, Carpinteria Unified School District, Carpinteria Sanitary District, and Carpinteria-Summerland Fire Protection District (CSFPD). The City and the consultant presented relevant results from the MJHMP and goals for mitigation and facilitated a discussion on changes in capabilities of the stakeholders since 2017, recent hazards, and mitigations ideas that could be incorporated into the 2022 LHMP update.

On January 20, the City distributed a press release and social media post with information about the LHMP's public workshop on February 1 and how to attend. No participants attended the public workshop. Therefore, the City and the consultant recorded the presentation and uploaded the video to the City's website and YouTube channel. During the video recording, the consultant presented about the importance of the LHMP, provided an overview of the City's capabilities and hazard prioritization list, and showed key vulnerability maps of the City. The consultant also provided an example of a hazard mitigation action to inspire ideas for other mitigation actions to address hazards in the City. The City and the consultant asked viewers to send in comments, questions, and ideas for mitigation actions by Friday, February 11. Two members of the public responded to the video presentation with email comments regarding mitigation opportunities (see Section 7.0, *Mitigation Plan*.

In April 2022, the LHMP was completed and made available for public review, concurrent with review by FEMA and California Office of Emergency Services (Cal OES). The opportunity to review documents was announced on the City's website. Hard copies of the document were available at the City Hall and a digital copy of the document was posted on the City's website. The community was welcome to submit written or verbal comments to the Emergency Services Program Manager. In addition, the opportunity for the community to be heard was permitted during the City Council meeting before the adoption of this plan.

4.0 CAPABILITY ASSESSMENT

The City is a vibrant but easy-going, family-oriented small beach town with an economically and ethnically diverse population with proximity to strategic business centers and an idyllic seaside location.

4.1 GEOGRAPHY AND CLIMATE

The City is located within the South Coast region of Santa Barbara County and is both the southernmost and easternmost city in the county. The City covers a land area of approximately 2.6 square miles, and an ocean area of approximately 4.7 square miles, for a total of 7.3 square miles. Elevation ranges from sea level to approximately 700 feet above sea level. It is approximately 12 miles southeast of the city of Santa Barbara and approximately 80 miles northwest of Los Angeles.

The Carpinteria coastline faces south and is generally aligned in a northwest-southeast direction which transitions from sandy beaches in the northwest to uplifted cliffs in the southeast. The Channel Islands, located offshore and to the south, protect the coast from southerly waves. Photo: City of Carpinteria

The climate in the City is Mediterranean, characterized by dry summers and moderately wet winters. Temperatures in the region range from a low of approximately 63 degrees Fahrenheit (°F) in January to a high of approximately 75 °F in August and September. Precipitation typically falls between November and March, and the average annual rainfall is approximately 18 inches per year based on data from 1985-2016; however, there is a significant interannual and annual variation from this average with especially wet years attributed to El Niño conditions and drought conditions (City of Carpinteria 2019).

Three main creeks transect the City, including Carpinteria Creek, Santa Monica Creek, and Franklin Creek, along with other smaller drainages and tributaries. Santa Monica Creek and Franklin Creek within the City boundary are concrete-lined drainage channels that both terminate at the Carpinteria Salt Marsh, one of the area's prominent hydrologic features. Carpinteria Creek remains unlined and has been identified as a target for restoration to improve habitat for threatened and endangered southern steelhead trout and tidewater goby. The Carpinteria Sanitary District's

Wastewater Treatment Plant is located adjacent to the lower reach of Carpinteria Creek (City of Carpinteria 2019).

4.2 POPULATION AND DEMOGRAPHICS

According to the Carpinteria Valley 2021 Economic Profile, the City had 13,196 residents in 2021. Between 2016 and 2021, the overall population fell by approximately 350 residents as rising home prices resulted in out-migration. According to the Santa Barbara County Association of Governments (SBCAG), the projected 2050 population for the City is 14,602, an approximately 5.7 percent increase (SBCAG 2021). The largest proportion of the population, 51.1 percent, are people between the ages of 25 and 64. The City is also comprised of 18.7 percent of people aged 65 or older, and 15.7 percent of people aged 5 to 17 (City of Carpinteria 2021a).

Carpinteria Valley has evolved as a relatively affluent area where residents report higher incomes than the average Californian or average Santa Barbara County resident. In 2021, the median household income in the City of Carpinteria was $86,944, which was higher than Santa Barbara County ($83,714) or California ($82,053). More than 40 percent of households in the City earned $100,000 or more, and almost 18 percent earned more than $200,000. Approximately 3.9 percent of the City's population lives in poverty, as defined by the California Department of Finance (City of Carpinteria 2021a). Approximately 21 percent of residents aged 25 and older have a bachelor's degree in the City (compared to 20 percent countywide), and 14 percent have an advanced degree (compared to 15 percent countywide). Approximately 29 percent of Carpinteria residents have earned an associate's degree or have attended some college classes without graduating, while 36 percent have a high school diploma or less (City of Carpinteria 2021a).

The employment rate within the City is 62.4 as of 2019. During the height of the pandemic-related economic recession, the unemployment rate climbed to 12.7 percent but has improved to 4.9 percent as of August 2021. Just over 700 jobs were lost in the Carpinteria Valley labor market in 2020, a direct consequence of the pandemic. By mid-2021, most of these jobs had been restored, and full reinstatement of the workforce is expected to be complete by mid-2022. The biggest job losses occurred in the information, accommodation, and food services sectors, whereas the construction and cannabis industries have grown over the past few years (City of Carpinteria 2021a). The agriculture sector employs more people than any other industry, followed by manufacturing, the production of information (software), and the hotel and food services sector. The largest employer in the Carpinteria Valley is Procore followed by Agilent, the Carpinteria Unified School District, LinkedIn, and NuSil Silicone Technology (City of Carpinteria 2021a).

Figure 4-1. City of Carpinteria Land Use Map

4.3 LAND USE

The City's Land Use Element establishes the type and intensity of land uses and guides growth and development in the City. The Land Use Element is the basis of the Land Use Plan of the City's Local Coastal Program (California Coastal Act of 1976, §30108.5). The City encourages greater density and intensity development to take place along main transportation corridors and development that is compatible with surrounding land uses and protective of coastal resources unique to the area (see Section 4.9, *Legal and Regulatory Capabilities*).

Carpinteria is located almost entirely on a coastal plain between the Santa Ynez Mountains and the Pacific Ocean. In general, the area's topography slopes from the foothills of the Santa Ynez Mountains in the north towards the Pacific Ocean in the south. Between the foothills and the populated area of the City is an agricultural zone under the jurisdiction of County of Santa Barbara. Transportation corridors, including U.S. Highway 101 and the Union Pacific Railroad (UPRR), bisect the City. The entire City is located within the designated California Coastal Zone (City of Carpinteria 2019).

The western part of the City is made up of mostly Medium Density Residential areas interspersed by General Commercial closer to Highway 101. East of Santa Monica Road, the majority of housing is considered Low Density Residential with pockets of Public Facilities and Open Space/Recreation land uses north of Highway 101. Areas south of Highway 101 consist of Medium Density Residential and General Commercial land uses. Medium and Low Density Residential and Open Space/Recreation areas border the coastline to the south. The eastern wing of the City is comprised of Coastal Dependent Industrial, Research Development Industrial, and Visitor-Serving Commercial areas. The urban core of the City is located primarily along Carpinteria Avenue and Linden Avenue. The land uses in the vicinity of this urban Downtown District include primarily General Commercial, Visitor-Serving Commercial, Medium Density Residential, and Public Facility (City of Carpinteria 2016).

The commercial areas in the City have tight office leasing markets and are home to several of the region's top employers, such as Procor and LinkedIn. Industrial space within the City had vacancy rates that fluctuated from 7.8 to 3.6 percent from 2020 to 2021. The retail vacancy rate has remained stable since 2019, as the City has very few vacant storefronts and few facilities that would need to be repurposed in the event of a store closure (City of Carpinteria 2021a).

Since the last update of the City's LHMP in 2017, land use and population in the City has not substantially changed. As described above, modest development has occurred consistent with the adopted Land Use Element and has primarily comprised infill development and redevelopment within the City limits. There has been no expansion of the City boundary or its Sphere of Influence (SOI) and no comprehensive changes to the Land Use Element that would result in substantial densification. Further, as described in Section 4.2, *Population and Demographics*, City population has slightly reduced. As a result, the City's level of vulnerability to hazards analyzed in Section 6.0, *Vulnerability Assessment*, has not substantially changed due to land use, development, or population growth.

4.4 ECONOMY

Carpinteria's economy is based on agriculture, tourism/retail, light industry, and research & development. The community has evolved to become a diverse economy consisting of growing tech companies, manufacturers, and financial services firms. Software and IT development have flourished in recent years, as has the visitor-serving sector (City of Carpinteria 2021a).

Carpinteria Valley has been one of the primary regions for legal cannabis cultivation in California and cannabis growing makes up a large portion of the greenhouses on agricultural land within the Carpinteria Valley. As of September 2021, there were 29 legal cannabis companies in the Carpinteria Valley. All of these companies grow cannabis, and some also process cannabis that has already been harvested. Most growers operate in the greenhouses that previously grew orchids and other flowers (City of Carpinteria 2021a).

The City is home to nearly 300 retail storefronts, most of which are locally-owned stores. There are no big-box or regionally serving retail stores within the City. However, retail sales have been declining for several years, and store closures have been frequent for home furnishings, hardware, and garden supply stores. The most successful retail subsector has been food and beverage establishments. Over the last five years, the number of local food and beverage establishments has expanded by 24 percent and sales have grown by 17 percent (City of Carpinteria 2021a).

The City's retail environment is heavily dependent on tourism activity. It has been estimated that visitors to Carpinteria account for 65 percent to 85 percent of all retail sales. Since 2019, the City has collected a local sales tax of 1.25 percent, meaning that visitors could contribute more than $1 million to the City budget through sales taxes. The annual Avocado Festival, Carpinteria State Beach, and Carpinteria City Beach are the main tourist attractions in the City (City of Carpinteria 2021a).

In 2020 and 2021, taxable retail sales in the City declined sharply. Sales are down because of pandemic restrictions. For example, restaurants were forced to operate at reduced capacities and the Avocado Festival was canceled. At restaurants, taxable sales declined by more than 30 percent in 2020. Sales have rebounded sharply in 2021 but are still below their pre-pandemic levels. As fewer commuters are traveling through Carpinteria, taxable transactions at gas stations also declined during the pandemic. Further, the transition to online shopping has accelerated. (City of Carpinteria 2021a).

4.5 INFRASTRUCTURE

4.5.1 Transportation

The transportation infrastructure of the City supports its industries and residents. The City's Public Works Department operates and maintains approximately 32.2 roadway miles (64.8 lane miles) of surface streets, seven vehicular bridges, seven pedestrian bridges, 685 streetlights, and four traffic signals. In addition, there are 3.38 roadway miles (14.6 lane miles) of State-maintained freeway (City of Carpinteria 2003).

The transit system routes that serve the City are currently provided by the Santa Barbra Metropolitan Transit District (SBMTD) and the Ventura County Transportation Commission (VCTC), respectively (see Table 4-1).

Table 4-1. Transit Routes Serving the City of Carpinteria

Route Number	Route Description	Operating Days
Santa Barbra Metropolitan Transit District (SBMTD) Routes		
20	Carpinteria (Transit Center-Milpas-Montecito-Summerland-Carpinteria)	Weekdays and Weekends
36	Seaside Shuttle (Train Station-Linden-Carpinteria Avenue-Casitas Pass Road-El Carro Lane-Santa Ynez Road)	Weekdays and Weekends
Ventura County Transportation Commission (VCTC) Routes		
80	Coastal Express- Northbound to Santa Barbara; Southbound from Santa Barbara; Southbound to Ventura	Weekdays and Weekends
80C	Coastal Express- Southbound to Santa Barbara	Weekdays
84U	Coastal Express- Northbound to Santa Barbara	Weekdays
85C	Coastal Express- Northbound to Goleta	Weekdays

SBMTD Route 36 is the only intracity transit route which uses electric shuttles. The other transit routes are mainly intercity routes which use buses. Paratransit services are currently provided by Easy Lift Transportation and Help of Carpinteria.

The county is also served by one federal and one state roadway. U.S. Highway 101 is the City's regional transportation corridor as described below:

- **Highway 101** serves as the primary transportation link between the City with other urban areas in the County (e.g., cities of Santa Barbara and Goleta) and with Ventura County to the south. It forms the foundation of the local transportation network, provides the primary freight artery through much of the central coast region, and is critical for the movement of people and goods statewide. Most trips along this route are related to business, government, recreation, tourism, and daily living, including the journey to work. In addition, Highway 101 carries the highest volumes of commercial trucks in the county, particularly between the Ventura-Santa Barbara County line and downtown Santa Barbara (SBCAG 2013).
- **State Route (SR-) 192** runs from SR-154 near Santa Barbara to SR-150 near the Santa Barbara–Ventura line. The two-lane road is better known as Foothill Road, as the route runs parallel to the foothills of the Santa Ynez Mountains.
- **SR 150** is a two-lane state highway that runs from Highway 101 near the Ventura/Santa Barbara County line to SR-126 in Santa Paula.

Highway 101, SR-192, and SR-150 are established as evacuation routes within the City as defined by the County's Climate Change Vulnerability Assessment (2021). The following local streets are also considered evacuation routes within the City boundaries (Figure 1-2):

- Santa Monica Road
- Casitas Pass Road
- Sandyland Cove Road

Figure 4-2. City of Carpinteria Evacuation Routes

4.5.2 Electricity and Natural Gas

Southern California Edison (SCE) provides electrical service to the City. In 2018, the City's residential energy usage was approximately 21,513,765 kilowatt-hours (kWh) of electricity, while non-residential facilities consumed approximately 48,411,607 kWh. The City is uniquely located near the end of the SCE power distribution grid. With most electric generation coming from only one southeasterly direction, Carpinteria is heavily dependent on a few key transmission lines. The 220-kilovolt (kV) lines going through the mountains provide most of the City's electricity, while 66-kV lines provide the remainder. Due to the set-up of the power distribution system, Carpinteria's power grid is less resilient to natural disasters. The Ellwood Natural Gas power plant is a backup capable of serving almost the entirety of southern Santa Barbara County but failed during the Thomas Fire and Montecito Debris Flows of 2018-2019. These events led to power outages for over 20,000 residents in the region; Carpinteria was left with decreased power supply for nearly a month. Due to these events, the City developed a Strategic Energy Plan (SEP) to improve emergency preparedness and the resiliency of the local electric distribution system (see Section 4.9.3, *City of Carpinteria Strategic Energy Plan*).

In addition to the recommendations found within the SEP, the City considers statewide renewable energy goals, such as Senate Bill (SB) 100 which sets a target of 100-percent carbon-free electricity by 2045. In 2019, the City became a member of Central Coast Community Energy (CCCE; formerly Monterey Bay Community Power), a locally managed public agency providing carbon-free and renewable energy to enrolled communities. CCCE is a Community Choice Energy Provider that partners with the local utility (i.e., SCE) which continues to provide service. However, the electricity supplied will be 100 percent carbon neutral and consist of approximately 35 percent renewable energy. The City enrolled in 2022, and the program aims to transition to 100 percent renewable energy, although a timeline has not yet been established (see also Section 5.3.6, *Energy Shortage & Resiliency*).

Regarding natural gas, the City and its surrounding areas receive natural gas from one supplier, the Southern California Gas Company (SoCal Gas). SoCal Gas pays a franchise fee as part of its agreement with the City and anticipates the resources necessary to sufficiently supply natural gas to the City for residential, commercial, and industrial uses.

4.5.3 Water Supply

The Carpinteria Valley Water District (CVWD) is the potable water purveyor for the Carpinteria community and serves a land area of approximately 11,098 acres located between the Santa Ynez Mountains and the Pacific Ocean. As of 2020, CVWD supplies potable water to approximately 15,966 people with a total of 4,531 service connections. Existing service connections under CVWD consist of the following account types: 3,265 single-family residential, 350 multi-family, 283 commercial/institutional, 58 industrial, 50 landscape irrigation, 386 agricultural, and 132 other (fire). Infrastructure to support 1,600 of these service connections was installed before 1964 (CVWD 2021a). Existing connections within the City primarily serve municipal uses (e.g., residential, commercial, and institutional), as very few agricultural parcels exist within City.

CVWD owns, operates, and maintains three potable water reservoirs with a combined storage capacity of approximately 10.68 acre-feet (AF). These reservoirs include Shepard Mesa (0.15 AF),

Foothill (9 AF), and Gobernador (1.53 AF). The Cachuma Operation and Maintenance Board, of which CVWD is a member unit, operates two additional reservoirs in the area, the Ortega Reservoir (60 AF) and Carpinteria Reservoir (44 AF). In addition, CVWD owns and operates approximately 88.8 miles of distribution pipelines, which consist of concrete (51 percent), steel (36 percent), and other materials (13 percent; CVWD 2021a). The existing pipeline infrastructure provides water to all developed parcels within the City. The CVWD obtains its water from the surface waters of the Cachuma Project and State Water Project (SWP) and groundwater from the Carpinteria Groundwater Basin. Lake Cachuma, located within the Santa Ynez River watershed, supplied approximately 41 percent of CVWD's water between 2016 and 2020 and has a maximum capacity of 195,600 AF. The SWP allocates up to 2,200 AF of water per year to CVWD, including a 200-AF drought buffer. Water from Lake Cachuma is treated at the Cater Water Treatment Plant north of the City of Santa Barbara before being conveyed to CVWD (CVWD 2021a).

The Carpinteria Groundwater Basin, which underlies the CVWD service area, provides the remaining water demand, extracted via groundwater wells. The Carpinteria Groundwater Basin spans approximately 16.6 square miles, with a maximum storage capacity of approximately 700,000 AF and a usable capacity of approximately 39,000 AF. Within the City, the CVWD owns, operates, and maintains five municipal wells, which have a combined capacity to produce approximately 3.98 million gallons per day. Two wells can extract and inject water, which helps meet peak water demand and provide some redundancy in the groundwater supply reliability (CVWD 2021a). See section 5.3.7, *Drought & Water Shortage* for further information regarding CVWD's water supply and drought management efforts.

4.6 SCHOOLS

The Carpinteria Unified School District (CUSD) provides public education services to students in the Carpinteria Valley, with district boundaries reaching south to the Ventura County line and west to Summerland. The CUSD serves approximately 2,200 students from transitional kindergarten through grade 12. The CUSD also provides early childhood programs to children three months to four years old. The CUSD has eight school sites: one comprehensive high school (Carpinteria High School), two small alternative high schools (Foothill Alternative High School, Rincon Continuation High School), one middle school (Carpinteria Middle School), three elementary schools (Aliso Elementary School, Canalino Elementary School, Summerland Elementary School), and a former public school site containing a public-private collaborative focused on early education and social services (Carpinteria Family School, which includes Canalino Early Childhood Learning Center and Special Education). Seven of the eight school sites are located within the City limits; Summerland Elementary School is located in Summerland outside the City's western boundary.

CUSD was one of the first school districts in California to open back up to in-person learning following school shutdowns amid the COVID-19 pandemic. In addition to difficulties with staffing within the District, student learning and the ability for teachers to engage with students were severely affected by the virtual learning environment during the pandemic. The ability of students to focus was also affected. The measurement of growth (i.e., grades) within CUSD has changed considerably as compared to the pre-pandemic environment to adapt to new learning approaches in schools (Pers. Comm. Maureen Fitzgerald 2022).

4.7 ADMINISTRATIVE AND TECHNICAL CAPABILITIES

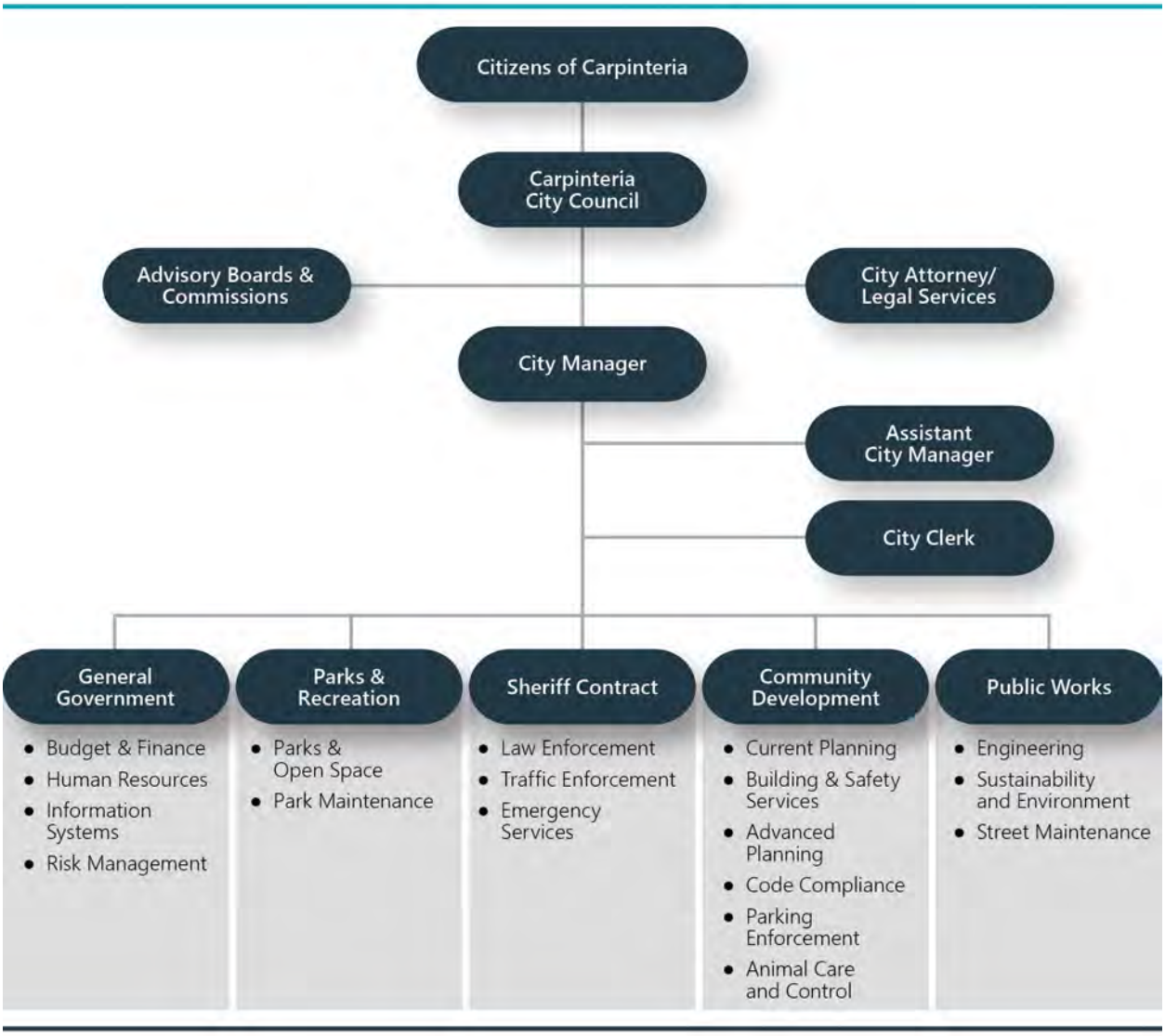
The City employs 32 full-time staff. The tourist season dictates the number of part-time staff, averaging 42 per year. The City has a robust volunteer program with approximately 200 volunteers participating in community and beach clean-up projects, docents, and the HOST Visitors Center. Over 270 community members have been Community Emergency Response Team (CERT) trained.

4.7.1 Governance

The City utilizes the Council-Manager form of local governance, which includes both elected officials and an appointed City Manager. Carpinteria has five City Council members, including a mayor and a vice mayor, which are appointed to represent the Carpinteria City Council.

The City Council is Carpinteria's legislative body, providing vision, setting and adopting policies, regulations, ordinances, and resolutions, approving budgets, and setting tax rates. City Council members hire the City Manager, who is responsible for the day-to-day administration of the City and serves as the Council's chief advisor. The City Manager prepares a recommended budget, recruits and hires most of the City's staff, and carries out the Council's policy. While the City Manager may recommend policy decisions, he is ultimately bound by the actions of the Council. The City Council also hires the City Attorney. The City's organizational chart is shown below.

Chart 4-1. City of Carpinteria Organizational Chart



4.7.2 City Administration

City Manager

The City Manager is responsible for overseeing the daily operations of the City and for organizational efficiency and effectiveness, for the preparation and presentation of the municipal budget, and keeping the City Council informed on other municipal financial matters, oversight of personnel matters, and for the oversight of municipal facilities. The City Manager leads the management team and all City departments.

The City Manager also serves as the Office of Emergency Services (OES) Director. The City Manager's office is responsible for the implementation of emergency management (including mitigation) programs for the City. As the OES Director, the City Manager oversees contracts with the Santa Barbara County Sheriff's Department for police services (see Section 4.7.3, *Police*

Department) and the Carpinteria-Summerland Fire District for fire services (see and Section 4.7.4, *Fire Department*).

4.7.3 Police Department

Police services in the City are provided via the Santa Barbara County Sheriff's Office Contract Service Bureau, which also provides services to the cities of Buellton, Goleta, and Solvang. Sheriff's deputies are responsible for responding to calls for service, conducting investigations, and providing crime prevention, community patrol, and public information services. The Sheriff's Office also actively participates in several programs, including Neighborhood Watch, youth school training, business training (e.g., educating merchants about fraud and site security), personal crisis consultation, and coordination with the California Department of Fish and Wildlife for wildlife and habitat violations. In addition, the Sheriff's Department develops and implements emergency response plans and policies, focusing on evacuation procedures and traffic control and including training for the Carpinteria CERT.

The Carpinteria Sheriff's Substation is located adjacent to City Hall at 5757 Carpinteria Avenue. The Sheriff's Office is contracted to support the City with at least two on-duty deputies on a 24/7 basis, in addition to one supervising deputy and administrative support, offering a deputy ratio of approximately one deputy per 4,500 City residents. During the more heavily visited summer months, the City employs additional deputies in the downtown corridor and Beach Neighborhood areas, with an additional two deputies working Friday through Sunday from approximately 10 a.m. to 8 p.m. When additional assistance is needed for patrol and incident response (usually no more than 2 to 5 percent of the time), the Carpinteria Sheriff's Substation receives assistance from Sheriff's deputies in nearby areas and assists with response in the nearby unincorporated County area.

Emergency Services Division

An Emergency Operations Center (EOC) provides a central location of authority and information and allows for face-to-face coordination among personnel who must make emergency decisions. The City's EOC, located at 1140 Eugenia Place, Suite A, provides centralized emergency management for when a major emergency or disaster strikes. The EOC includes a satellite phone, radios, conference rooms, and office areas. A generator provides emergency power to lighting panels, computers, wall circuits, telephones, and radios. The alternate EOC is located at Carpinteria City Hall Council Chambers (5775 Carpinteria Avenue). The alternate EOC is only be activated when the primary EOC is damaged, inaccessible, and/or evacuation of EOC staff members becomes necessary. When the use of the alternate EOC becomes necessary, those occupying the primary EOC will be asked to relocate to the alternative site.

When activated, representatives from City departments report to the EOC to coordinate City decision-making, simultaneously coordinate department activities, and liaise with different levels of government as well as with private entities. The following functions are performed in the City's EOC:

- Managing and coordinating emergency operations.
- Receiving and disseminating warning information.
- Developing emergency policies and procedures.
- Collecting intelligence from, and disseminating information to, the various EOC representatives and, as appropriate, to county and state agencies, military, and federal agencies.

- Preparing intelligence/information summaries, situation reports, operational reports, and other reports, as required.
- Maintaining general and specific maps, information display boards, and other data pertaining to emergency operations.
- Continuing analysis and evaluation of all data pertaining to emergency operations.
- Controlling and coordinating, within established policy, the operational and logistical support of departmental resources committed to the emergency.
- Maintaining contact and coordination with other local government EOCs and the Santa Barbara Operational Area.
- Providing emergency information and instructions to the public, making official releases to news media, and scheduling press conferences, as necessary.
- Resource ordering, dispatching, and tracking.

The City's Emergency Services Coordinator is responsible for management of the primary and alternate EOCs, including maintaining operational readiness of the EOCs. Positions assigned to the EOC will brief City decision-makers of the emergency situation and recommend actions to protect the public (e.g., alerting and warning the public, evacuation of risk area, activation of shelters, request for operational area/state/federal assistance, etc.). The Director of Emergency Services/EOC Director has the primary responsibility for ensuring that the City Council is kept apprised of the emergency situation.

The Emergency Services Division is organized into the following sections:

- **Management Section:** Responsible for overall emergency management policy and coordination through the joint efforts of governmental agencies and private organizations. Management will either activate appropriate sections or perform their functions, as needed.
- **Operations Section:** Responsible for coordinating all jurisdictional operations in support of the disaster response through implementation of the City's EOC Action Plan.
- **Planning & Intelligence Section:** Responsible for collecting, evaluating, and disseminating information and coordinating the development of the City's EOC Action Plan in coordination with other Sections.
- **Logistics Section:** Responsible for providing communications, facilities, services, personnel, equipment, supplies, and materials.
- **Finance & Administration Section:** Responsible for financial activities and other administrative aspects.

4.7.4 Fire Department

Fire protection service in the City is provided by the Carpinteria-Summerland Fire Protection District (CSFPD), which serves approximately 40 square miles along the coastline from the Santa Barbara-Ventura County line to the east and Montecito to the west. The CSFPD provides personnel and facilities to service the City in the event of a fire. As first responders, the CSFPD personnel also provide Emergency Medical Services (EMS) and are supported by ambulance services delivered through a public/private partnership, which includes American Medical Response. The CSFPD also provides non-emergency services that include fire and life safety inspections, building inspections, fire investigations, code compliance, and public education.

The CSFPD maintains two fire stations located at 911 Walnut Avenue in Carpinteria and 2375 Lillie Avenue in Summerland. Both stations provide response services to the City. Response times for fire services range from three minutes (inner City) to five minutes (City periphery). The CSFPD has a total of 27 firefighters, two fire engines, one squad, two water rescue wave-runners, two all-terrain vehicles (ATVs), and three command vehicles. All CSFPD apparatuses are staffed with a minimum of one licensed paramedic who provides advanced life support services as the EMS first responder. All fire fighters are trained in EMT-1 and fire suppression response.

At least one Ventura County Engine is available to the City for first alarm incidents through an automatic aid agreement. Additionally, the City's Emergency Operations Plan provides for the progressive mobilization of resources to and from local governments, operational areas, regions, and the state to provide requesting agencies with adequate resources. Using the Emergency Operations Plan, the City may request the assistance of additional fire engines as necessary, such as from the Montecito Fire Protection District (to the west) (City of Carpinteria 2014).

The Administration Section develops, implements, and monitors policies, procedures, budgets, fees, automatic aid agreements, mutual aid agreements, and liaisons with other City departments and outside agencies. The Fire Prevention Bureau coordinates the adoption of codes and ordinances, reviews site and building plans for fire code compliance, develops and presents public education programs, and manages the City's weed abatement program. The Suppression Section maintains the Department's personnel, apparatus, equipment, and fire stations in a state of readiness to respond to the community's needs, develops and implements standard operating procedures for various types of emergency responses, responds to all types of emergencies, and trains and interacts with neighboring jurisdictions and regional agencies.

4.7.5 Community Development Department

The Community Development Department (CDD) provides primary support to the Planning Commission and its advisory bodies, the Architectural Review Board and the Environmental Review Committee. CDD also provides staff support as needed to the City Council, City Manager, other City Departments, and other boards and committees as needed (Traffic Safety Committee, Tree Advisory Board, Downtown "T" Business Advisory Board, Technical Planning Advisory Committee and Joint Housing Task Group). Staff is also involved in reviewing and commenting on environmental documents prepared for projects in the County's jurisdiction as well as those proposed by Special Districts within and surrounding the City boundaries. All work is done with the goal of implementing the Department's Mission Statement. Individual Divisions are discussed below.

Building & Safety Division

The Building and Safety Division aids in applying for and reviewing Building Permit Applications, including site and building plans, for compliance with building codes and ordinances. The Building and Safety Division enforces the adoption of building, plumbing, electrical, seismic, and mechanical/structural codes and develops building ordinances. The Division also provides damage assessment of structures from multiple causes to facilitate the repair and future occupancy.

Planning Division

The Planning Division develops and maintains plans and permits, the City General Plan/Local Coastal Land Use Plan, zoning ordinances, and development standards. The Planning Division also provides oversight of the City development process assuring compliance with zoning and general plan, including environmental impact reports, design review, historic preservation, landscape review, habitat conservation, floodway prohibitions, and floodplain development standards.

Code Compliance

The Code Compliance Division investigates and resolves building and zoning compliance issues, enforces parking regulations, and implements the City's animal care and control programs.

4.7.6 Public Works Department

The Public Works Department is comprised of the following divisions and respective programs:

Engineering Division

- Public Works Administration
- Transportation, Parking, and Lighting
- Capital Improvements

Street Maintenance Division

- Street Maintenance
- Right-of-Way Maintenance

Sustainability and Environment Division

- Resource Conservation
- Solid Waste
- Watershed Management

The Public Works Administration Program is responsible for the planning, organizing, and directing of all services in the Public Works Department. The Public Works Department is augmented with contracts for professional (consulting) services, solid waste hauling, street sweeping, and street and right-of-way maintenance. The Public Works Administration Program also administers the Engineering Permits Service. Under this service, engineering permits are issued for grading, right-of-way encroachments, dumpsters, and oversize loads; and special event permits are issued for events held in the public right-of-way including temporary parking.

The Street Maintenance Program provides for the maintenance of all City streets. There are approximately 33 centerline miles of streets or 6 million square feet of pavement which now includes the new Via Real extension. Maintenance of City streets includes pavement, traffic control devices (traffic signals, signing, and striping), street lights, bikeways (bike paths, bike lanes, and bike routes), and bridges. Repairs of pavement potholes and traffic signing and striping are able to be performed by Street Maintenance Division staff. Maintenance contracts augment Street Maintenance Division staff for larger work involving pavement replacement, traffic signals, and street lights.

The Right-of-Way Maintenance Program provides for the maintenance of all City rights-of-way. Maintenance of City rights-of-way includes curbs, gutters, sidewalks, curb ramps, planter medians, benches, trash receptacles, bicycle racks, street trees, and graffiti removal.

The Resource Conservation Program provides for renewable energy development, energy efficiency, and strategic energy planning. The City is committed to providing equitable, clean resilient power for the community. The program involves the following services or activities: Community Choice Energy, Strategic Energy, and Energy Efficiency.

The Solid Waste Program provides for solid waste collection including handling, disposal, and recycling operations; and street sweeping. The City contracts with E.J. Harrison and Sons, Inc. to provide the solid waste collection and with Pacific Sweep, LLC to provide the street sweeping. The program also provides for the collection of antifreeze, batteries, oil, and paint; and an annual collection of household hazardous waste, household goods, and electronic waste (E-Waste). The Solid Waste Program is funded by Assembly Bill (AB) 939 fees which are collected by E. J. Harrison and Sons, Inc. and remitted to the City as part of the contract. The cost of the program is also offset with the Oil Payment Program Funds from the California Department of Resource, Recovery and Recycling (CalRecycle).

The Watershed Management Program provides for the public outreach and education of stormwater quality; tracking of illicit discharges; water quality testing at storm drain outfalls or discharge areas; implementation and enforcement of stormwater quality best management practices (BMPs) for development, redevelopment, and City operations; regional coordination; and the overall stewardship of local watersheds by regulating stormwater runoff into creeks and salt marsh. The program was created in response to a need to comply with the National Pollution Discharge Elimination System (NPDES) Phase II Small Municipal Storm Sewer System Permit. The program involves the following services or activities: Stormwater Management, Storm Drain Maintenance, Regional Watershed and Stormwater Funding Coordination, and State and Federal Permit Coordination.

4.7.7 Parks and Recreation Department

The City Parks and Recreation Department (PRD) provides the City's recreation programs and maintains the parks, the community pool, and the Veteran's Memorial Building. In total, there are 19 parks and recreation facilities within the City that are operated by the PRD. The PRD is responsible for responding to issues such as maintenance (e.g., weeding, graffiti) and street repairs (e.g., streetlight repairs, utility pole maintenance) associated with their facilities. Programs operated by PRD include Junior Lifeguards, adult coed softball, ocean recreation facilities such as the boathouse on Ash Avenue, and the operation of the Community Garden Park near the Amtrak train station. Privately sponsored sports leagues also exist for youth and adults such as baseball, football, and soccer.

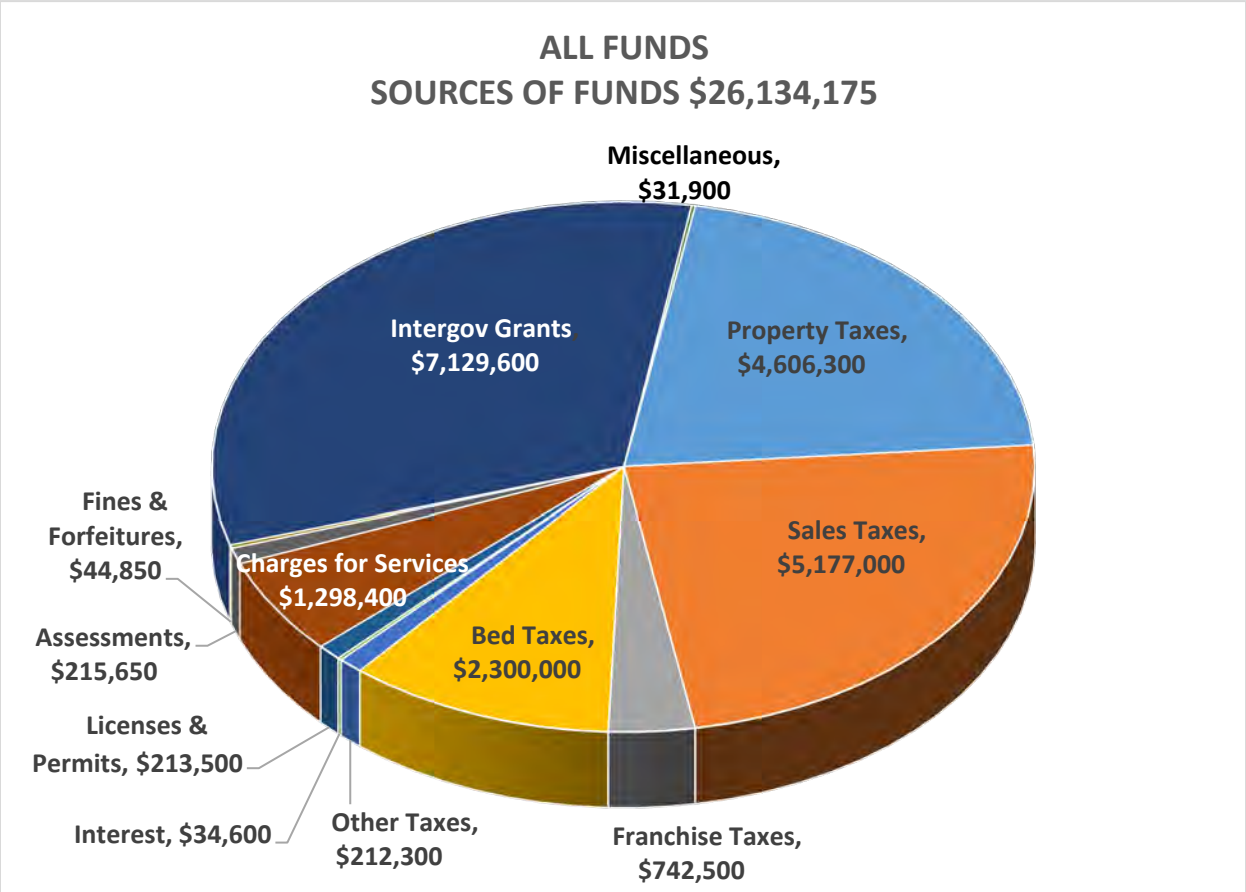
4.8 FISCAL MITIGATION CAPABILITIES

The Fiscal Year (FY) 2021-22 Adopted Budget of approximately $26.1 million, includes over $9 million in intergovernmental grants and City funds for capital improvements and major maintenance projects; a reflection of a growing demand for maintenance and replacement of the City

infrastructure and the City's interest in addressing those needs in a timely and strategic manner to minimize costs (City of Carpinteria 2021b). Chart 4-2 shows the City's All Funds Budget.

The General Fund Budget also includes general government administration services, public safety, planning, and environmental and public works services. The general fund balance is an important indicator of the financial strength of the jurisdiction.

Chart 4-2. City of Carpinteria All Funds Budget 2021-2022



4.9 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 City additionally offers the Community Emergency Response Team (CERT) trainings in Spanish and English and has over 200 CERT-trained volunteers throughout the city. The City also has resumed the LISTOS training in Spanish and English. The difference between CERT and LISTOS is that LISTOS focuses on the reading to respond to an emergency with relation to an individual or family unit whereas CERT focuses on a wider Community

response. The City can capitalize on its existing educational capacities, even non-hazard related such as school partnerships, 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 City. Additionally, the neighbor to neighbor program first piloted in 2019 will be a cornerstone program for a variety of services provided by the city including emergency preparedness, neighborhood watch and the development of an effective communication tree during emergencies.

As part of our communication and outreach, we have a website and page dedicate do Emergency Preparedness at https://carpinteriaca.gov/local-info/emergency-preparedness/. We have social media for ongoing communication about emergencies, as well as a bimonthly newsletter that is sent in English and one that is sent in Spanish. As part of the content the city publishes, we include emergency preparedness reminders for example warning system education, evacuation education, outreach about plans and policies including the City of Carpinteria LHMP update.

The City of Carpinteria has one staff member that is assigned to Emergency Services, including ongoing trainings and participation in coordination with the County of Santa Barbara Office of Emergency Management in any emergency and emergency planning.

The Emergency Services Program Manager receives and reviews all large events that require City permits and collaborates with named event coordinators for the development of emergency plans in coordination with law enforcement within the jurisdiction including but not limited to the Santa Barbara County Sherriff's Office, Carpinteria Fire District, State Parks, and the Carpinteria School District.

4.10 LEGAL AND REGULATORY CAPABILITIES

The legal and regulatory capabilities of the City are shown in Table 4-2, which presents the existing ordinances and codes that affect the physical or built environment of Carpinteria. Examples of legal and/or regulatory capabilities can include the City's building codes, zoning ordinances, subdivision ordinances, General/Coastal Land Use Plan, capital improvement plans, economic development plans, emergency response plans, and real estate disclosure plans.

Table 4-2. City of Carpinteria Capability Summary of Relevant Plans, Ordinances, and Programs

Relevant Plans, Ordinances, and Programs	
General Plan	X
Land Use Plan/Element	X
Zoning Ordinance	X
Subdivision Ordinance	X
Flood Damage Protection Ordinance (Floodplain Management Regulations)	X
Watershed Management Ordinance	X
Integrated Pest Management Plan	X

Relevant Plans, Ordinances, and Programs	
Building Code	X
Fire Department ISO Rating	
Stormwater Management Program	
Capital Improvement Program	
Economic Development Plan	
Emergency Operations Plan	X
Sea Level Rise Vulnerability Assessment and Adaptation Plan	X
Dune and Shoreline Management Plan	X
Strategic Energy Plan	
Transportation Emergency Preparedness Plan	
Santa Monica Debris Basin Emergency Action Plan	
Community Wildfire Protection Plan	X
Local Wildfire Mitigation Plan	
Local Wildland Fire Plan	
Tsunami Response Plan	

The City has a range of guidance documents and plans for each of its departments. These include capital improvement plans, emergency management plans, General Plan/Coastal Land Use Plan (GP/CLUP), Sea Level Rise Vulnerability Assessment and Adaptation Plan, and flood response guidelines. The City uses building codes, fire codes, zoning ordinances, subdivision ordinances, and various planning strategies to address how and where development occurs. One of the essential ways the City guides its future development and programs is through policies laid out in the General Plan, including the Safety Element. The LHMP directly informs these plans and is used to evaluate the need for adjustments or updates to existing plans and programs. The City considers the LHMP's assessment of capabilities, hazards, and vulnerabilities to inform planning, capital improvements, programs, decision-makers, and the public. The City also implements mitigation actions through the City's general plan, capital improvement program, maintenance programs, grant programming, community outreach, and budget process. The following plans were reviewed by the LPT and relevant information was incorporated into the LHMP.

4.10.1 City of Carpinteria General Plan

The GP/CLUP is the primary planning policy document for the City. The City is currently in the process of updating its GP/CLUP and expects it to be completed in 2024. The current General Plan was adopted in 2003. The content of the General Plan is arranged to achieve the community goal, which is to preserve the essential character of the beach town, its family-oriented residential neighborhoods, its unique visual and natural resources, and its open, rural surroundings while enhancing recreation, cultural, and economic opportunities for its citizens. The following are subject to change when the updated GP/CLUP is finalized in 2024.

The Carpinteria General Plan is organized into seven elements:

- Land Use

- Community Design
- Circulation
- Open Space & Conservation
- Safety
- Noise
- Public Facilities & Services

Post-2024, the updated General Plan will introduce two new elements:

- Healthy Community
- Coastal Resiliency

Land Use Element

The Land Use Element is the basis of the Land Use Plan of the City's Local Coastal Program (California Coastal Act of 1976, §30108.5). The Land Use Element establishes the type and density of land uses and guides growth and development by presenting a plan that reflects the community's desire to maintain and enhance an enjoyable, balanced quality of life. One land use objective that correlates with hazard mitigation is to reduce the density or intensity of a particular parcel if warranted by conditions such as topography, geologic, or flood hazards, habitat areas, or steep slopes. The Plan suggests that this can be achieved by establishing an environmentally sensitive overlay district in the City's Zoning Ordinance. The overlay district would have to include density and parcel size criteria for determining the appropriate intensity of these areas.

Safety Element

Specific to hazard mitigation, the Safety Element identifies known public safety hazards including seismic and other geologic hazards, flood hazards, slope stability, soil hazards, and fire hazards. Through the identification of various natural and manmade hazards, the City of Carpinteria aims to minimize the respective risks. Many of the identified risks can be avoided through adherence to standard policy while others may be lessened through the use of mitigation measures in the planning and land use review process. The LHMP is incorporated by reference in the Safety Element.

Key appliable policies are presented below.

- **Seismically Induced Hazards** All buildings requiring a building permit are to be reviewed by the City's Building inspector. Coastal installations require a wave action uprush study to demonstrate that the structure will withstand high surf.
- **Slope Stability Hazards** All developed areas at risk of bluff failure be protected from bluff retreat over a 100-year term.
- **Soil Hazards** New development on areas identified as having a high potential for expansive soil, soil settlement, or hydro compaction, then foundation recommendations shall be made by a qualified geotechnical engineer.
- **Flood Hazards** New development in flood hazard areas shall comply with the City's Floodplain Management Measures and obtain the necessary permits.

- **Fire Hazards** All new and redevelopment projects shall be reviewed and approved by the CSFPD.
- **Hazardous Materials** City policies concerning the use, storage, transportation, and disposal of hazardous materials shall reflect the County of Santa Barbara and the State Regional Water Quality Control Board policies and requirements and shall ensure that the use, storage, transportation, and disposal of hazardous materials does not result in hazardous discharge or runoff. Hazardous materials or wastes stored in closed containers at a facility should not be within 50 feet of an adjacent property. New residences should not be located adjacent to known handlers of acutely hazardous materials. Further, before the development of any site identified as having been used for the storage of hazardous materials, the City shall require the developer to submit documentation to demonstrate that testing has been conducted to determine the existence and extent of soil and/or groundwater contamination and that, based on the results, an appropriate clean-up program is established and completed. Habitable structures should not be located close to gas pipelines, railroad rights-of-way, oils wells, or other corridors that have the potential for hazardous materials leaks.

4.10.2 City of Carpinteria Emergency Operations Plan

This Emergency Operation Plan addresses the City's planned response to extraordinary emergencies associated with natural disasters, technological and intentional incidents, and national security emergencies. The document is divided into four parts:

- **Part I – Basic Plan.** Overall organizational and operational concepts relative to response and recovery, as well as an overview of potential hazards. The intended audience is the EOC Management Team.
- **Part II – Emergency Organization Functions.** Description of the emergency response organization and emergency action checklists. The intended audience is the EOC Management Team.
- **Part III – Hazard Appendix.** Provides threat assessments that identify and summarize the hazards which could impact the City.
- **Part IV – Supporting Documentation.** Provides supporting documentation to the City's Emergency Operation Plan that identifies Standardized Emergency Management System and National Incident Management System compliance as well as other required information.

With regards to hazards mitigation, the document cites that Section 322 of Public Law 106-390 (Disaster Mitigation Act [DMA] of 2000) requires, as a condition of receiving certain federal disaster aid, that local governments develop a mitigation plan that outlines processes for identifying the natural hazards, risks, and vulnerabilities in their jurisdiction. It also assigns key responsibilities to local government regarding hazard mitigation responsibilities. The City, in coordination with the County Office of Emergency Management (OEM), has prepared the 2022 Multi-Jurisdictional Hazard Mitigation Plan (MJHMP) Update.

The City's emergency management organization is responsible for recovery policy and coordination through the joint efforts of governmental and private organizations. Following a major disaster, recovery actions would occur in two general phases: Short-Term and Long-Term Recovery. Recovery operations would be managed and directed by the City Manager.

The goal of short-term recovery is to restore local government to at least a minimum capacity. The major objectives of short-term recovery operations include rapid debris removal and clean-up as well as restoration of essential services, such as electricity, water, and sanitary systems. In contrast, the goal of long-term recovery is to restore facilities to at least pre-disaster conditions. the major objectives of long-term recovery operations include the delivery of social and health services, reviewing potential improvements to land use planning, re-establishing the local economy to pre-disaster levels, recovery of disaster response costs, and integrating mitigation strategies into recovery planning.

The Hazard Mitigation Grant Program (HMGP) provides grants to states and local governments to implement long-term hazard mitigation measures after a major disaster declaration. The purpose of the HMGP is to reduce the loss of life and property due to natural disasters and to enable mitigation measures to be implemented during the immediate recovery from a disaster.

The Emergency Operation Plan also includes an organizational matrix which would be used to designate responsibilities to various City departments and agencies. Checklists are provided for care and shelter needs, which would be administered by the Department of Social Services; additional checklists are provided to assist those with disabilities and other special needs, to inspect buildings for re-occupancy of key facilities, and to ensure the maintenance and restoration of utilities and critical infrastructure.

To enhance the capability for the City to respond to emergencies, a Planning/Intelligence section is provided. Its responsibility is to collect, evaluate, display and disseminate incident information and resource status. This Section functions as the primary support for decision-making to the overall emergency organization.

The Logistics Section's primary responsibility is to ensure the acquisition, transportation, and mobilization of resources to support the response effort at the disaster sites, public shelters, EOCs, etc. This Section provides all necessary personnel, supplies, and equipment procurement support. Its objectives include the collection of information to determine needs and prepare for expected operations, the coordination of logistical support with the EOC Director, and the preparation of reports required for identifying the activities performed by the Logistics Section.

The Finance and Administration Section's responsibility is to maintain the financial systems necessary to keep the City functioning during a disaster. These systems include payroll, payments, revenue collection, claim processing, and cost recovery documentation. The Finance/Administration Section acts in a support role in all disasters/emergencies to ensure that all required records are preserved for future use and that documentation is properly archived for California Office of Emergency Services (Cal OES) and Federal Emergency Management Agency (FEMA) filing requirements.

The City will continue to review this LHMP when determining updates to the Capital Improvement Plan, so that new/ongoing projects may take into consideration hazard mitigation measures (see also, Chapter 8, *Plan Maintenance*).

4.10.3 City of Carpinteria Strategic Energy Plan

The SEP was prepared in partnership with the County of Santa Barbara and the City of Goleta to prepare for emergencies by improving the resiliency of the local electric distribution system. Increasing resiliency by promoting local renewable energy, energy efficiency, and energy storage projects will allow the residents and businesses in Carpinteria to reduce their dependence on the local electric distribution system and increase electricity reliability during power outages.

The SEP includes solar photovoltaic (PV) energy considerations, which holds the most potential for electricity generation in the City. Due to a lack of developable land in the Carpinteria area for utility-scale installations, the City instead contains opportunities for residential and commercial distributed electricity installations. If implemented on existing City structures, an estimated 18,000 to 24,000 households could be powered by the 51 to 69 Gigawatt hours generated annually if barriers such as funding are overcome. With the utilization of PV energy resource options, the City would contain more reliable electricity during both emergency and non-emergency scenarios, supporting a cleaner and more resilient future.

The SEP recommends strategies to reach renewed energy goals and increase the overall resiliency of Carpinteria's energy system. Strategies include:

- Update residential and commercial solar and solar storage permitting procedures to reduce permitting barriers
- Institute energy benchmarks for existing large commercial buildings
- Create a backup inverter program to prepare for emergencies by improving the resiliency of the local electric distribution system.
- Develop a community solar project in partnership with investor-owned utilities or a community choice aggregation
- Creation of a new financing mechanism so that residents and businesses can afford to buy solar projects. This may be achieved through a partnership with a private foundation or government agencies.
- Introduce financial incentives for solar adoption
- Diversify City funding streams
- Create a formal Energy Assurance Plan to protect key sites so that they continue to operate in the event of any disaster or electricity outage.
- Support a Countywide One-Stop-Shop to lead education efforts in the City
- Advocate for City energy goals at a state and Federal level.

4.10.4 City of Carpinteria Watershed Management Ordinance

In 2014, the City adopted Ordinance No. 667, adding Chapter 8.10, *Watershed Management*, to the City of Carpinteria Municipal Code. This ordinance establishes water quality protections to all water entering storm drain systems or waters of the state, consistent with the Clean Water Act and Porter-Cologne Act. The ordinance prohibits the discharge of pollutants or waters containing pollutants into the municipal storm drain system or watercourses. The ordinance also describes the

responsibility of new development and redevelopment to identify and implement best management practices to reduce pollutants in any stormwater runoffs and the responsibility to comply with terms and provisions of applicable permits, including the NPDES permit. All potential development projects with the potential to generate discharge of pollutants that would degrade water quality must adhere to stormwater management controls included in the chapter.

4.10.5 City of Carpinteria Sea Level Rise Vulnerability Assessment and Adaptation Plan

The Sea Level Rise Vulnerability Assessment and Adaptation Plan (SLRVAAP) provide a comprehensive assessment of the vulnerabilities of City resources, structures, and infrastructure, as well as the potential for future damages to the City associated with various coastal hazards, including sea level rise. The plan is intended to support adaption planning by identifying a full range of potential future adaptation strategies that can be employed to reduce the risk of future damages as well as thresholds of impacts that can guide long-term land use and planning goals, policies, and programs, including implementation measures related to citywide physical development.

The plan summarizes the existing and future vulnerabilities of 11 key resource and infrastructure sectors, provides an overview of potential risks caused by coastal flooding, coastal erosion, and tidal inundation to these 11 resource sectors, and identifies potential adaption strategies to address potential coastal hazards related to sea level rise. Recommended adaption strategies include:

- Prepare a winter storm berm program
- Prepare and U.S. Army Corps of Engineers (ACOE) Stroma Damage and Shoreline Protection Feasibility Study
- City coordination and/or collaboration with Beach Erosion Authority for Clean Oceans and Nourishment (BEACON) to optimize protection of City resources from coastal hazards
- Create a cobble and vegetative dune system along the shoreline
- Work with BEACON to develop a sedimentation program along beaches and bluffs and opportunities for beach nourishment
- Develop sand retention structures
- Develop stormwater infrastructure improvements
- Establish policy and program framework for adaptation such as development standards for the accommodation of sea level rise. Additionally, place a special zone district over properties within defined coastal hazard areas with the provision of additional adaptation options to avoid the need for developers to seek costly variances for projects that are designed to avoid or accommodate sea level rise hazards but may not be consistent with existing zoning
- Relocate development subject to repetitive damage and highly vulnerable utility infrastructure
- Protect the UPRR and Los Angeles-San Diego-San Luis Obispo (LOSSAN) Rail Corridor by elevating the railroad in the downtown region, raising the railroad on a causeway in the Carpinteria Salt Marsh area, and armoring the Carpinteria bluffs.

4.10.6 Carpinteria-Summerland Fire Protection Master Plan 2012 – 2022

The Carpinteria-Summerland Fire Protection Master Plan outlines the roles, responsibilities, immediate and long-range goals of the four divisions of the CSFPD. The four divisions include the Administration Division, Operations Division, Training Division, and Fire Prevention Division. The Administration Division is responsible for planning, directing, and evaluating the functions of the Fire District including financial administration and budget preparation. The Operation Division, managed by the Battalion Chief of Operations, is responsible for meeting the day-to-day operations of the Fire District, including but not limited to structural fire suppression, wildland fire suppression, emergency medical services, rescue services, hazardous materials mitigation, and surf rescue. The Training Division, managed by the Battalion Chief of Training, is responsible for preparing the staff to deliver service. The Fire Prevention Division, managed by the fire marshal, is responsible for the implementation of adopted codes and standards as they relate to new and future development. This function includes but is not limited to plan review, new construction inspection, addressing and certifying of occupancies.

4.10.7 National Flood Insurance Program

The City of Carpinteria is participating community of the National Flood Insurance Program (NFIP). As stated by FEMA, "The NFIP aims to reduce the impact of flooding on private and public structures. It does so by providing affordable insurance to property owners and by encouraging communities to adopt and enforce floodplain management regulations. These efforts help mitigate the effects of flooding on new and improved structures. Overall, the program reduces the socio-economic impact of disasters by promoting the purchase and retention of general risk insurance, but also of flood insurance, specifically."

FEMA Flood Insurance Rates Maps (FIRMs) are developed as part of the NFIP and identify areas in the County that are vulnerable to flooding. The flood zones identified on the FIRMs are areas susceptible to 100-year and 500-year flood events. A 100-year and 500-year storm event is when storms have a 1 percent or 0.2 percent annual chance of occurrence. Another measure of the probability of occurrence of a 100-year storm is there is at least a 26-percent chance of a 100-year storm during the life of a 30-year mortgage. Estimated parcels are located within these 100-year floodplain areas (see Table 6-16).

The information in the Flood Insurance Study and resultant FIRMs is based on historic, meteorological, hydrologic, hydraulic, and topographic data, as well as open-space conditions, flood control works, and development within the study area. Other information included on the maps includes Special Flood Hazard Areas (SFHA), Base Flood Elevations (BFE), and insurance risk zones. FIRMs are used to determine the BFE at specific sites or if a specific property is located in a floodplain or SFHA to administer floodplain management regulations, determine potential locations for new development, and make flood insurance determinations.

In 2012, the City adopted Ordinance No. 658 amending Chapters 14.40 and 15.50 of the Carpinteria Municipal Code for consistency with NFIP requirements. The Public Works Department is the lead department in enforcing the Floodplain Management Regulations. All development projects located within a SFHA must comply with the Floodplain Management Regulations.

Repetitive Loss (RL) Properties

Repetitive loss properties are defined as property that is insured under the NFIP that has filed two or more claims above $1,000 each within any consecutive 10-year period since 1978. FEMA repetitive loss data shows that there have been 18 properties in Carpinteria with multiple claims against the NFIP. Four of these properties have had more than three insurance claims, and one of them has had a total of six claims (City of Carpinteria 2019).

4.11 OPPORTUNITIES FOR MITIGATION CAPABILITY IMPROVEMENTS

The City 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 City 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 City to expand or improve on these policies and programs to further protect the community:

- **Regulatory Opportunities**: As part of this update, the City will comply with AB 2140 by amending its Safety Element to incorporate the LHMP by reference. The City will consider the LHMP in policy, land use plans, and programs, including coastal hazard and sea level rise planning. For example, the City's Sea Level Rise Vulnerability Assessment and Adaptation Plan recommends storm damage and shoreline protection strategies to study and develop to reduce coastal hazards in the City. The City aims to address emerging issues associated with shoreline management and protection, including continued implementation of the winter storm berm program and long-range planning for coastal resilience as part of the ongoing update of the City's General Plan and Coastal Land Use Plan.
- **Administrative/Technical Opportunities**: The City continues to improve its resilience to ensure emergency response operations are sustained during a hazardous event, including improvements to public safety facilities and planning. The City aims to improve its resilience to ensure emergency response operations are sustained during an hazardous event, including expanding participation in the NFIP and Repetitive Loss Program and ensuring emergency response supplies are stocked and available at City Hall. Enhancements to hazard training for staff in partnership with the County and other agencies or stakeholders would improve the City's ability to mitigate hazards with the latest knowledge and resources. The City can also include a review of the LHMP as part of its yearly Annual Plan development a yearly budget development so that the priorities in this planning document are accurately reflected in our actionable planning documents. This ensures that the mitigation priorities laid out, are adopted by the appropriate departments, and are adequately funded in the short and long terms.
- **Outreach Opportunities**: Enhanced community outreach, emergency notifications, and trainings would further enhance the City's capabilities to respond to and recover from hazards. The City could expand outreach through digital tools such as social media, participate in the Great California ShakeOut, and increase FireWise outreach events and media coverage. The City could also improve early warning systems to help with effective evacuation in the event of

wildfire or earthquake. The City's communication plan includes bilingual communication about our priorities as stated in its annual plan so that community leaders and community members understand the City's hazard mitigation needs and associated resources including staff time and financial priorities. Staff in emergency services for the City of Carpinteria continues ongoing collaboration with County Office of Emergency management on topics that directly impact the City including emergency alert systems, community education, emergency infrastructure and more. Staff continues ongoing training to respond to disasters and be prepared to respond to hazards that may potentially strike the area.

- **Fiscal Opportunities**: The City can update its CIP to include hazard mitigation actions from the LHMP and related documents such as the Sea Level Rise Vulnerability Assessment and Adaptation Plan and the General Plan/CLUP update. The City will continue to seek grants (e.g., HMGP, BRIC) to fund these CIP projects and related projects in the City's mitigation strategy. The City can seek opportunities to partner with the County and/or other stakeholder agencies in grant applications to address regional hazards more effectively. The City could also consider expanding its fiscal capabilities through its annual budget process and other revenue measures (e.g., raising taxes, property assessments, bonds).

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 City of Carpinteria Local Hazard Mitigation Plan (LHMP). The intent is to confirm and update the description, location and extent, and history of hazards facing the City of Carpinteria (City) 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 City.

5.2 HAZARD ASSESSMENT

In 2021, the Mitigation Advisory Committee (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 City refined the list of hazards applicable to the City and confirmed the hazard prioritization. The following sections provide the results of this effort.

5.2.1 Hazard Identification

The City is susceptible to natural and human-caused hazards. This LHMP update identifies and screens these hazards. Screening hazards intends to help prioritize which hazards present the greatest risks to the community. In total, 23 hazards have been identified and investigated for this

LHMP update. In alphabetical order, the hazards identified and investigated for the City's LHMP update include:

- Agricultural Pests
- Civil Disturbance
- Coastal Hazards
- Cyber Threat
- Dam Failure
- Drought & Water Shortage
- Earthquake
- Energy Shortage & Resiliency
- Extreme Heat/Freeze
- Flood
- Geologic Hazards
- Hazardous Materials Release
- Invasive Species
- Landslide
- Mudflow & Debris Flow
- Natural Gas Pipeline Rupture
- Oil Spill
- Pandemic/Public Health Emergency
- Terrorism
- Train Accident
- Tsunami
- Wildfire
- Windstorm

5.2.2 Hazard Screening/Prioritization

Historical data, catastrophic potential, relevance to the jurisdiction, and the probability and potential magnitude of future occurrences were all used to identify and prioritize the list of hazards most relevant in the City. The City completed the Plan Update Guide to start the process of screening and ranking hazards. The Plan Update Guide required scoring of the hazards based on the frequency/probability of occurrence, geographic extent, potential magnitude/severity of the hazard, and overall significance. As shown in Table 5-1, the scores for frequency/probability of occurrence, geographic extent, potential magnitude/severity of the hazard, and overall significance are assigned numerical points. Rankings with a greater impact, such as *Highly Likely* for Frequency/Probability of Occurrence and *Extensive* for Geographic Extent, are associated with a higher number of points, while rankings with a smaller impact are associated with a lower number of points (e.g., *Limited* for Geographic Extent). The hazard prioritization included in this LHMP update is primarily based on the numerical ranking completed with the City's Plan Update Guide. The City of Carpinteria Local Planning Team (LPT) refined the list of hazards identified in the Multi-Jurisdictional Hazard Mitigation Plan (MJHMP) to focus on the hazards with the potential to impact the City.

Table 5-1. Hazard Screening and Ranking

Hazard Type	Frequency/ Probability of Occurrence	Geographic Extent	Potential Magnitude/ Severity	Overall Significance	Total Score
Agricultural Pests	2 Occasional	1 Limited	1 Negligible	1 Low	5
Civil Disturbance	3 Likely	1 Limited	1 Negligible	1 Low	6
Coastal Hazards	4 Highly Likely	2 Significant	3 Critical	3 High	12
Cyber Threat	2 Occasional	2 Significant	2 Limited	2 Medium	9
Dam Failure	2 Occasional	2 Significant	3 Critical	2 Medium	9

Hazard Type	Frequency/ Probability of Occurrence	Geographic Extent	Potential Magnitude/ Severity	Overall Significance	Total Score
Drought & Water Shortage	3 Likely	3 Extensive	3 Critical	2 Medium	11
Earthquake	3 Likely	3 Extensive	4 Catastrophic	3 High	13
Energy Shortage & Resiliency	3 Likely	3 Extensive	2 Limited	3 High	11
Extreme Heat & Freeze	4 Highly Likely	3 Extensive	2 Limited	1 Low	10
Flood	4 Highly Likely	3 Extensive	4 Catastrophic	3 High	14
Geologic Hazards	2 Occasional	2 Significant	2 Limited	1 Low	7
Hazardous Materials Release	2 Occasional	1 Limited	2 Limited	2 Medium	7
Invasive Species	2 Occasional	2 Significant	1 Negligible	1 Low	6
Landslide	2 Occasional	1 Limited	3 Critical	2 Medium	8
Mudflow & Debris Flow	4 Highly Likely	2 Significant	4 Catastrophic	3 High	13
Natural Gas Pipeline Rupture	2 Occasional	1 Limited	2 Limited	3 High	8
Oil Spill	2 Occasional	1 Limited	2 Limited	3 High	8
Pandemic/Public Health Emergency	4 Highly Likely	3 Extensive	3 Critical	2 Medium	12
Terrorism	1 Unlikely	2 Significant	2 Limited	1 Low	6
Train Accident	2 Occasional	1 Limited	2 Limited	2 Medium	7
Tsunami	1 Unlikely	2 Significant	3 Critical	2 Medium	8
Wildfire	3 Likely	1 Limited	3 Critical	2 Medium	9
Windstorm	2 Occasional	2 Significant	1 Negligible	1 Low	6

Frequency/Probability of Occurrence:

4 - Highly Likely: Near 100% probability in next year

3 - Likely: Between 10 and 100% probability in next year or at least one chance in 10 years

2 - Occasional: Between 1 and 10% probability in next year or at least one chance in next 100 years

1 - Unlikely: Less than 1% probability in next 100 years.

Potential Magnitude/Severity:

4 - Catastrophic: Multiple deaths, a complete shutdown of facilities for 30 days or more, more than 50% of property within the City is severely damaged

3 - Critical: Multiple severe injuries, a complete shutdown of facilities for at least 2 weeks, more than 25% of property within the City is severely damaged

2 - Limited: Some injuries, complete shutdown of critical facilities for more than one week, more than 10 percent of the property within the City is severely damaged

1 - Negligible: Minor injuries, minimal quality-of-life impact, a shutdown of critical facilities and services for 24 hours or less, less than 10 percent of the property within the City is severely damaged

Geographic Extent:

3 - Extensive: 50-100% of the City

2 - Significant: 10-50% of the City

1 - Limited: Less than 10% of the City

Overall Significance:

3 - High: Widespread potential impact

2 - Medium: Moderate potential impact

1 - Low: Minimal potential impact

The hazards that scored the most points were considered to have the highest priority and the hazards with the least points were considered to have the lowest priority. Table 5-2 lists the hazard

types in order of highest priority to lowest priority, using the scoring methodology described above. Given the overall prioritization of hazard types, as summarized in Table 5-1 above, the discussion of hazards in Section 5.3 is organized as shown in Table 5-2 in descending order with "*higher priority*" hazards listed at the top and the "*lower priority*" hazards at the bottom.

Table 5-2. Hazard Priority in the City of Carpinteria

County Hazards Prioritization	Total Number of Points
Flood	14
Mudflow & Debris Flow	13
Earthquake & Liquefaction	13
Coastal Hazards	12
Pandemic/Public Health Emergency	12
Energy Shortage & Resiliency	11
Drought & Water Shortage	11
Extreme Heat/Freeze	10
Dam Failure	9
Wildfire	9
Tsunami	8
Cyber Threat	8
Natural Gas Pipeline Rupture	8
Oil Spill	8
Train Accident	7
Landslide	7
Hazardous Materials Release	7
Geologic Hazards	7
Windstorm	6
Civil Disturbance	6
Terrorism	6
Invasive Species	6
Agricultural Pests	5

5.2.3 Approach and Methodology

This hazards assessment covers the entire geographical area of the City. The following material provides an overview of the hazards. More information can be found in the State of California Multi-Hazard Mitigation Plan and the Santa Barbara County 2022 MJHMP.

Section 5.3 contains detailed hazard profiles for the identified hazards. Each hazard profiled includes the following subsections:

Section 5.3 contains **"Incident Profiles"** to describe a recent example of a hazardous incident within the county that required response.

- **Description of Hazard** – This section gives a description of the hazard and associated issues followed by details on the hazards specific to the City of Carpinteria.
- **Location and Extent of Hazard in the City of Carpinteria** – This section gives a spatial description of the potential location or areas of the City of Carpinteria that the hazard is expected to impact. This section also describes the potential strength or magnitude of the hazard as it pertains to the City of Carpinteria.
- **History of Hazard in the City of Carpinteria** – This section contains information on historical incidents, including impacts where known.
- **Probability of Occurrence** – The frequency of past events is used in this section to gauge the likelihood of future occurrences. Where possible, the frequency was calculated based on existing data. It was determined by dividing the number of events observed by the number of years on record and multiplying by 100. This gives the percent chance of an event happening in any given year (e.g., three droughts over 30 years equates to a 10 percent chance of a drought in any given year). The likelihood of future occurrences is categorized into one of the following classifications:
  - **Highly Likely** – Near 100 percent chance of occurrence in next year or happens every year.
  - **Likely** – Between 10 and 100 percent chance of occurrence in next year or has a recurrence interval of 10 years or less.
  - **Occasional** – Between 1 and 10 percent chance of occurrence in the next year or has a recurrence interval of 11 to 100 years.
  - **Unlikely** – Less than 1 percent chance of occurrence in next 100 years or has a recurrence interval of greater than every 100 years.
- **Climate Change Considerations** – This section describes the potential for climate change to affect the frequency, intensity, and location of the hazard in the future.

5.3 HAZARD PROFILES

5.3.1 Flood

Description of Hazard

All flooding is a breakdown in surface water conveyance. **Flooding** happens when water surpasses the capacity of local water bodies to contain it, creeks and rivers to carry it, or soil to absorb it. When flood control infrastructure fails, water builds up and washes into normally dry areas, where it can cause significant harm to buildings, people, infrastructure, and ecosystems. Floods can be caused by heavy rainfall, long periods of moderate rainfall, or blocked-off drainage areas during rainfall. A break in a dam or levee, water pipe, or water tank can also cause flooding in rare instances (see also, Section 5.3.9, *Dam Failure*). Floods that develop very quickly are called flash floods; they are especially dangerous because they give little or no warning.

Floods can cause substantial damage to structures, landscapes, and utilities as well as life safety issues. Floodwaters can be deep enough to drown people and move fast enough to carry away people or heavy objects, such as cars. In some cases, floods have lifted buildings off their foundations (Santa Barbara County Planning and Development Department 2021). Certain health hazards are also common to flood events. Standing water and wet materials in structures can become breeding grounds for microorganisms such as bacteria, mold, and viruses. This can cause disease, trigger allergic reactions, and damage materials long after the flood. When floodwaters contain sewage or decaying animal carcasses, a rise in infectious disease risk becomes a concern. Direct impacts, such as drowning, can be limited with adequate warning and public education about what to do during floods. Where flooding occurs in populated areas, warnings and evacuation are critically important to reduce life and safety impacts.

The area adjacent to a river or stream channel is the floodplain. Floodplains are illustrated on inundation maps, which show areas of potential flooding and water depths. In its common usage, the floodplain most often refers to the area that is inundated by the 100-year flood, the flood that has a one percent chance in any given year of being equaled or exceeded. The 100-year flood is the national minimum standard to which communities regulate their floodplains through the National Flood Insurance Program (NFIP). The 500-year flood is the flood that has a 0.2 percent chance of being equaled or exceeded in any given year. A 500-year flood event would be slightly deeper and cover a greater area than a 100-year flood event (Federal Emergency Management Agency [FEMA] 2020). The potential for flooding can change and increase through various land use changes and changes to the land surface, which can result in a change to the floodplain. A change in environment can create localized flooding problems inside and outside of natural floodplains by altering or confining natural drainage channels. These changes are most often created by human activity. Inland flooding is measured by the size of the areas flooded per year, and this will likely increase as more precipitation falls in fewer storms (Santa Barbara County Planning and Development Department 2021).

The City of Carpinteria is susceptible to various types of flood events as described below.

- **Riverine flooding** - Riverine flooding, defined as the condition when a watercourse (e.g., river or channel) exceeds its "bank-full" capacity, generally occurs as a result of prolonged rainfall, or rainfall that is combined with already saturated soils from previous rain events. This type of flood occurs in river systems whose tributaries may drain large geographic areas and include one or more independent river basins. Factors that directly affect the amount of flood runoff include precipitation amount, intensity and distribution, the amount of soil moisture, seasonal variation in vegetation, snow depth, and water resistance of the surface due to urbanization. In the City, flooding is largely caused by heavy and continued rains, and heavy flow from tributary streams. The City's three main creeks (i.e., Carpinteria Creek, Santa Monica Creek, and Franklin Creek), along with other smaller drainages and tributaries can all present flood hazards. Intense storms can overwhelm the local waterways as well as the integrity of any flood control structures. The warning time associated with slow rise floods assists in life and property protection.
- **Localized flooding** - Localized flooding problems are often caused by flash flooding, severe weather, or an unusual amount of rainfall. Flooding from these intense weather events usually

occurs in areas experiencing an increase in runoff from impervious surfaces associated with development and urbanization as well as inadequate storm drainage systems.

- **Dam failure flooding** - Flooding from a failure of the Santa Monica Debris Basin is also a concern to the City. A catastrophic flood control structural failure could easily overwhelm local response capabilities to save lives and require mass evacuations towards the north and south of the City. Impacts on life safety will depend on the warning time and the resources available to notify and evacuate the public. Loss of life could result, and there could be associated health concerns as well as negative effects on local buildings and infrastructure. Dam failure is addressed in more detail under Section 5.3.9, *Dam Failure*.
- **Coastal flooding** - Coastal foods come from the Pacific Ocean where large waves are and can be affected by storm surges. Coastal foods can be very dangerous when high waters are combined with the destructive forces of waves. In low-lying coastal areas, storm surges and flooding can reach many miles from the shoreline, flowing up rivers and across flat land (FEMA 2021a). Coastal flooding hazards are addressed in more detail under Section 5.3.4, *Coastal Hazards*.

Additionally, mudflow and debris flow which can be caused by localized flooding are discussed further in Section 5.3.2, *Mudflow & Debris Flow*.

Location and Extent of Hazard in the City of Carpinteria

Floods usually occur during the rainy season, with the highest precipitation during December through March during heavy rainfall. Streamflow throughout the City 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 drainages in the City are characterized by high intensity, short duration runoff events, due to the relatively short distance from the top of the Santa Ynez Mountains to the Pacific Ocean. Runoff from high intensity, short-duration storm events can cause inundation of overbank areas, debris including sediment, rock, downed trees in the water that can plug culverts and bridges, erosion and sloughing of banks, and loss of channel capacity due to sedimentation. The City is traversed by the floodplains of creeks that drain the Santa Ynez Mountains, with the degree of flood hazard varying substantially by creek. Some creeks in the City, such as Franklin and Santa Monica Creeks, have been channelized reducing but not eliminating flood hazards. Other creeks in the City, such as Carpinteria Creek, remain in a more natural condition with the corresponding potential for flood hazards. The Santa Monica Debris Basin was constructed on Santa Monica Creek to intercept sediment and debris, reducing the potential for plugging of downstream creek channels and associated flood hazards. Additionally, the City may be subject to flooding due to flash flooding, urban flooding, river channel overflow, and downstream flooding.

Another contributing factor to flooding is the City's location along the Pacific Ocean. Low-lying areas of the City are susceptible to wave attack, coastal flooding, and storm surge (see Section 5.3.4, *Coastal Hazards*).

History of Hazard in the City of Carpinteria

Flooding has been a major problem for communities and regions along rivers, creeks, and the shoreline throughout Santa Barbara County's history. Santa Barbara County has several hydrologic basins that have different types of flooding problems, including over bank riverine flooding, flash floods, tidal flooding/tsunamis, and dam failure. The most common flooding in Santa Barbara is due to riverine flooding and flash flood events.

Between 1907 and 2018, Santa Barbara County experienced 20 significant inland flood events. Eight of these floods received Presidential Disaster Declarations. Refer to Section 5.3.5, *Flood* of the MJHMP for a detailed discussion of these 20 significant inland floods in the county. More recent (since 1995) historical flood events and years, as well as information concerning the nature of the flooding and the extent of the damages, are described below for floods within the City or in the vicinity.

- **1995 Floods –** Two major storm-related flooding events occurred in the winter of 1995 – on January 10 and March 10. The floods of 1995 brought widespread flooding to Santa Barbara County, with the most severe flooding of creeks along on the South Coast while the rest of the county was largely spared from serious damages. Flooding occurred on most major streams in the cities of Goleta, Santa Barbara, and Carpinteria as well as the community of Montecito. Both floods caused closures of road and rail transportation for several hours and received Presidential Disaster Declarations. Estimated public and private damages were around $100 million. Flooding in the City was much less severe due to the installation of debris basins and channel improvements since 1969 in cooperation with the U.S. Department of Agriculture (USDA) National Resource Conservation Service (formerly USDA Soil Conservation Service) (Santa Barbara County Flood Control and Water Conservation District [County Flood Control] 1995).
- **January 1995 –** The January 10th flood affected approximately 510 properties along the South Coast and caused roughly $50 million of damage. Flooding occurred on most major creek channels in Goleta, Santa Barbara, Montecito, and Carpinteria. All modes of transportation in and out of the South Coast, including the Santa Barbara Airport, Highway 101, Union Pacific Railroad (UPRR), the harbor, and other major roads on the South Coast were cut off for several hours as a result of this flood. Highway 101 reopened to the north later that day; however, southbound roads, the airport, UPRR, and the harbor were not restored for several days (County Flood Control 1995). While flooding in Carpinteria was relatively minor compared to other South Coast areas, Arroyo Paredon Creek, to the west of Carpinteria, was the source of flooding at Via Real, Highway 101, and the UPRR (County Flood Control 1995).
- **March 1995 –** The storm event on March 10 caused flooding of most major channels in Goleta, Santa Barbara, Montecito, and Carpinteria. More than 300 structures were reported flooded and/or damaged, with many of the same structures flooded in January flooded again. Approximately $30 million of public and private property were damaged during the storm. Once again, the airport, Highway 101, and UPRR in and out of the South Coast were cut off for several hours. This flood received a Presidential Disaster Declaration (County Flood Control 1995).

- **1998 Floods –** The storm events of 1998 arrived on a strong El Niño and brought several record-breaking rainfalls with 50-year storm event intensities throughout February. By the end of the month, many areas in the county had received 600 percent of normal February rainfall. Flood-related damages within the county occurred during three major storm periods: February 1-4, February 6-9, and February 22-24. The cost to repair extensive flood damage to public and private property was estimated at $15 million. Just like in 1995, transportation throughout the county was disrupted through closures of roads, the Santa Barbara Airport, and train service. Flood damage was spread throughout the county and the county was declared a Federal Disaster Area on February 9. The floods received a Presidential Disaster Declaration (County Flood Control 1998).
- **February 2, 1998 –** During the first storm on February 2, winds with gusts as high as 63 miles per hour (mph) knocked over hundreds of trees and caused loss of power to thousands of homes across Goleta and Santa Barbara. The next day, 15-foot-high waves damaged pilings under Stearns Wharf and a broken sewer line near Arroyo Burro Beach, closing several nearby beaches due to high levels of bacteria buildup. Gaviota Creek overtopped and flooded the State Beach at the mouth of the creek. At the Gaviota Chevron plant, storm related damage caused a release of hazardous materials. The airport also closed down due to flood, and Highway 101 was shut down in Ventura, cutting off the City to the south (County Flood Control 1998).
- **February 6, 1998 –** With little time to recuperate, the South Coast was hit by a second major storm on February 6. Disruptions of transportation were widespread throughout the South Coast – a downed tree resulted in an accident that closed Highway 101. Along the coast, berms were hastily constructed to protect beachfront property (County Flood Control 1998).
- **February 22-24, 1998 –** Intense rain again hit the County on February 23 and 24 after several days of moderate rainfall. This time, it was the creeks of Montecito and Carpinteria that were most heavily affected. Among those creeks that overtopped their banks were Montecito, Romero, San Ysidro, Oak, and Arroyo Paredon. Transportation was again interrupted with the closure of the Highway 101 near Ventura, Sycamore Canyon Road, and Gaviota Road. Although the February 1998 storms had higher annual rainfalls, flooding in 1998 was considered less severe for the South Coast than other historical events, such as the 1995 event due to flood control improvements and channel and debris dam maintenance performed by the County (County Flood Control 1998).
- **2005 –** In January 2005, a powerful Pacific storm tapped into a subtropical moisture source to produce heavy rain, snow, flash flooding, high winds, and landslides to Central and Southern California. During the 5-day event, rainfall totals ranged from 4 to 8 inches over coastal areas to between 10 and 20 inches in the mountains. With such copious rainfall, flash flooding was a serious problem across Santa Barbara, Ventura, and Los Angeles counties. Flash flooding and mudslides closed Highway 101 at Bates Road in Carpinteria and Gibraltar Road at Mt. Calvary Road, stranding several vehicles. High winds gusting to 65 mph knocked down numerous trees and power lines (National Oceanic and Atmospheric Administration [NOAA] 2005).

- **2011** – A severe winter storm occurred March 19-21, 2011, that included flooding, debris flows, and mudflows throughout Santa Barbara County. The 2-day storm produced up to 11.5 inches of rainfall. The storm extremes were primarily located in the south county, especially Gibraltar and Cachuma. With all three primary Santa Ynez River-related county reservoirs full (as of March), the necessary water releases from Lake Cachuma added to the storm runoff to create relatively high discharge rates in the lower Santa Ynez River. This storm event resulted in moderate agricultural land flooding (approximately 200 acres) downstream of Cachuma. Several County Flood Control debris basins were filled and sustained some damage (County Flood Control 2011). According to County Insurance Claims, the storm cost approximately $1.7 million in damages (County Flood Control 2011).
- **2018** – Following the October 2017 Thomas Fire, heavy rains unleashed destructive rivers of water, mud, and debris in Santa Barbara County, particularly Montecito and Carpinteria, leaving at least 23 people dead, destroying over 100 homes, and damaging over 300 homes. Rain from the storm fell on hillsides and mountains stripped of trees and vegetation by the Thomas Fire. The National Weather Service, Los Angeles reported that 0.54 inches of rain had fallen in 5 minutes at Montecito and 0.86 inches in 15 minutes in the City (FloodList 2021) (see also, Section 5.3.2, *Mudflow and Debris Flow*).

Incident Profile: Carpinteria Creek Flooding

Southeast of the Montecito Debris Flows, the City of Carpinteria experienced hazardous conditions from intense floodwaters down Carpinteria Creek and isolation from communities to the north and south.

Source: California Water Environment Association

These flood flows triggered a chain of events in the City due to flooding in Carpinteria Creek. The surge of water and debris that came down Carpinteria Creek undermined and destabilized the concrete rock wall embankment that borders the southeast side of the City's Wastewater Treatment Plant. At the time of the storm, the California Department of Transportation (Caltrans) was in the process of building a new bridge over Carpinteria Creek. The intense storm dropped too much water too quickly and caused a massive debris flow, which built up enormous head pressure at this new bridge before breaking free. The velocity of the debris flow moved so quickly and with such force that boulders could be heard rolling down the creek from 5 blocks away. After the flood waters in the creek receded, the creek bed was scoured to a historical depth not previously seen and the wall embankment was noticeably impacted. Floodwaters surcharged the City's storm drain system. The road to the Wastewater Treatment Plant, its administration office, a preschool, and employee housing for California State Park employees was impassable due to the flooding. Highway 101 was also cut off to the northwest of the City for 3 weeks and to the southeast to Ventura for about a week, leaving the City isolated for an

extended amount of time. Both the supply chain (e.g., food, fuel) and staffing levels at the Treatment Plant as well as countless other businesses and offices in the City were compromised. Food from local grocery stores disappeared also immediately (California Water Environment Association 2022).

Probability of Occurrence

Likely – The 100-year flood is a flood that has a one percent chance in any given year of being equaled or exceeded. The 500-year flood is the flood that has a 0.2 percent chance of being equaled or exceeded in any given year. Figure 5-1 shows the location of the 100-year flood hazard zones in the City of Carpinteria as mapped by FEMA's Flood Insurance Rate Maps (FIRM). The floodplains shown delineate areas with potential exposure to flooding for 100-year storm flows.

Climate Change Consideration

As described in the County's Climate Change Vulnerability Assessment (CCVA), although climate change will increase the frequency and intensity of droughts (refer to Section 5.3.7, *Drought & Water Shortage*), scientists also project that it will increase the frequency and intensity of heavy rainstorms that cause inland flooding (Santa County Barbara Planning and Development Department 2021). 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. For example, what is currently a 200-year storm, or one that has a 1 in 200 chance of occurring in a given year, by 2100 would increase in frequency by 40 to 50 years (to a 1 in 150/160 chance in a given year). This means that the 100-year and 500-year floodplains may expand, and the current floodplains may become 40- to 50-year floodplains (Santa County Barbara Planning and Development Department 2021). The frequency and intensity of heavy rainstorms are projected to increase, causing fluvial flooding along the City's creeks, although overall annual precipitation levels are expected to increase only slightly. For discussion regarding the impacts of climate change on coastal flooding and sea level rise, see Section 5.3.4, *Coastal Hazards*.

Figure 5-1. City of Carpinteria FEMA Flood Hazards

5.3.2 Mudflow & Debris Flow

Description of Hazard

Mudflows are flows or rivers of liquid mud down a hillside on the surface of normally dry land. They occur when water saturates the ground, usually following long and heavy rainfalls or rapid snowmelt. Mud forms and flows down the slope if there is no ground cover such as brush or trees to hold the soil in place. To be considered a mudflow, more than half of the particles must be sand-sized or smaller that can flow very rapidly. A mud flow is the sandy, more water-saturated analog of a debris flow (Colorado Geological Survey 2021).

A **debris flow** is a soil flow where the majority of the materials are coarse-grained (fine sand to boulder size particles) and non-cohesive. Debris flow occurs when water begins to wash material from a slope or when water sheets off of a newly burned stretch of land. A debris flow is far more powerful and dangerous than a mudslide or mudflow. It can move faster and farther, and it's strong enough to carry enormous boulders and entire trees, not to mention cars, k-rails, and sandbags. Debris flows can move at rates ranging from meters per hour to meters per second and travel relatively long distances, making them a significant threat to life and property (California Geological Survey 2019a). The flow will pick up speed and debris as it descends the slope. As the system gradually picks up speed it takes on the characteristics of a basic river system, carrying everything in its path along with it. Chaparral land is especially susceptible to debris flows after a fire. Debris flows are most often triggered by intense rainfall following a period of less intense precipitation, or by rapid snowmelt (California Geological Survey 2019a).

Location and Extent of Hazard in the City of Carpinteria

Areas susceptible to mudflow and debris flow hazards are present throughout the City. For example, lowland areas of the City are prone to impacts from mudflows and debris flows as sediment, water, and debris slide down slopes towards these lowland areas. Vegetated upland areas within the City and Carpinteria Valley are prone to wildfires, which strips the land of vegetation that holds soil in place, and therefore, are susceptible to increased runoff, mudflows, and debris flows. Topographically steep areas of the City are also susceptible to mudflows and debris flows. Figure 5-13 of the MJHMP shows the debris flow hazard areas along the South Coast as of 2018, after the Thomas Fire. Figure 5-2 zooms in on the debris flow hazard areas within the City of Carpinteria. This hazard area may shift after a debris flow or landslide or other hazards have affected an area, such as wildfire, flooding, or drought (Santa Barbara County Department of Planning and Development 2021).

The Santa Monica Debris Basin, installed in 1970, was designed to capture 208,000 cubic yards of sediment, gravel, boulders, and vegetative debris that are washed Santa Monica Creek during storms. This allows water to flow downstream along the creek and into the City's municipal storm drain system, thereby reducing flood risk for neighborhoods downstream of the debris basin. The Santa Monica Debris Basin has prevented damages downstream on numerous occasions of severe rainstorms and associated flooding, including the floods of March 1995, "El Niño floods" of 1998, and floods in 2005 (refer to Section 5.3.1, *Flood*).

Figure 5-2. Debris Flow Risk in the City of Carpinteria

History of Hazard in the City of Carpinteria

As mentioned in Section 5.3.1, *Flood*, several historic storm and flood events in the county, particularly storms following intense wildfires, resulted in mudflows and debris flows. The most significant mudflow and debris flow events are described below.

- **1964** – Following the Coyote Fire, relatively light rain which fell on portions of the watershed burned by the fire, causing severe flooding in the areas surrounding Montecito, Hot Springs, and San Ysidro Creeks. Eyewitnesses reported 20-foot walls of water, mud, boulders, and trees moving down the channels at approximately 15 miles per hour. Bridges were swept away in seconds and flows inundated large areas damaging structures and depositing debris. Large boulders were carried along Montecito Creek by the flow and deposited upstream of the bridge near Hot Springs Road. A 20-inch high pressure gas line near Mountain Drive was bent by the force of the flow in San Ysidro Creek, although it did not break. County Flood Control estimated damages to public and private property at more than $300,000.
- **1980** – This flood, which also received a Presidential Disaster Declaration, consisted of severe flooding, mudslides, and high tides throughout the entire county.
- **1995 –** On January 10, flooding occurred on most major creek channels in Goleta, Santa Barbara, Montecito, and Carpinteria. This flood and mudslide affected approximately 510 properties along the South Coast and caused roughly $50 million of damage (County Flood Control 1995).
- **2005 –** In Santa Barbara County, flash flooding and mudslides closed down Highway 101 at Bates Road in Carpinteria. In Ventura County, SR 150 was closed at the Dennison Grade due to flash flooding and mudslides. Preliminary damage estimates from this storm range between $8-10 million with agricultural interests in Ventura County accounting for most of the monetary damage (NOAA 2005).
- **2018 –** Following the 2017 Thomas Fire, which burned approximately 281,893 acres in Ventura and Santa Barbara Counties, a reported 0.59 inches of rain fell within 30 minutes in the burn scars from the Thomas Fire in the foothills of Montecito on Tuesday, January 9, 2018. Four inches of rain fell in two days, causing massive debris flows and flooding that damaged or destroyed 400 homes, killed 23 residents, and led to the closure of Highway 101 and the UPRR for more than 3 weeks, cutting off the county from communities to the south. California Geological Survey scientists estimated the Montecito debris flow as having speeds of 10-15 mph, being up to 25-30 feet deep, and capable of carrying boulders as large as a tow truck. (California Geological Survey 2019b). In the City of Carpinteria, mudflows in Carpinteria Creek caused enormous pressure build-up and damage to the Wastewater Treatment Plant's retaining wall. Portions of Highway 101 were shut down to the northwest and southeast of the City, leaving the City and its residents isolated for weeks with limited food, fuel, and other resources (California Water Environment Association 2022). The Santa Monica Debris Basin was filled with debris during the January 2018 storms. This was the most significant test of the Basin since its construction and the first-time debris had filled the basin to the point of exceeding the crest of the emergency spillway. Fortunately, the basin capacity was adequate such that very little debris went through

the emergency spillway resulting in no significant debris flows downstream (National Watershed Coalition 2018; see also, Section 5.3.9, *Dam Failure*). Additionally, the County Flood Control District is undertaking operational improvements to the Santa Monica Debris Basin to allow more efficient basin clean-out and reduce basin repair and maintenance costs (refer to Section 7.3 of the MJHMP).

Probability of Occurrence

Highly Likely – Based on historical data and given the likelihood of wildfires and intense rainfall events, as well as steep slopes in the Carpinteria Valley upstream of the City, mudflow and debris flow hazards are likely to continue on an annual basis, with damaging mudflow and debris flow occurring less frequently. Mudflows and debris flows are usually a cascading effect of severe weather. The probability for more severe and damaging landslides increases during El Niño years or severe winter storms. The potential for debris flows dramatically increases following a wildfire (see also, Section 5.3.10, *Wildfire* and Section 5.3.16, *Landslide*).

Climate Change Consideration

As described in Section 5.3.10, *Wildfire*, California experiences wildfires nearly every year with most of them taking place immediately before the winter rainy season. 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 (USDA and U.S. Geological Survey [USGS] 2009).

Research dating back to the 1930s and 1940s shows an association between debris-flow occurrence and recent wildfires in mountain watersheds, commonly referred to as the "fire and flood cycle." Much of the burned areas near the City are on steep, brush-covered slopes drained by equally steep, short channels which facilitate debris flow occurrence. As previously described, the increased potential of wildfire occurrence also escalates the risk of mudflows and debris flows in the period following a fire, when slopes lack vegetation to stabilize soils and burned soil surfaces create more rainfall runoff. Therefore, greater wildfire frequencies result in an increased likelihood of precipitation-induced debris-flow events in recently burned areas (USDA and USGS 2009).

Additionally, as described in Section 5.3.7, *Drought & Water Shortage*, projected climate change-associated variance in rainfall events may result in more high-intensity events, which may increase landslide frequency. Landslides can result from intense rainfall and runoff events. 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, as occurred with the Thomas Fire in December 2017 and subsequent Montecito and Carpinteria debris flow in January 2018 (California Office of Emergency Services [Cal OES] 2018). Mudflows and debris flows will likely increase as more precipitation falls during a storm event and hillsides more frequently have burned.

5.3.3 Earthquake & Liquefaction

Description of Hazard

An **earthquake** is a sudden, rapid shaking of the ground caused by the breaking and shifting of rock beneath the earth's surface or along fault lines. When the accumulated energy grows strong enough, the plates that form the Earth's surface break free causing the ground to shake. Most earthquakes occur at the boundaries where the plates meet, commonly called faults; however, some earthquakes occur in the middle of plates.

A **fault** is a fracture in the earth's crust along which movement has occurred either suddenly during earthquakes or slowly during a process called creep. Damage associated with fault-related ground rupture is normally confined to a fairly narrow band following the trend of the fault. Structures are often not able to withstand fault rupture and utilities crossing faults are at risk of damage. Fault displacement involves forces so great that it is generally not feasible (structurally or economically) to design and build structures to accommodate this rapid displacement (Santa Barbara County Planning and Development Department 2015).

An earthquake is caused by a release of strain within or along the edge of the Earth's tectonic plates producing ground motion and shaking, surface fault rupture, and secondary hazards, such as ground failure. After just a few seconds, earthquakes can cause massive damage and extensive casualties. The effect of an earthquake on the Earth's surface is called the intensity. The intensity scale consists of a series of certain key responses such as people awakening, movement of furniture, damage to chimneys, and destruction.

Most people are familiar with the Richter scale, a method of rating earthquakes based on strength using an indirect measure of released energy (Table 5-3). The Richter scale is logarithmic. Each one-point increase corresponds to a 10-fold increase in the amplitude of the seismic shock waves and a 32-fold increase in energy released. For example, an earthquake registering 7.0 on the Richter scale releases over 1,000 times more energy than an earthquake registering 5.0. Figure 6-1 is the ShakeMap produced for a hypothetical 7.4 magnitude earthquake if the epicenter was located below the Santa Ynez Mountains along the Red Mountain fault.

Table 5-3. Richter Scale

Richter Magnitudes	Earthquake Effects
Less than 2.0	Microearthquakes generally not felt
2.0-2.9	Generally not felt but recorded.
3.0-3.9	Often felt, but rarely causes damage.
4.0-4.9	Noticeable shaking of indoor items, rattling noises. Significant damage is unlikely.
5.0 -5.9	Can cause major damage to poorly constructed buildings over small regions. At most slight damage to well-designed buildings.
6.0-6.9	Can be destructive in areas up to about 100 kilometers across residential areas.
7.0-7.9	Can cause serious damage to larger areas.
8 -8.9	Can cause serious damage in areas several hundred miles across.
9 or greater	Devastating in areas several thousand miles across.

Source: GNS Science 2021

Liquefaction occurs when ground shaking causes the mechanical properties of some fine-grained, saturated soils to liquefy and act as a fluid. It is the result of a sudden loss of soil strength due to a rapid increase in soil pore water pressures caused by ground shaking. For liquefaction to occur, three general geotechnical characteristics should be present: 1) groundwater should be present within the potentially liquefiable zone, 2) the potentially liquefiable zone should be granular and meet a specific range in grain-size distribution, and 3) the potentially liquefiable zone should be of low relative density. If those criteria are present and strong ground motion occurs, then those soils could liquefy, depending upon the intensity and duration of the strong ground motion. The duration of ground shaking is also an important factor in causing liquefaction to occur. The larger the earthquake magnitude, and the longer the duration of strong ground shaking, the greater the potential there is for liquefaction to occur.

Location and Extent of Hazard in the City of Carpinteria

The City is located in a high seismic activity zone in the Transverse Range geologic province (Santa Barbara County 2015). According to the California Department of Conservation Division of Mines and Geology criteria for classifying the activity level for faults, none of the faults in the City are considered "active." Thus, the fault rupture potential is low. Nevertheless, for planning purposes, all of the following faults should be considered potentially active:

Carpinteria Fault, the Rincon Creek Fault, the Holloway Fault, an unnamed fault, the Red Mountain Fault, the Arroyo Parida Fault, and the Shepard Mesa Fault. All historically active, active, and potentially active faults are represented in Figure 5-8 of the MJHMP as mapped by USGS and the California Geological Survey.

After earthquakes, some regions may be prone to **liquefaction**. On level ground, liquefaction results in water rising to the ground surface. On sloping ground, liquefaction will usually result in slope failure, such as the event at the Sheffield Dam in the aftermath of the 1925 Santa Barbara earthquake.

Liquefaction is important to consider for planning purposes as it can lead to ground failure associated with moderate and large earthquakes and contribute to substantial building and infrastructure losses. There is no historic evidence of liquefaction in the City (Santa Barbara County Planning and Development Department 2015). Most of the low coastal plain and valley bottoms are underlain by alluvium and are at moderate risk with respect to liquefaction potential. This rating is largely based on the probable depth to groundwater with consideration given to probable soil characteristics (i.e., classification, grain size, density) and probable earthquake intensity and duration. Areas in the City that are more susceptible to liquefaction include the low coastal areas with high groundwater and poorly consolidated sandy soils in the Toro Canyon-Carpinteria areas south of Highway 101 (Figure 5-3; Santa Barbara County Planning and Development Department 2015).

Figure 5-3. City of Carpinteria Liquefaction Severity

History of Hazard in the City of Carpinteria

The City is located in a high seismic activity zone and as such has a long history of earthquakes. Although most seismic activity in California occurs within the San Andreas Fault system, most historic seismic events in the region have been centered offshore on an east-west trending fault between the county and the Channel Islands. Several smaller earthquakes in the county have taken place in the past years, including a magnitude 3.4 earthquake one mile off the coast of Carpinteria in December 2021 (Los Angeles Times 2021). Earthquakes approximately magnitude 2.0 are fairly common in the county. Refer to Section 5.3.3 of the MJHMP for an overview of significant earthquake events within the last 50 years.

More than half of the City is located in an area with high liquefaction potential, primarily the areas north of Carpinteria Creek (see Figure 5-3) . However, there is no historic evidence of liquefaction in the City of Carpinteria or Santa Barbara County (Santa Barbara County Planning and Development Department 2015).

Probability of Occurrence

Likely - The USGS and their partners, as part of the latest Uniform California Earthquake Rupture Forecast Version 3, have estimated the chances of having large earthquakes throughout California over the next 30 years. Statewide, the rate of earthquakes around magnitude 6.7 (the size of the 1994 Northridge earthquake) has been estimated to be one per 6.3 years (more than 99 percent likelihood in the next 30 years); in southern California, the rate is one per 12 years (93 percent likelihood in the next 30 years) (refer to Table 5-10 of the MJHMP). Given that there are no active faults in the City, the likelihood of serious damage from an earthquake is lower than in other areas of the county.

Climate Change Considerations

While climate change is not expected to directly affect earthquake frequency or intensity; it could exacerbate indirect or secondary impacts of earthquakes. For example, climate change could increase the frequency and intensity of extreme precipitation events, which in turn increases the probability of landslides and liquefaction events during an earthquake if the earthquake coincided with a wet cycle (California Natural Resources Agency 2018).

5.3.4 Coastal Hazards

Description of Hazard

Coastal hazards result from coastal processes, such as rising and falling water levels, breaking waves, and shifting sands that can alter the coastline, as well as those hazards projected to increase substantially with sea level rise including coastal erosion and coastal flooding. Within the City, development within coastal areas has been and will continue to be susceptible to various types of coastal hazards.

Sea level rise is defined as the rising of the level of the oceans. Globally, sea levels are rising as a result of two factors caused by human-induced climate change. The first factor is the thermal expansion of the oceans. As ocean temperatures warm, the water in the ocean expands and occupies more volume, resulting in a rise in sea levels. The second factor contributing to global sea

level rise is the additional volume of water added to the oceans from the melting of mountain glaciers and ice sheets on land. The rate at which sea levels will rise is largely dependent on the feedback loop between the melting of the ice, which changes the land cover from a reflective ice surface, and the open ocean water, which absorbs more of the sun's energy and increases the rate of ice melt.

Coastal erosion refers to beach, dune, and bluff erosion that results from winter storms, tidal action, wave action, and over time rising sea levels. Erosion cuts into dunes and bluffs, threatening development along the coast, and can wash away beach sand supplies, resulting in narrower beach conditions and the landward encroachment of ocean mean high-water mark. In the county, coastal erosion is heavily influenced by storm surges when water levels are higher than normal and wave attacks are particularly strong.

Coastal accretion refers to sand build-up on beaches. Sand beaches form upcoast of headlands and points, in the protected portion of bays, along the seaward portion of dunes, and on the open coast where there are rivers to maintain a supply of new sand to the coast. Engineering structures such as groins and jetties can cause sand to build up on the upcoast side. Breakwaters can provide a protected harbor area landward of the structure, but also can trap sand and build up beach areas. Structures such as groins and jetties will usually produce accretion in one area but may produce erosion in another. Beach nourishment, which takes sand from offshore deposits or inland reservoirs and dams, can add new sand to beaches and provide for beach accretion without causing erosion elsewhere.

Coastal flooding can result from waves and runup, high tides including" king tides", storm surge, and the confluence of heavy rainfall and storms. It can include tidal flooding from extremely high tides causing seawater to spill inland to low-lying areas, and storm surges and wave attacks where runup from storm waves overtops beaches, rock revetments, or seawalls and washes inland, sometimes in concert with heavy rain events. Such flooding can inundate homes, businesses, and public facilities in low-lying areas while storm surges and wave attacks can damage or destroy structures or facilities. Wave attacks can flood low-lying areas, erode the shoreline or cause bluff retreat with damage to structures (FEMA 2021a).

All coastal hazards in the City can be exacerbated by El Niño events. El Niño events, which occur every 2-5 years, vary in severity, but can substantially increase storm frequency and severity, with much, but not all, of past coastal damage and current coastal hazards related to these events. Coastal storms produce large ocean waves that sweep across low-lying coastlines making landfall. Storm surges can inundate coastal areas, destroy dunes, and cause flooding. If a storm surge occurs at the same time as high tide, the water height will be even greater. Historically, the City has also been vulnerable to storm surge inundation associated with El Niño events and a related increase in storm severity.

Location and Extent of Hazard in the City of Carpinteria

The South Coast has a long history of exposure to coastal hazards from bluff retreat to coastal erosion and flooding. Low-lying areas such as those within the Beach Neighborhood of Carpinteria have experienced coastal flooding due to storms surges and wave attacks. Bluff erosion is another serious local hazard with annual bluff erosion rates generally varying from 6 inches to one foot per year, depending upon location.

Because many factors influence coastal erosion, including human activity, sea level rise, seasonal fluctuations, and climate change, sand movement will generally be locally variable.
Photo: City of Carpinteria

Coastal hazards modeling efforts show that the coastal dunes and bluffs in Carpinteria are vulnerable to coastal erosion caused by exposure to waves, weathering, and runoff (Santa Barbara County 2017). In such areas, erosive processes slowly eat away at the beach and foundations of the bluffs, reducing beach widths, eroding dunes, and creating risk for bluff collapse. Bluff collapses threaten bluff-top property and create a safety risk to people visiting the lower beaches.

Shoreline changes (coastal erosion and accretion) result from a change in sediment supply, coastal processes including large storms, and human activities. When sediment supply exceeds the gross longshore sediment transport rates then the coast will accrete seaward; when more sediment is removed than supplied, the coast will erode. Long-term changes in the shoreline are caused by sediment supply and sea level rise, whereas short-term or event-based erosion is caused by large storm events (City of Carpinteria 2019). Sandy beach widths on Carpinteria City beach range between 65 and 200 feet, although width varies seasonally and along the coast. Carpinteria beaches experience seasonal cycles in which winter storms move significant amounts of sand offshore, creating steep, narrow beaches. In the summer, gentle waves return the sand onshore, widening beaches and creating gentle slopes. Each year, the City installs an approximately 1,300-foot-long seasonal storm berm out of sand along Carpinteria City Beach to buffer against large wave events in the fall and winter. When the storm wave season passes in the spring, the City pushes the sand back onto the beach (City of Carpinteria 2019).

In response to coastal hazards, private property owners and local governments have erected rock revetments and seawalls to attempt to protect public and private improvements from coastal hazard damage. The UPRR has also installed both concrete seawalls and rock revetments to protect the railroad tracks along the South Coast from Carpinteria to Gaviota. The long-term effects of such coastal protection structures are subject to debate, as well as their secondary impacts on natural coastal processes and sand supply.

For example, cobbles were once plentiful under the Carpinteria beaches, and typically visible during the winter storm season. Cobbles enabled the beaches to dissipate large destructive wave energy. However, large El Niño storms in 1982-1983 and 1997-1998 removed most of the

cobbles. While no definitive studies have identified the exact cause, factors may include a decline in the supply of cobbles and sediment due to changes in the watersheds, the Sandyland Revetment, construction of sediment debris basins, and upcoast coastal armoring that protects cliffs from erosion.

The Sandyland Reventment is a rock revetment fronting Sandyland Cove located within the County of Santa Barbara. The reventment was built by Sandyland Cove residents in the mid-1980s under an emergency permit issued by the County of Santa Barbara as a result of shoreline changes in the 1900s. The revetment partially encroached on the public beach seaward of the Sandyland Cove homes and resulted in the burial of the beach due to the structure's footprint. Additionally, coastal erosion caused by an increase in the longshore currents moves sand along the Sandyland Revetment and erodes sand near the Ash Avenue access to Carpinteria City Beach, narrowing the beach (Revell et al 2008).

The installation of the Santa Monica debris basins in 1970 has also interrupted the migration of natural course sediments to the Carpinteria shoreline, reducing the amount of cobble transported to the City's beaches. While the debris basins have prevented severe damage from mudflows and debris flows during flood and storm events, they effectively prohibit the natural process of sediment movement along the City's creeks to the shoreline.

In localized spots adjacent to Carpinteria City Beach, shoreline protection in the form of coastal armoring structures also causes seasonal impacts to the sandy beach width, including a narrowing of the beach, an acceleration of sand transport, and a seasonal erosion hotspot at the end of Ash Avenue near the lifeguard tower (Revell et al 2008). Armoring of the coastline upcoast from Carpinteria significantly reduces sediment input to the shoreline. Armored shoreline structures do not allow sediment to migrate offshore during storm events and thereby prevent sand bars from forming (City of Carpinteria 2019).

The Sandyland Revetment, Santa Barbara Harbor, upcoast armored coastline structures, and watershed debris basins have significantly reduced the sandy beach width on Carpinteria City Beach, with the unintended consequence of starving the Carpinteria shoreline of natural sediments that are critical to providing shoreline resiliency. Additionally, the lack of cobble significantly reduces the shoreline's natural resilience to wave attack during intense storm events (City of Carpinteria 2019).

Low lying waterfront and beach areas are currently vulnerable to coastal flooding, including wave inundation or heavy rainfall, and are mapped by FEMA Flood Insurance Maps as part of the NFIP (Figure 5-1). This program requires a highly specific technical analysis of watershed characteristics, topography, channel morphology, hydrology, and hydraulic modeling to map the extent of existing wave run-up-related flood hazards. These maps represent the existing 100-year and 500-year FEMA flood events (1 percent and 0.2 percent annual chance of flooding, respectively) and determine the flood extents and flood elevations across the landscape. FEMA flood maps are based on existing flood hazards and do not account for coastal processes, sea level rise, or climate change.

Figures 5-4 depicts projected sea level rise and tidal inundation at 200 cm with no 100-year flood event. Figures 5-5 depicts projected 2030 and 2060 sea level rise scenarios and tidal inundation, including projections that account for flood events.

Figure 5-4. City of Carpinteria Sea Level Rise Projections Tidal Inundations: No Flood Event

Figure 5-5. City of Carpinteria Sea Level Rise Projections Tidal Inundations: 100 Year Flood Event

History of Hazard in the City of Carpinteria

Typically, coastal hazards increase during periods of major storms that can coincide with high tides, causing coastal flooding, coastal bluff erosion, and landslides such as those that were experienced during the 1983, 1998, and 2015/2016 El Niño storms. Segments of the South Coast have been subject to significant damage from coastal hazards. Historic coastal flooding has occurred along the county's South Coast, particularly in the City of Carpinteria, since the mid-1800s. Significant wave events in 1938, 1943, 1958, 1982–83, 1988, 1997–1998, 2002, 2007, and 2015-2016 demonstrate the dynamic and hazardous coastal environment. Homes along Sandyland Cove and Padaro Lane in the City of Carpinteria suffered substantial damage during the 1983 and 2015/2016 El Niño events in particular. While many of these storm events and creek flooding hazards are associated with El Niño, other causes can threaten the environment including storm events post-wildfire. In such situations, due to an absence of vegetation and resultant soil erosion, large fluxes of sediment can be rapidly transported to the coast. For example, the January 2018 storms caused severe mudflows and debris flow in Montecito and Carpinteria (refer to Section 5.3.2, *Mudflow & Debris Flow*).

Incident Profile: Carpinteria Beach Coastal Erosion

In 1987, a seasonal erosion hotspot resulted in damage to the City lifeguard facility at the terminus of Ash Avenue. This storm also caused significant damage to the property located at the end of Ash Avenue; subsequent development was therefore raised on pier piles to make the structure more resilient to future storms.

Photo: City of Carpinteria

The Carpinteria and Sandyland shoreline has changed dramatically since the late 1800s when a large dune field was present. These changes are mostly due to indirect or direct human impact or influences, including the downcoast erosion and loss of sediment supply as a result of the construction of the Santa Barbara Harbor approximately 10 miles to the west, and loss of dune and wetland habitat due to development along the Carpinteria shoreline. Breakwater construction at the Santa Barbara Harbor began in 1927 and was completed by 1930, during which approximately 2.6 million cubic yards of sand were impounded updrift of the Santa Barbara Harbor at Ledbetter Beach. Sand impoundment led to a well-documented erosion wave that migrated downcoast at a pace of approximately 1 mile per year. The arrival of the erosion wave to Sandyland and Carpinteria, combined with storm waves arriving from a hurricane that made landfall in Long Beach in 1938, resulted in the erosion of the historic dune field at Sandyland and the beach at Carpinteria in the late 1930s. In addition, the natural underwater sand peninsula (tombolo) between the dunes and Carpinteria Reef was eroded (City of Carpinteria 2019).

The effect of this erosion changed the longshore currents in Carpinteria and likely allowed more swell energy to rotate Carpinteria beaches in a slightly clockwise direction. The long-term shoreline and beach responses to this erosion event were to erode the beach in front of Sandyland Cove and accrete the beach in front of Tar Pits Park, effectively rotating the beach slightly to the southeast. Photogrammetric analysis of 16 historic aerial photographs shows long-term changes along the Carpinteria shoreline since the 1869 shoreline position was documented at Sandyland Cove Beach, Ash Avenue, Linden Avenue, and Tar Pits Park (City of Carpinteria 2019). Sandyland Cove Beach saw the largest changes, eroding by approximately 100 feet, and Ash Avenue narrowed by approximately 50 feet. Meanwhile, accretion occurred on the beach at Linden Avenue (approximately 30 feet) and Tar Pits Park (approximately 60 feet). These active erosion processes create a seasonal erosion hotspot which is shown in seasonal beach changes and a coarsening of the sediment grain size (Revell et al 2008). This erosion hotspot resulted in damage to the City lifeguard facility at the terminus of Ash Avenue in 1987. This storm also caused significant damage to the property located at the end of Ash Avenue; subsequent development was therefore raised on pier piles to make the structure more resilient to future storms (City of Carpinteria 2019).

Probability of Occurrence

Highly Likely - Coastal flooding from tidal inundation and wave attack and associated erosion of coastal bluffs and beaches occurs during many winters but is most pronounced during past major El Niño events, which have return intervals of 2 to 7 years. Although many private coastal properties and public facilities have been protected by rock revetments or seawalls, coastal flooding, beach and bluff erosion continue in the City of Carpinteria. While the existing probability of occurrence is typically confined to El Niño seasons or major storm events, as discussed below, climate change and sea level rise are projected to increase in frequency and severity of occurrence.

Climate Change Considerations

As of 2021, the most current sea level rise projections for California are from the Ocean Protection Council (OPC) 2018 *State of California Sea Level Rise Guidance* (OPC 2018). The California Governor's Office of Planning and Research 2018 *State of California Sea Level Rise Guidance* projections predict sea level in Santa Barbara County will rise 8.4 inches by 2030, 30 inches by 2060, and 79.2 inches by 2100 (Santa County Barbara Planning and Development Department 2021). OPC's 2018 guidance asserts the direction of sea level change is clear along coastal California and the coast is already experiencing early impacts including more extensive coastal flooding during storms, periodic tidal flooding, and increased coastal erosion (OPC 2018).

The County's 2017 Coastal Resiliency Project projects sea level in the county will rise by 10.2 inches in 2030, 27.2 inches by 2060, and 60.2 inches in 2100. The County's 2017 *Sea Level Rise and Coastal Hazards Vulnerability Assessment* used existing 2015 coastal hazards modeling from Jalama Beach to Rincon Point by Environmental Science Associates as well as additional coastal hazard modeling on the south coast by Revell Coastal, LLC with the same sea level rise scenarios and planning horizons. The County modeled coastal hazards for coastal armoring and no coastal armoring. Particularly susceptible areas of the county to sea level rise related impacts include segments of the UPRR and Highway 101 from the City of Carpinteria to the Gaviota Coast and the Beach Neighborhood and Downtown in Carpinteria (Santa Barbara County 2017).

More specific coastal hazard modeling was performed for the City of Carpinteria by Wood Environment & Infrastructure Solutions, Inc. and Revel Coastal, LLC as part of the City's 2019 Sea Level Rise Vulnerability Assessment and Adaptation Plan (SLRVAAP). This study similarly concluded that the most susceptible areas of the City include the Carpinteria Beach Neighborhood and Carpinteria Salt Marsh (City of Carpinteria 2019). Based on this study, sea levels are projected to rise by as much as 6.6 feet by 2100, though more extreme scenarios project sea levels rising as much as 7.1 feet by 2100; however, these extreme scenarios are based on worst-case greenhouse gas (GHG) emissions assumptions, are highly conservative, and considered to be very unlikely of occurring (see Table 5-4). While sea level rise projections will continue to change as scientific understanding increases and policy choices manifest, what is clear for the most current projections is that sea levels are bound to increase at a significant rate, further increasing both the probability and severity of coastal hazards throughout all of Santa Barbara County (OPC 2018).

Table 5-4. Projected State and Local Sea Level Rise Scenarios (inches)

Ocean Protection Council Rising Seas in California: An Update on Sea-Level Rise (2017)				
Year	*Sea Level Rise Scenario*			
	Median (50% Probability)	*Likely (67% probability)*	*Unlikely (5% Probability)*	*Very Unlikely (0.5% Probability)*
2030	1.2 – 6.0	0.0 – 7.2	4.8 – 8.4	6.0 – 10.8
2050	0.4 – 10.8	2.4 – 14.4	10.8 – 16.8	18.0 – 24.0
2010	8.4 – 31.2	1.2 – 43.2	27.6 – 55.2	57.6 – 85.2
County of Santa Barbara Sea Level Rise and Coastal Hazard Vulnerability Assessment (2017)				
Year	*Sea Level Rise Scenario*			
	Low Rate	*Medium Rate*	*High Rate*	--
2030	0.0 - 1.8	1.2 - 5.8	8.0 - 12.1	--
2060	0.0 - 6.3	7.2 - 11.8	22.5 - 30.8	--
2100	10.6 - 16.5	30.7 - 36.7	60.2 - 66.0	--
City of Carpinteria Sea Level Rise Vulnerability Assessment & Adaptation Plan (2019)				
Year	Sea Level Rise Scenario			
	Median (50% Probability)	*Likely (67% probability)*	*Unlikely (5% Probability)*	*Very Unlikely (0.5% Probability)*
2050	3.6 – 8.4	2.4 – 12.0	6.0 – 14.4	8.4 – 21.6
2080	8.4 – 16.8	4.8 – 25.2	16.8 – 32.4	26.4 – 51.6
2100	12.0 – 25.2	6.0 – 37.2	24.0 – 49.2	43.2 – 79.2

Source: OPC 2017; Santa Barbara County 2017; City of Carpinteria 2019.

Sea level rise will cause more rapid erosion of beaches, dunes, and bluffs, increasing the threat to shoreline development and infrastructure, including coastal homes in Carpinteria. Climate change will exacerbate the impacts of coastal hazards and erosion in the City. While sea levels are projected to increase globally, sea level rise will not occur uniformly, and along the Pacific Ocean, sea levels will depend partially on tectonic movements and weather patterns. The county's portion of the San Andreas Fault's tectonic plate is folded causing areas of uplift and subsidence. Local subsidence can lead to a slightly higher sea level rise in the county than global estimates and uplift can reduce the rate of sea level rise. Additionally, the City is affected by El Niño storm surge events,

particularly during some winter months. Sea level rise coupled with increased frequency, severity, and duration of high tide and storm events related to climate change will result in more frequent and severe extreme events along the coast. These events could expose the coast to severe flooding, damage to coastal structures and real estate, and salinity intrusion into delta areas and coastal aquifers (Cayan et al. 2006).

Further, the increased severity of coastal storms has the potential to increase coastal erosion events. More frequent storms will impact how frequently acute coastal erosion events occur, while more intense events will cause the erosion to extend further inland than before. Following a similar trend as projected rates of sea level rise, the rate of bluff-top erosion is also projected to increase by up to 140 percent on average with 6.6 feet of sea level rise and may increase from a current average rate of 6 inches to 1 foot per year to up to 3 feet per year along the South Coast. In addition, coastal flooding and tidal inundation will also become a more frequent and severe hazard, as coastal flooding is directly correlated with the mean average sea level.

5.3.5 Pandemic/Public Health Emergency

Description of Hazard

The amount of a particular disease that is usually present in a community is referred to as the baseline or endemic level of the disease. This level is not necessarily the desired level, which may be zero, but rather is the observed level. In the absence of intervention and assuming that the level is not high enough to deplete the pool of susceptible persons, the disease may continue to occur at this level indefinitely. Thus, the baseline level is often regarded as the expected level of the disease (Center for Disease Control and Prevention [CDC] 2012).

Occasionally, the amount of disease in a community rises above the expected level. When diseases spread quickly and easily, they may be classified as an outbreak, epidemic, or pandemic. An **outbreak** is when there are more cases than would be normally expected, often suddenly, of an infectious disease in a more limited geographic area (e.g., a community or facility). An **epidemic** carries the same definition as an outbreak but affects a population of a large geographic area and may occur seasonally. A **pandemic** refers to an epidemic that has spread over several countries or continents, usually affecting a large number of people (CDC 2012). Pandemics are larger than epidemics in terms of geographic area and the number of people affected. Pandemics are most often caused by new subtypes of viruses or bacteria for which humans have little or no natural resistance. Consequently, pandemics typically result in more deaths, social disruption, and economic loss than epidemics. Examples include pandemic influenza, Severe Acute Respiratory Syndrome (SARS), and the Coronavirus (COVID-19).

Three conditions trigger a pandemic declaration:

1. A new virus subtype must emerge that has not previously circulated in humans (and therefore there is no pre-existing immunity);
2. This new subtype must be able to cause disease in humans; and
3. The virus must be easily transmissible from human to human.

Pandemics may be caused by:

- Naturally occurring diseases spread person to person (e.g., measles, mumps, meningococcal disease, tuberculosis);
- Food-borne (e.g., salmonella, E. coli, botulinum toxin, etc.);
- Vectors such as a mosquito that spread disease (e.g., West Nile virus, dengue, Zika, malaria);
- Newly emerging infectious diseases (e.g., Ebola, Zika, SARS, Middle East Respiratory Syndrome (MERS), avian influenza); and
- The intentionally caused spread of disease or toxins, known as bioterrorism (e.g., the contamination of restaurant food with E. coli in Oregon [1984] and the release of Sarin gas in the Tokyo subway [1995]).

Public health measures are used to control outbreaks, epidemics, or pandemics of infectious diseases, and are especially important for diseases with high morbidity or mortality and limited medical prophylaxis and/or rapid treatment. Measures to control disease include:

- Legal measures (e.g., isolation and quarantine of persons or products, and legal closure of food establishments);
- Control of contaminated food or water through recall of product or, for water, "Do Not Use", "Do Not Drink" or "Boil Water" orders issued by state or local health departments;
- Individual mandates (e.g., wearing masks) to prevent spreading respiratory droplets;
- Social measures (e.g., social distancing); and
- Vector control to eliminate vectors, such as mosquitos, that carry the disease from person to person.

Secondary impacts include significant economic disruption to a community's infrastructure due to loss of employee work time, essential services and products, and costs of treating or preventing the spread of the disease. The disease could affect the County's infrastructure, and the ability of the Emergency Operations Center (EOC) and other County departments to respond due to disease-related loss of staff.

The Vector-Borne Disease Section of the California Department of Public Health reports risk or potential risk of exposure to the following vector-borne disease in California, which may occur in the City (California Department of Public Health 2021):

- Mosquito-Borne Diseases:
  - Zika
  - Chikungunya
  - Dengue
  - West Nile Virus
  - St. Louis Encephalitis Virus
  - Malaria
- Flea-Borne Typhus
- Hantavirus Pulmonary Syndrome
- Plague
- Tick-Borne Diseases:
  - Lyme Disease
  - Anaplasmosis
  - Babesiosis
  - Ehrlichiosis
  - Rocky Mountain Spotted Fever
  - Pacific Coast Tick Fever
  - Tick Paralysis
  - Tularemia

Location and Extent of Hazard in the City of Carpinteria

Public health emergencies, such as infectious disease hazards or epidemics, occur not only on a local or state level but on a national and global scale. It is likely that most communities in the county, including the City, would be affected, either directly or by secondary impacts. Some indirect consequences may be the diversion of resources that may be otherwise available given the limited regional transportation opportunities and flow of goods and materials to the City.

The University of California (UC) Natural Reserve System has identified 10 species of mosquitos known to breed in Carpinteria Salt Marsh. Some of the native mosquito species can carry malaria (e.g., Anopheles sp.), or encephalitis (e.g., Culex sp.). The Carpinteria Valley Mosquito Abatement District monitors the estuary during the rainy season and treats various sites, especially those with ponded water, to reduce or eliminate mosquitoes. The most common practices of control are the application of oil in ponded areas to suffocate mosquitoes and the occasional draining of ponded water (UC Natural Reserve System 2022).

History of Hazard in the City of Carpinteria

Outbreaks, epidemics, or pandemics can occur when a new virus emerges to which the population has little immunity.

Pandemics

The 20th century saw three pandemics, the most notable of which was the 1918 Spanish influenza pandemic that was responsible for 40 to 50 million deaths throughout the world. Since the early 20th century, five pandemics have swept the globe. The most notable pandemic of the 21st century is the current COVID-19 pandemic, described further below:

- **1918** – The Spanish Flu, an H1N1 virus, was arguably the most severe pandemic in recent history. The number of deaths was estimated to be 40 to 50 million worldwide and 500,000 in the U.S. Its primary victims were mostly young, previously healthy adults. At one point, more than 10 percent of the American workforce was bedridden (U.S. Department of Health and Human Services 2005).

- **1957** – The H3N2 pandemic in 1957, which was referred to as the "Asian Flu," killed 1 to 2 million people worldwide, including approximately 70,000 people in the U.S., mostly infants, the elderly, and chronically ill. Fortunately, the virus was quickly identified, and vaccine production began in May 1957 (U.S. Department of Health and Human Services 2005).
- **1968** – Another H3N2 pandemic occurred in 1968, which was commonly referred to as the "Hong Kong Flu." This virus killed 34,000 in the U.S. Again, the elderly were more severely affected. This pandemic peaked during school holidays in December, limiting student-related infections, which may have kept the number of infections down. Also, people infected by the Asian Flu ten years earlier may have gained some resistance to the new virus (U.S. Department of Health and Human Services 2005).
- **2009** – In the spring of 2009, a novel influenza A (H1N1) virus "Swine Flu" emerged. It was detected first in the U.S. and spread quickly across the U.S. and the world. This new H1N1 virus contained a unique combination of influenza genes not previously identified in animals or people. This virus was designated as influenza A (H1N1) pdm09 virus. While a monovalent (H1N1) pdm09 vaccine was produced, it was not available in large quantities until late November – after the peak of illness during the second wave had come and gone in the U.S. From April 12, 2009, to April 10, 2010, the CDC estimated there were 60.8 million cases, 274,304 hospitalizations, and 12,469 deaths in the U.S. due to the (H1N1) pdm09 virus. Within Santa Barbara County, the County Public Health Department coordinated the distribution of the initially limited supplies of H1N1 vaccine to medical providers. The vaccine distribution was targeted so that those providers that served the highest risk patients received the vaccine first. In addition, the department held numerous community vaccine clinics countywide where free H1N1 vaccinations were given, including the Canalino School in Carpinteria. Together with community response providers, more than 126,000 dosages of the vaccine against pandemic H1N1 flu were distributed countywide (County Public Health Department 2010).
- **2019-Ongoing** – The COVID-19 pandemic has severely impacted the economic, political, social, and environmental conditions of the City, county, California, the U.S., and the world. Older adults and people who have severe underlying medical conditions like heart or lung disease or diabetes seem to be at higher risk for developing more serious complications from COVID-19 illness; however, numerous stories were reported of young and healthy people who developed the disease and had serious complications. People with COVID-19 have had a wide range of symptoms reported – ranging from mild symptoms to severe illness. Symptoms of COVID-19 include but are not limited to fever or chills, cough, shortness of breath or difficulty breathing, fatigue, muscle or body aches, headache, new loss of taste or smell, sore throat, congestion or runny nose, nausea, or vomiting, and diarrhea. Symptoms may appear 2-14 days after exposure to the virus. Anyone can have mild to severe symptoms (CDC 2021). On January 26, 2020, the CDC confirmed the first COVID-19 case in California, the third case in the U.S. As of January 2022, there have been 56,574 confirmed COVID-19 cases within the county and 575 deaths (Santa Barbara County Public Health Department 2022). The County Public Health Department tracks the number of cases in the City along with the South County unincorporated areas of Montecito and Summerland. This region has reported a total of 3,207 confirmed

COVID-19 cases and 28 deaths (Santa Barbara County Public Health Department 2022). As of January 2022, 74 percent of Santa Barbara County was fully vaccinated (Santa Barbara County Public Health Department 2021). In the City of Carpinteria, the County Public Health Department distributes COVID-19 vaccines at the Carpinteria Health Care Center and the Boys & Girls Club. Additionally, the City of Carpinteria, in partnership with the Carpinteria Unified School District (CUSD) and County Public Health Department, distributed approximately 7,000 antigen test kits.

Epidemics

- **2003** – SARS is a respiratory illness that affected many people worldwide in 2003. It was caused by a coronavirus, called SARS-associated coronavirus (SARS-CoV). SARS was first reported in China in February 2003. The illness spread to 29 countries, where 8,096 people got SARS, and 774 of them died. Only eight people in the U.S. got SARS and none of them died. The SARS global outbreak was contained in July 2003. Since 2004, there have not been any known cases of SARS reported anywhere in the world (CDC 2016).

Outbreaks

In addition to pandemics that impacted the world, food-borne and other outbreaks occur every few years in Santa Barbara County, commonly the result of Norovirus (refer to Section 5.5.1 of the MJHMP).

Probability of Occurrence

Likely – Even before the COVID-19 pandemic began, most public health experts considered another major pandemic to be inevitable. Given the effects of globalization, the intense mobility of human populations, and the relentless urbanization, it is likely that the next emerging virus will also spread fast and far. It is impossible to predict the nature of this virus or its source, or where it will start spreading. Some indicators will be present, but not every new virus turns into a pandemic (World Health Organization [WHO] 2018). Based on the five pandemics that have affected the U.S. in roughly the last 100 years, a pandemic occurs on average approximately every 20 years.

Disease outbreaks and flu epidemics occur on an ongoing basis. As described above, food-borne outbreaks occur every year in Santa Barbara County, commonly the result of Norovirus. Occasionally, these outbreaks require the initiation of the Santa Barbara County Public Health Department Infectious Disease Response Plan but have required little to no support from the County EOC. There is a continued threat from a novel influenza virus or other emerging epidemic diseases that would require a disaster response at the EOC level.

Climate Change Consideration

It is widely accepted that the effects of climate change will facilitate increases in the frequency of infectious diseases. According to the National Institute of Environmental Health Services (NIH), many vector-borne and zoonotic diseases are climate-sensitive and ecological shifts associated with climate change are expected to impact the distribution and incidences of these diseases (NIH 2018). While many vector-borne and zoonotic diseases, such as malaria, yellow fever, dengue, and murine typhus, are rarely seen in the U.S., the City is directly susceptible to vector-borne and zoonotic

diseases that are found in warmer climates and vulnerable due to global trade and travel. Changes in temperature and precipitation directly affect vector-borne disease transmission through pathogen-host interaction, and indirectly through ecosystem changes and species composition. As temperatures increases, vectors can spread into new areas that were previously too cold. During warm weather, animal species that carry diseases typically become more active and insects and other pests reproduce more rapidly. As climate change causes warmer temperatures earlier in the spring and later in the autumn, these animals may be active for longer periods, increasing the time that diseases can be transmitted (NIH 2018).

Further, climate-related natural disasters (e.g., wildfire, drought and water shortage, flood, coastal hazards) also increase the risk of infectious disease by disrupting health services and infrastructures and damaging water and sanitation networks (WHO 2018).

5.3.6 Energy Shortage & Resiliency

Description of Hazard

Energy shortages (or disruptions) are considered a form of lifeline system failure. While the electrical power industry does not have a universal agreement for classifying disruptions, disruptions can be the consequence of another hazard or can be a primary hazard, absent of an outside trigger. A failure could involve one, or a combination of the potable water system, power system, natural gas system, wastewater system, communication system, or transportation system. Most power blackouts are the result of situations involving unintended events, such as an overwhelming need for power due to weather conditions, equipment failure, or accidents. They may also fail due to natural hazards such as earthquakes, floods, and landslides. These outages can last anywhere from a few minutes to several weeks.

Southern California Edison (SCE) provides power to the southern parts of the county, including the City. SCE is aware of the restrictions on its systems and is making planned systematic changes to address the shortcomings. SCE offers several programs to customers experiencing outages, such as hotel discounts, rebates for portable power devices, and providing customers who rely on medical equipment with portable backup batteries (SCE 2021). SCE also offers power outage alerts via phone and email to alert customers of outages.

Unintentional or unplanned disruptions are outages that come with no advance notice. This type of disruption is the most problematic. The following are categories of unplanned disruptions:

- Accident by the utility, utility contractor, or others
- Malfunction or equipment failure
- Equipment overload (utility company or customer)
- Reduced capability (equipment that cannot operate within its design criteria)
- Tree contact other than from storms
- Vandalism or intentional damage
- Weather, including lightning, wind, earthquake, flood, and broken tree limbs taking down power lines
- A wildfire that damages transmission lines

Due to recent massive wildfires throughout California and their ignition originating from utility infrastructure and high winds, the electric utilities have initiated a program to conduct Public Safety Power Shutdowns to prevent wildfire ignitions. These are classified as intentional, unscheduled disruptions. The utilities are currently working with the County to minimize power delivery interruption while managing wildfire hazards.

Location and Extent of Hazard in the City of Carpinteria

The City and surrounding areas are subject to energy shortages, which can vary in size and area of disruption for electrical services from a large area to a small number of service connections. Electricity service is also highly vulnerable because it is highly dependent on electrical transmission lines and substations functioning properly.

Electrical substations are facilities that convert electricity from one voltage to another, making them suitable for long-distance transmission or use by homes, businesses, and other electrical customers. There is one SCE substation in the City located at 4918 Foothill Road. **Electrical transmission lines** carry high-voltage electricity over long distances between power plants and electrical customers. **Power plants** generate large amounts of electricity that are distributed through the state and regional electrical grid. There are no power plants located in the City.

Additionally, **communication facilities** in the county are run by electricity and therefore, are dependent on electricity. Communication facilities include public radio and television transmitters, cell phone towers, emergency communication antennae, and a wide range of other public and private communication infrastructure systems. The Rincon Peak Relay Station is located at 10151 Oceanview Road in the City.

As described in Section 4.5.2, *Electricity and Natural Gas*, the City enrolled in the Central Coast Community Energy (CCCE) program. Under the program, customers will continue to receive energy services from SCE, but CCCE will determine the source of the energy. CCCE prioritizes clean energy sources and has a goal of achieving 100 percent clean and renewable energy by 2030. CCCE maintains the Uninterruptible Power Supply Fund to accelerate the adoption of reliable backup power for eligible public and private entities operating critical facilities. The program helps customers maintain critical operations during prolonged power outages, such as those caused by Public Safety Power Shutoff events or other natural disasters (CCCE 2022).

History of Hazard in the City of Carpinteria

One of the largest events affecting electric and natural gas services in the City in recent years was the 2017 Thomas Fire, during which the transmission system running from Ventura County to the City of Goleta was shut down, leaving more than 85,000 customers without power for an extended period during the emergency (SCE 2017). Similar service disruptions, though not quite as extensive, occur in areas affected by wildfires and other disasters or emergencies. Small-scale energy disruptions have occurred regularly in the City.

Probability of Occurrence

Likely - In any given year, the City of Carpinteria can be subject to energy shortages. A large disruption due to a power failure or rotating brown out is highly likely.

Climate Change Considerations

With increased changes in weather and climate, energy demands will shift too. The increased prevalence of extreme heat can drive energy demand and increase the need for intentional, unscheduled power shutoffs. Further, the resiliency of power systems can be threatened during a wildfire. As wildfire occurrences associated with climate change increase so does the risk for utility failure. Energy demand and management are critical during disaster response.

5.3.7 Drought & Water Shortage

Description of Hazard

A **drought** occurs when climactic and weather conditions are drier than normal for a long period, making less water available for people, agricultural uses, and ecosystems. Drought and water shortages are a gradual phenomenon and generally are not signified by one or two dry years. Carpinteria Valley Water District's (CVWD's) extensive system of water supply infrastructure (e.g., reservoirs, groundwater basins, and conveyance facilities) generally mitigates the effects of short-term dry periods for most water users. However, drought conditions are present when a region receives below-average precipitation over an extended multiple-year period (e.g., 3 to 4 or more years), resulting in prolonged shortages in water supply, whether atmospheric, surface, or ground water (California Department of Water Resources [DWR] 2021a).

The magnitude of a drought's impact is directly related to the severity and length. The severity of a drought depends on water availability and moisture deficiency, the period, and the size and location of the affected area. The longer the drought persists and the larger the area impacted, the more severe the potential impacts. Droughts can be a short-term event over several months or a long-term event that lasts for years or even decades. Hot and dry conditions that persist into spring, summer, and fall can aggravate drought conditions, making the effects of drought more pronounced as water demands increase during the growing season and summer months. Impacts increase with the length of a drought, as carry-over supplies in reservoirs are depleted and water levels in groundwater basins decline (DWR 2021b).

Longer-term droughts can impact surface water reservoir storage levels in major reservoirs, such as Lake Cachuma, which provides about 41 percent of CVWD's total water supplies (CVWD 2021a). Longer-term droughts can also impact water levels in major groundwater basins that are key to both urban and agricultural water supply. Drought impacts increase with the length of a drought, as carry-over supplies in reservoirs are depleted and water levels in groundwater basins decline.

Drought impacts are wide-reaching and may be economic, environmental, and/or societal. Public health and safety impacts are primarily associated with catastrophic wildfire risks, drinking water shortages, and declines in water quality most frequently for small water systems in rural areas and private residential wells. The most significant impacts associated with drought in the City are those related to water-intensive activities such as wildfire protection, municipal usage, commerce, tourism, recreation, and wildlife preservation. During a drought, voluntary water conservation measures are typically implemented during extended droughts. The City may face water restrictions during droughts, which are exacerbated by extreme heat days

Water quality deterioration can occur during droughts due to lower levels of precipitation and limited water storage supply (DWR 2021b). Increased groundwater pumping in combination with sea level rise can increase saltwater intrusion in groundwater aquifers (Environmental Protection Agency [EPA] 2021). Saltwater intrusion into the Carpinteria Groundwater Basin can also occur when groundwater levels fall below sea level proximate to the coast. This decrease in water quality also results in the subsequent degradation of riparian habitats (DWR 2021b).

Location and Extent of Hazard in the City of Carpinteria

As of May 2021, Governor Gavin Newsom declared a drought emergency in 41 California counties in northern and central California (CalMatters 2021). On July 13, the Santa Barbara County Board of Supervisors proclaimed a local emergency caused by current drought conditions within the county (Santa Barbara Independent 2021). The CVWD Board of Directors approved Ordinance 21-1 declaring a Stage 2 Drought Condition on October 13, 2021, in response to State and County of Santa Barbara drought emergency declarations issued in July 2021, continued dry conditions, possible surface water allotment reductions, and the likelihood of shortages within CVWD's service area of over 20 percent of average annual demand within the coming years (CVWD 2021b).

CVWD has a balanced water supply portfolio with groundwater from the Carpinteria Groundwater Basin, surface water supplies from the Cachuma Project, and imported surface water from the State Water Project (SWP). In 2020, the CVWD water demand was approximately 4,105 acre-feet (AF) of water (CVWD 2021a). Additional water supplies are pumped from the Carpinteria Groundwater Basin by private well owners primarily for irrigation purposes. During a normal water year with long-term sustainability considerations, the total water supply is estimated at 4,586 AF for 2025 and 5,586 AF for the period 2030 to 2045. During periods of prolonged drought, the CVWD water supply would be reduced compared to that of normal water-years. For instance, water supplies after four years of drought may be as low as 3,905 to 4,306 acre-feet per year (AFY) for the period 2025 to 2045, or approximately 600 to 1,300 AFY less than during normal conditions (CVWD 2021a).

Groundwater

Following the state declaration of a drought emergency in January 2014, the Governor signed a three-bill package (i.e., California Senate Bills [SBs] 1168 and 1319, and Assembly Bill [AB] 1739), known as the Sustainable Groundwater Management Act of 2014. The Sustainable Groundwater Management Act provides for the establishment of local Groundwater Sustainability Agencies to manage groundwater sustainability within the groundwater subbasins defined by the DWR. The DWR prioritized all groundwater basins in the state designating High and Medium priority basins to help identify, evaluate, and determine the need for additional groundwater level monitoring. High or Medium priority basins subject to critical conditions of overdraft are required to submit a Groundwater Sustainability Plan (GSP) by January 31, 2020, to ensure a sustainable yield of groundwater, without causing undesirable results. Failure to comply with that requirement could result in the state asserting its power to manage local groundwater resources. The state has identified the Carpinteria Groundwater Basin, which underlies the City and the CVWD district boundaries, as a high-priority groundwater basin (refer also to Table 4-7 and Figure 5-6 of the MJHMP).

CVWD overlays the Carpinteria Groundwater Basin (DWR Basin No. 3-018), a relatively large groundwater aquifer, that extends beyond the Ventura County line on the east, to Toro Canyon on the west, from the foothills of Santa Ynez Mountains to the north, and extending offshore to the southwest for over a mile. The Basin includes approximately 16.6 square miles of surface area and multiple water-bearing zones. Total storage in the aquifer is estimated to be approximately 700,000 AF (CVWD 1986), while usable storage for the Basin recharge area was estimated to be nearly 38,926 AF (Marks 2015). The estimated sustainable yield of the Basin Unit No. 1 is approximately 4,000 AFY. From Water Year 2015 to Water Year 2019, CVWD pumped an average of 1,953 AFY from the groundwater basin, which represents approximately 46 percent of CVWD's total supplies over that period (CVWD 2021a).

Groundwater rights in the Basin have not been adjudicated. CVWD adopted a Groundwater Management Plan in 1996 to establish its role as groundwater manager for the Carpinteria Groundwater Basin. The Groundwater Management Plan will ultimately be superseded by a GSP in 2024, which is currently under development (CVWD 2021a).

In years with little rainfall, higher levels of groundwater pumping can exacerbate ongoing overdrafts in the Carpinteria Groundwater Basin, accelerating groundwater draw down and potential water quality problems. Since groundwater level fluctuations are cyclical and sensitive to overdraft, groundwater withdrawal is closely monitored (Santa Barbara County Integrated Regional Water Management [IRWM] Cooperating Partners 2019).

Surface Water

Surface water found in streams and reservoirs are an important part of the regional water supply for domestic use. The development of reservoirs can reduce the threat of flooding and store stream runoff until it is needed, allowing society to use water from winter rains to meet our needs during the dry summer and fall months when streams cannot meet demand.

CVWD receives surface water supplies from the Cachuma Project and SWP. Over the period 2016 to 2020, CVWD has received an annual average of 2,448 AFY (62 percent of CVWD's water supplies) from these sources (CVWD 2021a). The Cachuma Project includes Lake Cachuma, Bradbury Dam, Tecolote Tunnel, and South Coast Conduit (SCC) and related distribution systems, which were constructed in the early 1950s. Lake Cachuma, the county's largest reservoir, is located on the middle Santa Ynez River about 25 miles northwest of Santa Barbara. During the most recent drought, Lake Cachuma was down to approximately 6 percent of its overall water holding capacity and although it has recovered, it is now only at approximately 48.1 percent capacity. Moreover, over the past 11 years and through five large fires, the watershed areas surrounding Lake Cachuma have been denuded of extensive amounts of vegetation, which will result in abundant amounts of sediment and debris during stormflows, much of which will end up in Lake Cachuma. The resultant debris flows have introduced large amounts of organic material into surface waters, and possible impacts could include increased nutrient loading, dissolved organic carbon, major ions, firefighting compounds, turbidity, and general treatability challenges in the region's largest drinking water source (Santa Barbara County IRWM Cooperating Partners 2019). CVWD purchased an annual average of 1,594 AF from the Cachuma Project over the period 2016 to 2020. This amount represents 41 percent of CVWD's total water supplies (CVWD 2021a).

Imported Water (State Water Project)

The SWP is the largest state-built, multi-purpose water project in the country. CVWD is an SWP participant in Santa Barbara County, with a maximum allocation set at 2,200 AFY in a normal year (including a 200 AF buffer) (CVWD 2021a). SWP water has helped reduce the use of groundwater in the Carpinteria Groundwater Basin. SWP water also has improved water quality in areas that directly receive SWP water and has increased the overall water supply in Santa Barbara County (Santa Barbara County 2017b). Since State Water is used primarily as a supplemental supply, the amount received by CVWD will vary each year. Actual SWP water deliveries to CVWD in 2020 were 0 AF. For the period 2016-2020, SWP water provided approximately 854 AFY, or 22 percent, of CVWD's water supplies (CVWD 2021a).

Recycled Water and Advanced Treatment

In addition to potable water supplies, several water purveyors in the county also use non-potable recycled wastewater to irrigate parks, schools, golf courses, and other large, landscaped areas. The CVWD is planning for future additional water supplies such as potable reuse via the Carpinteria Advanced Purification Project (CAPP). The CAPP will produce advanced treated recycled water that will be injected into the Carpinteria Groundwater Basin to be stored and later extracted to meet potable demands. The CAPP is expected to begin delivering water in 2026, and produce approximately 1,000 AFY of reliable, drought-proof local supply.

Water Conservation

To use all available water supplies wisely and efficiently, CVWD implements numerous water conservation or water use efficiency measures, including conservation tips, surveys, conservation programs, and rebate programs for residents, commercial users, and agricultural users. These measures are directed at helping water users minimize unnecessary use of water during times of plentiful supply and help stretch limited water resources during water shortages (see also Section 6.3.7, *Drought & Water Shortage*). The CVWD administers several demand management programs for municipal customers, including the following:

- Water waste prevention ordinances
- Metering
- Conservation pricing
- Public education and outreach
- Water loss control
- Conservation program coordination and staffing
- Other demand management measures that significantly impact water use.

During declared water supply shortages, the CVWD uses a six-stage rationing plan that includes voluntary and mandatory rationing, depending on the causes, severity, and anticipated duration of the shortage. The criteria for triggering the CVWD's water rationing stages and water usage reduction goals are summarized in Table 5-5 below.

Table 5-5 Water Shortage Stages and Goals

Shortage Condition	Stage	Customer Reduction Goal	Type of Rationing Program
Less than 10 Percent	1	10%	Voluntary
10 to 20 Percent	2	20%	Mandatory
20 to 30 Percent	3	30%	Mandatory
30 to 40 Percent	4	40%	Mandatory
40 to 50 Percent	5	50%	Mandatory
More than 50 Percent	6	>50%	Mandatory

Source: CVWD 2021a.

History of Hazard in the City of Carpinteria

California is no stranger to drought; it is a recurring feature of our climate. Three 20th century droughts were of particular importance from a water supply standpoint—the droughts of 1929–1934, 1976–1977, and 1987–1992. More recent multiyear droughts occurred in 2007–2009 and 2012–2017 (DWR 2021c). California's most recent multi-year drought occurred from 2012-2017, which was one of the documented driest consecutive water years in the county with 50.83 inches in cumulative rainfall (Santa Barbara County 2021; see also, Section 5.3.2 of the 2022 MJHMP for a detailed discussion of multi-year droughts that were identified as having significant impacts on the county). An iconic image of this drought was publicized in 2017 when the temporary emergency pumping plant and pipeline at Lake Cachuma were used to move water for the Santa Barbara area across the lake's dry bottom to the distribution system intake that had been stranded by falling lake levels. Lake Cachuma, which supplies 41 percent of CVWD's total water supplies as previously mentioned, had water levels so low a special barge fitted with large pumps had to be employed to access remaining water. On April 7, 2017, the Governor lifted the statewide drought emergency; however, given ongoing low water levels in local reservoirs, the County kept the local drought emergency in place until 2019. Effects of this drought included wetland and stream drying, impacts to agricultural land, and tree mortality across the Carpinteria Valley. Additionally, CVWD's water storage capacity and water quality were impacted at Lake Cachuma from increased sedimentation from the Thomas Fire in 2017 (Santa Maria Times 2021).

Probability of Occurrence

Likely - Droughts are a regularly recurring feature of Santa Barbara County weather that can be affected by overall regional or worldwide climactic patterns. El Niño and La Niña events are natural climate patterns over the Pacific Ocean often with global effects, with influence over the weather of the U.S. southwest that on average occur every two to seven years. In any given year, CVWD and the City can be subject to drought conditions and water shortages. However, out of the last 10 years, the county has been under a locally declared drought emergency for five years; therefore, it is likely drought and associated water shortages will continue and may increase due to climate change considerations, as described further below.

Climate Change Considerations

Climate change has the potential to make drought increasingly common along the west coast, including in the City of Carpinteria. DWR projects climate change will result in more variable weather patterns in California that may lead to more severe, frequent, and extended droughts,

which will impact the City's water supply (DWR 2021c). Extreme heat creates conditions more conducive for evaporation of moisture from the ground, thereby increasing the severity of drought as well as wildfires.

As described in the County's CCVA (Santa Barbara County Planning and Development Department 2021), "Two distinct metrics measure precipitation: 1) annual average precipitation and 2) seasonality. Although there will likely be a slight increase in precipitation throughout the 21st century, the seasonality may change (i.e., timing during a given year). There will likely be more rain during periods of precipitation (e.g., storms with higher rainfall totals), fewer total days with precipitation, and an increase in year-to-year variability. This means that more rain may fall during fewer storms throughout the year." Based on these projections, there will be a gradual increase in average annual precipitation in the South Coast (refer to Table 5-7 of the MJHMP; Santa Barbara County Planning and Development Department 2021).

Due to these changes in precipitation patterns, although episodic severe storm events may increase in severity, droughts will likely last longer and happen more frequently because of more variability in precipitation extremes. Average base flows in the City's creeks are projected to decline significantly in an early- and late-century (e.g., post-2050) extended drought scenario. This reduction in average base flows will affect two key local water supply sources (i.e., surface water reservoirs and groundwater), impacting urban and agricultural uses and natural resources (Santa Barbara County Planning and Development Department 2021).

Snowpack is the amount of snow that accumulates during the winter and is a natural reservoir that stores water during the winter. As it slowly melts in the spring and summer, it feeds streams and rivers that provide water to regions hundreds of miles away along the Central Coast and Southern California. The Sierra Nevada snowpack is important in terms of providing water storage and ensuring adequate supply in the summer to the SWP when water is most needed. A warming planet could lead to earlier melting of winter snowpacks, leaving lower stream flows and drier conditions in the Sierra Nevada during late spring and summer. In 2021, the snowpack in the Northern Sierra was 70 percent of the average, but the rain was less than 50 percent of the annual average, making it the third driest year on record. Loss of snowpack will increase as temperatures increase because of less precipitation during droughts, more precipitation falling as rain, and snow melting earlier in the spring (Santa Barbara County Planning and Development Department 2021). Changing precipitation distribution and intensity is projected to lead to increased run-off rather than be captured and stored exacerbating the potential for drought. The result of these processes is an increased potential for more frequent, longer-lasting, and more severe periods of drought (DWR 2021c).

5.3.8 Extreme Heat/Freeze

Description of Hazard

Extreme heat is defined by FEMA as temperatures that hover 10 degrees Fahrenheit (°F) or more above the regional average high temperature or over 100 °F in California and last for at least three days or even as long as several weeks (FEMA 2021b). Extreme heat is a function of heat and relative humidity. A heat index describes how hot the heat-humidity combination makes the air feel. As relative humidity increases, the air seems warmer than it is because the body is less capable of

cooling itself or regulating heat via evaporation of perspiration. As the heat index rises, so do health risks such as heat exhaustion, sunstroke, and heatstroke. Those at the greatest risk of heat-related stress and injuries include the elderly, small children, individuals who work outside, patients with chronic medical conditions, those on prescription medication therapy, and people with weight and alcohol problems, especially during heat waves in areas where moderate climate usually prevails.

While the effects of extreme heat on human health can be severe, so too can its effects be on natural ecosystems, services, infrastructure, and various economic sectors (e.g., agricultural sector). During periods of extreme heat, transportation, gas, power, and other services may be disrupted, and critical infrastructure may be destroyed or damaged (FEMA 2021b). The National Institute for Occupational Safety and Health (NIOSH), alongside the Occupational Safety and Health Administration (OSHA), provides a Heat Safety Tool App that offers occupational safety and health recommendations based on the heat index (NIOSH 2021; OSHA 2021). Each extreme heat day or heat wave can present additional risk of other hazards present within the City but is primarily a direct contributor to wildfire hazards and risks (see Section 5.3.10, *Wildfire*).

Freeze conditions are defined as particularly cold weather spells caused by cold fronts where temperatures are sustained at 32 °F or below for a period of two or three days. Typically, frost can occur when the temperature falls below 36 °F, especially in rural areas and in the early mornings. It is a localized phenomenon and can be quite variable across a small area, and though infrequent, it can severely affect unsheltered homeless individuals and individuals who work outside. Freeze conditions can also severely impact the agriculture sector, the largest economic sector in Carpinteria Valley and one of the largest economic sectors in the County, around the winter and spring growing seasons when freeze can cause extensive crop damage.

Location and Extent of Hazard in the City of Carpinteria

Extreme heat occurs when temperatures rise significantly above normal levels, and the key metric is the number of extreme heat events per year and heatwave duration. "Extreme heat" is a relative term—temperatures of 100 °F are normal in places like Palm Springs, but almost unprecedented in coastal areas of Santa Barbara County, such as the City.

Coastal communities on average have lower temperatures compared to communities in the inland areas of the county and could be less at risk to extreme temperatures although potentially less acclimatized to high temperatures if they occur. The highest average temperatures in the City occur in August and September. In coastal areas such as the City, average monthly high temperatures more moderately range from 65 °F to 75 °F (Western Regional Climate Center 2021).

The earliest median 32 °F freeze in the south county from 1980 to 2010 occurred between November 11-20. During inclement weather periods (very cold, or very cold with rain) Santa Barbara County contracts third parties to provide warming centers targeted at unsheltered homeless individuals. However, in the winter months of 2020, warming centers were severely limited amid safety concerns related to the COVID-19 pandemic (refer to Section 5.3.5, *Pandemic/Public Health Emergency*).

History of Hazard in the City of Carpinteria

Santa Barbara County has experienced several extreme heat events in the past; however, they are not well documented. One documented event reported as "simoon", occurred on June 17, 1859, where a record temperature of 133 °F was taken during an extreme heat and wind event that struck Santa Barbara in the early afternoon (Noozhawk 2020). This event set the world record for the hottest temperature ever recorded on Earth, which was held for 75 years until the record was broken by one degree in Death Valley on July 10, 1913 (Guinness World Records 2021). More recently, according to the NOAA Storm Events Database, a combination of high pressure and high humidity caused temperatures to spike to between 100 °F and 119 °F on July 22, 2006, throughout southern California, including the county (NOAA 2021a). In 2020, heatwaves in the Santa Ynez Valley with temperatures reaching 118 °F caused early grape harvests at wineries (Jervis 2020).

There have been two federally declared freeze events in the county. The first occurred from December 19, 1990, through January 3, 1991, and was federally declared on February 11, 1991 (DR-894-CA). The second occurred from January 11, 2007, through January 17, 2007, and was federally declared on April 20, 2007 (FEMA-1689-DR). Widespread freezing conditions were reported across agricultural areas of Santa Barbara County. Total crop damages in Santa Barbara County were estimated to be around $20 million (NOAA 2021a). In addition, the NOAA Storm Events Database reported a freeze event on December 21, 1998, that lasted three nights. The California Department of Food and Agriculture reported over $83 million in crop losses across a four-county area (NOAA 2021a).

Probability of Occurrence

Highly Likely - Nearly every summer, there are a few days of extreme heat. In any given year, the City can be subject to extreme heat or freeze conditions. As previously described, the hottest months in the City are August and September, while the coldest month is January. In Carpinteria, high temperatures are typically associated with offshore wind events and normally occur in the late summer and fall (see Section 5.3.19, *Windstorm*).

Climate Change Considerations

As temperatures rise due to climate change, residents, employees, and visitors in the City will face a greater risk of death from dehydration, heatstroke/exhaustion, heart attack, stroke, and respiratory distress caused by extreme heat. By mid-century, extreme heat events in urban centers could cause two to three times more heat-related deaths than occurring today. Freezing spells are likely to become less frequent as climate temperatures increase (Climate Central 2019).

Historically, Santa Barbara County has experienced an average of four extreme heat days a year, however, this is expected to increase to 12 extreme heat events per year by 2030, 19 extreme heat events per year by 2060, and 34 extreme heat events per year by 2100 (Santa Barbara County Planning and Development Department 2021). Due to the rising temperatures, heat waves are likely to become more frequent, which will have direct impacts on human health in terms of heat-related illness. The City and Carpinteria Valley's large farming and viticulture production which employs hundreds of outdoor laborers will be vulnerable to the rising temperatures and most at risk for heat-related illnesses. Residents will also be vulnerable to rising temperatures, as many of the homes on the coast do not have air conditioning units, as there was less of a need in the past,

and therefore may be less prepared compared to the inland region of the county to adapt to extreme heat events.

Cascading impacts include increased stress on water quantity and quality, degraded air quality, and increased potential for more severe or catastrophic natural events such as heavy rain, droughts, and wildfire. Another cascading impact includes increased duration and intensity of wildfires with warmer temperatures.

Extreme heat has also been shown to accelerate wear and tear on the natural gas system and electrical infrastructure. Projected increases in summer demand associated with rising temperatures may increase risks to energy infrastructure and may exceed the capacity of existing substations and distribution line infrastructure and systems.

For California, most projections of heat events have been conducted with cooperation from the Scripps Institute of Oceanography, UC San Diego. Models have been consistent in projecting increases in the annual average temperature of up to 5 °F by the 2030s and up to 10 °F by the end of the century or sooner, although not every day will be hotter. This work has also indicated that extreme temperature events will occur more frequently. Minimum nighttime temperatures are also predicted to increase and should be considered.

5.3.9 Dam Failure

Description of Hazard

Dam failure can occur due to prolonged periods of rainfall and flooding that exceed a dam's design requirements. Dam failures can also result from any one or a combination of the following: old age, poor design, structural damage, improper siting, improper maintenance, landslides flowing into a reservoir, or terrorist actions. Structural damage is often a result of a flood, erosion, or earthquake. A catastrophic dam failure generates a substantial degree of energy and can cause flooding downstream with catastrophic impacts to life and property. The force of the water from dam failure is large enough to carry boulders, trees, automobiles, and even houses along a destructive path downstream. The potential for casualties, environmental damage, and economic loss is great. Damage to electric generating facilities and transmission lines could impact life support systems in communities outside the immediate hazard area. Additionally, the associated water supply and water quality may be affected resulting in supply challenges and potential health concerns.

Location and Extent of Hazard in the City of Carpinteria

Two of the 14 dams in the county would impact the City of Carpinteria should they catastrophically fail, namely the Santa Monica Debris Basin and Carpinteria Dam (Table 5-6). As described above, federal dams are not subject to DWR Division of Safety of Dams (DSOD) jurisdiction and are exceptions; however, the U.S. Bureau of Reclamation (USBR) uses its form of risk analysis and best practices guidance to avoid potential dam failure events (USBR 2021). These dams range in purpose from water supply to flood control.

Table 5-6. Santa Barbara County Dams That Impact the City of Carpinteria

Dam Name	Owner Name	Year Built	Reservoir Capacity
Santa Monica Debris Basin	County Flood Control District	1978	N/A
Carpinteria Dam	USBR	1953	40 acre-feet

Source: DWR DSOD 2021b, USBR 2021.

The Santa Monica Debris Basin is a very large, engineered basin with a two-tiered dam face that was built in 1977 as an element of the Carpinteria Valley Watershed Project. It is owned and operated by Santa Barbara County Flood Control and is located on Santa Monica Creek, 2.3 miles north of the ocean. The debris basin was designed to trap 208,000 cubic yards of flood debris. The dam is over 60 feet high on the upstream and approximately 150 feet high on the downstream side. The dam is covered with large riprap and a concrete spillway located on the east side of the basin. The spillway is approximately 1,600 feet long and discharges into a plunge pool. The plunge pool is approximately 300 feet long, 150 feet wide, and 30 feet deep when clean and acts as a sediment catch basin and is cleaned and restored to full capacity after each storm event to be ready as needed for future storms (National Watershed Coalition 2018).

Carpinteria Reservoir is a concrete-lined basin built on Carpinteria Creek and serves as a terminal reservoir. The dam is an earthfill structure built 31feet high with a crest length of 1,350 feet and a capacity of 40 acre-feet. The dam, built in 1953, is owned by the USBR (USBR 2022).

Per California Code of Regulations Section 335.4, the DWR DSOD classifies dams into four categories (i.e., low, significant, high, and extremely high hazard potential) based on the size of the dam's reservoir and the population that would be impacted by a dam failure; it does not reflect the condition of the dam or its structures. All 14 dams in the county, including the Santa Monica Debris Basin and Carpinteria Dam, are identified by the DWR DSOD as high-hazard dams (i.e., dam failure would be expected to cause loss of at least one human life). Since 2017, California Legislature has required all state jurisdictional dams, except low hazard dams, to develop inundation maps and emergency action plans. The DWR DSOD mapped inundation zones show that portions of the City may be inundated should a dam catastrophically fail. Dam failure inundation zones mapped by the State of California indicate areas that would be inundated should a dam fail catastrophically. Figure 5-6 displays the dam locations and dam inundation areas in the City of Carpinteria.

Figure 5-6. City of Carpinteria Dam Inundation

History of Hazard in the City of Carpinteria

As described in the County MJHMP, the county has experienced one incident of catastrophic dam failure, which occurred in the community of Mission Canyon, approximately 10.5 miles northwest of the City. No historical dam failures have occurred within or in the vicinity of the City.

The DWR DSOD provides oversight of the design, construction, and maintenance of jurisdictional-sized and non-Federal dams. Due to the DWR DSOD, many potential dam issues have been addressed and/or resolved (DWR DSOD 2021a). Additionally, the USBR, responsible for oversight of the Carpinteria Dam and all other federal dams in the county, has improved systems to ensure that peak releases during heavy inflows do not result in excessive downstream flows, which reduces the possibility of inundation from overflows (Santa Barbara County Planning and Development Department 2015).

As described in Section 5.3.2, *Mudflow & Debris Flow*, the Santa Monica Debris Basin was filled with debris after the January 2018 storms. This was the most significant test of the Basin since its construction and the first time that debris had filled the Basin to the point of exceeding the crest of the emergency spillway. Fortunately, the basin capacity was adequate such that very little debris went through the emergency spillway resulting in no significant damage downstream. Local officials with assistance from FEMA and the U.S. Army Corps of Engineers (ACOE) responded rapidly in cleaning out the debris from the basin restoring its capacity to trap additional debris during the spring rains (National Watershed Coalition 2018). This was not the first year that the debris basin has functioned as designed and prevented damages downstream. Some of these memorable storms include the floods of March 1995, the "El Niño floods" of 1998, and floods in 2005 (refer to Section 5.3.1, *Flood*). After each of these events, major work was required and completed to clean and restore the basin as quickly as possible to be ready for future storms (National Watershed Coalition 2018).

Probability of Occurrence

Occasional - Dam failure events are infrequent and usually coincide with the events that cause them, such as earthquakes, landslides, and excessive rainfall and snowmelt; therefore, the probability of future occurrence is unlikely. There is a "residual risk" associated with dams; residual risk is the risk that remains after safeguards have been implemented. For dams, the residual risk is associated with events beyond those that the facility was designed to withstand. However, the probability of occurrence of any type of dam failure event is considered to be low in today's regulatory and dam safety oversight environment.

Climate Change Considerations

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.

5.3.10 Wildfire

Description of Hazard

A **wildfire** is an unplanned fire that burns in a natural area or wildlands, such as the Los Padres National Forest or undeveloped ranchland, particularly in the Santa Ynez Mountains. Of critical concern is the wildland-urban interface (WUI). According to the National Fire Plan issued by the U.S. Departments of Agriculture and Interior, the WUI is defined as "…*the line, area, or zone where structures and other human development meet or intermingle with undeveloped wildland or vegetative fuels*." In WUI fires, the fire is fueled primarily by naturally occurring vegetation in the wildland and urban areas as well as the urban structural elements themselves. The WUI area in the City includes developed single-family neighborhoods immediately adjacent to the foothills of the Santa Ynez Mountains and larger estate homes within the wildland areas in Carpinteria Valley. A wildfire in the WUI could burn from wildlands into the urban area, which has happened during several fires in Santa Barbara County such as the Thomas, Paint (Painted Cave), Sycamore Canyon, Tea, and Jesusita wildfires during which over 1,000 homes were damaged or destroyed in the South Coast.

The majority of wildfires are caused by humans or lightning. Once ignited, 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.

Mountainous terrain and limited road access to rural areas in the mountains inland of the City can sometimes prevent easy access by firefighting equipment. Weather as manifested in temperature, humidity, and wind (both short- and long-term) affect the probability, severity, and duration of wildfires. High winds, in particular, can cause a wildfire to rapidly advance through already dry vegetation posing a major challenge to fire fighting and may even at times limit the safe use of aircraft, which can greatly reduce firefighting capacity.

Location and Extent of Hazard in the City of Carpinteria

The California Department of Forestry and Fire Protection (CAL FIRE) Fire and Resource Assessment Program (FRAP) provides high-quality spatial data, maps, and online data viewers which provide critical information on the health and risk factors associated with forest and range lands within the State of California. These maps include but are not limited to Fire Hazard Severity Zones, WUI, and Fire Perimeters. 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 most current Fire Hazard Severity Zone maps were created in 2007. Figure 5-7 shows the Fire Hazard Severity Zones located in the City of Carpinteria. CAL FIRE's FRAP also developed data that displays the relative risk from wildfire to areas of significant population density, known as the WUI. This data is created by intersecting residential housing unit density with proximate fire threat to give a relative measure of potential loss of structures and threats to public safety from wildfire. Figure 5-8 was generated using this data and shows the WUI areas in the City. This figure depicts areas where potential fuels treatments (e.g., controlled burns, vegetation thinning) should be prioritized to reduce wildland fire threats to population centers.

Many of the communities at risk contain relatively old homes that reflect the building materials and/or codes in effect at the time of construction (e.g., wood shake roofs and siding, open eaves, unscreened crawlspace, and attic vents), which research has shown to be important in most home losses during wildfires. As such, these homes are at increased risk of ignition due to structure vulnerabilities. In addition to hazard reduction through fuel reduction, education of homeowners and mitigation of structure ignition vulnerabilities is an important priority in these communities. Programs that support retrofits to existing structures, combined with building codes that make future structures more fire-resistant, are needed in many fire-prone areas.

History of Hazard in the City of Carpinteria

Because Santa Barbara County is prone to wildfires, there is a long history of wildfires in the county. Table 5-7 lists the major wildfires (1,000 acres or greater) in Santa Barbara County from 1932-to 2021. CAL FIRE's FRAP also compiles fire perimeters of wildfires and has established an ongoing fire perimeter data capture process. Figure 5-4 of the County MJHMP shows wildfire perimeters of significant wildfires within the last 50 years (1970-2020) in Santa Barbara County. Fire perimeters provide a reasonable view of the spatial distribution of past large fires. These historic fires are organized by decade to show the evolution of fire behavior over the years.

Table 5-7. Major Wildfires in Santa Barbara County

Year	Fire Name	Acres Burned		Year	Fire Name	Acres Burned
1932	North Shore	7,576		2002	Sudden	7,500
1971	Cielo	2,010		2004	Gaviota	7,197
1971	Romero	14,538		2004	Cachuma	1,115
1975	--	1,527		2006	Bald Fire	4,332
1977	Cachuma	2,250		2006	Perkins	14,923
1977	Hondo Canyon	8,526		2007	Zaca	240,807
1979	Wasioja	2,006		2008	Gap	9,443
1981	Rey	1,638		2008	Tea	1,940
1981	Oak Mountain	8,688		2009	Jesusita	8,733
1984	Minuteman	1,187		2009	La Brea	89,489
1985	Wheeler	122,687		2010	Bear Creek	1,252
1989	Cocheo	1,233		2013	White	1,984
1990	Paint	4,424		2016	Rey	32,606
1993	Marre	43,864		2016	Sherpa	7,474
1994	Aliso	3,244		2017	Alamo Fire	28,834
1996	Wasioja	2,812		2017	Whittier Fire	18,430
1996	Cuyama	1,400		2017	Thomas Fire	281,893
1997	Logan	49,490		2018	Front Fire	1,014
1997	Azaela	1,351		2019	Cave Fire	3,126
1997	Haloween	1,129		2020	Scorpion Fire	1,395
1998	Ogilvy	4,029		2021	Alisal Fire	16,962
2000	Harris	8,684				

Source: National Interagency Fire Center 2021.

Notes: Acreage represents total burned by fire; however, a number of these fires such as the Thomas Fire burned in other counties as well (e.g., Ventura County) so acreages burned in Santa Barbara County would be lower in some instances.

The Wheeler Fire, which occurred from July 1-15, 1985, was caused by arson in Wheeler Gorge, located approximately 15 miles northwest of Ojai. The area had not burned in over 40 years and was full of dense, dry brush. A change in the wind caused the fire to move from Ventura County into Santa Barbara County and threaten Carpinteria. It moved into Matilija Canyon, causing the fire to slop over into the Santa Ynez watershed above Jameson Reservoir.

Carpinteria High School became the staging area. There were 2,700 firefighters on the scene, some from as far away as Michigan and Arkansas. Four days later, 81,000 acres had burned, and critical watershed areas and sensitive California condor habitats were threatened (Lompoc Record 2021).

It was decided that the only way stop the fire was to start backfires to burn off 30,000 acres of dense brush. Throughout the rest of the week, the fire continued to burn in several major canyons feeding into the Santa Ynez River. Finally, the fire began to wane when a tropical storm off Baja California helped lower the temperature into the 70s. The fire was controlled on July 15. It burned 119,361 acres, 19 homes, 37 buildings, 32 vehicles and $3 million worth of orchards (Lompoc Record 2021).

Over the last 10 years, Santa Barbara County has experienced nine major fires. Four of these fires (i.e., Thomas, Cave, Sherpa, and Whittier) directly threatened the heavily populated Santa Barbara front country. Three of these fires (i.e., Thomas, Sherpa, and Whittier) resulted in destroyed structures, with over 1,000 structures destroyed in the Thomas Fire, including many in the vicinity of the City. The City has not been directly affected by many of these recent wildfires. The Thomas Fire was the only major recent wildfire that directly threatened the City, burning rural hillsides above the City, but not reaching City limits.

At the time in 2017, the **Thomas Fire** was the largest wildfire in modern California history, with a total burn area of 281,893 acres; destroying 1,063 structures and resulting in one civilian and one firefighter fatality (Ventura County Fire Department 2019). The Thomas Fire, which occurred in December, was fueled by decadent brush, 10 years of drought, and strong sundowner winds. The fire was ignited north of Santa Paula in Ventura County and burned into Santa Barbara County through the Santa Ynez Mountains and parts of the upper Santa Ynez River watershed. It was one of the first wildfires to burn from inland Ventura County into the Santa Barbara front country of the Santa Ynez Mountains. The perimeter of the Thomas Fire nearly reached the City's boundaries. The Thomas Fire required evacuations of all areas of the City north of Highway 192 and the City served as a key staging area for regional firefighting efforts, but no structures were lost due to the Thomas Fire in the City. The fire was active for 40 days and at one time involved more than 8,500 firefighters, 800 fire engines, and dozens of aircraft (National Interagency Fire Center 2021; Santa Maria Times 2021). Over 2,000 of these firefighters were in the South Coast communities and had been for three days prepping houses, laying lines, scouting escape routes, and becoming familiar with the landscape (Community Environmental Council 2020).

Figure 5-7. Santa Barbara County Fire Hazard Severity Zones

Figure 5-8. Wildland-Urban Interface (WUI)

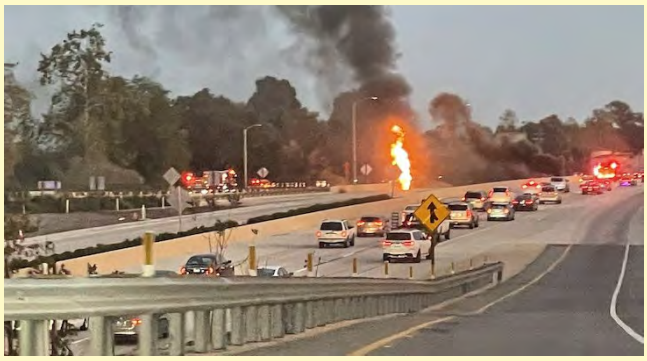
Figure 5-9. Wildfire Threat

Furthermore, large wildfires that burn hotter remove all vegetation and can melt surface soils creating hydrophobic soils which do not allow rainfall to percolate, increasing the threat of other disasters such as flooding and mud or debris flows. For example, the Thomas Fire was followed by the 2018 Debris Flows which severely damaged the community of Montecito, killed more than 20 residents, damaged or destroyed 400 or more homes, and led to a 3-week closure of Highway 101 and the UPRR, severing connections between the City and communities to the north and south (refer to Section 5.3.1, *Flood* and Section 5.3.2, *Mudflow & Debris Flow*).

In addition to larger wildfires, such as the Thomas Fire, on February 19, 2022, a small fire broke out in a storm drain pipe beneath Highway 101 within the City of Carpinteria. The fire started at the entrance of the storm drain near Carpinteria Creek, and spread hundreds of feet through the drain. Carpinteria-Summerland firefighters who responded to the scene found smoke and flames coming from two manhole covers and another opening under a bridge along Highway 101 between Bailard and Casitas Pass Rd, as well as along the 5700 block of Via Real. Highway 101 northbound from Bailard to Casitas Pass Road and the 5700 block of Via Real were closed to traffic due to safety concerns and firefighting efforts. Carpinteria-Summerland Fire was assisted by Montecito Fire Department, Santa Barbara City Fire Department and Ventura County Fire Department. Santa Barbara County Sheriff's deputies and CHP officers also responded to the scene to assist with traffic control (Edhat 2022).

Incident Profile: The Storm Drain Fire

A small fire broke out in the storm drain system beneath Highway 101 and the 5700 block of Via Real on the evening of February 19, 2022. The fire started at the entrance of the storm drain near Carpinteria Creek, and spread hundreds of feet through the drain.



Source: Edhat 2022. Photo: Montecito Fire Department

Southern California Gas Company (SoCal Gas) was called to the scene and determined no gas lines were involved in the incident. Carpinteria Sanitary District also responded to investigate whether a broken sewer line could be the source of the fire and that was also ruled out. The storm drain where the fire occurred is lined with a thick plastic material which caused the fire to continue burning with intensity for several hours. Firefighters were able to gain control and extinguish the flames that night by pumping large quantities of water into the storm drain. The northbound lanes of Highway 101 were reopened that night; however, Via Real remained closed (Edhat 2022).

At approximately 1:30 a.m. the next day, local road construction workers reported seeing smoke coming from the storm drain system in the same area. The closure of Highway 101 northbound from Bailard to Casitas Pass Road was reissued to allow for emergency operations. Carpinteria-Summerland firefighters responded to the scene and requested Montecito Fire's engine that is specially equipped with a Compressed Air Foam System. Firefighters sprayed the foam into the storm drain to eliminate the fire's oxygen source and successfully extinguish it. By 5 a.m., the closure

of Highway 101 northbound was lifted (Edhat 2022). No neighboring residences were exposed to risk during the blaze (Santa Barbara Independent 2022).

Probability of Occurrence

Likely - 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 (see Section 5.3.19, *Windstorm*). The City is set at the base of the Santa Ynez Mountains along the coast, which support chaparral vegetation, a shrubland habitat of dense and scrubby brush that has evolved to persist in a fire-prone habitat. Santa Barbara County was subject to 42 major wildfires over 88 years, resulting in a 48 percent chance of occurrence in any given year. While the likelihood that a wildfire affecting the City is lower given its coastal location and urban setting, it is highly likely that regional wildfires would require local action (e.g., evacuations, firefighting) and potential direct impacts (i.e., loss of structures) along the City's WUI.

Climate Change Considerations

Based on research performed by the California Governor's Office of Planning and Research and as noted by fire protection specialists, climate change is now playing a significant role in increasing the frequency and severity of wildfires (Office of Governor 2019). Growing amounts of GHGs coupled with population growth and development are expected to continue impacting forests and natural resources in the Carpinteria Valley. Likewise, 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 affecting the City.

Current scientific models suggest that climate change will affect total precipitation and wind patterns, with a tendency for drier conditions in Southern California, increasing fuel loading and the flammability of vegetation (California Natural Resources Agency 2018). As such, studies expect California will be affected by increased numbers of forest fires with added intensity due to longer warmer seasons, reduced the distribution of biodiversity, lack of moisture, changes in ecosystems, drought impacts (e.g., pest diseases and continued spread of invasive species), and other impacts in coming years. Wildfire behavior appears to be becoming more severe with fires burning hotter, moving more quickly, and even creating their own weather which in turn can cause firestorms that are difficult to contain. While wildfires are a natural part of California's ecology, the fire season is getting longer every year. Warmer temperatures, variable snowpack, and earlier snowmelt caused by climate change make for longer and more intense dry seasons, leaving forests more susceptible to severe fire. Anticipated growth and development in the vicinity of the City can also be expected to amplify these effects. As seen with the 2017 - 2018 wildfires, more damage occurred in developed areas like the Thomas Fire in Ventura and Santa Barbara counties.

Large wildfires also have several indirect effects beyond those of a smaller, local fire. These may include mudflows and debris flows, air quality and health issues, road closures, business closures, and other forms of losses (see also, Section 5.3.2, *Mudflow & Debris Flow*).

5.3.11 Tsunami

Description of Hazard

A **tsunami** is a series of extremely long waves caused by a large and sudden displacement of the ocean, usually the result of an earthquake below or near the ocean floor. This force creates waves that radiate outward in all directions away from their source, sometimes crossing entire ocean basins. Unlike wind-driven waves, which only travel through the topmost layer of the ocean, tsunamis move through the entire water column, from the ocean floor to the ocean surface (NOAA 2018). Once a tsunami forms, its speed depends on the depth of the ocean. In the deep ocean, a tsunami can move as fast as a jet plane, over 500 mph, and its wavelength, the distance from crest to crest, could be hundreds of miles. Mariners at sea will not normally notice a tsunami as it passes beneath them; in deep water, the top of the wave rarely reaches more than three feet higher than the ocean swell. A tsunami only becomes hazardous when it approaches land. As a tsunami enters shallow water near coastal shorelines, it slows to 20 to 30 mph. The wavelength decreases, the height increases, and currents intensify (NOAA 2018).

Large tsunamis are significant threats to human health, property, infrastructure, resources, and economies. Rushing water from waves, floods, and rivers are incredibly powerful. Just six inches of fast-moving water can knock adults off their feet, and twelve inches can carry away a small car. Tsunamis can be particularly destructive because of their speed and volume. They are also dangerous as they return to the sea, carrying debris and people with them. Low-lying areas could experience severe inland inundation of water and deposition of debris. Effects can be long-lasting and felt far beyond the coastline. Tsunamis typically cause the most severe damage and casualties near their source, where there is little time for warning. But large tsunamis can also reach distant shorelines, causing widespread damage. The 2004 Indian Ocean tsunami, for example, impacted 17 countries in Southeastern and Southern Asia and Eastern and Southern Africa (NOAA 2018).

Location and Extent of Hazard in the City of Carpinteria

As shown in Figure 5-10, areas prone to tsunami hazards in the City are limited to coastal areas and offshore areas. The City is very susceptible to tsunami hazards, given that it is located on or near several offshore geological faults, the more prominent faults being the Mesa Fault, the Santa Ynez Fault in the mountains, and the Santa Rosa Fault (refer to Section 5.3.3, *Earthquake & Liquefaction*). Other unnamed faults in the offshore area of the Channel Islands may present tsunami hazards. These faults have been active in the past and can subject the City's coastal area to seismic action at any time.

History of Hazard in the City of Carpinteria

Earthquakes along the county's coast along submarine fault lines could generate large, destructive tsunamis. However, the relative threat for local tsunamis in the City can be considered low due to low recurrence frequencies. Major faults of the San Andreas zone, although capable of strong earthquakes, cannot generate any significant tsunamis. Only earthquakes in the Transverse Ranges, specifically the seaward extensions in the Santa Barbara Channel and offshore area from Point Arguello, can generate local tsunamis of any significance (Pararas-Carayannis 2007). The reason for this may be that earthquakes occurring in these regions result in a significant vertical displacement of the crust along these faults. Such tectonic displacements are necessary for tsunami

generation. Most of the tsunamis observed in California have been small, causing a slight rise in water levels in coastal areas and little damage. Large, locally generated tsunamis are estimated to occur once every 100 years (Pararas-Carayannis 2007).

There have been no recorded locally generated tsunamis since 1988. Additionally, previous tsunami events were poorly documented, and the precise extent of environmental and public impacts is uncertain. Two tsunami events have affected the City:

- **December 1812.** Historical records indicate one or two tsunamis were generated from major earthquakes in the Santa Barbara region in December of 1812. Researchers have theorized that a landslide triggered by an earthquake caused the tsunami (NBC Los Angeles 2018). The size and extent of these tsunamis are relatively uncertain due to the lack of historical records; however, unconfirmed estimates in various literature and based on anecdotal history reports that the Gaviota Coast was impacted by 15-foot waves, the City of Santa Barbara received 30- to 35-foot waves, and Ventura County received waves of approximately 15 feet or more (Pararas-Carayannis 2007). Additionally, the USGS, in cooperation with Moss Landing Marine Laboratory, mapped the slopes of the Santa Barbara Channel using sonar and was able to link a large earthquake in 1812 to a tsunami, which wiped out many coastal villages and destroyed ships in harbor (USGS 2003). Low lying areas of Santa Barbara and Ventura were flooded and damage was reported to nearby ships due to powerful waves (NBC Los Angeles 2018).
- **February 27, 2010**. A magnitude 8.8 earthquake occurred along the central coast of Chile and produced a tsunami. For the coast of Southern California, it was one of the largest tsunami episodes since 1964. At Santa Barbara Pier, significant beach erosion was reported along with displacement of buoys. The tsunami surge lasted more than 20 hours. The most significant damage occurred along the coasts of Ventura and the south coast of the county. Numerous reports of dock damage were reported along with beach erosion.

Probability of Occurrence

Unlikely – The University of Southern California Tsunami Research Group has modeled areas in the City that could potentially be inundated in the event of a tsunami. This model is based on potential earthquake sources and hypothetical extreme undersea, near-shore landslide sources. The data was mapped by the California Geological Survey and Cal OES for Tsunami Evacuation Planning. The maps and data are compiled with the best currently available scientific information and represent areas that could be exposed to tsunami hazards during a tsunami event. The tsunami inundation map helps to assist cities and counties in identifying their tsunami hazard areas. Figure 5-10 shows tsunami hazard areas of the City.

Based on the tsunami inundation map above, several areas along the coast of the City have the potential to be inundated by a tsunami. Given there is a medium probability of an earthquake, which would result in high impacts including potential tsunami events in the City, the City is at risk of future tsunami events. However, the only documented major tsunami event occurred in 1812 and the county continues to develop and maintain emergency plans for tsunamis.

Figure 5-10. City of Carpinteria Tsunami Hazard Area

Climate Change Consideration

As previously described, tsunamis are created by earthquakes or other earth movements. To date, no direct relationship has been made between climate change and the occurrences of earthquakes or other earth movements (refer to Section 5.3.3, *Earthquakes and Liquefaction*).

5.3.12 Cyber Threat

Description of Hazard

The 2018 California State Hazard Mitigation Plan defines cyber-attacks as "attempts by cyber criminals to attack a government, organization, or private party by damaging or disrupting a computer or computer network, or by or stealing data from a computer or computer network for malicious use." Cyber-attacks use malicious code to alter computer operations or data. The vulnerability of computer systems to attacks is a growing concern as people and institutions become more dependent upon networked technologies. The Federal Bureau of Investigation (FBI) reports that "cyber intrusions are becoming more commonplace, more dangerous, and more sophisticated," with implications for private- and public-sector networks (refer to Section 5.5.2, *Cyber Threat* of the MJHMP for a discussion of the types of cyber attacks).

In a recent attempt to combat this threat, the State of California adopted SB 327 in September of 2018. This bill seeks to improve information privacy, specifically on connected devices. Existing laws in California require businesses to take all reasonable steps to dispose of customer records within their custody containing personal information and also require businesses that own, license, or maintain personal information about a California resident to implement and maintain reasonable security procedures. SB 327, which went into effect January 1, 2020, further requires the manufacturer of connected devices to equip the device with a reasonable security feature to protect user information.

Location and Extent of Hazard in the City of Carpinteria

Cyber-attacks can and have occurred in every location regardless of geography, demographics, and security posture. Incidents may involve a single location or multiple geographic areas. A disruption can have far-reaching effects beyond the location of the targeted system; disruptions that occur far outside the state can still impact people, businesses, and institutions within the county. The Santa Barbara County Grand Jury determined in 2020 that cyber-attacks and related threats are an ongoing security issue for all public entities within the county, which requires prompt and aggressive actions to prevent significant disruption (Santa Barbara County Grand Jury 2020). This hazard can occur anywhere within the City; however, cyber threats are generally targeted towards larger corporations or the government.

The City's Financial Services Director, Licette Maldonadoto, is responsible for the City's IT budget and oversees all City IT projects. The City's IT consultant, Policore, works closely with Licette to apply appropriate network and security solutions. Currently, Policore visits the City once per week to handle routine IT tasks which require on-site presence; although, the City is considering expanding the amount of time spent on-site. Policore also provides support to the network and its users remotely for urgent and off-hours maintenance. City staff holds periodic meetings with Policore to discuss

network status, outstanding issues, upcoming projects, and Policore's recommendations regarding new technology topics (Policore 2022).

Policore and the City work together to increase the City's security posture on an ongoing basis. For example, various network security upgrades have been implemented, such as advanced firewall systems, multi-layered security, operating system hardening, and developing a culture of security awareness amongst the City staff. Legacy systems are reviewed often for possible security upgrades, replacement and configuration for a more secure environment. Policore has additional recommendations for enhancing the City's security needs and expects to deliver them during security focused meetings (Policore 2022).

History of Hazard in the City of Carpinteria

Between 2012 and 2015, 50 million records of Californians were breached, and the majority of these breaches resulted from security failures, with malware and hacking; physical breaches constituted three-quarters of all events. As the use of digital information expands, Californians will increasingly become more vulnerable to the slow-moving, potential technological hazard of cyber damage (Cal OES 2018).

While the City experiences minor cyber threats (e.g., spam and phishing emails), none have reached a level of significance within the City. There have been no logged instances of network breaches or attempted breaches in the City's cyber security to date (Policore 2022).

Probability of Occurrence

Occasional – As described above, cyber threats are on the rise globally, nationally, and locally. The probability of occurrence of cyber threats is rapidly increasing, especially with increased reliance on the Internet and cloud-based computing. Small-scale cyber-attacks occur daily, but most have negligible impacts at the local or regional level. Data breaches are also extremely common, but again most have only minor impacts on government services. Perhaps of greatest concern to the City are ransomware attacks, which are becoming increasingly common. It is difficult to predict the odds of the City being hit with a successful ransomware attack in any given year, but it is likely to be targeted in the coming years. The possibility of a larger disruption affecting systems within the City is a constant threat, but it is difficult to quantify the exact probability due to such highly variable factors as the type of attack and intent of the attacker. Major attacks specifically targeting systems or infrastructure in the City cannot be ruled out.

Climate Change Consideration

While there is no evidence to link climate change to an increase in occurrences of cyber threats, the target could be related to issues with individuals or companies perceived to affect the climate (i.e., GHG producers).

5.3.13 Natural Gas Pipeline Rupture

Description of Hazard

The U.S. is heavily dependent on transmission pipelines to distribute energy and fuel sources. Virtually all-natural gas, which accounts for approximately a third of the energy consumed annually, is transported by transmission pipelines (California Public Utilities Commission [CPUC] 2021).

Generally speaking, transmission lines are large-diameter steel pipes carrying natural gas at high pressure and compressed to provide higher carrying capacity. Transmission lines are both interstate and intrastate, with the latter connecting to smaller distribution lines delivering gas directly to homes and businesses.

Significant failure, including pipe breaks and explosions, can result in loss of life, injury, property damage, and environmental impacts. Causes of and contributors to pipeline failures include construction errors, material defects, internal and external corrosion, operational errors, control system malfunctions, outside force damage, subsidence, and seismicity.

Location and Extent of Hazard in the City of Carpinteria

Natural gas is transported via the interstate pipelines, and some of the California-produced natural gas, is delivered into the Pacific Gas & Electric (PG&E) and SoCal Gas intrastate natural gas transmission pipeline systems (commonly referred to as California's "backbone" natural gas pipeline system) (CPUC 2021). Natural gas on the utilities' backbone pipeline systems is then delivered into the local transmission and distribution pipeline systems or to natural gas storage fields. PG&E and SoCal Gas own and operate several natural gas storage fields that are located in Northern and Southern California. Locally, SoCal Gas, which serves the City of Carpinteria, operates the La Goleta Storage Field, a natural gas storage field at More Ranch Road in the Eastern Goleta Valley. SoCal Gas purchases market-quality natural gas when prices are low and stores it in a depleted gas reservoir located at this field.

The Petroleum Unit of the County's Planning and Development Department, Energy Division regulates onshore oil and gas activities within the county by performing annual inspections of onshore wells, facilities, pipelines, and other pertinent equipment throughout oil production leases (Santa Barbara County Planning and Development Department, Energy Division 2018).

Natural Gas Odorant and Metering Facilities

Natural gas is a colorless and odorless gas and can be harmful if inhaled, can cause suffocation, fire, or explosion. As such, and as required by law, natural gas must be odorized before entering a pipeline distribution system. The odor also assists in the detection of gas leaks and the prevention of hazardous consequences. The odorant used by the Gas Company is tetrahydrothiophene and has the well-known "rotten egg" smell. The two natural gas odorant and metering facilities located in the City of Carpinteria, the Carpinteria Natural Gas Odorant and Metering Facility and the Pitas Point Facility, were recently shut down and are no longer operational (City of Carpinteria 2022). These facilities, both owned by SoCal Gas, were shut down in 2018 and will be fully decommissioned by SoCal Gas in 2023.

History of Hazard in the City of Carpinteria

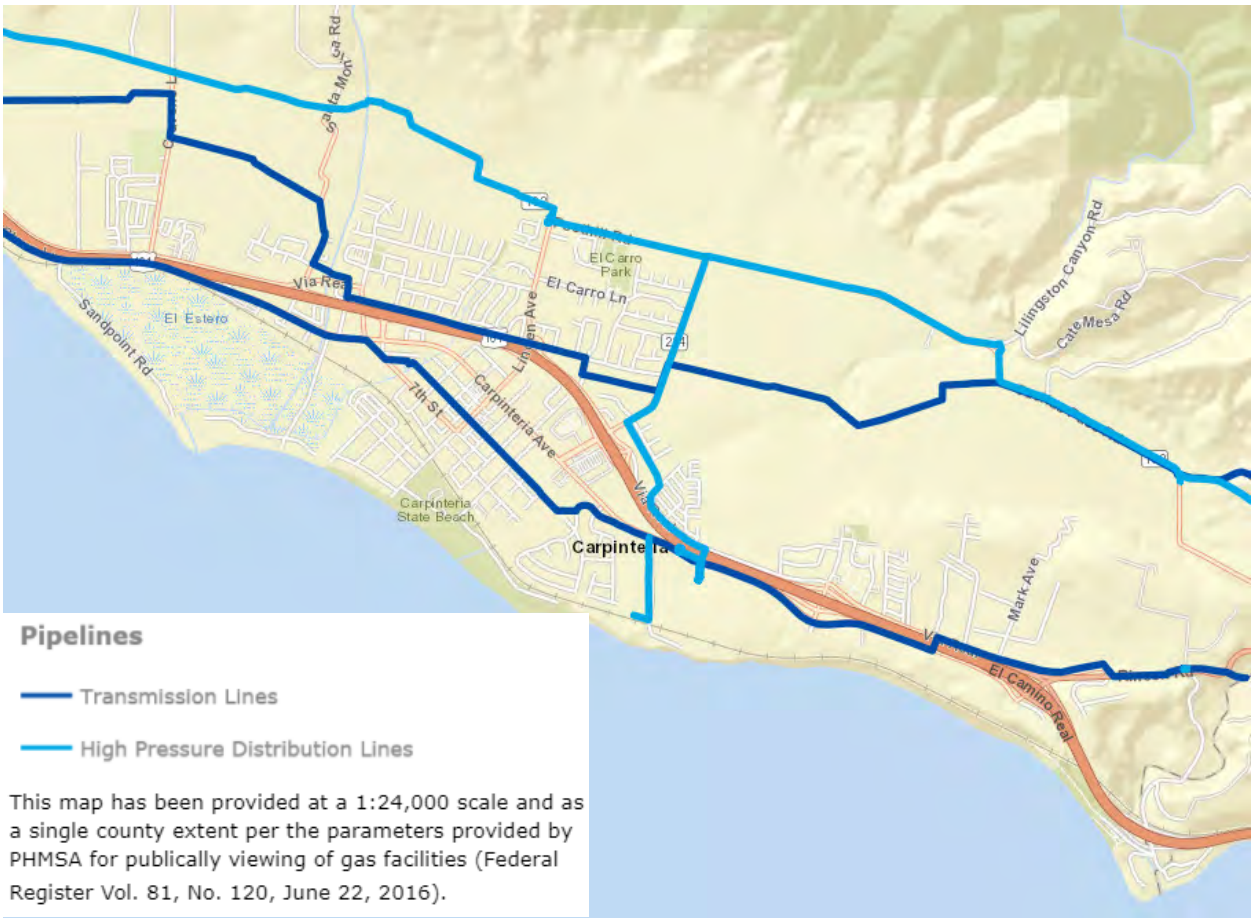
There have been no significant historical events to report to date in the City of Carpinteria or Santa Barbara County.

Probability of Occurrence

Occasional – Increased urbanization is resulting in more people living and working closer to existing gas transmission pipelines that were placed before government agencies adopted and implemented land use and other pipeline safety regulations. Compounding the potential risk is the

age and gradual deterioration of the gas transmission system due to natural causes. Growth in population, urbanization, and land development near transmission pipelines, together with the addition of new facilities to meet new demands, may increase the likelihood of pipeline damage due to human activity and the exposure of people and property to pipeline failures.

Figure 5-11. Natural Gas Pipeline in the City of Carpinteria



Climate Change Consideration

Climate change will not have a direct effect on natural gas pipelines; however, the 2016 California Legislation (SB 32) to reduce emissions to 40 percent below 1990 levels by 2030 could reduce demand and use of natural gas across California. Further, in a decision issued on November 1, 2019, CPUC now requires all energy utility companies, including PG&E and SoCal Gas to file vulnerability assessments, which includes consideration of climate change (CPUC 2019). This decrease in demand, as well as mandatory evaluation of the climate change vulnerabilities for local natural gas service providers and the identification of strategies for achieving climate resiliency, may reduce the number of pipeline ruptures and release events.

5.3.14 Oil Spill

Description of Hazard

An **oil spill** is a release of liquid petroleum hydrocarbon into the environment due to human activity or technological error that results in pollution of land, water, and air. Oil releases also occur naturally through oil seeps either on land or under water. Marine oil spills, whether accidental or intentional, can result from the release of crude oil from offshore oil platforms, drilling rigs, wells, underwater pipelines, tank trucks, and marine tank vessels (tankers) and even supply pipelines on land. Refined petroleum products such as gasoline, diesel, and heavier fuels such as bunker fuel used by cargo ships are also sources of potential oil spill releases (Cal OES 2018).

Oil spills have immediately visible consequences on animals and habitats. Depending on the origin, size, and duration of the release, an oil spill can have serious impacts on air and water quality, public health, plant and animal habitat, and biological resources. Oil in the water can be deadly for animals. Oil is toxic when ingested. When birds get oil on their feathers, it impairs the important waterproofing that is necessary to keep a bird warm. A bird may also lose its ability to float in the water or to fly if it is covered in oil. Oiled marine mammals may suffer from hypothermia. Oil may cause reproductive problems and genetic abnormalities in fish. Contaminants may enter the food chain and result in seafood that is unfit for people to eat (California Coastal Commission 2019). Clean-up and recovery are time and cost-consuming, and dependent on weather conditions such as wind and rain. Tidal and current conditions may also make the spill more dynamic, which causes further difficulties with clean-up activities.

Many state and federal agencies are involved in preventing and responding to oil spills. Platforms in federal waters are regulated by the U.S. Department of the Interior's Minerals Management Service. Facilities located in state waters less than 3 nautical miles from shore are regulated by the California State Lands Commission and California Geologic Energy Management Division, under the jurisdiction of the California Department of Conservation (Cal OES 2018). California enacted the Oil Spill Prevention and Response Act in 1990, which established the Office of Oil Spill Prevention and Response within the Department of Fish and Game, which is authorized to direct spill response, cleanup, and natural resource damage assessment activities, as well as regulate all private vessels over 300 gross tons (672,000 pounds) that enter California ports (California Coastal Commission 2019).

Location and Extent of Hazard in the City of Carpinteria

This hazard can occur in any part of Santa Barbara County where existing oil and gas operations are located, either onshore through supply pipelines and well facilities or offshore where there are several platforms and undersea pipelines. Currently, there are 19 offshore oil platforms off the coast of Santa Barbara County as well as two onshore refineries and six oil separation and treatment plants (refer to Figure 5-32 of the MJHMP; County Department of Planning and Development 2017). Since the 2015 spill described below, seven offshore oil platforms have been shut down (refer to Section 5.6.7, *Oil Spill* of the MJHMP).

The Carpinteria Oil and Gas Processing Facility (CPF) site, located at 5675 Carpinteria Avenue, was obtained by Chevron (formerly Standard Oil Company) in 1959 and was originally built to

receive oil and gas from Platforms Hilda, Hazel, Hope, and Heidi all of which were decommissioned in 1996. The CPF began receiving oil and gas production from Platforms Gail and Grace in 1988. In 1998, Venoco, Inc. (Venoco) acquired 100 percent ownership of Outer Continental Shelf Leases P-0204, P-0205, P-0208, P-0209, P-0215, and P-0217 from Chevron, and took over as operator of the existing offshore and onshore production. Chevron reacquired ownership of the CPF in an agreement between Chevron and Venoco in 2017. The plant facilities include a large bulk crude oil storage tank, pipeline shipping pumps and metering skids, a gas compression plant, a natural gas liquids recovery plant, field offices, tanks, maintenance shops, and other equipment and facilities (City of Carpinteria 2022). Historically, processing levels at the Chevron facility have been as high as 20,000 barrels per day of crude oil and 20 million standard cubic feet per day of natural gas. Although Platform Grace ceased production in 1998, the Plant and Tank 861 continued to receive oil and gas production from Platform Gail until approximately 2017 (Chevron West Coast Decommissioning Program 2021).

Incident Profile: 1969 Santa Barbara Oil Spill

In 1969, a blowout of a Union Oil drilling rig platform off the coast of Santa Barbara resulted in a spill of 4.2 million gallons of crude oil into the ocean and onto nearby shores. This disaster is considered to have been a catalyst for the modern environmental movement.

Photo: vcstar.com

Offshore pipelines that make landfall in the City include the Platform Gail to Platform Grace to the CPF oil (12- and 10-inch) and gas (10-inch) lines and the Platform Habitat to the Pitas Point Natural Gas Odorant and Metering Facility gas (12-inch) line. Onshore pipelines in the City include a common carrier crude (10-inch) pipeline from Carpinteria to the Rincon Common Carrier Crude pipeline system (10-inch mainline) (City of Carpinteria 2022).

Chevron is currently planning to decommission and remediate the CPF site and associated pipelines and filed a Coastal Development Permit with the City of Carpinteria in the Fall of 2021 in support of this activity. Decommission and remediation of the CPF site would include demolition of surface and subsurface facilities and remediation of any subsurface impacted soil and groundwater at the CPF. The decommission and remediation project also includes the removal of nearshore/offshore pipelines out to three miles (State Waters limit; Chevron West Coast Decommissioning Program 2021).

History of Hazard in the City of Carpinteria

Santa Barbara County has experienced several large oil spills (refer to Section 5.6.7 of the MJHMP). Two significant oil spills have affected the City:

- **1969:** The Santa Barbara oil spill occurred in January and February 1969 in the Santa Barbara Channel, near the city of Santa Barbara in Southern California. On January 28, 1969, pressure built up in a 3,500-foot-deep well on Platform A of a Union Oil drilling rig platform off the coast of Santa Barbara as a pipe was being extracted. A burst of natural gas blew out the drilling mud that was being pumped into the well, split the steel casing, and caused cracks to form in the seafloor surrounding the well. The large volume of oil and gas being released caused a "blowout" of the well, releasing approximately three million gallons of oil over 11 days. Workers pumped chemical mud down the 3,500-foot shaft at a rate of 1,500 barrels an hour. It was then topped by a cement plug. Although capped, gas continued to escape and another leak sprung up weeks later, releasing oil for several more months. Union Oil drilled a relief well and pumped cement into a leaking wellbore, thereby killing it. However, small amounts of oil continue to leak from fractures in the seafloor to this day. An estimated total of 100,000 barrels (4.2 million gallons) of crude oil was spilled into the ocean and onto nearby shores over several months, impacting over 40 miles of coastline Platform A of the Union Oil drilling rig is still in operation (Cal OES 2018; California Coastal Commission 2019; Santa Barbara Channelkeeper 2021).

  The cause of the blowout and spill was attributed to the inadequate protective casing allowed by the U.S. Geological Survey waiver. Investigators postulated that more steel pipe sheathing inside the drilling hole would have prevented the rupture (Cal OES 2018).

  It was the largest oil spill in U.S. waters by that time and now ranks third after the 2010 Deepwater Horizon and 1989 Exxon Valdez spills. The incident received international attention and was a major catalyst in the development of modern environmental law in the United States. The spill influenced the passage of major state and federal legislation, such as the National Environmental Policy Act, Clean Water Act, California Environmental Quality Act (CEQA), California Coastal Initiative in 1972 (Proposition 20), and California Coastal Act of 1976. According to these and other statutes, development permits for onshore or offshore oil and gas facilities cannot be issued without provisions to protect terrestrial, marine, visual, recreational, and air resources (Cal OES 2018). This disaster is considered to have been a catalyst for the modern environmental movement (California Coastal Commission 2019; Santa Barbara Channelkeeper 2021).

- **2015:** Another tragic oil spill blackened the shores of Santa Barbara County at Refugio on May 19, 2015, when a 24-inch subterranean pipeline (Line 901) owned and operated by Plains All America Pipeline ruptured on the Gaviota Coast, west of Refugio State Park. Much of the crude oil spilled ran down a storm drain and into a ravine under the freeway and entered the ocean. The size of the spill ranged from 100,000 to 140,000 gallons, covering the Santa Barbara County coastline and extending nearly 9 miles out into the ocean. Various agencies, including local, county, state, and federal partners, were involved in response and recovery efforts, with the participation of approximately 1,300 field personnel and 325 incident command post personnel. Notifications from the county to state and federal partners were aligned with the Santa Barbara Operational Area Oil Spill Contingency Plan and Los Angeles-Long Beach Area

Contingency Plan. The incident command post remained operational for the first 13 days of the incident.

Three bills were signed into law in response to the spill. Under a new law, the California Fire Marshal will be required to review the oil pipelines conditions every year, while federal regulations only mandate a review every five years. Another new law provides for making oil spill response times faster and more effective. The third will force intrastate pipelines to use the best-known technology such as automatic shut-off valves (Cal OES 2018).

Probability of Occurrence

Occasional – In any given year, the county and City of Carpinteria could be subject to oil spills onshore or offshore. Given that 2 spills affecting the City occurred between 1969 and 2020, there is an approximately 4 percent probability of an oil spill occurring in the City.

Climate Change Considerations

With increased changes in weather, climate, and economics, the demands for oil and gas production may shift. This shift in demand could increase production, distribution, and transportation of oil products; thus, increasing the potential for oil spill occurrences.

5.3.15 Train Accident

Description of Hazard

Train accidents are defined as any accidents involving public or private trains carrying passengers or cargo along the rail corridor. Train accidents, like other transportation accidents, are less likely to lead to a state or federal disaster declaration than other hazards described in this LHMP. Train accidents are generally localized, and the incidents result in limited impacts at the community level. However, if there are toxic, volatile, or flammable substances on the train and the train is in a highly populated or densely forested area, death, injuries, and damage to homes, infrastructure, and the environment, including forest fires, can occur (see Section 5.3.17, *Hazardous Materials Release* for a full discussion of hazards related to release of hazardous materials and substances).

Location and Extent of Hazard in the City of Carpinteria

The UPRR carries both freight and passengers through the coastal areas. The county is served by two Amtrak train routes for passenger-only services along the UPRR: the Pacific Surfliner and Coast Starlight (Santa Barbara 2021). The Pacific Surfliner runs adjacent to Highway 101 and the coastline with stops in San Diego, Orange, Los Angeles, and Ventura counties (Santa Barbara 2021). The Coast Starlight connections Seattle and Los Angeles traveling south from Seattle with stops in Portland, the San Francisco Bay Area, Sacramento, Paso Robles, San Luis Obispo, and Santa Barbara.

Within the City of Carpinteria, the UPRR runs northwest-southeast along the Pacific coastline, south of the Downtown District, and curving north around the El Estero salt marsh. The Carpinteria Station train station is located in the Downtown District at 475 Linden Avenue.

In addition to passenger-only rail services, the Carpinteria train station receives train movements from the shipment of commodities, such as hazardous materials, fuel (including oil), agriculture,

meats, and non-consumables. Train accidents are generally localized and the incidents result in limited impacts at the community level. However, if there are volatile or flammable substances on the train and the train is in a highly populated, death, injuries, and damage to homes, infrastructure, and the environment, including forest fires, can occur. Additionally, a hazardous materials incident on the rails or roadway has the potential to shut down both rail and highway transportation routes, such as Highway 101, where the two are within proximity to one another.

History of Hazard in the City of Carpinteria

No major train accidents have occurred in the City of Carpinteria or Santa Barbara County. However, in the last thirty years, numerous train accidents have occurred throughout the southern California region. For example, in 1991 the Seacliff Incident occurred in Ventura County when a train released 440 gallons of aqueous hydrazine (used to make agricultural, metal, and plastics processing chemicals) and naphthalene (industrial solvent) (Los Angeles Times 1991). The accident required the evacuation of the nearby Seacliff Community along with the shutting down of Highway 101 and took 5 days to cleanup.

Probability of Occurrence

Occasional – Given that no known train accidents have occurred in the City or county, the probability of occurrence is low. While neither of the train accidents described above occurred within the county, due to the scale and scope of train transportation for people and commodities, such events have the potential to occur.

Climate Change Consideration

There is no known linkage between climate change and train accidents; however, because of railroad track proximity to the Pacific Ocean within the county, sea level rise could impact service. Current estimates project the range of sea level in the county will be between 27.2 and 30 inches by 2060 (refer to Section 5.3.4, *Coastal Hazards*). The railroad alignment along the Carpinteria Bluffs is highly vulnerable to coastal erosion; with approximately 5 feet of sea level rise, up to 1.4 miles of the UPRR could be damaged. Coastal flooding could also impact the railroad in other parts of the City north of the Salt Marsh and in the Downtown core. Disruption of the railroad could have substantial economic impacts on the region (City of Carpinteria 2019).

5.3.16 Landslide

Description of Hazard

Landslide movements are interpreted from the geomorphic expression of the landslide deposit and source area, and are categorized as falls, topples, spreads, slides, or flows. Falls are masses of soil or rock that dislodge from steep slopes and free-fall, bounce, or roll downslope. Topples move by the forward pivoting of a mass around an axis below the displaced mass. Lateral spreads, commonly induced by liquefaction of material in an earthquake, move by horizontal extension and shear or tensile fractures. Slides displace masses of material along one or more discrete planes. In rotational sliding, the slide plane is curved and the mass rotates backward around an axis parallel to the slope; in translational sliding the failure surface is more or less planar and the mass moves parallel to the ground surface. Flows mobilize as a deforming, viscous mass without a discrete failure

plane (California Geological Survey 2019a). Debris flows are described in Section 5.3.2, *Mudflow & Debris Flow*.

For landslides to occur, the correct geological conditions, which include unstable or weak soil or rock, and topographical conditions, such as steep slopes, are necessary. Heavy rain often triggers these hazards, as the water adds extra weight that the soil cannot bear. Over irrigating has the same effect. Earthquakes can also affect soil stability, causing enough weakening to favor gravitational forces.

Location and Extent of Hazard in the City of Carpinteria

Landslides and landslide-prone sedimentary formations are present throughout the coastal plain of western Santa Barbara County. Generally, areas with soft soils are more prone to movement. Figure 5-18 of the MJHMP shows the location of soil types throughout the county. Many of these landslides are thought to have occurred under much wetter climatic conditions than at present. Reactivations of existing landslides can be triggered by disturbances such as heavy rainfall, seismic shaking, and/or grading. Many recent landslides are thought to be reactivations of ancient landslides.

Section 5.3.7 of the MJHMP lists the areas in Santa Barbara County where there are geologic formations that can lead to fairly severe landslides as identified by the Santa Barbara County Comprehensive Plan Seismic Safety and Safety Element (Santa Barbara County Planning and Development Department 2015). Some areas of the City are prone to more frequent rain-induced landslides, resulting in disruption to transportation and damage to roadways. The most common areas of recent historic landslides are Gobernador Canyon and all roads that are underlain by the Rincon Shale Formation.

The City of Carpinteria's General Plan identifies areas within the City that have a high landslide susceptibility. Areas of relatively high landslide and rock fall potential are primarily located in the northern portion of the planning area, outside areas of current or planned urban development. In general, the areas most susceptible to mudflows and debris flows correspond to the areas with a high potential for earthquake-induced landslides (refer to Section 5.3.2, Mudflow & Debris Flow; City of Carpinteria 2003).

History of Hazard in the City of Carpinteria

As previously mentioned, the northern portion of the City is prone to landslides; however, many previous landslide occurrences were smaller and are not well documented. Additionally, significant historic mudflows and debris flows are described in Section 5.3.2 above. Three of the more significant recent landslides in the vicinity of the City are discussed below:

- **1995** – In the spring of 1995, La Conchita, located at the western border of Ventura County and adjacent to Santa Barbara County, experienced a landslide that destroyed several houses in its path.
- **2005** – In January 2005, a powerful Pacific storm brought heavy rain, snow, flash flooding, high winds, and landslides to Central and Southern California. With such copious rainfall, flash flooding was a serious problem across Santa Barbara, Ventura, and Los Angeles counties. In Santa Barbara County, flash flooding and mudslides closed Gibraltar Road at Mt. Calvary Road, stranding several vehicles, while mudslides inundated 3 homes in Lake Casitas. Across

Ventura County, flash flooding and mudslides closed down Creek Road at Hermosa Road. In addition, the Ventura Beach RV Resort was flooded and Highways 1 and 126 were closed due to flooding. In La Conchita, a devastating mudslide killed 10 people, destroyed 15 homes, and damaged 12 other homes (NOAA 2005).

Probability of Occurrence

Occasional – Figure 5-12 shows the locations of deep-seated landslide susceptibility in the City as mapped by the California Geological Survey. This map shows the relative likelihood of deep landslide based on the three site factors that most determine susceptibility: prior failure (from a landslide inventory), regional estimates of rock or soil strength, and steepness of slopes. On the most basic level, weak rocks and steep slopes are more likely to generate landslides. The map uses detailed information on the location of past landslides, the location and relative strength of rock units, and the steepness of the slope in a methodology developed by Wilson and Keefer (1985). The result shows the distribution of one very important component of landslide hazard. It is intended to provide infrastructure owners, emergency planners, and the public with a general overview of where landslides are more likely. The map does not include information on landslide triggering events, such as rainstorms or earthquake shaking, nor does it address susceptibility to shallow landslides such as debris flows. Therefore, this map is not appropriate for the evaluation of landslide potential at any specific site (California Geological Survey 2019a). The areas shaded in darker red in Figure 5-12 are considered to have a higher probability of landslide occurrence than the low landslide risk areas in the City.

Climate Change Consideration

A 2021 study by the USGS finds that Southern California is likely to see increased post-wildfire landslides caused by climate change-induced shifts in the state's wet and dry seasons. Wildfires make the landscape more susceptible to landslides when rainstorms pass through as the water liquefies unstable, dry soil and burned vegetation. Wildfire frequency, higher temperatures, and increased droughts projected to occur under climate change can reduce soil absorption capacity and kill vegetation that holds soil in place, making it unable to absorb as much water, further destabilizing slopes. Slope failure is expected to become more frequent as more precipitation falls during fewer storm events (refer also to Section 5.3.1, *Flood*). Also, the increased heavy precipitation events may cause instability in areas where landslides were not as likely before. Therefore, resulting landslides may be larger or more widespread.

Major landslides capable of damaging 40 or more structures can be expected every 10 to 13 years – about as frequently as magnitude 6.7 earthquakes occur in California. Combined with recent research showing California's wildfire season is getting longer and the rainy season is getting shorter and more intense, the new findings suggest Californians face a higher risk of wildfires and post-wildfire landslides that can damage property and endanger people's lives (USGS 2021).

Figure 5-12. City of Carpinteria Deep-Seated Landslide Susceptibility

5.3.17 Hazardous Materials Release

Description of Hazard

Hazardous waste/materials are defined under the U.S. Congress' original statutory definition under the Resource Conservation and Recovery Act (RCRA) as substances with physical or chemical properties of flammability, corrosivity, reactivity, or toxicity, which because of quantity, concentration, or physical, chemical, or infection characteristics may cause or significantly contribute to increased mortality or serious illness (RCRA Section 1004(5)). Hazardous waste/ materials are widely used or created at facilities, such as hospitals, wastewater treatments plants, universities, and industrial/manufacturing warehouses.

Both mobile and external hazardous materials releases can spread and affect a wide area, through the release of plumes of chemical, biological, or radiological elements or leaks or spills. Conversely, internal releases are more likely to be confined to the structure the material is stored in. It is also common to see hazardous materials releases as escalating incidents resulting from other hazards, such as floods, wildfires, and earthquakes. The release of hazardous materials and waste can greatly complicate or even escalate the response to a natural hazards disaster that caused the spill. Hazardous materials and waste may pose a substantial present or potential hazard to human health and/or the environment when improperly treated, transported, stored, disposed of, or otherwise managed. Chemicals may also be corrosive or otherwise damaging over time. A hazardous materials release could also result in fire or explosion. Contamination may be carried out of the immediate area of the incident by people, vehicles, wind, and water. Weather conditions can increase the size and intensity of the Hazardous Materials Release. Typography, such as hills and canyons, can increase the size of the release or make it more difficult to contain.

The EPA has developed a regulatory definition and process that identifies specific substances known to be hazardous and provides criteria for the regulation of hazardous waste. Several household products, such as cleaning supplies and paint are also considered hazardous materials. The County regulates approximately 350 substances subject to the California Code of Regulations, Title 19.

The U.S. Department of Transportation (DOT), EPA, and OSHA all have responsibilities relating to the transportation, storage, and use of hazardous materials and waste. The National Response Center is the designated federal point of contact for reporting all oil, chemical, radiological, biological, and etiological discharges into the environment, anywhere in the U.S. and its territories. The National Response Center is a primary source of information on the use and storage of hazardous materials, as well as data regarding spills and releases.

The California Environmental Protection Agency and the Department of Toxic Substances Control (DTSC) are authorized by the EPA to enforce and implement federal hazardous materials laws and regulations within the state. EnviroStor is DTSC's online data management system for tracking their cleanup, permitting, enforcement, and investigation efforts at hazardous waste facilities and sites with known or suspected contamination issues. Additionally, the State Water Resources Control Board GeoTracker information system provides online access to environmental data from water quality regulatory programs, including oil and gas monitoring-related activities. EnviroStor and GeoTracker sites within the City are shown in Figure 5-13.

Figure 5-13. Hazardous Sites (Envirostor/Geotracker) within the City of Carpinteria

At the local level, the County's Environmental Health Services Department is the approved Certified Unified Program Agency (CUPA) responsible for the administration of permitting, inspections, and enforcement for hazardous waste and hazardous materials programs. The CUPA administers the Hazardous Material Business Plan, California Accidental Release Prevention program, and the Aboveground Storage Act, as well as permitting and inspection activities for hazardous waste generators, onsite hazardous waste treatment facilities, and underground storage tanks. The Seismic Safety and Safety Element of the Santa Barbara County Comprehensive Plan includes goals, policies, and implementation measures for hazardous materials.

Location and Extent of Hazard in the City of Carpinteria

The locations and identity of facilities that store hazardous materials are reported to local and federal governments. Many facilities have their own hazardous materials guides and response plans, including transportation companies that transport hazardous materials. Some of the most notable hazardous material sites that may affect the City include oil processing facilities along the South Coast. While these oil and gas facilities have been closed, they have not yet been decommissioned and remediated. Figure 5-13 shows the location of hazardous material sites in the City (i.e., former Camarillo Auto Repair and former CPF).

Hazardous materials may be found in the materials of older buildings, such as asbestos or lead-based paints or may have been used routinely for the operation of certain land uses, such as automotive repair shops, commercial agricultural fields, medical offices, dry cleaners, and photo processing centers. Potentially hazardous materials are commonly found in urban and agricultural areas, and generally include cleaning and metal solvents, pesticides/herbicides, paints, and oils and lubricants. Land uses that are particularly sensitive to the release of hazards or hazardous materials include residential, educational, assisted living, and daycare, which are located throughout the City.

Two large industrial facilities and two CVWD water treatment plants are located in the City. These include the former CPF site, the Carpinteria Sanitary District Wastewater Treatment Plant, and the water treatment sites located at 4810 Foothill Road and El Carro Lane and Namouna Street. The former CPF consists of natural gas dehydration and metering stations. These facilities may store and/or use flammable hazardous materials/waste, highly toxic and corrosive materials/waste, as well as acutely hazardous materials/waste.

Agricultural production activities, including both conventional and organic agriculture, occur in a limited capacity within the City and more widely in unincorporated areas surrounding the City. Agricultural activities involve the use of regulated hazardous materials, particularly commercial pesticides. Pesticide use is regulated by the County Agricultural Commissioner's Office, with permits required for pesticide application. Such pesticide use is carefully regulated under state law and consistent with guidelines issued by the California Department of Pesticide Regulation. Such regulations generally govern the type of pesticide applied, as well as the location, timing, and rules of applications. Special consideration is given to applications near schools.

Pesticides including rodenticides, insecticides, herbicides, fungicides, and other pest-controlling substances are applied in landscaped areas, nurseries, and agricultural lands in the City. Consequently, pesticides, fertilizers, and associated contaminants may be present in near-surface soils in residual concentrations at these locations. Many irrigated lands are currently required to

operate under the Irrigated Lands Regulatory Program to regulate runoff of pesticides, fertilizers, and sediments from irrigated lands through Waste Discharge Requirements issued by the State Water Resources Control Board.

Crude oil activities have historically occurred onshore and continue to exist offshore in the Carpinteria area. These facilities have the potential to result in the release of hazardous materials in the City, as further described in Section 5.3.14, *Oil Spill*.

Hazardous materials release is most likely to occur at facilities handling acutely hazardous materials or during transport of hazardous materials. Highway 101 is the major vehicular transportation corridor through the City in which hazardous materials release is likely to occur. The UPRR may also result in hazardous materials due to freighter rail cars that are known to carry hazardous materials through the City. Specifically, jet fuel is transported from Los Angeles northward through the City to Vandenberg Space Force Base (SFB) via UPRR. The City also contains other hazardous materials sites, including four sites designated by the EPA as "small quantity generators" of hazardous waste such as dry cleaners and gas stations.

History of Hazard in the City of Carpinteria

Several significant hazardous material incidents have occurred in the County in the past century, and include the oil spills which occurred in 1969, 1997, 2007, 2008, 2015, and 2020 (see Section 5.6.7, *Oil Spill* of the MJHMP for a detailed discussion of these incidents and risks associated with oil spill-related hazards). Eight hazardous materials incidents in the City were reported to the Cal OES Warning Center from 2006 through 2021 (Cal OES 2021). These incidents include both transportation and fixed-facility incidents. This list does not capture all hazardous material spills within the City, only those that were significant enough to be reported to Cal OES (refer to Table 5-18 of the MJHMP for a summary of hazardous materials incidents reported to Cal OES in Santa Barbara County by location and type). The data indicates that hazardous materials incidents can occur across the county with a greater frequency in the more developed areas.

Probability of Occurrence

Occasional – The City experiences hazardous materials incidents every year; however, the vast majority of the incidents are minor and have highly localized impacts. Incidences can occur during the production, storage, transportation, use, or disposal of hazardous materials. Communities can be at risk if a chemical is used unsafely or released in harmful amounts into the environment. Hazardous materials can cause death, serious injury, long-lasting health effects, and damage to buildings, the environment, homes, and other property. However as described above, a range of federal and state regulations exist to limit the risk of upset during the use, transport, handling, storage, and disposal of hazardous waste and materials including the EPA, DTSC, OSHA, and DOT. The State Water Resources Control Board is responsible for prevention and enforcement in California for hazardous materials associated with water quality. Additionally, OSHA regulates hazardous materials and potential exposure to workers to prevent impacts on human health, and DOT is responsible for the regulation of the transport of hazardous materials and waste to avoid accidental spills and exposure to the public through transport.

Climate Change Consideration

There are no known effects of climate change on human-caused hazards including hazardous material and waste incidents.

5.3.18 Geologic Hazards

Description of Hazard

Land subsidence is defined by the USGS as the lowering of the land-surface elevation from changes that take place underground. Common causes of land subsidence from human activity are pumping water, oil, and gas from underground reservoirs; drainage of organic soils; and initial wetting of dry soils (i.e., hydrocompaction). Overdraft of aquifers is the major cause of subsidence in the southwestern U.S., and as groundwater pumping increases (such as during periods of drought), land subsidence also will increase. In many aquifers, groundwater is pumped from pore spaces between grains of sand and gravel. If an aquifer has beds of clay or silt within or next to it, the lowered water pressure in the sand and gravel causes slow drainage of water from the clay and silt beds. The reduced water pressure is a loss of support for the clay and silt beds. Because these beds are compressible, they compact (become thinner), and the effects are seen as a lowering of the land surface. Weight, including surface developments such as roads, reservoirs, and buildings, and manmade vibrations from such activities as blasting and heavy truck or train traffic can accelerate the natural processes of subsidence, or induce subsidence over human-made voids (USGS 2016).

Land subsidence causes serious, localized problems including:

- changes in elevation and slope of streams, canals, and drains;
- damage to bridges, roads, railroads, underground utilities (e.g., storm drains, sanitary sewers, pipelines, etc.), streams, canals, and levees;
- damage to private and public buildings; and
- failure of well casings from forces generated by compaction of fine-grained materials in aquifer systems.

In some coastal areas, subsidence has resulted in tides moving into low-lying areas that were previously above high-tide levels, increasing the effects of coastal hazards, such as coastal storm surge (USGS 2016).

Erosion is a geological process in which earthen materials (i.e., soil, rocks, sediments) are worn away and transported over time by natural forces (e.g., water, wind, ice), although sometimes this is sped up by poor management or other human impacts on land (e.g., farming, land clearing). Coastal erosion, which is caused by the ocean, is discussed under Section 5.3.4, *Coastal Hazards*. Soil erosion occurs primarily when the dirt is left exposed to strong winds, hard rains, flowing water, and ice. In some cases, human activities leave soil vulnerable to erosion. For example, when farmers till (plow) the soil before or after growing a season of crops, they may leave it exposed to the elements for weeks or months. The overgrazing of farm animals like cattle and sheep can also leave large areas of land devoid of ground-covering plants that would otherwise hold the soil in place (Natural Resources Defense Council 2021).

Soil erosion reduces the quantity and the quality of soil ecosystems and arable land (i.e., land that can be used to grow crops). Severe soil erosion can result in the loss of food crops, negatively impact community resiliency and livelihoods, and even alter ecosystems by reducing biodiversity above, within, and below the topsoil. Approximately 60 percent of soil that is washed away ends up in rivers, streams, and lakes, along with whatever has been applied to that soil, including agrochemicals and other pollutants that can contribute to harmful algal blooms and polluted waterways. Dirt that enters water bodies can also clog their natural flow and increase flooding along the waterways (Natural Resources Defense Council 2021).

Expansive soils are soils that can undergo a significant increase in volume with an increase in water content and a significant decrease in volume with a decrease in water content. Changes in the water content of an expansive soil can result in severe distress to structures constructed upon the soil. Expansive soils tend to swell with seasonal increases in soil moisture in the winter months and shrink as soils become drier in the summer months. Repeated shrinking and swelling of the soil can lead to stress and damage of structures, foundations, fill slopes, retaining walls, and other associated facilities.

Location and Extent of Hazard in the City of Carpinteria

Subsidence

Land subsidence is common in several areas of California, usually as a result of groundwater pumping, peat loss, or oil and gas extraction. DWR's Draft California Groundwater Update 2020 is the state's most up-to-date compendium of statewide data and information on the occurrence, nature, use, and conditions of California's groundwater resources and their management. DWR provides an interactive map with information about land subsidence in California (2009-2018) that is presented in California's Groundwater Update 2020. The point data in the map displays land elevation changes over varying periods as recorded by a collection of continuous global positioning system stations and is presented for groundwater basins within Santa Barbara County in Table 5-13 of the MJHMP. As shown therein, no vertical displacement (subsidence) has been measured for the Carpinteria Groundwater Basin, which underlies the City of Carpinteria.

As described in the City's General Plan Safety Element, no recognized subsidence has occurred in the City or immediate vicinity due to either groundwater or oil extraction. Accordingly, the potential for subsidence is considered to be minimal. However, the General Plan identifies the potential for soil settlement within the eastern portion of the City and to the north of the City boundaries (City of Carpinteria 2003).

Erosion

Erosion can vary greatly in short distances, and thus, erosion has not been mapped or rated at the county level (Santa Barbara County Planning and Development Department 2015). However, there are a few areas that are particularly susceptible to erosion given their basic granular characteristics. The Santa Barbara formation and old dunes are subject to erosion. The Santa Barbara formation occurs in patches on the coastal hills and the lower foothills from Carpinteria to Goleta. Because it is so soft and weakly cemented, the Santa Barbara Formation is rapidly gullied and washed away when vegetation is removed making it hazardous, especially on steep slopes.

When short grass and other annuals are not present, the soft and uncemented sand is subject to wind erosion and gullying (Santa Barbara County Planning and Development Department 2015).

The Santa Barbara County coastline is mainly subject to marine erosion. The western coastline is comprised of dunes and sea cliffs. The majority of exposed rocks in the sea cliffs are readily eroded by marine and non-marine processes (Santa Barbara County Planning and Development Department 2015). The exposed seacliffs in the City of Carpinteria are composed of the Monterey (Modelo) Formation, which is a thinly bedded, hard, siliceous shale. The Monterey Formation readily yields to erosion, slumping, landslides, and other erosional processes (refer to Section 5.3.4, *Coastal Hazards*; City of Carpinteria 2003).

Expansive Soils

Expansive soils can cause problems because they contain clay minerals that swell when the moisture content increases and shrink when the moisture decreases. Such soils are usually described as "adobe," and form ground cracks when they are allowed to dry out. The volume changes resulting from variable moisture conditions can cause movement and cracking of structures built on expansive soils. Soils beneath concrete floor slabs tend to increase in moisture content, thus causing heave. Soils under raised floors tend to dry out and shrink, causing settlement of the structure. The most hazardous areas occur in a belt along the south coastal foothills, where geological formations are either highly expansive themselves or generate highly expansive topsoil (Santa Barbara County Planning and Development Department 2015).

The City's General Plan states that expansive soils with shrink-swell potential are present in the City and primarily overlap with outcrops of claystone, siltstone, and shale and areas that are susceptible to soil compaction. The areas of potentially highly expansive soil are limited to the western portion of the City and the El Estero salt marsh to the south (City of Carpinteria 2003).

History of Hazard in the City of Carpinteria

Land subsidence, erosion, and expansive soils have been identified as issues in the City as described above. There is no history of acute, specific events associated with these hazards in the City.

Probability of Occurrence

Occasional – The frequency of future land subsidence incidents in the City will largely be dependent on the mitigation actions and pumping regulations initiated by the state, the county, and local regulations. As described in Section 5.3.7, *Drought & Water Shortage*, groundwater basins that are designated as a high or medium priority by the DWR must form a Groundwater Sustainability Agency, which is responsible for the development, implementation, and oversight of a GSP. GSP objectives require that future groundwater use does not cause undesirable results, including land subsidence (Santa Barbara County Public Works 2020).

Climate Change Consideration

The most likely impact that climate change will have on land subsidence risk is the potential for extended and severe drought, which could likely result in more groundwater pumping and human-induced subsidence. In areas where climate change results in less annual precipitation and reduced surface-water supplies, communities will pump more groundwater. During periods of drought, water levels may be drawn too low. Also, an increasing population in California will increase demands on

groundwater supplies. The water cannot recharge the layers, causing irreversible compaction of aquitards and diminishment of groundwater storage capacity. In the future, an increasing population may result in subsidence problems in metropolitan areas where subsidence could severely damage infrastructure (USGS 2016).

Climate is also a major driver of erosion. Changes in rainfall and water levels can shift soil, extreme fluctuations in temperature can make topsoil more vulnerable to erosion, and prolonged droughts can prevent plants from growing, leaving soil further exposed (Natural Resources Defense Council 2021).

There is also evidence that climate change may affect the impacts of expansive soils. Climate change effects on expansive soil movements are quantified using the Thornthwaite Moisture Index. The Thornthwaite Moisture Index is calculated from the moisture deficiency and surplus, both related to rainfall, and the potential evapotranspiration which is derived from temperature. Established relationships between the Thornthwaite Moisture Index and the depth and magnitude of soil suction changes for sites with and without the presence of trees, and the relationships between soil movement and soil suction changes, are used to predict the increase in soil movement for a site. It is shown that a significant increase in predicted soil movement is expected with climate change (Mitchell 2014).

5.3.19 Windstorm

Description of Hazard

Santa Barbara County is known to experience a unique, damaging wind known as a **sundowner**, which is a kind of offshore wind that occurs in the late afternoon or early evening along the southern slopes of the Santa Ynez mountains from Gaviota to Carpinteria. Sundowners occur when a north-south oriented high-pressure gradient develops directly north of the area and perpendicular to the Santa Ynez Mountains. They bring gusty, low humidity winds which can reach up to 80 mph and blow over the Santa Ynez Mountain range and descend towards the Pacific Ocean. Sundowner events are most prevalent in the spring and summer months but can strike at any time of the year. Sundowners are particularly dangerous during the wildfire season because the hot, dry air can fuel raging wildfires on the south coast. As the winds come up and over the mountain, they warm and dry the air (which is typically cool and moist along the coast) and gain speed coming down through the passes and coastal canyons causing a high wind speed. These winds often precede Santa Ana winds which are warm, dry, and can exceed 40 mph (Live Science 2012). Santa Ana winds are most prevalent in the autumn and winter months. These winds originate from cool, dry high-pressure air masses in the Great Basin. They come up, over, and are pulled southward down the eastern side of the Sierra Nevada Mountains and into the Southern California region (National Weather Service 2021).

Location and Extent of Hazard in the City of Carpinteria

All of the City is susceptible to Santa Ana winds. The City, like the rest of the south county, is also susceptible to sundowner winds due to the unique east-west orientation of the Santa Ynez Mountains and the Pacific Coast which generates the required high-pressure gradient necessary for these winds to occur.

History of Hazard in the City of Carpinteria

Sundowner winds have caused extreme heat bringing record-breaking temperatures to the area (such as the Simoon event in Goleta in 1859), as well as exacerbating fire weather and expanding already burning brush fires (such as the Painted Cave Fire in 1990, Gap and Tea Fire in 2008, Jesusita Fire in 2009, and Sherpa Fire in 2016). Santa Ana winds were unusually strong and persistent during the Thomas Fire in 2017, causing a wind event on and off for a little over two weeks. Beyond extreme heat and dangerous fire weather conditions, winds can cause damage to critical infrastructure, crops/agriculture, and personal property.

Probability of Occurrence

Occasional – The City is at risk of windstorms at any given time during the calendar year.

Climate Change Considerations

Climate change effects, although still being studied, will affect sundowner and Santa Ana windstorms in the future. Severe weather events, including strong winds and sundowners, are expected to become more frequent with climate change; however, recent studies suggest that climate change and global warming may decrease the frequency of Santa Ana wind events in the early and late season – fall and spring – but the peak season and intensity of these wind events likely to remain unchanged (Guzman-Morales and Gershunov 2019). Another 2019 study pointed to natural climate cycles and changing temperatures for the wind changes, suggesting that wind speeds declined by an estimated 8 percent between 1980 and 2010, but have significantly increased in the past decade, and are likely to continue to increase in the future (Zeng et al. 2019). Contradicting research suggests that in some areas wind speeds will increase while others decrease, possibly due to temperature changes caused by climate change.

5.3.20 Civil Disturbance

Description of Hazards

The term **civil disorder** is defined by 18 U.S. Code Section 232 as any public disturbance involving acts of violence by assemblages of three or more persons, that causes an immediate danger of or results in damage or injury to the property or person of any other individual. Civil disturbance can range from unlawful forms of protest against socio-political problems to riots.

Civil disorders occur in California sporadically and last from a few days to months. Loss of life and loss of property have occurred in the last 25 years. There are various causes for civil disturbance, all human-caused. All begin as local events. (Cal OES 2018).

As described in the State Hazard Mitigation Plan and MJHMP, the majority of significant civil disorder events in California started in response to violence against people of color, as well as the acquittal of police officers and other persons on trial for committing violence against people of color. Refer to Section 5.5.4 of the MJHMP for a description of historical examples.

In the summer of 2020, a string of peaceful protests as well as violent riots took place across the country in response to graphic images of the killing of George Floyd under a police officer's knee. The anti-racism and anti-police brutality protests resulted in hundreds of reports of police brutality and excessive force used during the protests.

More than a dozen after-action evaluations have been completed, looking at how police departments responded to the demonstrations that broke out in hundreds of cities between late May and the end of August. Across U.S. cities, the reports reveal the extensiveness of police forces that were poorly trained, heavily militarized, and stunningly unprepared for the possibility that large numbers of people would surge into the streets in response to the killing of George Floyd (New York Times 2021). Departments were criticized for not planning for protests, despite evidence that they would be large. Almost uniformly, the reports said departments need more training in how to handle large protests (New York Times 2021).

Incident Profile: George Floyd Protests

Nationwide protests surged following the murder of George Floyd, an unarmed black man, by a Minneapolis police officer. Among them, students from Carpinteria High School organized a peaceful "Carp for Black Lives Matter" protest on June 6, 2020, on all corners of Linden and Carpinteria Avenues.

Photo: Edhat

Demonstrations were large, constant, and unpredictable, often springing up organically in several neighborhoods at once. While most protests were peaceful, in cities like New York, Philadelphia, Minneapolis, and Portland, buildings were looted and fires were set, and demonstrators hurled firecrackers and Molotov cocktails at law enforcement officers. At least six people were killed; hundreds were injured; thousands were arrested (New York Times 2021).

News reports and social media repeatedly blamed police departments for escalating violence instead of taming it. Responding officers often treated all protesters the same, instead of differentiating between peaceful protesters and violent rioters or looters. In part, reports acknowledged, that was because of the chaos. But it was also because the protests pitted demonstrators against officers, who became defensive and emotional in the face of criticism, some reports said (New York Times 2021).

Location and Extent of Hazard in the City of Carpinteria

Civil disturbance can occur in any part of the City; however, this hazard generally occurs within more populated areas, such as the Downtown District.

History of Hazard in the City of Carpinteria

Santa Barbara County's urban communities have on occasion experienced civil unrest, with the college town of Isla Vista perhaps having the most notable disturbances.

In 2020, footage of the murder of George Floyd incited civil disturbances nationwide, including peaceful protests in the county. The peaceful protests, as well as sporadic post-demonstration vandalism (e.g., spray-painting buildings) and disturbances that occurred in the City of Santa Barbara and the City of Santa Maria, are described further in Section 5.5.4 of the MJHMP. In the City of Carpinteria, students from Carpinteria High School organized a peaceful "Carp for Black

Lives Matter" protest on June 6, 2020. The event took place on all corners of Linden and Carpinteria Avenues. Protesters marched between Casitas Pass and Elm with local police and Santa Barbara County Sheriff's Deputies assisting with traffic control (Edhat 2020).

On October 18, 2021, more than three dozen Carpinteria parents stood outside of the CUSD administrative office for a few hours in protest over Governor Gavin Newsom's COVID-19 vaccine mandate for California schools. Under the current plan – unlike other vaccine requirements – the mandate allows for an exemption to the COVID-19 vaccine requirement based on personal beliefs, such as religious or ideological reasons. According to the CUSD, approximately 90 percent of school district employees are vaccinated. However, in the first six weeks of school, the School District reported seven COVID-19 cases among its students and three among its vaccinated staff (Edhat 2021).

Probability of Occurrence

Likely – There are no studies that predict the probability of civil disturbance occurrences. However, major national events such as the Vietnam War and anti-racism protests are associated with spillover disturbances into urban areas. As a result, local law enforcement adopts robust responses to such large community events with hundreds of law enforcement personnel typically deployed to maintain order.

Climate Change Consideration

Climate change results in stresses and long-term reduction in a range of natural resources, such as potable water, food, and arable land. United Nations has declared stresses on natural resources increase the likelihood of conflict (United Nations Education, Scientific, and Cultural Organization 2021). Potential for climate change-induced migration is now recognized internationally as people flee their home countries due to drought, floods, and other factors with the U.S. southern border being impacted more frequently by new climate refuges from Central America. While such migrants are typically nonviolent and seeking relief from the dire circumstances in their homeland and improved lives for their families, the movements of large numbers of often desperate people can create the potential for civil unrest. The County continues to evaluate and model future climate risk and vulnerability of the environment and community to reduce the likelihood of future impacts, including civil disturbance.

5.3.21 Terrorism

Description of Hazard

Terrorism refers to intentional, criminal malicious acts. There is no single, universally accepted definition of terrorism, and the term can be interpreted in many ways. The federal definition for terrorism found in the Code of Federal Regulations (28 Code of Federal Regulations [CFR], Section 0.85) is "*...the unlawful use of force and violence against persons or property to intimidate or coerce a government, the civilian population, or any segment thereof, in furtherance of political or social objectives.*" The 2018 California State Hazard Mitigation Plan defines refers to terrorism as the use of weapons of mass destruction, including biological, chemical, nuclear, and radiological weapons; arson, incendiary, explosive, and armed attacks; industrial sabotage and intentional hazardous

materials releases; and cyber terrorism (refer to Section 5.3.12, *Cyber Threat* for a detailed discussion of cyber-attacks; Cal OES 2018).

Terrorist threats are difficult to predict. Many different groups use terrorist attacks for various reasons. Two things are clear from the perspective of hazard mitigation: the most often used weapons of terrorists in California are incendiary bombs, and the greatest potential for loss is from active shooters or weapons of mass destruction. Additional concerns include the use of chemical and biological weapons (Cal OES 2018).

Location and Extent of Hazard in the City of Carpinteria

Terrorism can occur throughout the City but due to its intended purpose would most likely happen in more populous urban areas where more devastation and panic would ensue, such as the Downtown District, or in the City of Santa Barbara or Isla Vista.

History of Hazard in the City of Carpinteria

The county has seen several recent events of mass casualties brought on by disgruntled or distraught individuals; however, none of them can be categorized as terrorism. No terrorist events have been documented in the City.

Probability of Occurrence

Unlikely – The County has never experienced a terrorist attack. Given the small population and low density of the City of Carpinteria relative to other cities in the county (e.g., Santa Barbara, Santa Maria, etc.), the probability of a terrorist act occurring in the City of Carpinteria is low; however, terrorist acts in other more populous areas of the county would likely affect the City (see Section 6.3.21, *Terrorism*).

Climate Change Consideration

Climate change is and will continue to cause increased resource scarcity including, energy, water, and arable land globally, which is likely to result in increased global terrorism (United Nations 2019). While resource scarcity is not an immediate challenge for the City, sea level rise predictions, growing wildfire threat, and drought will result in mid-term climate change impacts, as previously described.

5.3.22 Invasive Species

Description of Hazard

Non-indigenous species are transported to new environments, both intentionally and unintentionally, through human activities (Cal OES 2018). The introduction of non-indigenous species into California and Santa Barbara County has fundamentally altered many of the City's environments and ecosystems ranging from the City's upland habitats (e.g., nonnative grasslands) to coastal marine and estuarine waters. A non-indigenous species is considered an invasive species when it becomes established in a new geographic location, causing impacts (Cal OES 2018). Invasive species can cause significant and enduring economic, human health, and environmental impacts.

Terrestrial Invasive Species

Plant invasive species can threaten vegetation native to the City. When exotic plants begin to colonize natural landscapes, each ecosystem is subject to changes that threaten the integrity and longevity of that system. As a result, the native flora and fauna are often displaced with less desirable species (Santa Barbara Botanic Garden 2021). Ecosystem damage caused by invasive plant species can include competition with native species, changes in hydrology and soil chemistry, hazards for natives due to loss of food supply, protective cover, physical harm, and potentially devastating new diseases or insect pests.

Aquatic Invasive Species

In coastal environments, commercial shipping is the most significant vector for species introductions. Ships transfer organisms to California waters from throughout the world. Once introduced, invasive species could become a permanent part of an ecosystem and may flourish, creating environmental imbalances, presenting risks to human health, and causing significant economic problems. The introduction of nonindigenous species into California's marine, estuarine, and freshwater environments can cause significant economic, human health, and ecological impacts (Cal OES 2018). Biofouling organisms are aquatic species attached to or associated with submerged or wetted hard surfaces, such as pipes or piers. Ships transfer organisms to California waters from throughout the world.

The quagga mussel and closely related zebra mussel are two of the most devastating aquatic pests in the U.S. The small freshwater mussels grow on hard surfaces such as water pipes and can cause major problems for water infrastructure. They can also negatively impact ecosystems and fisheries by feeding on microscopic plants and animals that support the food web. First appearing in North America in the 1980s, they appeared in California in 2007. The cost of managing these mussels is estimated at billions of dollars since their introduction into the U.S. (UC Santa Barbara [UCSB] 2019).

Location and Extent of Hazard in the City of Carpinteria

Terrestrial Invasive Species

All of the City, including wildlands, are subject to invasive plant species. Non-indigenous species occur throughout the City and are often very prevalent within grassland and riparian woodland habitats. Several of these riparian invasive species in the riparian habitat within and surrounding Carpinteria Creek and Lagunitas Creek are documented in the City of Carpinteria's 2005 Creeks Preservation Program report, as described further below (City of Carpinteria 2005).

Carpinteria Creek

Non-native understory vegetation in Carpinteria Creek includes giant reed (*Arundo donax*), which is highly invasive and forms dense, monotypic stands along the creek banks in several areas. Prominent non-native vines including German ivy (*Senecio mikanoides*), English ivy (*Hedera helix*), and greater periwinkle (*Vinca major*) dominate the ground layer in areas. These highly invasive vines have extended into the canopy and killed several riparian trees. Other non-native plants in the riparian corridor of Carpinteria Creek include blue gum (*Eucalyptus globulus*), Durango root (*Datisca glomerata*), sweet fennel (*Foeniculum vulgare*), castor bean (*Ricinus communis*), black

mustard (*Brassica nigra*), iceplant (*Carpobrotus edulis*), ripgut brome (*Bromus diandrus*), wild radish (*Raphanus sativus*), common sow thistle (*Sonchus oleraceus*), smilo grass (*Piptherum millaceum*), annual beard grass (*Polypogon monspeliensis*), bent grass (*Agrostis viridis*), rescue grass (*Bromus catharticus*), Japanese honeysuckle (*Lonicera japonica*), garden nasturtium (*Tropaeolum majus*), myoporum (*Myoporum laetum*), and poison hemlock (*Conium maculatum*) (City of Carpinteria 2005).

Lagunitas Creek

Non-native vegetation found in the riparian forest along Lagunitas Creek includes Monterey cypress (*Cupressus macrocarpa*), nasturtium, common sow thistle, filaree (*Erodium cicutarium*), sweet fennel, black mustard, poison hemlock, wild radish, scarlet pimpernel (*Anagallis arvensis*), prickly ox tongue (*Picris echioides*), Harding grass (*Phalaris aquatica*), and petty spurge (*Euphorbia peplus*) (City of Carpinteria 2005).

Carpinteria Salt Marsh Mosquitos

According to the UC Natural Reserve System, 10 species of mosquitos are known to breed in Carpinteria Salt Marsh, including species that prefer fresh, brackish, or salt water. The Carpinteria Valley Mosquito Abatement District monitors the estuary during the rainy season and treats various sites, especially those with ponded water, to reduce or eliminate mosquitoes. These insects are native to the ecosystem but can be a nuisance to residents if they occur in large numbers. Some of the native mosquito species also can carry malaria (e.g., *Anopheles sp.*), or encephalitis (e.g., *Culex sp.*) (refer to Section 5.3.5, *Pandemic/Public Health Emergency*). The most common practice of control is the application of "Golden Bear" oil in ponded areas to suffocate mosquitoes and other larvae that breathe at the surface of the water. Another abatement activity is the occasional draining of ponded water. Historically, various portions of the estuarine wetlands were "ditched" to drain ponded areas. This technique had little impact on mosquitos in the wetlands (UC Natural Reserve System 2022).

Aquatic Invasive Species

According to a 2019 scientific article published by UCSB, Santa Barbara County's waters have so far been clear of the invasive quagga and zebra mussels, thanks to aggressive measures to prevent contamination (UCSB 2019).

The majority of the estuarine wetland habitats at the Carpinteria Salt Marsh Reserve are dominated exclusively by native plants. This is in contrast to the artificial berms and other adjacent upland habitats that can be dominated exclusively by exotic species, including plants from Eurasia, Africa, Australasia, South America, and elsewhere in North America such as Mexico. Natural habitat restoration and enhancement with native species require the eradication or control of invasive exotic plant species that dominate the vegetation. On-going management goals include the eradication or control of many aggressive species that dominate some portions of the reserve such as the upland habitats and palustrine wetland habitats of the delta of Santa Monica Creek. Management techniques include manual and mechanical removal or trimming and occasional treatment with environmentally sensitive herbicides (UC Natural Reserve System 2022). Selected target invasive exotic species are listed in Table 5-8.

Table 5-8. Common Invasive Plant Species in Santa Barbara County

Common Name	Scientific Name	Common Name	Scientific Name
Giant Reed	*Arundo donax*	Iceplant	*Malephora crocea Croceum*
Black Mustard	*Brassica nigra*	Sea Lavender	*Limonium ramosissimum*
Italian Thistle	*Carduus pycnocephalus*	Myporum	*Myoporum laetum*
Hottentot Fig	*Carpobrotus edulis*	Kikuyu Grass	*Pennisetum clandestinum*
Poison Hemlock	*Conium maculatum*	Caster Bean	*Ricinus communis*
Pampas Grass	*Cortaderia jubata*	Russian Thistle	*Salsola tragus*
Sweet Fennel	*Foeniculum vulgare*		

Source: UC Natural Reserve System 2022.

The UC Natural Reserve System lists several other species, which are potentially problematic or not widespread enough at this time to warrant specific actions. Table 5-9 lists some of these less problematic species.

Table 5-9. Common Invasive Plant Species in Santa Barbara County

Common Name	Scientific Name	Common Name	Scientific Name
Australian Salt Bush	*Atriplex semibaccata*	Slender Crystalline Iceplant	*Mesembryanthemum nodiflorum*
Five-hook	*Bassia hyssopifolia*	Indian-Fig	*Opuntia ficus-indica*
Tecolote, Napa Thistle	*Centaurea melitensis*	Feathertop	*Pennisetum villosum*
Bermuda Grass	*Cynodon dactylon*	Victorian Box	*Pittosporum undulatum*
Italian Ryegrass	*Lolium multiflorum*	Wild Radish	*Raphanus sativus*
Tree Tobacco	*Nicotiana glauca*	New Zealand Spinach	*Tetragonia tetragonioides*

Source: UC Natural Reserve System 2022.

A species of Limonium (Sea Lavender, *Plum-baginaceae*) has invaded portions of the upper marsh near the mouth of the estuary. As with many introduced species along berms and on bars, this species probably was ocean-transported from a local source and subsequently deposited as a fragment in the rack that accumulates at the high tide line. The species has successfully reproduced and now covers many square meters of wetland habitat, including the only site on the UC Natural Reserve System property where Salt Marsh Bird's-beak, a Federal-listed endangered species, occurs. Funding from the U.S. Fish and Wildlife Service (USFWS) initiated an eradication and research program to learn more about this species including its identity and potential methods of control or eradication. As with other invasive exotics at the Carpinteria Salt Marsh Reserve, this species has been located in several gardens near the estuary. It and other species of Limonium are sold in the local horticultural trade and may present a serious future problem because many of these species occur naturally in salt marshes in Europe and elsewhere and may colonize coastal wetlands in California relatively easily (UC Natural Reserve System 2022).

History of Hazard in the City of Carpinteria

As described above, as part of the Creeks Preservation Program, the City of Carpinteria monitors and manages invasive plant species along the riparian corridors of creeks within the City. The UC Natural Reserve System, in coordination with other agencies, such as the USFWS and Carpinteria

Valley Mosquito Abatement District, monitors and manages invasive and other exotic species in the Carpinteria Salt Marsh Reserve.

Probability of Occurrence

Occasional – While the probability of future occurrence is usually calculated based on experience, different invasive species have different recidivism rates across the county. Based on past occurrences, invasive species will continue to present a constant threat to the county and City.

Climate Change Consideration

According to the International Union for Conservation of Nature (IUCN), globalization over the recent decades has increased the movement of people and goods around the world, leading to a rise in the number of species introduced to areas outside their natural ranges. A 2017 study found that over one-third of all introductions in the past 200 years occurred after 1970 and the rate of introductions is showing no sign of slowing down. A 2020 study predicts that the number of established alien species will increase by 36 percent between 2005 and 2050 (IUCN 2021).

The impacts from invasive species can be compounded by climate change. Extreme climatic events resulting from climate change, such as hurricanes, floods, and droughts can transport invasive species to new areas and decrease the resistance of habitats to invasions. Climate change is also opening up new pathways of the introduction of invasive species. For example, emerging Arctic shipping passages due to melting ice caps will greatly reduce the time taken for ships to travel from Asia to Europe. This will increase the risk of invasive species surviving the journey (IUCN 2021).

Many invasive species can expand rapidly to higher latitudes and altitudes as the climate warms, out-pacing native species. Invasive species that are regularly introduced by humans but have so far failed to establish may succeed in doing so thanks to climate change, creating new sets of invaders.

Some habitats, such as temperate forests and freshwater systems that currently have thermal barriers limiting the establishment of invasive species will become more suitable for alien species as the climate changes (IUCN 2021).

5.3.23 Agricultural Pests

Description of Hazard

Agricultural pests and disease infestation occur when an undesirable organism inhabits an area in a manner that causes serious harm to agriculture crops, livestock or poultry, and wild land vegetation or animals. Countless insects and diseases live on, in, and around plants and animals in all environments. Most are harmless, while some can cause significant damage and loss. Under some conditions, insects and diseases that have been relatively harmless can become hazardous. For example, severe drought conditions can weaken trees and make them more susceptible to destruction from insect attacks than they would be under normal conditions.

Different pests can impact different crops in different ways; while there is no scale to define the extent of an infestation, a pest could have a major economic impact on the value of infested crops. Another large factor that may influence crop yield is the spread of invasive plants, which may compete with crops for resources and in some cases also introduce pests.

Agricultural pests and pathogens (e.g., insects, fungi, bacteria, viruses, and invasive plants) cause injury or severe destruction to crops or livestock. These pests pose significant threats to crops, farm workers, the economy, food supply, and native habitat. Agricultural pests and diseases also weaken crops, vineyards, and livestock, which makes them more susceptible to harm from extreme heat, wildfire, and drought. They can also result in increases in food prices for consumers. The number of invasive pests and pathogens newly detected in California and the rest of the U.S. has increased at alarming rates in recent years, and that trend is projected to continue. Insect pests and diseases, such as bark beetles and Sudden Oak Death in trees, can also destroy forests and oak woodland habitat in the City, which can, in turn, increase the fuel load and lead to greater fire risk.

Location and Extent of Hazard in the City of Carpinteria

Figure 5-23 of the MJHMP shows agricultural, farm, and grazing lands in the county, which are susceptible to agricultural pests and diseases. Agriculture occurs in the Carpinteria Valley. As shown in Figure 4-1, there are only two small agricultural lands in the City, which are susceptible to agricultural pests and diseases.

In 2020, 217 pests were intercepted through the County of Santa Barbara's Pest Exclusion Program, the most commonly intercepted species being the Lesser Snow Scale (*Pinnaspis strachani*) (Santa Barbara County Agricultural Commissioner's Office 2020). These pests and diseases, such as the light brown apple moth, white peach scale, Asian citrus psyllid, Pacific mealybug, and avian influenza, can retard the growth of plants and animals, damage them so that their products are less appealing and harder to sell, or even kill them (Santa Barbara County Planning and Development Department 2021). By July 2020, the California Department of Food and Agriculture confirmed the presence of Asian citrus psyllids (*Diaphorina citri*), Kuwayama, in Santa Barbara County, indicating that a breeding population exists in the area. Asian citrus psyllids are a harmful exotic insect pest and a vector of Huanglongbing disease, one of the most devastating citrus diseases. In response to this infestation, the County ordered insecticide treatments within a 400-meter radius around the Asian citrus psyllids detection site (California Department of Food and Agriculture 2020). Though there are treatment options for many agricultural pests and diseases, some have no cure (Santa Barbara County Planning and Development Department 2021).

History of Hazard in the City of Carpinteria

Santa Barbara County is susceptible to infestation or infection by the light brown apple moth, white peach scale, Asian citrus psyllid, Pacific mealybug, and avian influenza. Infestations of Mediterranean Fruit Fly, Oriental Fruit Fly, Gypsy Moth, Glassy-winged Sharpshooter, Asian Citrus Psyllid, and Light-Brown Apple Moth have all occurred in the last 30 years. Diseases such as Chrysanthemum White Rust and Pierce's Disease of Grapes have caused significant losses to local growers. Between November 15, 2019, to July 7, 2020, the California Department of Food and Agriculture (CDFA) confirmed the presence of Asian Citrus Psyllid in the county (CDFA 2020). Additionally, UC Riverside and the UC Cooperative Extension recently sent out notification warnings of the invasive black fig fly, which has spread to Santa Barbara County (UC Riverside and the UC Cooperative Extension 2021). These pests could affect crops and other vegetation within the City.

Probability of Occurrence

Occasional – Due to its interaction with the global economy, its mild Mediterranean climate, and its diversified agricultural and native landscape, the City currently experiences and will continue to experience periodic losses due to agricultural pests and diseases. Many pests and organisms that carry diseases are most active during warmer months, so the threat of infection or infestation is higher during that time of year (Santa Barbara County Planning and Development Department 2021).

Climate Change Consideration

Continued climate change is likely to alter the abundance and types of many pests, lengthen pests' breeding season, and increase pathogen growth rates. For example, the pink bollworm, a common pest of cotton crops, is currently a problem only in southern desert valleys because it cannot survive winter frosts elsewhere in the state. However, if winter temperatures rise, the pink bollworm's range would likely expand northward, which could lead to substantial economic and ecological consequences for the state (Allen-Diaz 2009). Projection trends show temperatures getting warmer earlier in the year and remaining warmer until later in the year due to increases in air temperature, which creates a wider activity window for pests and diseases (Santa Barbara County Planning and Development Department 2021).

California's Fourth Climate Change Assessment (2018) notes that "climate change impacts terrestrial ecosystems and wildlife in multiple ways, including invasion by exotic species, the prevalence of wildlife disease, and loss of native habitats." Changing climate conditions can impact viable living areas of species and cause migration; shift the spread of pests and disease northward by changing habitat temperatures and making previously undesirable habitats welcoming for new species and lengthen habitable seasons (California Natural Resources Agency 2018). Longer growing seasons may also allow agricultural pests to persist longer, which can increase the severity of infestations on agricultural operations. Further, weather events have become more numerous and more severe. Changes in weather patterns can also have dramatic impacts on the ecosystem, including agriculture systems, and more severe impacts can be expected into the future.

6.0 VULNERABILITIES ASSESSMENT

6.1 PURPOSE & METHODOLOGY

The purpose of this section is to estimate the potential vulnerability (impacts) of hazards within the City on the built environment (residential, non-residential, critical facilities, etc.) and population. This assessment informs the development of mitigation strategies to avoid or lessen potential impacts through the 2022 Local Hazard Mitigation Plan (LHMP) update. To accomplish this, three different approaches are used:

1. Application of scientific loss estimation models (i.e., Hazus);
2. Analysis of exposure of critical facilities to hazards; and
3. A qualitative estimate of the impacts to hazards.

This section summarizes the methodologies and approaches employed in the assessment of vulnerabilities contained in Sections 6.2 and 6.3. A detailed discussion of the methodologies and approaches employed in the Multi-Jurisdictional Hazard Mitigation Plan (MJHMP) and this 2022 LHMP update is provided in Section 6.1 of the MJHMP.

6.1.1 Approach to Earthquake Vulnerability Assessment

Earthquake loss estimation for the 2022 LHMP update utilizes the Federal Emergency Management Agency's (FEMA's) Hazus-MH 5.0 natural hazard loss estimation software. Hazus-MH uses state-of-the-art Geographic Information Systems (GIS) software to map and display hazard data and the results of damage and economic loss estimates for buildings and infrastructure. It also allows users to estimate the impacts of earthquakes and floods on populations.

Hazus also uses U.S. Census data to estimate loss using 2010 Census tracts and for estimating population by multiplying the number of Residential and Multi-Use parcels by average household size by jurisdiction. As with any model, there are uncertainties, and the results should be considered approximate for broad hazard mitigation planning purposes.

To evaluate potential losses associated with earthquake activity in the City, two Hazus scenarios were run, including a Hazus 2,500-year probabilistic scenario and a Magnitude 7.4 – Red Mountain Fault ShakeMap Scenario.

The earthquake loss estimation analysis in Section 6.2.1 is broken into two subsections:

4. **Hazus 2,500-year probabilistic scenario**: this assesses the City-wide vulnerabilities to ground shaking based on overall seismic probabilities (7.0 magnitude) in the county; and
5. **Magnitude 7.4 – Red Mountain Fault ShakeMap Scenario**: this assesses the unique vulnerabilities that may exist in the City if the epicenter for an earthquake (7.4 magnitude) was located along the Red Mountain Fault south of the Santa Ynez Mountains.

See Section 6.2.1, *Earthquake (Ground shaking)* for a discussion of the City's vulnerabilities to ground shaking hazards.

6.1.2 Approach to Flood Vulnerability Assessment

To assess flood vulnerability and loss estimations, a flood vulnerability assessment was performed for the City using the following GIS methodology. Santa Barbara County's effective Digital Flood Insurance Rate Maps (DFIRM) was used as the hazard layer. A DFIRM is FEMA's flood risk data that depicts the 1-percent annual chance (100-year) and the 0.2-percent annual chance (500-year) flood events. Table 6-1 summarizes the flood zones included on these maps.

Table 6-2. City of Carpinteria Community Information System Policies in Force by Flood Zone

Flood Zone	City of Carpinteria
A01-30 & AE Zones	126
A Zones	76
B, C & X Zone	
Standard	93
Preferred	128
Total	**423**

The DFIRM flood zones were overlaid in GIS on the County's parcel layer to identify properties and structures that would likely be inundated during a coastal 1-percent annual chance (e.g., storm/ high tide inundation), riverine 1-percent annual chance, and riverine 0.2-percent annual chance flood event. The extent of the FEMA floodplain in the City is shown in Figure 5-1 and Figure 6-4. Building and contents values were totaled to estimate exposure. The result is an inventory of the number and types of improved parcels subject to flooding in the City. It is important to note that there could be more than one structure or building on an improved parcel (e.g., a condo complex occupies one parcel but might have several structures). This flood loss analysis does not account for business disruption, emergency services, environmental damages, or displacement costs, thus actual losses associated with flooding would likely exceed the estimate shown. Conversely, this analysis does not differentiate parcels that may have been developed since when the City adopted floodplain regulations, which would be mitigated to the 1-percent annual chance of flood if developed per local floodplain regulations.

Similar to the 2022 MJHMP update, Hazus modeling for this LHMP was completed for earthquake hazards only and was not used to develop approximate flood hazard areas given that Hazus flood modeling results are typically not as accurate and do not always coincide with the regulatory FEMA FIRM or local flood mapping. Therefore, proven GIS methods were used to estimate flood risk to structures where GIS is used to overlay the FEMA flood mapping on parcel-based inventory data, as described further below. This approach yields a more accurate count and types of structures at risk.

See Section 6.3.1, *Flood* for a discussion of the City's vulnerabilities to flood hazards.

6.1.3 Approach to Analysis of Exposure of Critical Facilities to Hazards

Critical facilities are key support facilities and structures most necessary to withstand the impacts of and respond to natural hazards (e.g., utilities, transportation infrastructure, and emergency response and services facilities). The Carpinteria Local Planning Team (LPT) reviewed and updated its list of critical facilities and generated a summary of the facilities by major categories: Law Enforcement, Fire, Public Works (including transportation and flood control facilities), Health and Human Services, Administrative, Communications, and Other.

Using a GIS and the mapped extents of the hazards affecting the City, it was determined which critical facilities are exposed to which hazards depending on whether they fall within the mapped hazard area. This approach was taken for Wildfire, Earthquake-Induced Liquefaction, Flood, Dam Failure, Landslide, Coastal Hazards, Tsunami.

Table 6-2 below presents the 57 mapped critical facilities within the City. These facilities primarily included utilities, government, medical, and educational structures as well as bridges. Of the available data, it was shown that these buildings are worth approximately $130,249,918 in total building value (i.e., structural and content value) (Table 6-2). No values were able to be obtained for many major facilities, so the actual value may be substantially higher.

It should be noted that operations at the Carpinteria Oil and Gas Plant and the Natural Gas Odorant Facility, both located at 5675 Carpinteria Avenue, have ceased, as described in Section 5.13 and Section 5.14. However, given that these facilities have not yet been removed or remediated, they remain included as critical facilities. Additional public facilities, such as Viola Fields, the Cavalli Property (Friends of the Library building), and Monte Vista Park, are considered in Sections 6.3.1 through 6.3.23. However, these facilities are not considered FEMA Lifelines as defined above and therefore, are not included in the analysis of critical facilities in the City.

Table 6-2. City of Carpinteria Critical Facilities List

Type	Facility	Address	Total Value
Communications	Critical Facility	10151 Oceanview Rd	$98,226
Communications	Rincon Peak Relay Station	5115 Ogan Rd	-
Energy: Industrial	Verizon	5675 Carpinteria Ave	-
Energy: Substation	Natural Gas Odorant Carpinteria Oil and Gas	4918 Foothill Rd	-
Utilities	SCE - Substation	1488 Linden Ave	$5,000,000
Utilities	Sewage Pump Station 7	546 Palm Ave	$2,000,000
Utilities	Sewage Pump Station 1	1301 Santa Ynez Ave	$2,266,000
Utilities	Water District Maintenance Building	4527 Carpinteria Ave	$1,500,000
Utilities	Sewage Pump Station 2	1301 Santa Ynez Ave	$1,500,000
Utilities	Headquarters Well	4859 Foothill Rd	$1,500,000
Utilities	High School Well	5315 Foothill Rd	$1,500,000
Utilities	El Carro Well	5315 Foothill Rd	$1,500,000
Utilities	El Carro Well Filtration Plant	1301 Santa Ynez Ave	$1,400,000
Utilities	Water District Main Office	3950 Via Real	$1,000,000
Utilities	Sewage Pump Station 4	4859 Foothill Rd	$800,000
Utilities	High School Well Treatment Plant	1301 Santa Ynez Ave	$700,000
Utilities	Headquarters Well Control Building	1301 Santa Ynez Ave	$90,000
Wastewater Treatment Plant	Headquarters Well Enclosure	5300 Sixth St	$60,000,000
Hazardous Material	Wastewater Treatment Plant	5675 Carpinteria Ave	-
Health and Medical Clinic	Carpinteria Oil and Gas Plant	4806 Carpinteria Ave	-
Health and Medical Clinic	Sansum Clinic-Carpinteria	931 Walnut Ave	-
EMS Station	PHD Carpinteria Clinic	911 Walnut Ave	-
EMS Station	Carpinteria - Summerland Fire Protection District Station 1	4235 Carpinteria Ave	-

Type	Facility	Address	Total Value
Nursing Home	American Medical Response Station 1	5464 Carpinteria Ave	-
Veteran Services	Granvida Senior Living and Memory Care	941 Walnut Ave	-
Veteran Services	Carpinteria Veterans Memorial Building	941 Walnut Ave	-
Colleges / Universities	Veteran's Memorial Building	1015 Mark Ave	-
Education	International Sports Sciences Association	4810 Foothill Rd	$28,535,898
Education	Carpinteria High School	5351 Carpinteria Ave	$14,366,233
Education	Carpinteria Middle School	1480 Linden Ave	$10,583,606
Education	Canalino Elementary	4545 Carpinteria Ave	$6,457,908
Education	Aliso Elementary	5201 Eighth St	$4,360,870
Education	Carpinteria Children's Project at Main	4698 Foothill Rd	$210,720
Education	Rincon/Foothill High School	1400 Linden Ave	-
Education	Carpinteria Unified School District (CUSD) District Office	1480 Linden Ave	-
Education	Carpinteria Family	1480 Linden Ave	-
Education	Canalino Elementary	5315 Foothill Rd	-
Fire Station	The Howard School	911 Walnut Ave	$7,150,000
Government	Carpinteria Fire Station 1	5775 Carpinteria Ave	$4,436,787
Government	City Hall, Sheriff's Substation, Maintenance	1140 Eugenia Pl	$60,000
Library	Carpinteria Summerland HQ	5141 Carpinteria Ave	-
Museum	Carpinteria Public Library	956 Maple Ave	-
Sheriff	Carpinteria Valley Museum of History	5775 Carpinteria Ave	$111,767
Transportation	Carpinteria Sheriff's Station	HWY 101 SB / Franklin Creek	-
Transportation	Bridge	HWY 101 NB / Franklin Creek	-
Transportation	Bridge	7th St / HWY 101	-
Transportation	Bridge	SR-150 (Rincon Rd) / HWY 101	-
Transportation	Bridge	7th St / Franklin Creek	-
Transportation	Bridge	Carpinteria Ave / Franklin Creek	-
Transportation	Bridge	Carpinteria Rd / Carpinteria Creek	-
Transportation	Bridge	Via Real / Santa Monica Creek	-
Transportation	Bridge	4th St / Carpinteria Creek	-
Transportation	Bridge	HWY 101 SB / Santa Monica Creek	-
Transportation	Bridge	HWY 101 NB / Santa Monica Creek	-

Type	Facility	Address	Total Value
Transportation	Bridge	Carpinteria Avenue / Santa Monica Creek	-
Transportation	Bridge	Bailard Avenue / HWY 101	-
Transportation	Bridge	Malibu Dr / Franklin Creek	-

The results of the exposure analysis are included in this section. A further description of the threats and methodologies used in this analysis is provided in Chapter 6.0, *Vulnerability Assessment* of the 2022 MJHMP. As the City continues to assess its vulnerability, the collection of better and more complete data will help to improve the risk assessment process to direct planning and mitigation decisions.

Table 6-3. Summary of Potential Impacts to Critical Facilities

Hazard Type	Specific Risk	Count	% of Critical Facilities Impacted	Exposure ($)
Wildfire	Low to Extreme Wildfire Threat	0	0%	$0
Liquefaction (Earthquake)	High Liquefaction Potential	49	86%	$154,237,262
Flood	FEMA 1% Annual Chance Flood Zone	14	25%	$37,504,526
	FEMA 0.2% Annual Chance Flood Zone	4	7%	$63,500,000
Coastal Hazards	Sea Level Rise (2060)	1	2%	-
Dam Failure	Santa Monica Debris Basin Failure	9	16%	$12,513,908
Landslide	Class 7	2	4%	$210,720
Tsunami		10	18%	$9,957,908

6.1.4 Approach to Qualitative Estimate of Impacts

The approach used to complete this effort involves utilizing readily available data (i.e., U.S. Census) to extrapolate and estimate potential vulnerability. In some cases, the estimation would build upon historic events but it may also include projecting worst-case potentials. The Carpinteria LPT summarized the remaining hazards to which the City is vulnerable and assessed the amount and type of damage that could be expected. This approach of qualitative assessment was done for the following hazard types in Section 6.3.5 through Section 6.3.23 below:

- Drought & Water Shortage
- Pandemic/Public Health Emergency
- Extreme Heat/Freeze
- Energy Shortage & Resiliency
- Mudflow and Debris Flow
- Windstorm
- Hazardous Materials Release
- Cyber Threat
- Invasive Species
- Civil Disturbance
- Natural Gas Pipeline Rupture
- Agricultural Pests
- Train Accident
- Terrorism
- Oil Spills
- Geologic Hazard

6.2 SCIENTIFIC LOSS ESTIMATION (HAZUS) ANALYSIS

6.2.1 Earthquake (Ground shaking)

The 2,500-year scenario considers multiple faults in the region. The methodology utilizes probabilistic seismic hazard contour maps developed by the U.S. Geological Survey (USGS) for the 2018 update of the National Seismic Hazard Maps that are included with Hazus-MH. The USGS maps provide estimates of potential ground acceleration and spectral acceleration at periods of 0.3 seconds and 1.0 seconds, respectively. The 2,500-year return period analyzes ground shaking estimates from the various seismic sources in the area with a two percent probability of being exceeded in 50 years. The International Building Code uses this level of ground shaking for building design in seismic areas.

The Magnitude 7.4 – Red Mountain Fault ShakeMap Scenario is a deterministic scenario that predicts the outcome of a specific earthquake event. This deterministic scenario used USGS provided ShakeMap datasets to model what a Magnitude 7.4 earthquake of the Red Mountain Fault would generate in terms of damages and losses for the chosen area of interest (City of Carpinteria). The datasets used to import into Hazus 5.0 for these scenarios included four USGS-provided key data layers in a geospatial format: peak ground velocity, peak ground acceleration, peak spectral acceleration for 0.3 seconds (0.3 percent gravitational velocity [g]), and peak ground acceleration for 1.0 seconds (1.0 percent g).

Figure 6-1 is the ShakeMap produced for the Magnitude 7.4 – Red Mountain Fault ShakeMap Scenario. As shown in the figure, in the Red Mountain Fault ShakeMap Scenario, the entire City would perceive severe to extreme shaking and would likely receive moderate/heavy to very heavy damage.

Figure 6-1. City of Carpinteria Red Mountain Fault 7.4 Magnitude ShakeMap

Property

Hazus estimates the number of buildings that would be damaged during a modeled earthquake, and these estimates are provided in the tables below. The 2,500-year probabilistic scenario is expected to produce more severe building damage than the Red Mountain Fault ShakeMap Scenario. For example, an earthquake from the 2,500-year probabilistic scenario could demolish (i.e., "Complete" building damage) 177 homes compared to 28 homes from the Red Mountain Fault Shakemap Scenario (Tables 6-4 and 6-5). Hazus estimates that under the 2,500-year probabilistic scenario, about 3,148 buildings will be at least moderately damaged (i.e., Moderate, Extensive, Complete building damage), which is over 74 percent of the buildings in the region. On the other hand, under the Red Mountain Fault Shakemap Scenario, 1,918 buildings will be at least moderately damaged, which is over 45 percent of the buildings in the region.

Table 6-4. Expected Building Damage by Occupancy – 2,500-year Probabilistic Scenario

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	County	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	0.94	0.55	4.73	0.52	11.08	0.69	8.89	1.20	10.35	1.28
Commercial	4.34	2.54	21.60	2.36	72.61	4.55	93.50	12.64	118.95	14.66
Education	0.32	0.19	1.43	0.16	3.30	0.21	2.62	0.35	2.33	0.29
Government	0.05	0.03	0.25	0.03	0.90	0.06	1.22	0.16	1.59	0.20
Industrial	0.81	0.47	4.43	0.48	17.11	1.07	24.42	3.30	33.23	4.10
Other Residential	13.81	8.08	72.88	7.98	155.84	9.75	182.56	24.69	462.92	57.05
Religion	0.36	0.21	1.72	0.19	4.39	0.27	4.32	0.58	5.21	0.64
Single Family	150.31	87.93	806.71	88.29	1332.29	83.40	421.92	57.06	176.77	21.79
Total	171		914		1,598		739		811	

Source: Hazus-MH 5.0

Table 6-5. Expected Building Damage by Occupancy – Red Mountain Fault ShakeMap Scenario

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	County	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	5.53	0.66	9.26	0.62	10.68	0.94	6.19	1.33	4.35	1.39
Commercial	32.77	3.93	55.92	3.77	98.63	8.64	76.27	16.42	47.41	15.16
Education	1.81	0.22	2.69	0.18	2.98	0.26	1.64	0.35	0.88	0.28
Government	0.36	0.04	0.62	0.04	1.16	0.10	1.06	0.23	0.80	0.26
Industrial	7.02	0.84	13.00	0.88	25.50	2.23	20.69	4.45	13.78	4.41
Other Residential	70.88	8.51	136.25	9.20	208.69	18.28	256.84	55.29	215.35	68.84
Religion	2.16	0.26	3.51	0.24	4.62	0.40	3.41	0.73	2.30	0.73
Single Family	712.23	85.53	1260.34	85.07	789.09	69.14	98.41	21.19	27.93	8.93
Total	833		1,482		1,141		465		313	

Source: Hazus-MH 5.0

Figure 6-2. City of Carpinteria 2,500-year Probabilistic Scenario Total Building Loss

Figure 6-3. City of Carpinteria Red Mountain Fault ShakeMap Scenario Total Building Loss

The total citywide building loss for these two scenarios is shown in Figures 6-2 and Figure 6-3. Potential building losses would likely be clustered within built communities and downtown areas where structures are older and denser. As shown in Figure 6-2 and Figure 6-3, for both scenarios, the western and southwestern portions of the City would have the highest total building loss. However, the absolute dollar amount of total citywide building loss under the 2,500-year Probabilistic Scenario is higher than the Red Mountain Fault ShakeMap Scenario.

People

Utility Services: Loss of utility services would have a major impact on the people of the City. The following tables indicate the number of projected households that would experience potable water and electric power loss, and the number of days the loss would last. For example, this analysis shows that more than 2,700 households would remain without electricity 7 days after an earthquake under the 2,500-year Probabilistic Scenario. The 2,500-year Probabilistic Scenario is expected to cause a long delay in the recovery of potable water and electric power systems as well as cause more people to be without potable water or electric power compared to the Red Mountain Fault ShakeMap Scenario (Tables 6-6 and 6-7).

Table 6-6. Expected Potable Water and Electric Power System Performance – 2,500-year Probabilistic Scenario

	Total Number of Households	Number of Households without Service				
		At Day 1	At Day 3	At Day 7	At Day 30	At Day 90
Potable Water	4,695	4,571	4,125	0	0	0
Electric Power		4,395	3,841	2,725	963	5

Table 6-7. Expected Potable Water and Electric Power System Performance – Red Mountain Fault ShakeMap Scenario

	Total Number of Households	Number of Households without Service				
		At Day 1	At Day 3	At Day 7	At Day 30	At Day 90
Potable Water	4,695	3,819	0	0	0	0
Electric Power		3,373	2,057	821	153	5

Source: Hazus-MH 5.0

Sheltering: Sheltering is another concern during an earthquake – people may be displaced from their homes due to the earthquake, and those displaced people may need accommodations in temporary public shelters. Table 6-8 shows the projected total displacement and projected shelter needs for each scenario. The total number of residents seeking shelter could range from 185 under the Red Mountain Fault ShakeMap Scenario to 534 under the 2,500-year Probabilistic Scenario. The 2,500-year Probabilistic Scenario is expected to result in more displaced households and also people seeking shelter than the Red Mountain Fault ShakeMap Scenario. Displaced households that do not seek shelter may require other evacuation services as well.

Table 6-8. Shelter Requirements

2,500-year Probabilistic Scenario		Red Mountain Fault ShakeMap Scenario	
Total Population	13,025	Total Population	13,025
Total Displaced Households	813	Total Displaced Households	283
Total Seeking Shelter	534	Total Seeking Shelter	185

Source: Hazus-MH 5.0

Casualties: Hazus estimates the number of people that would be injured or killed by the earthquake, based on magnitude and time of occurrence for the earthquake. The casualties are broken down into four severity levels that describe the extent of the injuries.

- **Level 1:** Injuries would require medical attention but hospitalization is not needed
- **Level 2:** Injuries would require hospitalization but are not considered life-threatening
- **Level 3:** Injuries would require hospitalization and can become life-threatening if not promptly treated
- **Level 4:** Victims are killed by the earthquake

The casualty estimates are provided for three times of day: 2:00 AM, 2:00 PM, and 5:00 PM. These times represent the periods of the day that different sectors of the community are at their peak occupancy loads. The 2:00 AM estimate considers that the residential occupancy load is maximum, the 2:00 PM estimate considers that the educational, commercial, and industrial sector loads are maximum, and 5:00 PM represents peak commute time. The worst-case outcome is projected for a 2:00 PM earthquake under the 2,500-year Probabilistic Scenario with total casualties of 543 individuals, including 38 deaths. These estimates of casualties are broken down in Table 6-9 for the 2,500-year Probabilistic Scenario and Table 6-10 for the Red Mountain Fault ShakeMap Scenario. In both scenarios, an earthquake at 2:00 PM would cause the most casualties and deaths. The 2,500-year Probabilistic Scenario is expected to result in more casualties and also more severe casualties than the Red Mountain Fault ShakeMap Scenario.

Table 6-9. Casualty Estimates – 2,500-year Probabilistic Scenario

		Level 1	Level 2	Level 3	Level 4
2 AM	Commercial	4.39	1.41	0.24	0.48
	Commuting	0.03	0.04	0.07	0.01
	Educational	0.00	0.00	0.00	0.00
	Hotels	0.00	0.00	0.00	0.00
	Industrial	4.57	1.45	0.24	0.48
	Other- Residential	97.46	25.87	2.65	4.86
	Single Family	55.54	11.07	0.69	1.17
	Total	**162**	**40**	**4**	**7**
2 PM	Commercial	244.67	78.24	13.39	26.35
	Commuting	0.27	0.40	0.63	0.12
	Educational	65.05	20.76	3.60	7.05
	Hotels	0.00	0.00	0.00	0.00

		Level 1	Level 2	Level 3	Level 4
	Industrial	33.73	10.67	1.78	3.49
	Other- Residential	15.89	4.22	0.45	0.80
	Single Family	9.54	1.90	0.14	0.20
	Total	**369**	**116**	**20**	**38**
5 PM	Commercial	176.09	56.02	9.62	18.67
	Commuting	5.40	7.81	12.45	2.45
	Educational	8.38	2.68	0.46	0.91
	Hotels	0.00	0.00	0.00	0.00
	Industrial	21.08	6.67	1.12	2.18
	Other- Residential	36.21	9.61	1.02	1.82
	Single Family	22.07	4.39	0.32	0.46
	Total	**269**	**87**	**25**	**26**

Source: Hazus-MH 5.0

Table 6-10. Casualty Estimates – Red Mountain Fault ShakeMap Scenario

		Level 1	Level 2	Level 3	Level 4
2 AM	Commercial	2.07	0.62	0.10	0.20
	Commuting	0.01	0.02	0.03	0.01
	Educational	0.00	0.00	0.00	0.00
	Hotels	0.00	0.00	0.00	0.00
	Industrial	2.16	0.63	0.10	0.19
	Other- Residential	47.12	11.54	1.11	2.04
	Single Family	16.09	2.54	0.15	0.26
	Total	**67**	**15**	**1**	**3**
2 PM	Commercial	115.43	34.28	5.63	11.07
	Commuting	0.13	0.20	0.30	0.06
	Educational	30.66	9.13	1.54	3.01
	Hotels	0.00	0.00	0.00	0.00
	Industrial	15.89	4.61	0.73	1.41
	Other- Residential	7.58	1.86	0.19	0.34
	Single Family	2.70	0.43	0.03	0.04
	Total	**172**	**51**	**8**	**16**
5 PM	Commercial	83.07	24.58	4.05	7.86
	Commuting	2.47	3.75	5.78	1.15
	Educational	4.07	1.22	0.21	0.40
	Hotels	0.00	0.00	0.00	0.00
	Industrial	9.93	2.88	0.45	0.88
	Other- Residential	17.31	4.26	0.42	0.77
	Single Family	6.26	0.99	0.07	0.10
	Total	**123**	**38**	**11**	**11**

Source: Hazus-MH 5.0

Economy

Depending on its location and magnitude, an earthquake could have a devastating impact on the City's economy. In general, impacts would be related to debris cleanup and management, building and infrastructure damage, and losses related to business and infrastructure interruption.

Hazus estimates economic impacts including building-related losses, and transportation and utility lifeline losses over 15 years after the incident. Building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. Business interruption losses are the losses associated with the inability to operate a business because of the damage sustained during the earthquake. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the earthquake.

Table 6-11. Economic Losses (Millions of Dollars)

Category	Single Family	Other Residential	Commercial	Industrial	Others	Total
2,500-year Probabilistic Scenario						
Income Losses	26.45	19.53	77.4	3.15	4.82	131.36
Capital Stock Losses	280.64	154.57	206.17	65.41	58.07	764.86
Total	**307.09**	**174.10**	**283.58**	**68.56**	**62.89**	**896.22**
Red Mountain Fault ShakeMap Scenario						
Income Losses	9.59	10.19	45.45	1.95	2.73	69.91
Capital Stock Losses	103.61	70.71	100.29	30.17	27.62	332.41
Total	**113.20**	**80.90**	**145.75**	**32.12**	**30.35**	**402.32**

Source: Hazus-MH 5.0

The 2,500-year Probabilistic Scenario is expected to result in more economic losses than the Red Mountain Fault ShakeMap Scenario (Table 6-11).

- **2,500-year Probabilistic Scenario:** The total building-related losses were over $896 million. Fifteen percent of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies, which made up over 54 percent of the total loss.
- **Red Mountain Fault ShakeMap Scenario**: The total building-related losses were over $402 million. Seventeen percent of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies, which made up over 48 percent of the total loss.

Critical Facilities and Infrastructure

The 2,500-year Probabilistic Scenario (Table 6-12) is also expected to result in more lifeline system (e.g., transportation, utility, communication) losses than the Red Mountain Fault ShakeMap Scenario (Table 6-13).

Table 6-12. 2,500-year Probabilistic Scenario Lifeline System Losses – Transportation and Utility (Millions of Dollars)

System	Inventory Value	Economic Loss
Highway	248.65	12.38
Railways	40.93	6.73
Light Rail	0	0
Bus	1.83	1.43
Ferry	0	0
Port	3.62	2.83
Airport	0	0
Potable Water	4.02	2.33
Wastewater	329.63	236.39
Natural Gas	17.69	1.84
Oil Systems	0	0
Electrical Power	0	0
Communication	0	0

Table 6-13. Red Mountain Fault ShakeMap Scenario Lifeline System Losses – Transportation and Utility (Millions of Dollars)

System	Inventory Value	Economic Loss
Highway	248.65	5.52
Railways	40.93	3.73
Light Rail	0	0
Bus	1.83	0.76
Ferry	0	0
Port	3.62	1.51
Airport	0	0
Potable Water	4.02	1.22
Wastewater	329.63	103.85
Natural Gas	17.69	0.84
Oil Systems	0	0
Electrical Power	0	0
Communication	0	0

Source: Hazus-MH 5.0

An earthquake could have a major impact on critical infrastructure, including hospitals, schools, EOCs, police stations, and fire stations. All of these facilities would sustain at least moderate

damage under the 2,500-year Probabilistic Scenario while 75 percent would sustain at least moderate damage under the Red Mountain Fault ShakeMap Scenario.

Table 6-14. Expected Damage to Critical Facilities – 2,500-year Probabilistic Scenario

Classification	Total	Number of Facilities		
		At Least Moderate Damage > 50%	Complete Damage > 50%	With Functionality > 50% on Day 1
Hospitals	0	0	0	0
Schools	6	6	0	0
EOCs	0	0	0	0
Police Stations	1	1	0	0
Fire Stations	1	1	0	0
Total	**8**	**8**	**0**	**0**

Table 6-15. Expected Damage to Critical Facilities – Red Mountain Fault ShakeMap Scenario

Classification	Total	Number of Facilities		
		At Least Moderate Damage > 50%	Complete Damage > 50%	With Functionality > 50% on Day 1
Hospitals	0	0	0	0
Schools	6	5	0	0
EOCs	0	0	0	0
Police Stations	1	0	0	0
Fire Stations	1	1	0	0
Total	**8**	**6**	**0**	**0**

Source: Hazus-MH 5.0

The 2,500-year Probabilistic Scenario is expected to cause more damage and also more severe damage to critical facilities, as well as result in delays for the critical facilities to recover than the Red Mountain Fault ShakeMap Scenario. The more extreme damage to critical facilities would require additional time to repair and ensure safe operation post-earthquake.

Other Earthquake Vulnerabilities

Social Vulnerability. The entire City's population is exposed in some way to earthquake hazards. Populations most vulnerable to earthquake hazards would be those that rely on specific services or electrical power, which may not be available during or after a quake, such as health care patients and the elderly. Residents would have a difficult time receiving emergency notifications or evacuating due to age or disability, houselessness, or language barriers. Such socially vulnerable and sometimes financially disadvantaged households may not have the financial resiliency to cope with both short-term post-earthquake issues such as paying for lodging and clean up as well as potentially lacking resources to address longer-term issues such as major structural repairs or replacement.

Eastern Carpinteria has an above-average social vulnerability based on statewide ranking as identified by the Center for Disease Control's (CDC's) social vulnerability index (SoVI) (refer to

Figure 4-3 of the MJHMP). Therefore, this portion of the City may be more vulnerable to natural hazards such as earthquakes.

Historic, Cultural, and Natural Resources. Earthquake effects on the environment, natural resources, and historic and cultural assets could be very destructive depending on the type of seismic activity experienced and secondary/cascading effects from an event (e.g., wildfire). The biggest impact would likely be on older properties such as wooden or masonry buildings, though reinforced masonry structures would be much more resilient during earthquakes. However, an earthquake-triggered event such as a rockslide could impact natural foothill or mountain habitats.

Future Development. Future development in the City is not anticipated to significantly affect vulnerability to earthquakes when designed according to modern building codes. However future development would result in a slight increase in exposure of the population, building stock, and related infrastructure to earthquakes.

6.3 VULNERABILITIES

6.3.1 Flood

The geographical location, climate, and topography of Carpinteria make some areas of the City prone to flooding. While there are some benefits associated with flooding, such as maintaining natural riparian processes along creeks, replenishment of beach sand and nutrients to agricultural lands, it presents a hazard to development in floodplains. In addition to the damage to properties, flooding can also cut off access to utilities, emergency services, transportation, and may impact the overall economic well-being of an area. Emergency responses can be interrupted by damaged roads and infrastructure. Fire can break out as a result of dysfunctional electrical equipment. Hazardous materials can also get into floodways, causing health concerns and polluted water supplies. During a flood, the drinking water supply can be contaminated. Climate change is expected to increase the frequency and intensity of heavy rainstorms that cause riverine flooding.

Based on the GIS analysis, the City has 551 improved parcels valued at over $300 million in the 1-percent annual chance floodplain. Based on this analysis, which accounts for residents only and not workers, 9,190 residents are living in the 1-percent annual chance floodplain throughout the City.

An additional 419 improved parcels and $160.7 million in value fall within the 0.2-percent annual chance floodplain. Areas of the City vulnerable to the 0.2-percent annual chance riverine flood are home to 23,681 residents. Development in the 0.2-percent annual chance floodplain is typically not regulated, thus a large flood event could be extremely damaging in the City. This information is summarized in Table 6-16 below. Additionally, a GIS vulnerability assessment was conducted delineating the areas exposed to the coastal 1-percent annual chance flood hazard in the City. Utilizing this data for an exposure analysis, the City has 37 improved parcels valued at over $18 million located within the 1-percent annual chance coastal floodplain.

Table 6-16. City of Carpinteria FEMA Floodplain Exposure and Loss

Property Type	Improved Parcel Count	Total Value	Estimated Loss	Population
Riverine 1% Annual Chance Floodplain Exposure and Loss				
Commercial	13	$28,348,074	$7,087,019	
Exempt	4	$308,904	$77,226	
Industrial	5	$18,497,223	$4,624,306	
Mixed Use	3	$4,332,258	$1,083,065	
Residential	526	$250,693,286	$62,673,321	
Total	**551**	**$302,179,744**	**$75,544,936**	9,190
Riverine 0.2% Annual Chance Floodplain Exposure and Loss				
Commercial	8	$2,262,698	$565,675	
Exempt	1	$0	$0	
Residential	410	$158,401,811	$39,600,453	
Total	**419**	**$160,664,509**	**$40,166,127**	23,681
Coastal 1% Annual Chance Floodplain Exposure and Loss				
Residential	37	$18,184,314	$4,546,079	340

As listed in Table 6-17, 16 critical facilities in the City would be vulnerable to damage or destruction from 1-percent or 0.2-percent annual chance flood (Figure 6-4; see also, Section 6.3.3, *Flood* of the 2022 MJHMP). The majority of transportation critical facilities located within a flood zone are bridges, but other vulnerable facilities include the well and water treatment plants, schools (i.e., Carpinteria High, Aliso Elementary, and Rincon/Foothill High), the Granvida Senior Living and Memory Care, Sansum Clinic, and two sewage pump stations. Hazardous material facilities include the Wastewater Treatment Plant and sewage pump stations.

Table 6-17. City of Carpinteria Critical Facilities at Risk to Flood Hazard

Type	Critical Facility	Flood Hazard	Total Value
Utilities	High School Well Treatment Plant	1% Annual Chance	$1,500,000
Wastewater Treatment Plant	Wastewater Treatment Plant	1% Annual Chance	$800,000
Nursing Home	Granvida Senior Living and Memory Care	1% Annual Chance	-
Education	Carpinteria High School	1% Annual Chance	$28,535,898
Education	Aliso Elementary	1% Annual Chance	$6,457,908
Education	Rincon/Foothill High School	1% Annual Chance	$210,720
Bridge	8 Bridges	1% Annual Chance	-
Utilities	Sewage Pump Station 1	0.2% Annual Chance	$2,000,000
Utilities	Sewage Pump Station 2	0.2% Annual Chance	$1,500,000
Wastewater Treatment Plant	Wastewater Treatment Plant	0.2% Annual Chance	$60,000,000
Clinic	Sansum Clinic-Carpinteria	0.2% Annual Chance	-

Based on this analysis, in the event of a major flood, damage to the Water Treatment Plant or sewage pump stations can cause the systems to backup and leak effluent into the surrounding soil and water. Transportation facilities, such as bridges along State Route (SR-) 192 and Highway 101, may be damaged or destroyed in a flood, compromising evacuation routes and delaying emergency response services. Residents, clientele of the Granvida Senior Living and Memory Care and Sansum Clinic, and students of Carpinteria High School, Aliso Elementary School, and Rincon/Foothill High School may need to be relocated or evacuated during a flood event; however, difficulties may arise due to flood damage to transportation facilities and mobility constraints of affected residents. It should be noted that the CUSD is considering adaptation strategies, including both on- and offsite measures and regional approaches, to protect Aliso Elementary School from flooding, as identified in the City's 2019 Sea Level Rise Vulnerability Assessment and Adaptation Plan (SLRVAAP). The locations of critical facilities within the City relative to the FEMA 1-percent annual chance (100-year) flood are shown in Figure 6-4.

Repetitive Loss (RL) Properties

An RL property is defined by FEMA as "a property for which two or more National Flood Insurance Program (NFIP) losses of at least $1,000 each have been paid within any 10 years since 1978". An RL property may or may not be currently insured by the NFIP.

As described in Section 4.9.7, *National Flood Insurance Program*, FEMA's RL data shows that there have been 18 properties in Carpinteria with multiple claims against the NFIP. Four of these properties have had more than three insurance claims, and one of them has had a total of six claims (City of Carpinteria 2019). According to the City's 2019 SLRVAAP, 79 residential structures are vulnerable to damage and flooding from coastal hazards; an additional 164 residential structures become vulnerable with approximately 1 foot of sea level rise, 234 additional residential structures become vulnerable with approximately 2 feet of sea level rise, and 264 additional residential structures become vulnerable with approximately 5 feet of sea level rise, for a total of 769 structures. It is anticipated that over time, sea level rise would result in repetitive loss to at least a portion of these structures (see Section 6.3.4, *Coastal Hazards*; City of Carpinteria 2019).

The City identified a need for an RL program in the 2019 SLRVAAP to reduce damage to private property, injury or loss of life, demand on emergency services, and disruption to public services caused by frequent flooding and associated damages for the RL properties in the City (see mitigation action 2022-26). Under an RL program, a property that repeatedly experiences substantial damages from storms and coastal flooding within a given period may not be permitted to redevelop. It is important to note, however, the City intends to combine this adaptation strategy with other protection strategies, such as a living shoreline and beach nourishment, which could provide an additional buffer for private development from coastal hazards in the near-term (see Section 7.4, *Mitigation Implementation Plan*). Nonetheless, in the mid- to long-term and with higher elevations of sea level rise, protection strategies may be less effective and could result in loss or damage to private property.

Figure 6-4. City of Carpinteria Critical Facilities in FEMA Flood Hazard Zones

6.3.2 Mudflow & Debris Flow

As described in Section 5.3.2, *Mudflow & Debris Flow*, hillsides and communities at the base of the Santa Ynez mountains are especially at risk of debris flows and mudflows following wildfires. Three acres (0.16 percent) of the City are within Extreme risk and 309 acres (18.8 percent) of the City is within High risk for debris flows. As shown in Figure 6-5, critical facilities located along the creeks that extend from the foothills towards the coast (i.e., Santa Monica, Carpinteria, and Gobernador, creeks) have been most recently at risk for debris or mudflow. However, debris flow hazard mapping is not well developed in the City or surrounding County of Santa Barbara with formal mapping confined to these creeks due to the recent 2018 debris flows. In addition, properties located along the base of the Santa Ynez Mountains could also be vulnerable.

Transportation infrastructure is vulnerable to debris flow hazards, where bridges, culverts, and roadways may be washed out or blocked by debris and mud. Highway 101 and SR-192 extend east to west and pass-through areas susceptible to debris flow due to intersecting with multiple drainages from the Santa Ynez Mountains, with this vulnerability demonstrated by severe damage sustained during the January 2018 debris flows following the Thomas Fire. Following the debris flows, a 30-mile section of Highway 101 was closed for 13 days (Robert D Niehaus, Inc 2018). Multiple bridges along SR-192 and Highway 101 were damaged. As such, in the event of mudslide or debris flow, these highways can be vulnerable to damage or destruction.

As discussed in Section 6.3.10, *Wildfire*, in the event of an emergency the county would utilize existing alert systems and the county's website to distribute alerts and emergency updates. However, these channels require prior planning for recipients to already be signed up to receive emergency notifications from the county and have access to a reliable internet connection and/or service provider, leaving populations with limited resources, existing social or economic disparities, language and communication barriers, and distrust of government programs, staff, and officials vulnerable to natural hazards such as mudflows and debris flows. Emergency notification and evacuation efforts may be hindered in Carpinteria where the potential for debris flow within developed communities is greatest.

Figure 6-5. Debris Flow Storm Impact Consideration and Critical Facilities

6.3.3 Liquefaction (Earthquake)

Earthquake-related vulnerabilities within the City were quantified using Hazus and analyzed in Section 6.2.1, *Earthquake (Ground shaking)* above. Vulnerabilities within the City associated with liquefaction, which is often caused by earthquake ground shaking, are discussed below.

As described in Section 5.3.3, *Earthquake and Liquefaction*, the rating of high, moderate, and low hazard is based on the probable depth to groundwater with consideration given to probable soil characteristics. As shown in Figure 6-6, the majority of areas within the City of Carpinteria have a high liquefaction severity class. In particular, low-lying areas of the Cities of Carpinteria that were constructed over historic salt marsh and wetland areas are vulnerable, such as the Beach Neighborhood. High liquefaction vulnerable areas of the City are home to 7,760 residents and are valued at $1,519,375,447. Regional earthquakes could cause liquefaction in the City, which could damage buildings and utilities when soils become unstable.

As listed in Table 6-18, 49 critical facilities in the City would be vulnerable to damage or destruction from liquefaction during a significant regional earthquake (i.e., high liquefaction potential). These critical facilities at risk include facilities related to utilities, wastewater treatment, clinics, emergency response stations, veteran services, education, transportation, and nursing homes. Of those critical facilities, those with the highest building value include a wastewater treatment plant, schools, and a fire station. No critical facilities are located in areas with moderate liquefaction potential and 8 critical facilities are located in areas of the City with low liquefaction potential (see also, Section 6.3.3, *Liquefaction (Earthquake)* of the 2022 MJHMP).

Table 6-18. City of Carpinteria Critical Facilities in High Liquefaction Zones

Type	Critical Facility	Liquefaction Potential	Total Value
Relay Station	Rincon Peak Relay Station	High	$98,226
Utilities	Verizon	High	-
Sub Station	Southern CA Edison - Substation	High	-
Utilities	Sewage Pump Station 7	High	$5,000,000
Utilities	Sewage Pump Station 1	High	$2,000,000
Utilities	Water District Maintenance Building	High	$2,266,000
Utilities	Sewage Pump Station 2	High	$1,500,000
Utilities	Headquarters Well	High	$1,500,000
Utilities	High School Well	High	$1,500,000
Utilities	El Carro Well	High	$1,500,000
Utilities	El Carro Well Filtration Plant	High	$1,500,000
Utilities	Water District Main Office	High	$1,400,000
Utilities	Sewage Pump Station 4	High	$1,000,000
Utilities	High School Well Treatment Plant	High	$800,000
Utilities	Headquarters Well Control Building	High	$700,000
Utilities	Headquarters Well Enclosure	High	$90,000
Wastewater Treatment Plant	Wastewater Treatment Plant	High	$60,000,000

Type	Critical Facility	Liquefaction Potential	Total Value
Clinic	Sansum Clinic-Carpinteria	High	-
Clinic	PHD Carpinteria Clinic	High	-
EMS Station	Carpinteria Summerland – Fire Protection District Station 1	High	-
EMS Station	American Medical Response Station 1	High	-
Nursing Home	Granvida Senior Living and Memory Care	High	-
Veteran Services	Carpinteria Veterans" Memorial Building	High	$1,657,801
Veteran Services	Veterans' Memorial Building	High	-
Education	Carpinteria High School	High	$28,535,898
Education	Carpinteria Middle School	High	$14,366,233
Education	Canalino Elementary	High	$10,583,606
Education	Aliso Elementary	High	$6,457,908
Education	Carpinteria Children's Project at Main	High	$4,360,870
Education	Rincon/Foothill High School	High	$210,720
Education	CUSD District Office	High	-
Education	Carpinteria Family	High	-
Education	Canalino Elementary	High	-
Education	The Howard School	High	-
Fire Station	Carpinteria Fire Station 1	High	$7,150,000
Government	Carpinteria Summerland HQ	High	$60,000
Library	Carpinteria Public Library	High	-
Museum	Carpinteria Valley Museum of History	High	-
Bridge	11 Bridges	High	-
Industrial	Natural Gas Odorant Carpinteria Oil and Gas	Low	-
RMP Facilities	Carpinteria Oil and Gas Plant	Low	-
Colleges / Universities	International Sports Sciences Association	Low	-
Government	City Hall, Sheriff's Substation, Maintenance	Low	$4,436,787
Sheriff	Carpinteria Sheriff's Station	Low	$111,767
Bridge	3 Bridges	Low	-

Figure 6-6. City of Carpinteria Critical Facilities within Liquefaction Severity Zones

6.3.4 Coastal Hazards

As described in Section 5.3.4, *Coastal Hazards*, under current sea levels, shoreline areas of the City are vulnerable to bluff and beach erosion, wave impacts, and flooding of low-lying areas (City of Carpinteria 2019). Beaches buffer the shoreline from erosion, wave attack, and flooding, with beach widths governed primarily by sediment input from coastal streams and storm wave erosion, with beach width varying significantly over time based on these factors. However, outside of areas with historic wetland and dune complexes, such as Carpinteria Beach, South Coast beaches generally consist of a thin layer of sand overlying rocky marine terraces.[1]

Rising sea levels would amplify the damaging effects of coastal hazards. As sea level continues to rise, areas that would have previously only been temporarily flooded or submerged during very high tides or strong storm conditions would begin to be more consistently submerged or inundated by routine high tide inundation.

For example, with approximately 2 feet of sea level rise, more extensive coastal flooding and coastal beach erosion during storms could affect properties, land uses, and infrastructure between both Ash and Linden Avenues north of the Union Pacific Railroad (UPRR), as well as in the Carpinteria State Beach campgrounds. Coastal cliff erosion could continue to impact the UPRR, recreational trails, and habitats along the Carpinteria Bluffs, but not any structures. Coastal flooding may also begin encroaching through the Carpinteria Salt Marsh into the Beach Neighborhood. Routine high tides would largely be confined to existing creek channels and the Carpinteria Salt Marsh; however, during rain events, the increased tide elevations would likely back up stormwater drains and could cause extensive stormwater flooding in low-lying neighborhoods (City of Carpinteria 2019).

With approximately 5 feet of sea level rise, coastal beach erosion could extend through the first row of properties inland of Sandyland Road and begin to affect dwellings and infrastructure in the Concha Loma neighborhood. Coastal flooding during a large storm wave event could expand in depths and extend inland into the Downtown Core along Linden Avenue, affecting portions of the Old Town District inland of the UPRR, Carpinteria Salt Marsh, and areas along Franklin Creek. Coastal cliff erosion could continue to impact the UPRR, recreational trails, and habitats along the Carpinteria Bluffs and potentially impact one commercial structure. Routine monthly high tides could inundate much of the Downtown Beach Neighborhood and Carpinteria State Beach inland to the Tomol Interpretative Park, even in areas not directly connected due to daylighting, or the surfacing, of groundwater due to tidal inundations (City of Carpinteria 2019).

The rate of sea level rise is expected to increase over time due to the effects of climate change and global warming, resulting in increased flooding and erosion hazards along the City's coastal shoreline. The County of Santa Barbara and the City of Carpinteria have both completed sea level rise studies with varying approaches to modeling and associated assumptions. While each of these models is useful for general initial hazard planning purposes and represents the best available tools, all have limitations. As discussed further below, while the best available tools, these limitations

[1] Wildfires and floods can have significant benefits to beach width due potential large volumes of sand from areas creeks reaching the shoreline. For example, historically wide beaches experienced during over a decade the late 1970s and early 1980s along much of the South Coast are thought to have originated from the 1955 Refugio Fire and subsequent heavy rains which left beaches such as Goleta Beach over 400 feet in width (Noble Engineers, 2018). These wide beaches were heavily eroded during the historically severe 1983 El Niño.

may cause the models in some instances potentially to overstate the degree of sea level rise hazard. According to the City's SLRVAAP, 43 acres of land within the City are currently vulnerable to coastal erosion and flooding, and 170 acres are projected to be affected by approximately 5 feet of sea level rise (City of Carpinteria 2019). According to Coastal Storm Modeling System (CoSMoS), a regional model employed in the County's 2017 sea level rise study, by 2030, a 10.2-inch sea level rise and 100-year flood (refer to Section 6.3.1, *Flood*) is projected to inundate 86 acres (5.26 percent) of Carpinteria, particularly within the City's Beach Neighborhood, accounting for 5.26 percent of the City. By 2060, sea level rise is projected to increase to 27.2 inches, inundating 136 acres (8.3 percent) of Carpinteria.

Approximately 131 improved parcels valued at over $79,731,008 and a population of approximately 359 may be at risk to the projected 2030 sea level rise. Under projected 2060 sea level rise conditions, 342 improved parcels valued at $151,092,437 and a population of 918 may also be at risk to coastal hazards from sea level rise (Table 6-19). Damages could be particularly severe within the Beach Neighborhood. Key coastal campgrounds at Carpinteria State Beaches may also all be vulnerable to increased damage.

Table 6-19. City of Carpinteria at Risk to the 2030 and 2060 Sea Level Rise Hazard

Year	Acres	Improved Parcel Count	Total Value	Population
2030	86	131	$79,731,008	359
2060	136	342	$151,092,437	918

The City's SLRVAAP identifies 79 residential structures as vulnerable to damage and flooding from coastal hazards; an additional 164 residential structures become vulnerable with approximately 1 foot of sea level rise, 234 additional residential structures become vulnerable with approximately 2 feet of sea level rise, and 264 additional residential structures become vulnerable with approximately 5 feet of sea level rise, for a total of 769 residential structures (Table 6-20; City of Carpinteria 2019). As described in Section 6.3.1, *Flood*, sea level rise is anticipated to result in repetitive loss to at least a portion of these structures.

Table 6-20. City of Carpinteria Parcels at Risk to Sea Level Rise Hazard in SLRVAAP by Land Use

Sea Level Rise	Residential	Commercial and Mixed Use	Industrial	Open Space & Recreational	Public Facilities
Existing	79	1	1	42	3
~1 foot	164	1	3	4	1
~2 feet	234	3	2	5	3
~5 feet	292	16	4	8	2
Total	**579**	**20**	**10**	**59**	**9**

Source: City of Carpinteria 2019.

Figure 6-7. City of Carpinteria Critical Facilities and Sea Level Rise Projections Tidal Inundations: No Flood Event

Figure 6-8. City of Carpinteria Critical Facilities and Sea Level Rise Projections Tidal Inundations: 100-Year Flood Event

However, this vulnerability assessment is based on long-term regional models that cannot reflect the mitigating effects of local conditions such as revetments, sand elevations, beach profiles, the distance of structures from the shoreline, and the construction of structures that may be able to better withstand coastal hazards. Damage from sea level rise can be substantially affected by location and elevation, the presence of hard structures or revetments, and intervening structures between the facility and the shoreline. For example, while the City of Carpinteria's 2019 SLRVAAP projects substantial flooding inland through the Carpinteria Salt Marsh, the model employed could not account for the presence of 16-foot-high rock revetments fronting most of the Marsh which constrict tidal influx and projected inland tidal flooding passage to the 100-foot-wide Santa Monica Creek ocean outlet. Similar modeling limitations may apply to the projected extent and depth of flooding of Carpinteria's Beach Neighborhood (City of Carpinteria 2019).

A sand retention wall originally constructed in 1977 fronts the Carpinteria Shores apartments, and small portions of revetment are located at the base of Casitas Pier and under the Carpinteria Bluffs. Tar Pits Park, Carpinteria State Beach, and a portion of San Miguel Campground also have a small amount of shoreline protection. The protective features at San Miguel Campground consist of materials used as part of the former burn dump site and were installed in fall 2013 under a Development Plan and Coastal Development Permits issued by the City. The City was also recently awarded grant funding to create the Dune and Shoreline Management Plan, which includes developing several options for a living shoreline. The purpose of this project is to plan for a living shoreline dune system that will protect the shoreline and landward infrastructure against coastal hazards and future sea level rise.

While there are currently minimal shoreline revetments within the City, the City experiences some impacts to Carpinteria City Beach at Ash Avenue as a result of the Sandyland Revetment. In particular, an erosion hotspot has been identified at Ash Avenue located at the end of the Sandyland Revetment within the City jurisdiction. Presently, approximately 10 to 15 feet (>1 percent) of the approximately 2,800-foot-long rock revetment is placed on the City Beach within City jurisdiction. This small segment interacts with waves during most high tides in the winter. This wave and revetment interaction causes accelerating erosion and is increasing the alongshore current velocities and scour potential along the revetment on Carpinteria City Beach (City of Carpinteria 2019).

The County's model shows that while none of the City's critical facilities are at risk of becoming periodically or more frequently inundated and exposed to repeated damage by sea level rise by 2030, one facility (the American Medical Response Station 1) is at risk of damage by sea level rise by 2060 (Table 6-21) (see also, Section 6.3.6, *Coastal Hazards* of the 2022 MJHMP).

Table 6-21. City of Carpinteria Critical Facilities at Risk to Sea Level Rise

Year	FEMA Lifeline	Type	Critical Facility	Address	Total Value
2030	-	-	-	-	-
2060	Health and Medial	EMS Station	American Medical Response Station 1	4235 Carpinteria Ave	-

One of the City's most important infrastructure challenges associated with sea level rise is the need for efficient rapid drainage of storm water; however, the City's existing storm drain system lacks the elevation requirements necessary for a gravity-flow system to accommodate current and projected storm events. Within the Beach Neighborhood, some storm drains are located down-gradient from outfall locations, at a lower elevation than necessary for gravity flow, which is a problem that becomes exacerbated during high tide storm events when outfalls can be inundated. Presently, the existing infrastructure is not always able to accommodate all storm water flow, which can flood portions of the Beach Neighborhood and Downtown. As sea levels rise, greater portions of the system may not drain during high tides and during more of the tide cycle, which in turn may increase storm water flood depths and frequency. Culverts and pipes may also create back flows of ocean water into the neighborhoods. Ash Avenue and Linden Field experience tidal inundation with areas of ponded flood waters from rainfall event storm water runoff. For the City, the storm water infrastructure that is vulnerable to coastal hazards includes approximately 6 outlets, 3 outfalls, and 1 mile of storm drains, which would likely require a moderately sized storm water infrastructure installation. Additionally, storm water is not diverted to the Carpinteria Wastewater Treatment Plant for treatment and no pumps exist to convey storm water (City of Carpinteria 2019).

6.3.5 Pandemic/Public Health Emergency

The City of Carpinteria, as well as the state, nation, and the entire world, is vulnerable to outbreaks, epidemics, and pandemics caused by either newly emerging or existing diseases spread person to person, through a vector such as a mosquito, or both. A significant public health emergency can have a considerable impact on the population, the economy, and essential public services (e.g., fire and police protection, medical services, etc.).

Populations identified by the county as especially vulnerable to human health hazards include undocumented persons, senior citizens, senior citizens living alone, persons with existing chronic health conditions, persons experiencing homelessness, overcrowded households and neighborhoods, low-resourced ethnic minorities people of color, households in poverty, communities with a high-pollution burden (Santa Barbara County Planning and Development Department 2021). Undocumented or non-English speaking individuals may be less able to understand such pandemic-related instructions or receptive to responding to government outreach, while lower-income households may lack the means to comply with the direction. Trends of the COVID-19 pandemic further revealed vulnerable groups within Santa Barbara County population and how such public health emergencies have the potential to affect the local economy. For example, COVID-19 disproportionately impacted the county's Hispanic/Latino population. While Hispanics/Latinos accounted for 48 percent of Santa Barbara County's population they represented 59 percent of COVID-19 cases and 63 percent of hospitalizations (Santa Barbara County Public Health Department 2022). In contrast, Whites represented 17 percent of cases while accounting for 43 percent of the population (Santa Barbara County Public Health Department 2022). While Whites made up 43 percent of deaths, many of these deaths occurred at skilled nursing homes and other congregate care settings, which have been highly impacted by the pandemic. As described in Section 5.3.5, *Pandemic/Public Health Emergency*, the County Public Health Department tracks the number of cases in the City along with the South County unincorporated areas of Montecito and Summerland. This region has reported a total of 3,207 confirmed COVID-19 cases and 28 deaths (Santa Barbara County Public Health Department 2022).

The data found that working-age adults (18 to 49 years) had the highest proportion of cases, with 20 year-olds being the 10-year age group with the most common cases (Santa Barbara County Public Health Department 2022). Many of these younger adults likely make up a large proportion of students and workers in frontline occupations and highly exposed industries, putting them at greater risk of contracting the virus. The COVID-19 pandemic also presented a major strain on the Santa Barbara County healthcare system due to hospitalizations of primarily the 50-69 and 70+ year-olds age groups (33 percent and 30 percent, respectively, of hospitalizations countywide) (refer to Section 6.5.1 of the MJHMP).

The arrival of the COVID-19 pandemic led to unprecedented nationwide economic restrictions and shutdowns. According to the 2021 Carpinteria Valley Economic Profile, over 700 jobs were lost in the Carpinteria Valley labor market in 2020 due to the COVID-19 pandemic. By mid-2021, most of these jobs had been restored, and full reinstatement of the workforce is expected to be complete by mid-2022 (City of Carpinteria 2021a). During 2020, the most prominent job losses were observed in two industries – Information Services and Accommodation and Food Services (i.e., hotels, restaurants, caterers, and bars). The largest pandemic-related impact on employment in the Carpinteria Valley occurred in the hotels and restaurants. Job counts in Accommodation and Food Services declined sharply in 2020 as restaurants were forced to suspend in-person dining, bars were ordered to cease operations completely, hotels were subjected to a huge decline in demand, and caterers were impacted by the cancelation of live events. However, very few restaurants closed during the pandemic, and the Accommodation and Food Services sector began rapid recovery since the state opened up entirely in June 2021 (City of Carpinteria 2021a).

Additionally, as described in Section 5.3.22, the Carpinteria Valley Mosquito Abatement District monitors the estuary for mosquitoes during the rainy season and treats various sites to reduce or eliminate the native mosquito species, which can carry malaria (e.g., *Anopheles sp.*), or encephalitis (e.g., *Culex sp.*).

6.3.6 Energy Shortage & Resiliency

Energy disruptions are considered a form of lifeline system failure. Electricity service is also highly vulnerable because it is highly dependent on electrical transmission lines and substations functioning properly. Much of the City's electrical lines are located in areas at risk for hazards (e.g., in high fire risk and flood hazard areas). For example, most of the electrical transmission lines that serve the City run through the Santa Ynez Mountains, making them susceptible to service disruption in the event of a wildfire or landslide (Santa Barbara County Planning and Development Department 2021).

As described in Section 5.3.6, *Energy Shortage & Resiliency*, since the entire City is served by SCE, a major interruption of service in the South Coast planning region could result in all service within the City likely being denied. If this existing transmission network were to be disrupted, metered customers would face extended blackouts, preventing the use of critical services such as electric medical devices, traffic lights, retail businesses, grocery stores, gas stations, ATMs, and banks. Power outages and communication system failures can directly harm the economy, government operations, public safety, and hinder recovery efforts. Transportation may also be disrupted during a power outage for Amtrak as well as populations that use electric vehicles and therefore rely on electric vehicle charging stations.

Additionally, the City is vulnerable to power outages during PSPS, which would occur when Southern California Edison (SCE) shuts off the electric power to protect public safety during extreme weather conditions (refer to Section 6.3.8, *Extreme Heat/Freeze* and Section 6.3.19, *Windstorm*). In extreme heat conditions, increases in air conditioning use can stress and overload the grid, causing power outages and potential damage to electricity transmission lines and substations. During severe wind events, electricity transmission lines can be damaged or turned off by SCE, causing widespread power outages and hardships for City residents. During a PSPS, all customers serviced by an affected power line would have their power shut off, and such power outages could last multiple days depending on the severity of the weather and other factors (e.g., wildfire risk).

As climate change increases the frequency and intensity of related wildfire and weather hazards, energy disruptions are likely to occur more frequently and last longer. Predicted increases in heatwaves, as well as increasingly severe winter storms, would put greater strain on SCE energy facilities throughout the City.

6.3.7 Drought & Water Shortage

Prolonged droughts can deplete regional surface water storage and decrease groundwater recharge, affecting two primary water sources for the Carpinteria Valley Water District (CVWD), the potable water purveyor for the Carpinteria community. Locally, drought can impact water reservoirs included in the Cachuma Project, particularly Lake Cachuma, from which CVWD receives the majority of its surface water supplies. As of November 9, 2021, Cachuma Reservoir, a key water supply for the entire South Coast, was reported to be at 48.1 percent capacity (refer to Table 5-6 of the MJHMP) (County Flood Control 2021).

Droughts can impact the level of water supplies that the City has for drinking water, fire-fighting purposes, and the agriculture industry. Income-constrained communities within the City may struggle to pay for increased water utility bills that may occur during drought or a continuing climate crisis (Santa Barbara County Planning and Development Department 2021).

Drought can also have many secondary impacts. For example, drought is a major contributor to increased wildfire hazards, in that it creates a greater propensity for fire starts and larger, more prolonged conflagrations fueled by excessively dry vegetation, along with reduced water supply for firefighting purposes. See Section 6.3.10, *Wildfire* for greater detail on vulnerability to wildfire risk. During droughts, overdraft (when groundwater recharge cannot keep up with groundwater extraction) of the Carpinteria Groundwater Basin can occur. While sustained groundwater overdraft is related to long-term trends in the balance between groundwater withdrawals and recharge, droughts increase demand on groundwater basins while decreasing or even eliminating recharges and replenishment, sometimes for multiple years. Such droughts can delay the recovery of groundwater basins even during wet years and cause problems such as declines in water quality, drying of surface creeks and wetlands, etc. As described in Section 5.3.7, *Drought & Water Shortage*, the Carpinteria Groundwater Basin is identified as High or Medium priority basins subject to critical conditions of overdraft (refer to Figure 5-6 of the MJHMP; California Department of Water Resources [DWR] 2021a). Groundwater overdraft often leads to subsidence, the lowering of the land-surface elevation (see Section 6.3.18, *Geologic Hazards*). Drought can also prevent dams and wastewater infrastructure from functioning properly. Without rainfall and river flow during periods of drought, beach sediments are not replenished, making beaches smaller and more

vulnerable to coastal hazards related to sea level rise (refer to Section 6.3.4, *Coastal Hazards*) (USGS 2017).

Climate change has the potential to make drought events more common in the City of Carpinteria (DWR 2021c). Extreme heat creates conditions more conducive for the evaporation of moisture from the ground, increasing the possibility of drought and affecting both CVWD's local surface water supplies and groundwater recharge. As described in Section 5.3.7, *Drought & Water Shortages*, changing precipitation patterns are anticipated to increase the severity of episodic severe storms; however, droughts would likely last longer and happen more frequently because of more variability in precipitation extremes (Santa Barbara County Planning and Development Department 2021).

As described in Section 5.3.7, *Drought & Water Shortage*, CVWD uses a six-stage rationing plan during declared water supply shortages that include voluntary and mandatory rationing, depending on the causes, severity, and anticipated duration of the shortage (refer to Table 5-5). To address potential water shortages in the future, CVWD is planning for future additional water supplies such as potable reuse via the Carpinteria Advanced Purification Project (CAPP). The CAPP will produce advanced treated recycled water that will be injected into the Carpinteria Groundwater Basin to be stored and later extracted to meet potable demands. The CAPP is expected to begin delivering water in 2026, and produce approximately 1,000 acre-feet per year (AFY) of reliable, drought-proof local supply.

6.3.8 Extreme Heat/Freeze

As described in Section 5.3.8, *Extreme Heat/Freeze*, coastal communities, such as the City, have lower temperatures on average compared to communities in the inland areas of the county and could be less at risk to extreme temperatures. Although temperatures are lower in coastal areas, it is still dangerous when temperatures are higher than usual because people are potentially less acclimatized to high temperatures if they occur and may not have the resources to cope with extreme temperatures (Santa Barbara County Planning and Development Department 2021). For example, people may be less aware of the behaviors that can reduce exposure (e.g., reduce activity level or go to an air-conditioned location) or reduce physiologic stress (e.g., appropriate hydration), and the built environment may not be designed for extreme heat or freeze conditions (e.g., homes, workplaces, and institutions are less often equipped with air conditioning or it is inadequate for extreme or prolonged heat events). Even in areas equipped with air conditioning, the increased use of air conditioners during heat waves (or heaters during extreme cold events) may overload demands for electricity and lead to power outages, which presents health concerns to individuals outside in the temperatures. Electrical power outages may impact response capabilities or care capabilities for hospitals and clinics in the City. Critical infrastructure such as water pumping stations that rely on public utility systems could also be overloaded and may result in impacts during extreme heat events.

While extreme heat rarely damages buildings, both extreme heat and freeze can cause damage to utility and transportation infrastructure. Water infrastructure is at risk from freezing during extreme cold events, including line breaks and frozen valve gates affecting the water distribution system. The City wraps pipes before freezing temperature events to help prevent damage. Both

extreme heat and freeze can also impact transportation conditions through increased wear and stress on asphalt roads and bridges. Exposed populations may be at risk while waiting for public transportation, particularly when combined with wind-chill, and some vehicles may not start, which impacts the commute of the workforce and, in worst-case scenarios, the movement of emergency services personnel.

The elderly, children, people in poor physical health, and the homeless are also vulnerable to exposure. However, any populations working or recreating outdoors during periods of extreme cold or heat are exposed, including otherwise young and healthy adults and homeless populations. Extreme heat poses the greatest danger for Carpinteria Valley's outdoor laborers who support the City's agriculture economy. Exertional heat illness also occurs in the following industries and occupations: construction, firefighting, warehousing, delivery, and service work.

Although infrequent in the City, prolonged freezing temperatures can damage or destroy crops, affecting the economy and agricultural jobs in Carpinteria Valley. Freezing temperatures occurring during winter and spring growing seasons can cause extensive crop damage, impacting farmers and potentially causing significant increases in food prices to the consumer due to shortages. Freezing spells are likely to become less frequent as climate temperatures increase.

6.3.9 Dam Failure

Vulnerability to dam failures is confined to the areas and populations subject to inundation downstream of the facility. As described in Section 5.3.9, *Dam Failure*, there are two dams in the City of Carpinteria: Santa Monica Debris Basin and Carpinteria Dam. Based on dam inundation data from the County, DWR, and National Inventory of Dams, failure of Santa Monica Debris Basin would inundate portions of the City, as well as Highway 101 and SR-192, with little evacuation time (Figure 6-9).

The City could be affected by dam failure from the Santa Monica Debris Basin/Dam, located on Santa Monica Creek, 2.3 miles north of the ocean. Any critical asset located under the dam in an inundation area would be susceptible to the impacts of a dam failure. Of particular risk would be roads and bridges that could be vulnerable to washouts, further complicating response and recovery opportunities by cutting off impacted areas. The City of Carpinteria area has 358 parcels, which are home to 3 residents and are valued at $156,637,957 within the dam inundation zone for the Santa Monica Debris Basin (Table 6-22).

Table 6-22. City of Carpinteria at Risk to Dam Inundation Hazard

Improved Parcel Count	Improved Value	Estimated Content Value	Total Value	Population
358	$103,183,093	$53,454,864	$156,637,957	3

Figure 6-9. City of Carpinteria Critical Facilities and Dam Failure Inundation Areas

As listed in Table 6-23, there are nine critical facilities within the dam inundation zones. These facilities include the CVWD Maintenance Building and Headquarters Well, a sewage pump station, a medical station, Aliso Elementary School, and two bridges (Figure 6-9; see also, Section 6.6.3, *Dam Failure* of the 2022 MJHMP). All of these facilities would be affected by a failure of the Santa Monica Debris Basin.

Table 6-23. City of Carpinteria Critical Facilities at Risk to Dam Inundation Hazard

Type	Critical Facility	Dam Name	Total Value
Utilities	Water District Maintenance Building	Santa Monica Debris Basin	$1,500,000
Utilities	Sewage Pump Station 2	Santa Monica Debris Basin	$6,457,908
Utilities	Headquarters Well	Santa Monica Debris Basin	-
Utilities	Headquarters Well Control Building	Santa Monica Debris Basin	-
Utilities	Headquarters Well Enclosure	Santa Monica Debris Basin	-
EMS Station	American Medical Response Station 1	Santa Monica Debris Basin	-
Education	Aliso Elementary	Santa Monica Debris Basin	-
Bridge	2 Bridges	Santa Monica Debris Basin	-

The Santa Monica Debris Basin has a history of becoming plugged with debris. While debris is cleaned out regularly, it could pose a problem if storms arrive in rapid succession without time for the required maintenance. An Emergency Action Plan for the Santa Monica Debris Basin is maintained by Santa Barbara County Flood Control (City of Carpinteria 2014).

6.3.10 Wildfire

The county has extensive areas within mapped Fire Hazard Severity Zones and Wildland-Urban Interface (WUI) areas. These hazard areas generate vulnerability for life and structures, particularly within rural foothills areas where dry vegetation, steep slopes, and difficult access combine to create a high probability of wildfire. Based on these maps, the City has 1 acre (0.07 percent) within Very High Wildfire Threat areas, 35 acres (2.12 percent) within High Wildfire Threat areas, 148 acres (9.04 percent) within Moderate Wildfire Threat areas, and 8 acres (0.49 percent) within Low Wildfire Threat areas (Table 6-24).

Table 6-24. City of Carpinteria Fire Threat

Threat Level	Fire Threat Acres	Total Acres	Percent
Extreme Wildfire Threat	None	None	0%
Very High Wildfire Threat	1	1,643	0.07%
High Wildfire Threat	35	1,643	2.12%
Moderate Wildfire Threat	148	1,643	9.04%
Low Wildfire Threat	8	1,643	0.49%

Most of these areas are residential with limited vulnerabilities in commercial and agricultural areas. There are 47 residential properties and one industrial property located in High fire threat zones in the City of Carpinteria. Additionally, 80 residential, two agricultural, and one commercial properties in the City of Carpinteria are located in Moderate fire threat zones. These vulnerable areas are home to 425 residents and are valued at $88,753,343. None of the City's critical facilities fall within wildfire threat areas (see also, Section 6.3.1, *Wildfire* of the 2022 MJHMP).

Figure 6-10 depicts the location of the City's critical facilities relative to Fire Hazard Severity Zones. Figure 6-11 depicts critical facilities and WUI Zones within the City. Figure 6-12 depicts critical facilities and Fire Threat within the City.

Further, as indicated by Figure 4-1 of the MJHMP, emergency access and evacuation can be constrained in hillside neighborhoods and rural communities where limited ingress and egress can slow and prevent the efficient movement of people and vehicles. This is particularly true in denser communities with larger populations served by narrow local roads. During an evacuation, additional residents would depend on the existing roadway network to flee and emergency responders would have additional residents to protect and serve. Highway 101 is the only freeway evacuation route in the City of Carpinteria. Casitas Pass and Santa Monica Road lead north to Foothill Road, which serves as an alternate evacuation highway if Highway 101 closes from mudslide or fire disasters.

In the event of a wildfire, real-time emergency and disaster information for large-scale incidents is provided on the County's Ready Santa Barbara County website (see also, Chapter 4, C*ommunity Profile and Capability Assessment* of the MJHMP). However, access to this information requires an accessible and reliable internet connection and/or service provider. Further, during immediately threatening events, the Carpinteria-Summerland Fire Protection District (CSFPD) and Santa Barbara County Sheriff's Office may send emergency alerts and press release information through its Nixle alert system. Such systems are only effective if City residents are already signed up to receive alerts. This leaves populations with limited resources, existing social or economic disparities, language and communication barriers, and distrust of government programs, staff, and officials vulnerable.

Figure 6-10. Critical Facilities in Fire Hazard Severity Zones

Figure 6-11. Critical Facilities in Wildland Urban Interface (WUI)

Figure 6-12. Critical Facilities in Fire Threat Zones

6.3.11 Tsunami

The University of Southern California Tsunami Research Group has modeled areas in Santa Barbara County that could potentially be inundated in the event of a tsunami. This model is based on potential earthquake sources and hypothetical extreme undersea, near-shore landslide sources were mapped and used to profile maximum potential exposure. The data was mapped by the California Geological Survey and California Office of Emergency Services (Cal OES) for Tsunami Evacuation Planning (Figure 6-13). As shown in this figure, much of the City's coastline and beaches are considered within tsunami hazard areas and threaten critical facilities and infrastructure within the City.

Areas of the City vulnerable to tsunami inundation are home to 2,332 residents and are valued at $405,364,480. These properties are primarily residential, with limited commercial and industrial uses.

Critical facilities were compared against the extreme tsunami inundation zone overlay to see whether they fall within the geographic extent of the hazard. Based on the GIS mapping, 10 Carpinteria critical facilities fall within the tsunami risk area, of which six facilities are bridges (Table 6-25). Other facilities within the tsunami hazard zone include critical infrastructures, specifically, two sewage pump stations. A medical station and Aliso Elementary School are also at risk for tsunami inundation. Together, these 10 facilities have an estimated structure value of over $9.9 million (Figure 6-13; see also, Section 6.3.9, *Tsunami* of the 2022 MJHMP).

Table 6-25. City of Carpinteria Critical Facilities in Tsunami Inundation Zone

Type	Name	Total Value
Utilities	Sewage Pump Station 2	$1,500,000
EMS Station	American Medical Response Station 1	$6,457,908
Education	Aliso Elementary	-
Bridge	6 Bridges	-

Figure 6-13. City of Carpinteria Critical Facilities and Tsunami Inundation Areas

6.3.12 Cyber Threat

In the event of a significant cyber-attack event, there could be a considerable impact on the population, built environment, lifeline infrastructure, environment, and the economy. A cyber threat can infiltrate many institutions including banking, medical, education, government, military, and communication and infrastructure systems. Cyber-attacks generated toward large corporations can negatively affect the economy. Attacks geared toward critical infrastructure and hospitals can result in the loss of life and the loss of basic needs, such as power and water, to the general public. Cyber-attacks can also lead to the loss of operational capacity.

The county provides the public with online guidance to avoid cyber risks and cyber-attacks on personal information, such as keeping software applications and operating systems up to date and limiting the personal information you share online (Ready 2021). Humans are the weakest link in a chain of cyber security; it remains difficult to continuously monitor and manage human/operator vulnerability. However, to address this weakness it is suggested that the City continues or develops a security training program which all employees are required to complete or renew annually.

6.3.13 Natural Gas Pipeline Rupture

No history of major natural gas pipeline or storage facility incidents have occurred in the City; although a minor rupture has occurred along the 20-inch high-pressure gas transmission line (600 pounds per square inch [psi]). It can be assumed that any facility near a natural gas transmission pipeline is at risk. This risk is heightened if the facility is also located in an area of high seismicity, where multiple gas line failures and resulting fires can be expected (Cal OES 2018).

Compounding the potential risk is the age and gradual deterioration of the gas transmission system due to natural causes. Significant failure, including pipe breaks and explosions, can result in loss of life, injury, property damage, and environmental impacts. Causes of and contributors to pipeline failures include construction errors, material defects, internal and external corrosion, operational errors, control system malfunctions, outside force damage, subsidence, and seismicity. Growth in population, urbanization, and land development near transmission pipelines, together with the addition of new facilities to meet new demands, may increase the likelihood of pipeline damage due to human activity and the exposure of people and property to pipeline failures (Cal OES 2018).

As described in Section 5.3.13, gas odorization facilities in the City, including the Carpinteria Natural Gas Odorant and Metering Facility and Pitas Point Facility, are no longer operating and are planned for decommissioning and removal by the Southern California Gas Company (SoCal Gas) in in the next 10 years.

6.3.14 Oil Spill

As described in Section 5.3.14, oil spills can be caused by people making mistakes or being careless, by equipment breaking down, by natural disasters, and by deliberate acts of terrorism, vandals, or illegal dumpers. Depending on the origin, size, and duration of the release, an oil spill can have serious impacts on air and water quality, public health, plant and animal habitat, and biological resources. Spill clean-up and remediation activities may cost millions of dollars and impacts can last for years (Cal OES 2018).

Since the close of operations at the Carpinteria Oil and Gas Processing Facility in 2017, the risk of onshore oil spill in the City has been significantly reduced. However, oil spills originating from offshore oil platforms can create devastating and significant impacts on the economy and natural environment of the City. During an oil spill, the oil floats on saltwater and often floats on freshwater. Depending on the type of oil, oil can sink in freshwater but usually, oil spreads out across a large area. Onshore oil spills result in similar impacts to surface waters, habitats, and wildlife. The environmental impacts from oil spills contribute to short- and long-term impacts on economic activities in areas affected by oil spills. Tourism may decline in the City, resulting in economic hardship on individuals that are dependent on those industries for their livelihood and on the economic health of the community. Oil spills may also impact recreational uses such as camping, non-commercial fishing, and beach visits (Cal OES 2018).

Wetlands, marshes, and other sensitive habitats, such as the Carpinteria Salt Marsh and the Carpinteria Seal Sanctuary, are especially at risk for long-term significant impacts of oil spills. Marshes and wetlands provide critical habitat to a diverse range of species, including migratory birds and endangered plants and animals. Once oil enters a marsh below sediment levels it becomes near impossible to remove and has longstanding impacts on wildlife and ecosystems.

The California Department of Fish and Wildlife (CDFW) Office of Spill Prevention and Response (Oiled Wildlife Division) treats countless thousands of oiled birds and other wildlife annually (Cal OES 2018).

6.3.15 Train Accident

As described in Section 5.3.15, trains running through the City, and near Highway 101 in some areas, carry commuters as well as commodities, such as hazardous materials and fuel (including oil). Train accidents are generally localized, and the incidents result in limited impacts at the community level. However, a hazardous material incident on rails or roadways in the City has the potential to damage and destroy habitat and built structures, harm people and wildlife, and shut down both rail and highway transportation routes where the rail line and Highway 101 are nearby. Secondary impacts related to train accidents may include the shutdown of rail transportation and associated effects on commuting, transportation of goods, and the regional economy.

The risk of train accidents in the City is limited to areas immediately surrounding Amtrak's Pacific Surfliner and Coast Starlight routes. Within the City, both of these routes hug the Pacific Coastline. The routes also run proximate to Highway 101 at the northwest and southeast corners of the City. As described in Section 6.3.4, *Coastal Hazards*, the railroad alignment along the Carpinteria Bluffs is highly vulnerable to coastal erosion. For example, with approximately 5 feet of sea level rise,

up to 1.4 miles of the UPRR could be damaged. This vulnerability may lead to pressure to repair existing seawalls or armor a significant portion of the City's shoreline, which could further impact coastal access, beach habitats, and sand supply. Coastal flooding could also impact the railroad in other parts of the City north of the Carpinteria Salt Marsh and in the City's Downtown core. Disruption of the railroad could have substantial economic impacts on the region (City of Carpinteria 2019).

6.3.16 Landslide

As described in Section 5.3.16, *Landslides*, landslides are most common on steep slopes made of loose soil and other material such as those found in North County and the South Coast, but they can also happen on shallower slopes. Landside susceptibility areas and the location of critical facilities are depicted in Figure 6-14.

Table 6-26 below summarizes the total exposure of properties in areas of the City at risk for landslide hazards. As shown therein, the City has 132 improved parcels valued at $128,827,530 and a population of approximately 318 at risk of landslide hazards. The majority of these properties are located at the base of the foothills just south of the Santa Ynez Mountains.

Table 6-26. City of Carpinteria at Risk to Landslide Hazard

Total Improved Parcel Count	Total Value	Population
132	$128,827,530	318

As listed in Table 6-27, two critical facilities in the City would be vulnerable to damage or destruction from landslides, including Rincon/Foothill High School and a bridge (Figure 6-14; see also, Section 6.3.7, *Landslide* of the 2022 MJHMP). Both of these critical facilities are located in the northern portion of the City at the base of the foothills just south of the Santa Ynez Mountains. All facilities not shown fall into the low-risk category.

Table 6-27. City of Carpinteria Critical Facilities in Landslide Zones

Type	Critical Facility	Landslide Severity Class	Total Value
Education	Rincon/Foothill High School	7	$210,720
Bridge	Bridge	7	-

If the Rincon/Foothill High School was damaged by landslides the facility would be unable to serve as a temporary community shelter to support emergency response and, if damaged while occupied by faculty, staff, or students, human life could be endangered. If the bridge is damaged by landslides, fire and emergency medical response or evacuation efforts in the area may be delayed.

Figure 6-14. City of Carpinteria Critical Facilities and Landslide Incidence

6.3.17 Hazardous Materials Release

As described in Section 5.3.17, *Hazardous Materials Release*, the release of hazardous materials into the environment can cause a multitude of problems for the population, built environment, lifeline infrastructure, environment, and the economy. The impact of a fixed hazardous facility, such as a chemical processing facility is typically localized to the property where the incident occurs. The impact of a small spill (i.e., liquid spill) may also be limited to the extent of the spill and remediated if needed.

While hazardous material incidents could take place anywhere across the City and could be unpredictable, higher risk areas include transportation-related infrastructure, such as roadways and railways, as well as areas within a half-mile in either direction of designated hazardous materials routes or hazardous waste treatment, storage, and disposal facilities. The locations and identity of facilities that store hazardous materials are reported to local and federal governments. Many facilities have their own hazardous materials guides and response plans, including transportation companies that transport hazardous materials. As shown in Figure 5-13, hazardous material sites in the City include the former Camarillo Auto Repair and former Carpinteria Oil and Gas Facility. However, because both these facilities are no longer operating, the risk of a hazardous material incident that could result in the release of hazardous materials affecting surrounding communities is low.

Hazardous material incidents can cause long-term traffic delays and road closures resulting in major delays in the movement of goods and services. These incidents would be more severe if they result in traffic delays on road closures on any of the designated truck routes or hazardous materials routes in the City, such as Highway 101. The primary economic impact of hazardous material incidents results in lost business, delayed deliveries, property damage, and potential contamination. Large and publicized hazardous material-related events can deter tourists and recreationists too. In addition, agricultural farm workers are most vulnerable to pesticide exposure and other hazardous material incidents associated with the agricultural operation.

Communities can be at risk if a chemical is used unsafely or released in harmful amounts into the environment. For example, a toxic spill or a release of an airborne chemical near a populated area can lead to significant evacuations and have a high potential for loss of life.

6.3.18 Geologic Hazards

As described in Section 5.3.18, *Geologic Hazards*, geologic hazards in the City include land subsidence, inland erosion, and expansive soils. However, instances of erosion within the City are primarily limited to coastal erosion along the exposed sea cliffs of the City. Vulnerabilities to coastal erosion are described in Section 6.3.4, *Coastal Hazards*. Earthquake-induced liquefaction vulnerabilities are discussed in Section 6.3.3, *Liquefaction (Earthquake)*. Therefore, the discussion below is limited to vulnerabilities from expansive soils and land subsidence. While these hazards often result in severe property damage, they typically do not present risks to human life.

While expansive soils are present in the City and areas of potentially highly expansive soil are limited to the western portion of the City and the El Estero salt marsh to the south, expansive soils are not identified as a major hazard. Policies outlined in the General Plan describe development

on areas identified as having a high potential for expansive soils require recommendations by a qualified geotechnical engineer to be integrated into project design (City of Carpinteria 2003).

As described in Section 5.3.18, *Geologic Hazards*, no vertical displacement (subsidence) has been measured for the Carpinteria Groundwater Basin, which underlies the City of Carpinteria. The lack of detailed data on land subsidence in the City makes it difficult to quantify potential losses. Most subsidence instances result in relatively minor damage and settling of buildings. Linear infrastructure (e.g., roads and bridges, water and sewer lines, pipelines) tends to have the most risk to land subsidence.

Typically, there is little impact on the natural environment from land subsidence. However, subsidence events can disrupt and alter the flow of surface or underground water, an impact that may not be noticed until long after the fact. However, the City's General Plan and Local Coastal Plan identify the potential for subsidence in the City is considered minimal, as no recognized subsidence has occurred within the City due to either groundwater or soil extraction (City of Carpinteria 2003).

Severe land subsidence can also reduce the future capacity of aquifers. For example, land subsidence is caused by loss of support underground, which can result from an overdraft of groundwater supplies (National Oceanic and Atmospheric Administration [NOAA] 2021b). Furthermore, soil compaction resulting from subsidence can permanently reduce aquafer capacity, impacting water supplies long into the future. Therefore, increased water pumping resulting from new development or increased agricultural production has the potential to increase the frequency and severity of subsidence. Increased efforts to monitor and manage groundwater pumping, increased accuracy of mapping, and emphasis on appropriate grading and ground compaction during development would help alleviate vulnerability for future development in unknown areas of risk. Further discussion of water storage loss can be found in Section 6.3.7, *Drought & Water Shortage*.

6.3.19 Windstorm

Severe winds, especially sundowner winds, can directly impact the City by damaging or destroying buildings, knocking over trees, and damaging power lines and electrical equipment (Santa Barbara County Planning and Development Department 2021). Secondary impacts of damage caused by wind events often result from damage to communication, transportation, or medical infrastructure. During severe wind events in and near the City, electricity transmission lines can be damaged or turned off by SCE, causing widespread power outages and hardships for City residents. Severe winds, particularly on steep slopes, can also damage communication facilities (Santa Barbara County Planning and Development Department 2021). Downed power and communications transmission lines, coupled with disruptions to transportation, create difficulties in reporting and responding to emergencies.

High winds can also cause severe indirect impacts by sparking wildfires and spreading them quickly over the terrain (Santa Barbara County Planning and Development Department 2021). The effects of wildfire on population, built environment, lifeline infrastructure, and the economy in the City of Carpinteria are further discussed in Section 6.3.10, *Wildfire*. Windstorms can also damage or destroy crops, affecting the economy and agricultural jobs in the Carpinteria Valley.

Vulnerable groups of the community are especially exposed to the indirect impacts of high winds, particularly the loss of electrical power. These populations include the elderly or disabled, especially those with medical needs and treatments dependent on electricity. Nursing homes, community-based residential facilities, and other special needs housing facilities are also vulnerable if electrical outages are prolonged since backup power generally operates only minimal functions for a short period.

6.3.20 Civil Disturbance

As described in Section 5.3.20, *Civil Disturbance*, the county has been historically vulnerable to some degree of civil disturbance unrest, particularly within the densely populated college community of Isla Vista and within larger cities surrounding the City of Carpinteria. However, there is no history of significant civil disturbance incidents in the City. Recently, the City has seen a rise in protests and demonstrations for social change (e.g., anti-racism, anti-vaccines for children), indicating that this type of civil disturbance may occur in the future. While these protests themselves are peaceful, they can be followed by sporadic post-demonstration vandalism (e.g., spray-painting buildings) (The Independent 2020).

Serious civil disturbances can be triggered by national or international events, or potentially local events that cause high levels of community concern. Based on historical occurrences, the City of Carpinteria's vulnerability to the potential for such civil disturbances is low.

Climate change may also result in increased civil disturbance over competition for natural resources. In this county, climate change-induced water shortages may increase competition for water between urban and agricultural users or between farming and natural resources preservation interests, although civil disturbances for such competition have not historically occurred.

6.3.21 Terrorism

In the unlikelihood of a significant terrorism event, there could be a considerable impact on the population, built environment, lifeline infrastructure, environment, and the economy. Terrorism can occur throughout the entire county but due to its intended purpose would most likely happen in more populous urban areas where more devastation and panic would ensue, such as the City of Santa Barbara, Isla Vista, or the City of Santa Maria. Military operations at Vandenberg Space Force Base (SFB) could be a target for terrorism, though unlikely given the location of the SFB in a remote coastal location over 100 miles north of the Los Angeles metropolitan area. Therefore, the City has a low likelihood of being targeted for terrorism.

6.3.22 Invasive Species

All of the City of Carpinteria, including wildlands, are vulnerable to invasive plant species. The City supports dozens of non-native species, with different potential to increase the vulnerability of native ecosystems, farmland, and even urban environments. Invasive plant species can increase maintenance costs for agriculture, homes, and roads. The City's natural environment is vulnerable to the uncontrolled spread of invasive plant species, which could reduce biodiversity, increase fire risk, and result in crop loss. For example, eucalyptus trees are non-native to California yet occur along the Carpinteria Creek riparian corridor and throughout the county. However, these trees are highly

flammable and can worsen the spread and severity of wildfire events. As described in Section 5.3.22, *Invasive Species*, the City of Carpinteria monitors and manages invasive plant species along the riparian corridors of creeks within the City as part of the Creeks Preservation Program.

Although not currently an issue, the City's marine environments may become vulnerable to, invasive species due to commercial shipping causing the introduction of non-indigenous species to the Santa Barbara Channel. Biofouling (i.e., the colonization of submerged surfaces by microorganisms) can affect submerged or wetted hard surfaces in the City, such as the Casitas Pier. Rapid reproduction can negatively disrupt an ecosystem in a short amount of time. Once these mussels are introduced into a waterway, there is no way to fully eradicate the species. To date, there are no indications that the City's waters, including Carpinteria, Santa Monica, and Franklin creeks, have been exposed to quagga or zebra mussels, and early detection monitoring has detected no mussels. Close monitoring of marine and lake vessels is performed in the county to prevent the colonization of marine invasive species in the county's water bodies.

6.3.23 Agricultural Pests

Agricultural losses occur on an annual basis and are usually associated with severe weather events, including heavy rains, floods, freeze. The State of California Multi-Hazard Mitigation Plan attributes most of the agricultural disasters statewide to drought, freeze, and insect infestations. Other agricultural hazards include fires, crop and livestock disease, noxious weeds, and contamination of animal food and water supplies.

A widespread infestation of crops could severely impact the economic base of the City and its communities employed by the agriculture industry. While agricultural production in the county can enhance the economy and improve human health and ensure stable food prices, certain habitats established for irrigation and agricultural output can also threaten human health by increasing the risk of vector-borne diseases (e.g., mosquitos, etc.). Jobs could be negatively impacted during an agriculture emergency. Critical facilities in the City would not be directly impacted by agricultural pests or diseases; however, the City's farms and the associated food processing facilities would be directly impacted economically by long-term disruptions in the food supply associated with crop losses due to agricultural pests and disease.

As further described in Section 6.5.5 of the MJHMP, rising temperatures and drought conditions due to climate change could also lead to increases in the occurrence and transport of pathogens in agricultural environments, which would increase the risk of food contamination and direct human exposure to pathogens and toxins (U.S. Global Change Research Program 2016).

The County of Santa Barbara's Pest Exclusion Program acts as the first line of defense to prevent pests and diseases that are potentially devastating to crops and livestock from becoming established. Incoming plant material is inspected at mail carriers, nurseries, retailers, and homes for pests (County of Santa Barbara Agricultural Commissioner's Office 2020). Pesticides, herbicides, and antibiotics can also help crops resist pests and diseases and new cultivars of crops that are heat and drought-resistant can be planted. However, this may be expensive for farm owners and there may be hesitancy from the community.

7.0 MITIGATION PLAN

7.1 MITIGATION GOALS AND OBJECTIVES

As a key part of the 2022 Multi-Jurisdictional Hazard Mitigation Plan (MJHMP) Update, Mitigation Advisory Committee (MAC) members reviewed the goals and objectives from the 2017 plan and made the following adjustments to better reflect current conditions, community inputs, and agency concerns. The City of Carpinteria adopted the same mitigation goals for the Local Hazard Mitigation Plan (LHMP) as updated for the 2022 MJHMP update. 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 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 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 STATUS OF PREVIOUS MITIGATION ACTIONS

Since 2017, the City has incorporated the LHMP goals, objectives, and mitigation actions into its local plans and processes, including the General Plan Safety Element by reference, specific hazard planning efforts (e.g., Sea Level Rise Vulnerability Assessment and Adaptation Plan, General Plan/CLUP update), the City's grant pursuits, and capital improvement planning. Ongoing monitoring and evaluation of the LHMP by the City ensured mitigations are implemented and tracked. Key mitigation actions completed since 2017 include updating the Master Drainage Plan and Floodplain Management Ordinance and completing the Sea Level Rise Vulnerability Assessment and Adaptation Plan. The City is also underway with a comprehensive update of the General Plan/Coastal Land Use Plan, including the Safety Element.

During the planning process for the LHMP update, the City's Local Planning Team (LPT) reviewed the mitigation actions identified in the 2017 LHMP, which include several strategies brought forward from the 2011 LHMP, to determine the status of each mitigation action. These actions from the 2017 LHMP were revisited, re-evaluated, and in some cases re-prioritized for inclusion in the 2022 LHMP. All incomplete projects were reassessed by the LPT and, if deemed necessary, are included in the Mitigation Implementation Plan (Section 7.4). Table 7-1 provides a summary report for each mitigation action included in the former 2017 LHMP, including the current status (e.g., completed,

ongoing, not started, under construction) and whether the action has been included in the 2022 implementation plan provided in Section 7.4.

Table 7-1. Status of Previous Mitigation Actions

Project Number	Project Description	Comments	Status	In 2022 Plan?
EQ-1	Work with Venoco, Inc. to research Earthquake Related Risks at the Venoco Oil and Gas Processing Facility	Chevron is now in control of the property and the facility is shut down. Application to decommission the site has been submitted and is under review.	Cancelled	
EQ-2	Work with the Southern California Gas Company (SoCal Gas) and the California Public Utilities Commission (CPUC) to review gas pipeline safety documents and to conduct public outreach related to gas pipeline safety	While the Carpinteria Gas Odorant and Metering Facility was shut down in 2018, the City continues to coordinate with SoCal Gas and the CPUC to ensure gas pipeline safety until full decommissioning of the facility in 2023.	Ongoing	X
FLD-1	Update Master Drainage Plan	Completed in 2015.	Completed	
FLD-2	Update Floodplain Management Ordinance	Completed in 2015.	Completed	
FLD-3	Expand participation in the National Flood Insurance Program (NFIP) Community Rating System (CRS)	The City continues to work actively to expand its participation in the NFIP.	Ongoing	X
FLD-4	Carpinteria Avenue Bridge Replacement	Construction of this project has not begun; however, it is planned to be completed in 2026.	Not Started	X
FLD-5	Linden/Casitas Interchanges	Though the public infrastructure is deemed for public beneficial use as of September 2020, the City does not consider the project "complete" because the California Department of Transportation (Caltrans) has not yet fulfilled its conditions of approval for the Condition Use Permit/Coastal Development Permit.	In Progress	X
FLD-6	General Plan/Coastal Land Use Plan Update	Grant-funded program to include analysis of climate change impacts and development of policies addressing sea level rise, drought habitat changes, and increased weather-related hazards.	In Progress	X
GEN-1	Community Emergency Response Team (CERT) Training	While this program is ongoing, all CERT training has been halted due to the Covid-19 pandemic.	Ongoing	X
GEN-2	Create a disaster response supplies warehouse for emergency supplies at City Hall	The City will secure the location and update supplies and materials - budgetary restrictions may apply.	In Progress	X
GEN-3	Provide information to residents to increase community awareness of early warning systems	The City will provide information to residents on the County's "Aware & Prepare" alert system that was implemented in 2016.	Ongoing	X

Project Number	Project Description	Comments	Status	In 2022 Plan?
GEN-4	Conduct Critical Facility Audit	The updated list was completed in 2021. The City will continue to update as needed.	Ongoing	X
GEN-5	Update Comprehensive Emergency Response Plan	The City's updated Emergency Operations Plan was completed in 2014.	Ongoing	X
GEN-6	Conduct community disaster education programming related to general disaster preparedness	The City will conduct public outreach related to general disaster preparedness on an ongoing basis.	Ongoing	X
GEN-7	Host Annual Oil & Gas System Safety Review Group Meeting	These meetings between the City and Venoco personnel as well as other regulators such as APCD occurred between 2009 to 2017 and facilitated discussion of regulatory compliance matters associated with the operation of the Carpinteria Oil & Gas Processing Facility (CPF). Venoco's bankruptcy occurred as part of a broader reduction of oil and gas production in the region and the Interagency Decommissioning Working Group (IDWG), led by Bureau of Safety and Environmental Enforcement and Bureau of Ocean Energy Management, was formed in response to this reduction of assets on federal leases in the Santa Barbara Channel. The IDWG facilitates interagency coordination concerning decommissioning of offshore oil platforms and pipelines in the Santa Barbara Channel. Chevron took over the CPF for the purpose of decommissioning because, as the legacy operator, Chevron retains environmental liability. Once decommissioning is complete, these meetings may wind down and/or shift emphasis to other coordination issues.	In Progress	X
GEN-8	Participate in County Drought Task Force	Multi-jurisdictional drought task force to assess vulnerabilities and monitor drought conditions, water supply.	Ongoing	X
WDF-3	Perform a Comprehensive Evaluation of all Wildfire Hazard Reduction Programs	Programs are driven by federal grant money and are ongoing in various phases based on funding.	Ongoing	X
WDF-4	Firewise Community Planning and Prevention Techniques	Completed in 2012.	Completed	

7.3 PRIORITIZATION PROCESS

Per the Disaster Mitigation Act (DMA) of 2000 requirements, the LHMP update used a cost-benefit methodology in determining action priority; however, this was not quantitative analysis. Once the available mitigation actions were identified by City staff, stakeholders, and the public, each action was evaluated for cost-benefit considerations to assist in prioritizing each measure. 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 would be considered when developing the Cost-Benefit 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?

The cost-benefit considerations are included in the Mitigation Priority and Performance summary tables below each mitigation action presented in Section 7.4, *Mitigation Implementation Plan*. Based on these cost-benefit considerations determined by the LPT, the relative priority rank (High, Medium, and Low) is also included in the Mitigation Priority and Performance summary tables below. 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

7.4 MITIGATION IMPLEMENTATION PLAN

This Mitigation Implementation Plan was developed to present the recommendations developed by the LPT for how the City can reduce the vulnerability of people, property, infrastructure, and natural and cultural resources to future disaster losses. Over time the implementation of these projects will be tracked as a measure of demonstrated progress on meeting the plan's goals.

The Mitigation Implementation Plan summarizes who is responsible for implementing each of the prioritized actions as well as when and how the actions will be implemented. Each action summary also considers the benefit-cost of the action to meet the regulatory requirements of the DMA. The Mitigation Implementation Plan identifies the updated mitigation actions for the City of Carpinteria. Actions specific to the County and other participating agencies are detailed in the 2022 MJHMP Update and other jurisdictional annexes, respectively.

It is important to note that the City has numerous existing, detailed action descriptions, which include benefit-cost estimates, in other planning documents, such as general plan elements, community wildfire protection plans, and capital improvement budgets and reports. These actions are considered to be part of this plan, and the details, to avoid duplication, should be referenced in their source document (see also, Chapter 4.0, *Capability Assessment*). The City also realizes that new needs and priorities may arise as a result of a disaster or other circumstances and reserves the right to support new actions, as necessary, as long as they conform to the overall goals of this plan.

2022-1. Review and Conduct Public Outreach Related to Gas Pipeline Safety

The City shall continue to work with the Southern California Gas Company (SoCal Gas) and the California Public Utilities Commission (CPUC) to review high-pressure gas pipeline safety documents

and to conduct public outreach related to gas pipeline safety. The City shall focus on key areas of public concern.

Mitigation Priority and Performance	
Priority	Low
Hazards Mitigated	Earthquake, Energy Shortage & Resiliency, Natural Gas Pipeline Rupture
Estimated Timeline	Ongoing
Estimated Cost/Funding Source	$1,000 annually/General fund for staff salaries, CPUC grants
Responsible Agency/Department	Public Works Department
Cost-Benefit Consideration	While it would require time and planning with SoCal Gas and the CPUC to review high-pressure gas pipelines and conduct associated public outreach, this action would ensure gas pipeline safety to avoid potential pipeline rupture or leaks.
Comments	This mitigation action is adapted from EQ-2 included as part of the 2017 LHMP.

2022-2. Expand Participation in the National Flood Insurance Program (NFIP) Community Rating System (CRS)

The City shall continue to work actively to expand its participation in the NFIP CRS. The CRS is a voluntary incentive program that recognizes and encourages community floodplain management practices that exceed the minimum requirements of the NFIP. In CRS communities, flood insurance premium rates are discounted to reflect the reduced flood risk resulting from the community's efforts that address the three goals of the program:

1. Reduce and avoid flood damage to insurable property
2. Strengthen and support the insurance aspects of the National Flood Insurance Program
3. Foster comprehensive floodplain management

Mitigation Priority and Performance	
Priority	Low
Hazards Mitigated	Flood, Coastal Hazards (Sea Level Rise)
Estimated Timeline	Ongoing
Estimated Cost/Funding Source	$5,000/General fund for staff salaries
Responsible Agency/Department	Public Works Department
Cost-Benefit Consideration	While this action does not directly mitigate existing flood hazards in the City, it is an ongoing action that supports community-wide floodplain management practices and reduces flood insurance premium rates in the City.
Comments	This mitigation action is adapted from FLD-3 included as part of the 2017 LHMP.

2022-3. Carpinteria Avenue Bridge Replacement

The existing bridge deck at Carpinteria Avenue is severely deteriorated and has inadequate hydraulic capacity under the bridge for flood flows. The purpose of the project is to remove the

structurally deficient bridge and replace it with a bridge designed to meet current structural, geometric and hydraulic standards.

Mitigation Priority and Performance	
Priority	High
Hazards Mitigated	Earthquake, Flood, Coastal Hazards
Estimated Timeline	2026
Estimated Cost/Funding Source	$14 million/Federal Highway Bridge Program, Local highway, interchanges, and bridges development impact fees
Responsible Agency/Department	Public Works Department
Cost-Benefit Consideration	While construction of the bridge would cost money, it is required to ensure the bridge meets all safety requirements during heavy rain.
Comments	This mitigation action is adapted from FLD-4 included as part of the 2017 LHMP.

2022-4. Linden/Casitas Interchanges

The Highway 101: Linden and Casitas Pass Project is a combination of local circulation improvements and key bridge replacements that prepare for future Highway 101 widening. The roadway extensions, bike lanes, and sidewalk improvements make it easier for residents to use local streets for in-town trips. The longer overcrossings, new bridges, and safer on and off-ramp connections all prepare for the future addition of a carpool lane on Highway 101. Though the public infrastructure is deemed for public beneficial use as of September 2020, the City does not consider the project "complete" because the California Department of Transportation (Caltrans) has not yet fulfilled its conditions of approval for the Condition Use Permit/Coastal Development Permit. The City shall continue to coordinate with Caltrans to fulfill its conditions of approval.

Mitigation Priority and Performance	
Priority	High
Hazards Mitigated	Earthquake, Flood, Coastal Hazards
Estimated Timeline	2022
Estimated Cost/Funding Source	$60 million/Federal Highway Bridge Program, Local highway, interchanges, and bridges development impact fees
Responsible Agency/Department	Public Works Department, Caltrans, Santa Barbara County Association of Governments (SBCAG)
Cost-Benefit Consideration	This action will make local travel easier in Carpinteria.
Comments	This mitigation action is adapted from FLD-5 included as part of the 2017 LHMP.

2022-5. General Plan/Coastal Land Use Plan (GP/CLUP) Update

The City shall continue to work on this grant-funded program to update the 2003 combined GP/CLUP document. There will be two new elements of the General Plan: 1) the Climate Change and Resiliency Element, which will be based on the City's Sea Level Rise Vulnerability Assessment and Adaptation Plan (SLRVAAP), and 2) the Healthy Community Element, a multi-disciplinary element that focuses on public health.

Mitigation Priority and Performance	
Priority	High
Hazards Mitigated	All Hazards
Estimated Timeline	2023
Estimated Cost/Funding Source	$1 million/California Coastal Commission grant, General fund for staff salaries
Responsible Agency/Department	Community Development Department (CDD)
Cost-Benefit Consideration	While the mandatory GP/CLUP Update would cost money, this action is partially grant-funded and would provide the City with a long-term guidance document to plan for future development, policies, and programs.
Comments	This planning process was halted due to the COVID-19 pandemic. This mitigation action is adapted from FLD-6 included as part of the 2017 LHMP.

2022-6. Community Emergency Response Team (CERT) Training

The Carpinteria-Summerland Fire Protection District (CSFPD) supports and assists the City of Carpinteria and the County of Santa Barbara with CERT Training.

Mitigation Priority and Performance	
Priority	High
Hazards Mitigated	All Hazards
Estimated Timeline	Ongoing
Estimated Cost/Funding Source	$2,500/ General fund for time and materials, FEMA Building Resilient Infrastructure and Communities Grant
Responsible Agency/Department	CSFPD
Cost-Benefit Consideration	CERT provides City residents with emergency preparedness training to prevent property damage, injuries, and fatalities during hazardous events.
Comments	While this program is ongoing, all CERT training has been halted due to the Covid-19 pandemic. This mitigation action is adapted from GEN-1 included as part of the 2017 LHMP. Training is expected to resume in 2022

2022-7. Listos Training

Listos is a grass-roots disaster preparedness program that partners with community leaders, jurisdictions, non-profits, faith-based organizations, schools, and other community institutions to provide disaster preparedness information to the Spanish-speaking community. With a basic understanding of Incident Command Structure, Listos can instruct the participants in the command structure of First Responders, ensuring communication between Listos graduates and firefighters and police in the event of an emergency. The California Office of Emergency Services (Cal OES) recently announced that funding is available for peer-to-peer education and outreach activities designed to build readiness and protect lives in communities too often overlooked by traditional emergency management programs, such as Listos. The City shall obtain Cal OES grant funding provide local Listos Training to support emergency preparedness within the Spanish-speaking community.

Mitigation Priority and Performance	
Priority	High

Mitigation Priority and Performance	
Hazards Mitigated	All Hazards
Estimated Timeline	Ongoing
Estimated Cost/Funding Source	$25,000/Cal OES Listos Grant
Responsible Agency/Department	Public Works Department, County Flood Control District
Cost-Benefit Consideration	While Listos training would cost money, this training would be covered by the Cal OES Listos Grant and would provide emergency preparedness education to the Spanish-speaking community of Carpinteria, which are often overlooked and not able to participate in CERT training.
Comments	This mitigation action is sourced from the 2019 SLRVAAP.

2022-8. Emergency Response Supplies Warehouse at City Hall

The City's emergency supplies have been stored in the dedicated CERT trailer and a separate closet in City Hall since the recent renovation of City Hall. The City shall secure the location of a supply warehouse within City Hall. The City shall consolidate and organize existing supplies in this new warehouse location and then update with new supplies and materials, as needed.

Mitigation Priority and Performance	
Priority	High
Hazards Mitigated	All Hazards
Estimated Timeline	2023
Estimated Cost/Funding Source	$15,000/General fund for staff salaries
Responsible Agency/Department	Emergency Services Division
Cost-Benefit Consideration	Creation of an emergency response supplies warehouse would require time and planning by City staff; however, it would benefit the City to have all emergency supplies organized in one designated location.
Comments	This mitigation action is adapted from GEN-2 included as part of the 2017 LHMP. Budgetary restrictions may apply.

2022-9. Increase Community Awareness of Early Warning Systems

The City shall increase community awareness of early warning systems by providing residents information on County alert systems. The City has provided early warning systems information in the Emergency Operations Plan and at community disaster education presentations through *Don't Panic! Prepare!* since 2008. The City shall continue to utilize every opportunity to register residents at ReadySBC.org, the County's existing alert system. Additionally, the City is developing a social media campaign on an ongoing basis to include educational information about emergency warnings and orders.

Mitigation Priority and Performance	
Priority	High
Hazards Mitigated	All Hazards
Estimated Timeline	Ongoing
Estimated Cost/Funding Source	$5,000/General fund for staff salaries
Responsible Agency/Department	Emergency Services Division

Mitigation Priority and Performance	
Cost-Benefit Consideration	Early warning systems are the best way to alert residents of hazardous events and the best response when they occur. Encouraging residents to register for the County's alert system requires little cost and planning.
Comments	This mitigation action is adapted from GEN-3 included as part of the 2017 LHMP.

2022-10. Conduct Critical Facility Audit

The City's Critical Facilities list was updated in preparation for this LHMP in 2021. The City shall collect and maintain accurate and detailed critical facility information to ensure the next LHMP update can include a more accurate risk assessment. Data that should be collected for critical facilities should include structural system, the number of stories, year of construction, seismic code used for design, building square footage, construction materials, building replacement value, and content replacement value. This should also be done for schools. A review of each participating agency's critical facilities list shall occur annually and be confirmed by emergency management staff.

Mitigation Priority and Performance	
Priority	Medium
Hazards Mitigated	All Hazards
Estimated Timeline	Ongoing
Estimated Cost/Funding Source	$2,000 annually/General fund for staff salaries
Responsible Agency/Department	Emergency Services Division
Cost-Benefit Consideration	This action will require time and planning by City staff; however, an updated critical facilities list would ensure the next LHMP update can include a more accurate risk assessment.
Comments	This mitigation action is adapted from GEN-4 included as part of the 2017 LHMP.

2022-11. Update Comprehensive Emergency Operations Plan

The City's most recent Emergency Operations Plan was updated in 2015. The City shall update the Emergency Operations Plan based on the capabilities, hazards, and vulnerabilities identified in this LHMP.

Mitigation Priority and Performance	
Priority	High
Hazards Mitigated	All Hazards
Estimated Timeline	2023
Estimated Cost/Funding Source	$50,000/General fund for staff salaries
Responsible Agency/Department	Emergency Services Division
Cost-Benefit Consideration	While the Emergency Operations Plan update would require time and planning, the plan would benefit the City by outlining the planned courses of action for each City department should a hazardous event occur.

Mitigation Priority and Performance	
Comments	This mitigation action is adapted from GEN-5 included as part of the 2017 LHMP.

2022-12. Community Disaster Education Programming

Don't Panic! Prepare! is a public education and awareness program run by the City's Emergency Services Division, which is designed to increase emergency preparedness at home, work, and school for City residents. The program features free customizable emergency preparedness training for residents in coordination with community partners. The City shall continue to conduct public outreach related to general disaster preparedness on an ongoing basis.

Mitigation Priority and Performance	
Priority	Medium
Hazards Mitigated	All Hazards
Estimated Timeline	Ongoing
Estimated Cost/Funding Source	$7,000/General fund for staff salaries
Responsible Agency/Department	Emergency Services Division
Cost-Benefit Consideration	This public education and awareness program is an ongoing program that requires little maintenance costs and provides helpful emergency preparedness information to City residents.
Comments	This mitigation action is adapted from GEN-6 included as part of the 2017 LHMP.

2022-13. Participate in County Drought Task Force

The County's Drought Task Force has been established "to seek countywide solutions to the current drought situation, and to provide the best advice possible to local decision-makers." The County identifies mitigation action 2022-91 in the MJHMP to maintain the Drought Task Force to 1) Assess vulnerability to drought risk; 2) Monitor drought conditions; 3) Monitor water supply; 4) Plan for drought; 5) Develop related mitigation projects and programs. The City shall continue to participate in the multi-jurisdictional drought task force to assess vulnerabilities and monitor drought conditions and water supply.

Mitigation Priority and Performance	
Priority	Medium
Hazards Mitigated	Drought & Water Shortage, Agricultural Pests
Estimated Timeline	Ongoing
Estimated Cost/Funding Source	$1,000 - $10,000 annually/FEMA Building Resilient Infrastructure and Communities Grant, FEMA Emergency Management Program Grant, General Fund
Responsible Agency/Department	County Executive Office (CEO) / Environmental Program Manager
Cost-Benefit Consideration	Participation in the County's Drought Task Force requires time and planning; however, this would allow the City to stay informed on regional drought conditions and water supply.
Comments	This mitigation action is adapted from GEN-8 included as part of the 2017 LHMP.

2022-14. Comprehensive Evaluation of all Wildfire Hazard Reduction Programs

The Community Wildfire Protection Plan is a community-based plan that assesses the community's exposure and vulnerabilities to wildfire threats, serves to guide the community in an effort to reduce the wildfire threat. The plan also provides an opportunity for federal funding to help fund implementation of the plan. This Community Wildfire Protection Plan was developed through a collaborative process involving the CSFPD, surrounding fire agencies, County officials, County, state, and federal land management agencies, and community members. It meets the Community Wildfire Protection Plan requirements set forth in the federal Healthy Forests Restoration Act.

Mitigation Priority and Performance	
Priority	High
Hazards Mitigated	Wildfire
Estimated Timeline	Ongoing/Every 10 years
Estimated Cost/Funding Source	$150,000/Federal vegetation management funds/grants
Responsible Agency/Department	CSFPD
Cost-Benefit Consideration	This Community Wildfire Protection Plan provides a science and engineering-based assessment of the wildfire threat in the wildland-urban interface (WUI) of the CSFPD.
Comments	This mitigation action is adapted from WDF-3 included as part of the 2017 LHMP. The City of Carpinteria (Dave Durflinger) signed off on the Community Wildfire Protection Plan Update in August 2021.

2022-15. Create Solar and Storage Permitting Procedures

The City shall update residential and small commercial ordinances for combined solar and storage systems to go beyond Assembly Bill (AB) 2188 and AB 546 regulations. To do this, the City must:

1. Implement electronic submission for energy storage permitting; and
2. Update Carpinteria Municipal Code Section 15.29 – Solar Energy Permitting to streamline permitting for larger sized systems, up to anywhere between large residential (<20 kilowatts [kW]) to small commercial systems (<100 kW), with a checklist of planning and zoning requirements that must be, and typically are, met to make projects eligible for the streamlining.

Other potential methods to streamline permitting beyond current requirements are listed below:

1. Enable online permit submissions and over-the-counter permits for larger systems;
2. Pilot solar design software for solar developers that only creates designs that are already permit approved; and
3. Enable virtual safety inspections for solar installations.

Mitigation Priority and Performance	
Priority	Low
Hazards Mitigated	Energy Shortage & Resiliency
Estimated Timeline	2024

Mitigation Priority and Performance	
Estimated Cost/Funding Source	$30,000 annually/General fund for staff salaries, FEMA Hazard Mitigation Grant, FEMA Building Resilient Infrastructure and Communities Grant, PG&E Better Together Resilient Communities Grant Program
Responsible Agency/Department	CDD, Public Works Department
Cost-Benefit Consideration	This action would require time and planning but would help the City become a desirable area for solar installers to operate.
Comments	This mitigation action is adapted from Strategy 5.1.1 included as part of the 2019 Strategic Energy Plan (SEP).

2022-16. Commercial Building Energy Benchmarks

While state-wide building codes are aimed at making new construction more energy-efficient, energy benchmarking is aimed at reducing the energy use of already constructed buildings. Energy benchmarking involves a comparison of how much energy buildings use, normally specified per square foot so that it applies to buildings of different sizes. Depending on the implementation, it can be either voluntary or mandatory. The City shall institute energy benchmarks for large commercial buildings to encourage commercial building owners to undertake energy projects.

Mitigation Priority and Performance	
Priority	Low
Hazards Mitigated	Energy Shortage & Resiliency
Estimated Timeline	Ongoing
Estimated Cost/Funding Source	$45,000 - $65,000 annually/General fund for staff salaries
Responsible Agency/Department	CDD, Public Works Department
Cost-Benefit Consideration	This action would require time and administrative work; however, energy benchmarking would reduce the energy use of existing large commercial buildings that comprise a large amount of the City's energy use.
Comments	This mitigation action is adapted from Strategy 5.1.2 included as part of the 2019 SEP.

2022-17. Backup Inverter Program

This program aims to promote backup inverters to bridge the gap between the low up-front costs and high emissions of a backup generator and the high up-front costs and lack of emissions from battery storage. The City would need to avoid pushing a specific vendor or solution, but if the City releases a Request for Offers for vendors to provide solutions, they may receive more applicants.

The City shall conduct research on possible solutions and vendors for backup power supplies to create a draft Request for Offers with a request for solar and backup inverter standard offers, with specifications including the amount of backup power and cost.

Mitigation Priority and Performance	
Priority	Low
Hazards Mitigated	Energy Shortage & Resiliency
Estimated Timeline	2025-2027

Mitigation Priority and Performance	
Estimated Cost/Funding Source	$25,000 annually/General fund for staff salaries, FEMA Building Resilient Infrastructure and Communities Grant, PG&E Better Together Resilient Communities Grant Program
Responsible Agency/Department	Public Works Department
Cost-Benefit Consideration	Implementation of a backup inverter program would require research and planning. Backup inverters provide a small amount of power from solar panels while they are active, but as with solar panels without batteries, do not provide power during the night.
Comments	This mitigation action is adapted from Strategy 5.2.1 included as part of the 2019 SEP.

2022-18. Diversify Funding Streams

The City shall diversify its funding streams using one or more of the following proposed methods:

1. Aggressively pursue new federal, state, and private foundation funding sources;
2. Continue to work closely with the CPUC and Southern California Edison (SCE) to maximize the City's share of existing renewable program funding; and
3. Partner with other nearby regional governments to create energy programs.

The City shall continue to work with the CPUC and SCE both to maximize its intake from a utility funding stream that may decrease and to receive CPUC funding that would otherwise go to utilities to administer local programs.

Mitigation Priority and Performance	
Priority	Medium
Hazards Mitigated	Energy Shortage & Resiliency
Estimated Timeline	Ongoing
Estimated Cost/Funding Source	$10,000 - $15,000 annually/General fund for staff salaries, CPUC funding
Responsible Agency/Department	Public Works Department, CPUC, SCE
Cost-Benefit Consideration	While diversifying funding streams would require planning and coordination with other agencies, this action would ensure the City has a stable funding stream that is not dependent on any one source.
Comments	This mitigation action is adapted from Strategy 5.3.3 included as part of the 2019 SEP.

2022-19. Energy Assurance Plan

The City shall create and implement an energy assurance plan to ensure electrical reliability at critical facilities. Energy assurance planning is an important step in improving the robustness, security, and reliability of energy infrastructure by creating plans to protect key sites so that they continue to operate in the event of any disaster or electricity outage. This will increase the reliability of critical services such as water distribution. Energy Assurance Plans are therefore a key step in building a resilient, local electricity grid. The City has already taken several key steps towards assurance planning by conducting an Emergency Action Plan and this LHMP.

To develop a strong Energy Assurance Plan, the City shall:

1. Use results from Emergency Action Plan to identify the City-owned buildings and facilities that are most critical from a resiliency perspective, such as sites used as Emergency Operations Centers (EOCs) or community gathering spots;
2. Evaluate each critical site, including its current level of emergency preparation from an energy perspective and the renewable energy potential present; and
3. Evaluate opportunities to supplement diesel generators with battery storage.

Mitigation Priority and Performance	
Priority	Medium
Hazards Mitigated	Energy Shortage & Resiliency
Estimated Timeline	Ongoing
Estimated Cost/Funding Source	$106,000/General fund for staff salaries
Responsible Agency/Department	Public Works Department
Cost-Benefit Consideration	While energy assurance planning would require time, planning, and labor costs for the City, it would allow key sites (e.g., medical, fire departments, water distribution, etc.) to continue to operate in the event of any disaster or electricity outage.
Comments	This mitigation action is adapted from Strategy 5.4.1 included as part of the 2019 SEP.

2022-20. Winter Storm Berm Program

The winter storm berm is a protection device that buffers landward assets from coastal storm damage during the winter storm season. Since 1983, the City has implemented an annual Winter Storm Berm Program to protect beachfront properties along the Carpinteria City Beach from wave action and related flooding during the winter storm season. A sand berm is erected annually and is in place for approximately three months out of the year during the winter storm season, (typically late November until early March the following year), based on storm predictions and beach conditions. This ongoing measure reduces the probability of damage to development and infrastructure.

Mitigation Priority and Performance	
Priority	High
Hazards Mitigated	Flood, Coastal Hazards
Estimated Timeline	Ongoing
Estimated Cost/Funding Source	$35,500 annually/General fund and assessment district comprising beachfront property owners
Responsible Agency/Department	California Coastal Commission, ACOE, Central Coast Regional Water Quality Control Board, Parks & Recreation Department, Public Works Department
Cost-Benefit Consideration	The California Coastal Commission is the primary responsible agency for this action. This program benefits the City by protecting beachfront properties along the Carpinteria City Beach from wave action and coastal flooding during the winter storm season, a high priority hazard for the City.
Comments	This mitigation action is sourced from the 2019 SLRVAAP.

2022-21. Storm Damage and Shoreline Protection Feasibility Study

An independent study is currently being prepared by Army Corps of Engineers (ACOE) that could result in a funding opportunity for an adaptation project. As a result of long-term erosion of City beaches, ACOE is working with the City to prepare a Storm Damage and Shoreline Protection Feasibility Study that will identify a range of possible measures to address coastal erosion. Analyzing an approximate 0.25-mile section of shoreline between Ash Avenue and Linden Avenue, this Feasibility Study investigates vulnerabilities to structures that may be directly affected by existing shoreline erosion and wave attack during severe storms. Additionally, the Feasibility Study aims to preserve and enhance the biological environment by restoring nesting, feeding, and resting areas for species dependent on sandy beaches.

Mitigation Priority and Performance	
Priority	High
Hazards Mitigated	Coastal Hazards
Estimated Timeline	Ongoing
Estimated Cost/Funding Source	$2,700,000/General fund for staff salaries, ACOE funding, Federal grants
Responsible Agency/Department	ACOE, USFWS, California Coastal Commission, California State Lands Commission, CDFW, Central Coast Regional Water Quality Control Board, County of Santa Barbara, Public Works Department
Cost-Benefit Consideration	The majority of this action would be funded by federal grant funds. This study would also benefit the City by investigating the City's vulnerabilities to existing shoreline erosion and wave attack during severe storms, a high priority hazard for the City.
Comments	This mitigation action is sourced from the 2019 SLRVAAP.

2022-22. Living Shoreline

Historically, the City's western one mile of shoreline supported a large dune field that buffered low-lying areas from wave attack and flooding. The former dune system has been eroded over the last 90 years, largely due to human impacts (or influences), and the dune system has not recovered. Improving shoreline resiliency to reduce hazards from coastal flooding and erosion from large storm events may include the development of a stabilized (e.g., cobble-based) dune complex that would function as a "living shoreline." The City initiated the living shoreline planning process in the fall of 2020 and prepared the Dune and Shoreline Management Plan as of February 2022. The City shall pursue funding and partnerships, including with the County, State Parks, and Beach Erosion Authority for Clean Oceans and Nourishment (BEACON).

Mitigation Priority and Performance	
Priority	Medium
Hazards Mitigated	Coastal Hazards
Estimated Timeline	2023
Estimated Cost/Funding Source	$9 million - $12 million, $100,000 annually for maintenance/ACOE Project Partnership Agreement, 2019-2020 Caltrans Adaptation Planning grant, other state grants
Responsible Agency/Department	ACOE, USFWS, California Coastal Commission, California State Lands Commission, CDFW, Central Coast Regional Water Quality Control Board, California State Parks, Caltrans, Public Works Department

Mitigation Priority and Performance	
Cost-Benefit Consideration	While the Living Shoreline and associated studies/analyses would require planning and cost money, this action would buffer low-lying areas of the City from wave attack and flooding, which would protect infrastructure and prevent future costs associated with infrastructure and building repair.
Comments	This mitigation action is sourced from the 2019 SLRVAAP. This action was presented to City Council in February 2022, and the Council continued the item with a request for additional information. The additional information for this project will be presented to City Council in April 2022. A detailed cost-benefit analysis is the next recommended step for this project.

2022-23. Coastal Regional Sediment Management Plan Update and Sediment Management Program

The maintenance of a wide and sandy beach provides widespread economic and recreational benefits for nearby communities. Fifty years after the debris basin installations, the loss of natural beach cobble quantities is visible on Carpinteria City Beach. The City should revise the Coastal Regional Sediment Management Plan in order to consider exporting sediment onto Carpinteria City Beach for re-nourishment and coastal resiliency. This effort should be in coordination with BEACON, the Santa Barbara County Flood Control & Water Conservation District, and UCSB Natural Reserve System. The Coastal Regional Sediment Management Plan, as adopted by BEACON in 2009, includes information about sand supplied to the Santa Barbara Littoral Cell between Point Conception and Point Mugu as well as an understanding of erosion hot spots and shoreline protection. The revised Coastal Regional Sediment Management Plan should consider adaptation strategies that export sediment from the watershed to sandy beaches in order to mimic historical natural processes and improve coastline resiliency within existing funding levels. Adaptation strategies should include changing the approach of local debris basin cleanout activities and the deposition of these materials within the watershed as well as the transport to Carpinteria City Beach or other adjacent coastlines depending on the extent of sediment transport, sediment quality and quantity, and potential regional benefits. Consideration of mud placements in Carpinteria Salt Marsh should also be investigated in order to increase sediment discharge from the marsh which would ultimately elevate the marsh to keep pace with sea level rise and result in increased sediment transport along the coastline. BEACON is currently working to develop a regional opportunistic sediment placement program for the Coastal Regional Sediment Management Plan. The sediment placement program would focus on ensuring sediment reaches local beaches through the natural sediment transport process. The sediment placement would also establish a program of pre-permitted coastal locations (i.e., receiver sites) within the BEACON region where materials from sediment basins could be opportunistically deposited to augment existing sand supplies. That program would address sediment transportation and deposition approaches including trucking routes, deposition locations, dredging techniques, and transportation management in order to minimize adverse effects to the Carpinteria community including the City's infrastructure. The City emphasizes the use of hydraulic dredging rather than desilting, dewatering, and trucking because of its reduced impact to the City's infrastructure as well as to beach access. The City should coordinate with BEACON and the Santa Barbara County Flood Control & Water Conservation District in order to facilitate the implementation of the sediment management program and establish sediment removal permits and protocols.

The City shall conduct the following tasks to implement a successful shoreline sediment management program:

- Coordinate with BEACON in order to develop a flexible regional opportunistic sediment placement program that identifies specific placement or receiver locations in and upcoast of the City for appropriate sediment sizes.
- Address appropriate methods for sediment disposal.
- Incorporate recommendations from the City's Sea Level Rise Vulnerability Assessment and Adaptation Plan and the Dune and Shoreline Management Plan.
- Streamline regulatory approvals with extended permit duration (e.g., 20 years).
- Prioritize retention of sediment for local use and beach nourishment and avoid exporting debris basin sediments out of the watershed.
- Create sustainable local, state, and federal funding programs.

Mitigation Priority and Performance	
Priority	High
Hazards Mitigated	Flood, Mudflow & Debris Flow, Coastal Hazards, Dam Failure
Estimated Timeline	Ongoing
Estimated Cost/Funding Source	$743,000 - $6 million annually/FEMA Hazard/Pre-Disaster Mitigation Grant, FEMA Building Resilient Infrastructure and Communities Grant, Department of Water Resources Grants, Department of Boating and Waterways Grants
Responsible Agency/Department	BEACON member agencies, ACOE, USFWS, California Coastal Commission, California State Lands Commission, CDFW, Central Coast Regional Water Quality Control Board, California State Parks, Caltrans, County of Santa Barbara, Parks & Recreation Department, Public Works Department
Cost-Benefit Consideration	This action would ensure efficient management and use of sediment resources within the City and County to improve coastline resiliency within existing funding levels.
Comments	This mitigation action is sourced from the 2019 SLRVAAP.

2022-24. Storm Drain Master Plan and Improvements

To address the stormwater infrastructure deficiencies during high tide, the City shall update the Storm Drain Master Plan as needed. As part of the Storm Drain Master Plan, the City shall investigate the use of stormwater pumps and/or lift stations (pumps) to move water out of the Beach Neighborhood. The range of options for consideration should also include potential tide gates, mud flaps, and creek alterations that could be utilized as preventative measures before stormwater or tidal effects can reach the storm drain systems (e.g., inlets, outfalls). The investigation should be focused along inland portions of Ash Avenue and Linden Field, which experience tidal inundation with areas of ponded floodwaters from rainfall event stormwater runoff. As tidal inundation increases with sea level rise, even without heavy rainfall or runoff events, the use of pumps to move water out of the lower-elevation areas could be investigated. The use of pumps is moderately adaptable, as the pumping capacity could be increased or improved over time when the pumps need to be replaced. As the necessary volume of water to be pumped increases, operational and maintenance costs would likely escalate over time. Additional challenges for the operation of

stormwater pump systems can include accommodating the large amounts of fibrous material and solids that often accompany stormwater.

Accommodation for storm drain improvements shall be integrated into the City's Capital Improvements Program. The action item would have the intent of improving stormwater runoff, reducing tidal inundation, and accommodating larger volumes of storm or tidal water that have the potential to inundate vulnerable areas of the City. Examination of precedent stormwater infrastructure projects that have included the installation or replacement of stormwater pumps, lift stations, and associated maintenance results in a variety of associated costs.

Mitigation Priority and Performance	
Priority	Medium
Hazards Mitigated	Flood, Coastal Hazards (Sea Level Rise)
Estimated Timeline	Ongoing
Estimated Cost/Funding Source	$4 million/Pre-Disaster Mitigation Grant, FEMA Flood Mitigation Assistance Grant, CalOES 404 Grant
Responsible Agency/Department	California Coastal Commission, California State Lands Commission, Caltrans, County Flood Control District, Public Works Department
Cost-Benefit Consideration	While a Storm Drain Master Plan Update could cost money for planning, it would help identify stormwater management and storm drain improvements for the Beach Neighborhood, protecting this neighborhood from flooding and sea level rise.
Comments	This mitigation action is sourced from the 2019 SLRVAAP.

2022-25. Coastal Adaptation Overlay

The City shall implement a Coastal Adaptation Overlay to address land use and infrastructure vulnerabilities that could become at risk from coastal hazards affected by projected sea level rise. Overlay zoning is a regulatory tool that places a special zone district over an existing base zone with additional regulations and incentives. The overlay zone identifies special provisions in addition to or instead of the base zone given special circumstances to promote planning for orderly development and to provide protection of the public's health, safety, and general welfare.

Implementation of a Coastal Adaptation Overlay Zone could address potential risks to private property, reduce liability for the City, and accomplish multiple adaptation objectives. For example, an overlay zone would define the nature, intensity, scale, uses, and location of suitable development within projected hazard areas. Based on the projected time of exposure, siting and construction standards may be applied including, but not limited to, increased setbacks, relaxed building heights, limitations on habitable first floors, and use of flexible construction methods (e.g., movable foundations) based upon site-specific technical studies. An important aspect of this overlay is that it may be able to provide more flexibility in design and/or use than is currently permitted by the base zone regulations. Standards for increased heights or mixed uses could also be incorporated into the overlay zone to respond to changing sea level rise conditions. As determined necessary and appropriate, the Coastal Adaptation Overlay Zone could also provide a framework to transition at-risk development away from coastal hazards and/or could implement the concepts of managed retreat over time, by including standards for gradual relocation of development away from the increasingly hazardous surf and coastal flooding areas.

The boundaries of a Coastal Adaptation Overlay Zone shall correspond to the best available science of projections of hazards and shall be reviewed periodically (e.g., every 5 to 10 years) to incorporate the emerging scientific understanding of sea level rise and coastal hazards, as well as regional approaches to adaptation planning.

The Coastal Adaptation Overlay Zone shall define policy considerations and establish required processes triggered by actions. Such requirements may include:

- Provision of a Notice to Property Owner at the time of transfer of real property to future buyers within the Coastal Adaptation Overlay Zone of coastal hazard-related development requirements. Such requirements could include, but are not limited to, building coverage, height, raised floors, or other adopted strategies. This disclosure would also inform interested buyers of potential hazards (e.g., erosion, flooding, inundation, possible intrusion onto public trust lands, etc.) as a result of climate-induced impacts, such as sea level rise.
- Submittal of site-specific Coastal Hazard and Sea Level Rise reports as part of a Coastal Development Permit application. The reports would evaluate specific risks for proposed structural development or exterior expansions of habitable space in an existing development, identify design requirements to ensure compliance with health and safety codes, and estimate the life expectancy of the development. Authority to implement necessary development requirements (e.g., increased base floor elevations, building heights, development setbacks, use of perimeter foundations, etc.) within the Coastal Overlay Zone would be based on findings of the Coastal Hazard and Sea Level Rise reports and/or compliance with planning and building codes for new structural development, including additions to habitable space.
- An indemnification agreement between the City and prospective applicants acknowledging coastal hazard risks and owner-assumption of damages resulting from development proposed in the Coastal Adaptation Overlay Zone.
- The City's Capital Improvement Program could include a provision to investigate and identify eligible roads within the Coastal Adaptation Overlay Zone that could be elevated or relocated. This study would also identify priority road segments, schedules, and methods (e.g., additional pavement improvements during established road resurfacing activities).
- The City and residents could consider the creation or modification of an assessment district to address costs of special public services or improvements. Consistent with Coastal Commission guidance, the Coastal Adaptation Overlay may establish a prohibition of seawalls and hard armoring on the City and State Beaches.
- The planned/expected life of development and redevelopment could be standardized. The following table is provided as a recommended life of development based on state guidance and other jurisdictional policy approaches. Coastal Development Permits may be required to include analysis of the effects of sea level rise and coastal hazards, identify and incorporate adaptation strategies into the project, and discuss the adaptive capacity of the development as part of the application process.

Mitigation Priority and Performance	
Priority	Medium
Hazards Mitigated	Coastal Hazards
Estimated Timeline	2023-2024
Estimated Cost/Funding Source	$1 million/Grant funds and/or general fund for staff salaries
Responsible Agency/Department	CDD, California Coastal Commission, California State Parks, Carpinteria Unified School District (CUSD)
Cost-Benefit Consideration	The overlay would provide the City with a planning tool to analyze the effects of sea level rise, guide future development planning, and address vulnerabilities.
Comments	This mitigation action is sourced from the 2019 SLRVAAP.

2022-26. FEMA's Repetitive Loss Program

Before implementation of a repetitive loss program, the City shall continue to monitor triggers such as storm frequency and sea level rise and evaluate the effectiveness of this measure with consideration to social, economic, and environmental effects. If coastal hazards continue to increase, the City shall consider a repetitive loss program that allows properties subject to repetitive loss to be downsized, moved away from the shoreline, or in extreme cases with frequent and severe damages, may even grant the City, State, or other public agency the right of first refusal to purchase the property and restrict for open space uses. Any such program shall be designed to be consistent with FEMA's repetitive loss program. Per the California Coastal Commission Draft Residential Adaptation Guidelines (2018), the City could choose to adopt a policy within the GP/CLUP Update that provides a mechanism for such a program to be developed when necessary and appropriate based on the increase of coastal hazards.

Mitigation Priority and Performance	
Priority	Medium
Hazards Mitigated	Flood, Coastal Hazards
Estimated Timeline	2025
Estimated Cost/Funding Source	$1 million/FEMA Hazard/Pre-Disaster Mitigation Grant
Responsible Agency/Department	Environment and Sustainability Division, Emergency Services Division, FEMA, Cal OES, California Coastal Commission
Cost-Benefit Consideration	The RL program would benefit repetitive property damage and risks to residents at the 18 properties in Carpinteria with multiple claims against the NFIP (refer to Section 6.3.1, *Flood*).
Comments	This mitigation action is sourced from the 2019 SLRVAAP.

2022-27. Protection of Union Pacific Railroad (UPRR) Corridor

The UPRR railroad corridor runs south of Highway 101 and through the City. At its closest, the corridor is approximately 290 feet landward of the mean high water tideline along the Carpinteria Bluffs. UPRR intends to construct an additional railroad track at the Carpinteria Station by 2023. A 0.4-mile segment of the track will be elevated on a platform, and a pedestrian underpass will be constructed. Efforts to expand and raise the track are intended to increase pedestrian safety and

expand train service in the region. Despite the inclusion of an underpass, this track elevation provides an opportunity to address storm-based flooding vulnerabilities.

The City would pursue opportunities to coordinate with the Los Angeles – San Diego – San Luis Obispo (LOSSAN) Rail Corridor Agency and other regional jurisdictions to maintain and improve this important transportation corridor. By establishing effective partnerships with these agencies, the City could ensure that a well-designed adaptation approach for the railroad synergistically protects important infrastructure such as recreational trails, downtown development, and residential neighborhoods.

Mitigation Priority and Performance	
Priority	Low
Hazards Mitigated	Flood, Coastal Hazards (Sea Level Rise), Train Accident
Estimated Timeline	2023 and ongoing
Estimated Cost/Funding Source	$1 million/LOSSAN Rail Corridor Agency
Responsible Agency/Department	UPRR, Public Works Department
Cost-Benefit Consideration	This action would protect the UPRR, an important means of transportation and evacuation in the City, from coastal flooding; however, this action is a low priority since LOSSAN Rail Corridor Agency is the primary responsible agency for this action and sea level rise/coastal flooding on the LOSSAN rail corridor is not an immediate concern.
Comments	This mitigation action is sourced from the 2019 SLRVAAP.

2022-28. Protection of Highway 101

Since Highway 101 is subject to flooding with approximately 5 feet of sea level rise, significant coordination and collaboration between Caltrans and the City would be required to ensure protection from coastal hazards, particularly flooding. The City has been awarded funding from Caltrans under the 2017-2018 Adaptation Planning Grant Program for additional analysis of sea level rise impacts to transportation infrastructure with the City, impacts to vulnerable populations within the City, and the identification of adaptation strategies to build resiliency within the transportation network. In the long term, this may include capital improvements to improve drainage and conveyance beneath the Highway 101 corridor, elevating the segment of Highway 101 that is vulnerable to flooding impacts, or identifying alternative routes in case of closures. The City shall continue to coordinate with Caltrans to efficiently facilitate such adaptation measures.

Mitigation Priority and Performance	
Priority	Low
Hazards Mitigated	Flood, Coastal Hazards (Sea Level Rise)
Estimated Timeline	2023 and ongoing
Estimated Cost/Funding Source	$100,000/ Caltrans Adaptation Planning Grant Program, general fund for staff salaries
Responsible Agency/Department	Caltrans, CDD, Public Works Department
Cost-Benefit Consideration	This action would protect Highway 101, the primary evacuation route in the City, from coastal flooding; however, this action is a low priority since Caltrans is the primary responsible agency for this action and sea level rise and coastal flooding on Highway 101 is not an immediate concern.

Mitigation Priority and Performance	
Comments	This mitigation action is sourced from the 2019 SLRVAAP.

2022-29. Carpinteria Sanitary District Wastewater Treatment Plant

To protect the Wastewater Treatment Plant from coastal flooding and inundation with sea level rise, the City shall continue to coordinate with the Carpinteria Sanitary District to identify and develop mid- to long-term improvements to reduce coastal hazard risks, including installation of a fortified flood control wall along Carpinteria Creek, additional elevation and setbacks of any new facilities, and installation of backflow protection devices. The City shall continue to coordinate with the Carpinteria Sanitary District regarding findings of the SLRVAAP to consider future sea level rise hazards.

Mitigation Priority and Performance	
Priority	Medium
Hazards Mitigated	Flood, Coastal Hazards (Sea Level Rise)
Estimated Timeline	Ongoing
Estimated Cost/Funding Source	$100,000/FEMA Hazard/Pre-Disaster Mitigation Grant
Responsible Agency/Department	Public Works Department, CDD, Emergency Services Division, Carpinteria Sanitary District
Cost-Benefit Consideration	The Wastewater Treatment Plant would be vulnerable to coastal flooding and inundation with approximately 5 feet of sea level rise. Coordination with the Carpinteria Sanitary District would help identify potential capital improvements that will build resiliency.
Comments	This mitigation action is sourced from the 2019 SLRVAAP.

2022-30. Sandyland Revetment

Alteration, relocation, or removal of the Sandyland Revetment could reduce the erosion hotspot that primarily affects a small portion of the City Beach and Beach Neighborhood. As Sandyland Cove is largely within Santa Barbara County, any alterations to the revetment would need to be processed by the County in coordination with the City, in addition to the California Coastal Commission and Sandyland Cove Homeowners Association. However, alteration of the revetment may result in significant changes and may expose homes to wave attack or damage or potentially increase flooding in areas adjacent to the Carpinteria Salt Marsh. Therefore, the City shall coordinate with the County Public Works Department to prepare a study of the potential effects of alteration, relocation, or removal of the Sandyland Revetment.

Mitigation Priority and Performance	
Priority	Low
Hazards Mitigated	Flood, Coastal Hazards (Sea Level Rise)
Estimated Timeline	2025
Estimated Cost/Funding Source	$100,000/County funds
Responsible Agency/Department	CDD, Public Works Department, County Flood Control District
Cost-Benefit Consideration	An impact study for alteration, relocation, or removal of the Sandyland Revetment would by costly and require time and planning.

Mitigation Priority and Performance	
Comments	This mitigation action is sourced from the 2019 SLRVAAP.

8.0 PLAN MAINTENANCE

The City of Carpinteria (City) and its departments have been continually implementing mitigation actions and monitoring their effectiveness since the last update of the Local Hazard Mitigation Plan (LHMP) in 2017. Since the last LHMP in 2017, the LPT has monitored, evaluated, and updated the plan on a continuing and as-needed basis. The City was very successful in implementing the 2017 mitigation actions as noted in Table 7-1. The remaining mitigation actions outlined in the 2017 LHMP are ongoing at the time of this 2022 update.Some deferred projects from 2011 were completed successfully, while others are ongoing or still pending. This section sets forth the intended process for monitoring and maintaining the 2022 LHMP.

8.1 MONITORING, EVALUATING, AND UPDATING THE PLAN

The City of Carpinteria will be responsible for ensuring that this LHMP is monitored on an ongoing basis. The City will convene Carpinteria's Local Planning Team (LPT) representatives on an annual basis to review progress on the LHMP. As noted in Chapter 7.0, *Mitigation Plan*, the City's LPT representatives will report on efforts to integrate the hazard mitigation plan into local plans, programs, and policies at the annual LPT plan review meeting. Additionally, actions identified in the LHMP will be tracked and discussed during other regular City department meetings.

The City will also ensure that as new hazard information is discovered or produced, the LPT will review and determine the appropriateness of incorporation. As part of this effort, as major disasters and other significant events affect the City of Carpinteria, the LPT will be convened to review and assess the LHMP. Additionally, LPT members will be ensuring that lessons learned from the LHMP planning process are incorporated and/or leveraged in other plans and planning efforts.

The City will continue to participate in the countywide Mitigation Advisory Committee (MAC) and attend the annual meeting organized by the County Office of Emergency Management (OEM) to discuss items to be updated/added in future revisions of this plan. The City will follow the procedures to monitor, review, and update this LHMP per Santa Barbara County as outlined in Chapter 8 of the Multi-Jurisdictional Hazard Mitigation Plan (MJHMP). The City acknowledges it is important to review the plan regularly and update it every five years per the Disaster Mitigation Act Requirements as well as other State of California requirements.

8.2 IMPLEMENTATION THROUGH EXISTING PLANS AND PROGRAMS

The City 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., General Plan, building codes, floodplain management ordinance). The General Plan and the LHMP annex are complementary documents that work together to achieve the goal of reducing risk exposure to the City's citizens. An update to a general plan 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 City incorporates the LHMP by reference into its General Plan Safety Element. Under AB 2140, the City may adopt its current, FEMA-approved LHMP into the Safety Element of the General Plan. This adoption makes the City eligible to be considered for part or all of its local-share costs on eligible Public Assistance funding to be provided by the state through the California Disaster Assistance Act (CDAA) (see Section 2.0, *Plan Purpose and Authority* for the adopting resolutions). The LHMP has also been prepared to support the City's Sea Level Rise Vulnerability Assessment and Adaption Plan to address changing coastal hazards over time, including coastal sediment management and shoreline protection. The Floodplain Management Ordinance applies in concert with the City's zoning ordinance and building codes to reduce flooding hazards from land use. The LHMP includes several mitigations addressing critical infrastructure to support the City's efforts to reduce improve resilience to natural hazards, including wildfire and coastal flooding.

The information contained within this LHMP, including results from the Vulnerability Assessment and the Mitigation Strategy, will be used by the City to help inform updates and the development of local plans, programs, and policies. The Engineering Division may utilize the hazard information when implementing the City's Community Investment Program and the Planning and Building Divisions may utilize the hazard information when reviewing a site plan or other type of development applications. The City may utilize the hazard information when developing and implementing the City's capital improvement programs and the Planning and Building Divisions may utilize the hazard information when reviewing a site plan or other type of development applications. The City's budget process and CIP are updated to include hazard mitigation actions.

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 City 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 City 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 Olivia Uribe-Mutal, Emergency Services Program Manager using the following information:
Olivia Uribe-Mutal, Emergency Services Program Manager
City of Carpinteria
5775 Carpinteria Avenue
Carpinteria, CA 93013
805-*755*-4401
oliviau@carpinteriaca.gov

9.0 LIST OF ACRONYMS

°F	Fahrenheit
AB	Assembly Bill
ACOE	U.S. Army Corps of Engineers
AF	acre-feet
AFY	acre-feet per year
BEACON	Beach Erosion Authority for Clean Oceans and Nourishment
BFE	Base Flood Elevations
BMPs	best management practices
CAL FIRE	California Department of Forestry and Fire Protection
Cal OES	California Governor's Office of Emergency Services
Caltrans	California Department of Transportation
CAPP	Carpinteria Advanced Purification Project
CCCE	Central Coast Community Energy
CDC	Center for Disease Control
CDD	Carpinteria Community Development Department
CDFA	California Department of Food and Agriculture
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
CERT	Community Emergency Response Team
CFR	Code of Federal Regulations
City	City of Carpinteria
CLUP	Coastal Land Use Plan
County	Santa Barbara County
County Flood Control	Santa Barbara County Flood Control and Water Conservation District
COVID-19	Coronavirus
CPF	Carpinteria Oil and Gas Processing Facility
CPUC	California Public Utilities Commission
CSFPD	Carpinteria-Summerland Fire Protection District
CUPA	Certified Unified Program Agency
CUSD	Carpinteria Unified School District
CVWD	Carpinteria Valley Water District
DFIRM	Digital Flood Insurance Rate Map
DMA	Disaster Mitigation Act of 2000
DOT	U.S. Department of Transportation
DSOD	Division of Safety of Dams
DTSC	California Department of Toxic Substances Control
DWR	California Department of Water Resources
EMS	Emergency Medical Services
EOC	Emergency Operations Center
EPA	Environmental Protection Agency
FBI	Federal Bureau of Investigation

FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
FMA	Flood Mitigation Assistance
FRAP	Fire and Resource Assessment Program
FY	Fiscal Year
GHG	greenhouse gas
GIS	Geographic Information Systems
GP/CLUP	General Plan/Coastal Land Use Plan
GSP	Groundwater Sustainability Plan
HMGP	Hazard Mitigation Grant Program
IUCN	International Union for Conservation of Nature
kV	kilovolt
kWh	kilowatt-hours
LHMP	Local Hazard Mitigation Plan
LOSSAN	Los Angeles-San Diego-San Luis Obispo
LPT	Local Planning Team
MAC	Mitigation Advisory Committee
MJHMP	Multi-Jurisdictional Hazard Mitigation Plan
NFIP	National Flood Insurance Program
NIH	National Institute of Environmental Health Services
NIOSH	National Institute for Occupational Safety and Health
NPDES	National Pollution Discharge Elimination System
OEM	County Office of Emergency Management
OES	Carpinteria Office of Emergency Services
OPC	Ocean Protection Council
OSHA	Occupational Safety and Health Administration
PDM	Pre-Disaster Mitigation
PG&E	Pacific Gas & Electric
POP	Public Outreach Plan
PRD	Parks and Recreation Department
psi	Pounds per square inch
PV	photovoltaic
RCRA	Resource Conservation and Recovery Act
RL	Repetitive Loss
SARS	Severe Acute Respiratory Syndrome
SARS-CoV	SARS-associated coronavirus
SB	Senate Bill
SBCAG	Santa Barbara County Association of Governments
SBMTD	Santa Barbra Metropolitan Transit District
SCE	Southern California Edison
SEP	Strategic Energy Plan
SFHA	Special Flood Hazard Areas

SLRVAAP	Sea Level Rise Vulnerability Assessment and Adaptation Plan
SoCal Gas	Southern California Gas Company
SoVI	social vulnerability index
SR-	State Route
SWP	State Water Project
UC	University of California
UCSB	University of California, Santa Barbara
U.S.	United States
UPRR	Union Pacific Railroad
USBR	U.S. Bureau of Reclamation
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
Vandenberg SFB	Vandenberg Space Force Base
VCTC	Ventura County Transportation Commission
WHO	World Health Organization
WUI	Wildland-Urban Interface

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City of Goleta
Local Hazard Mitigation Plan

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

February 2023

CITY OF GOLETA

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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 City of Goleta (City) 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 City. The LHMP was last comprehensively updated in 2017 as an annex to the 2017 MJHMP. Since 2017, the City has:

- Incorporated the LHMP goals, objectives, and mitigation actions into its local plans and processes, including the General Plan Safety Element by reference and specific hazard planning efforts (e.g., Stormwater Management Plan).
- Used the LHMP's assessment of capabilities, hazards, and vulnerabilities to inform planning, capital improvements, programs, decision-makers, and the public.
- Implemented mitigation actions through the City's general plan, capital improvement program, maintenance programs, grant programming, community outreach, and budget process.
- Reviewed and evaluated mitigation actions before and after disasters, including the Thomas Fire and Holiday Fire.

This 2022 update to the LHMP builds on and refines the MJHMP's assessment of hazards and vulnerabilities countywide to develop a mitigation plan for the City. The City participated in the 2022 MJHMP Mitigation Advisory Committee (MAC) and Local Planning Team (LPT), reviewed all portions of the MJHMP pertaining to the City, 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 City is a participating agency in the County's MJHMP update.

The City'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 City. Vulnerability assessments summarize the identified hazards' impact on the City. 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 City's 2022 LHMP.

[INSERT CITY RESOLUTION(S) ADOPTING PLAN UPDATE]

[INSERT CITY 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 City'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 Mitigation Advisory Committee (MAC) and the second is the Local Planning Team (LPT).

All eight incorporated cities and the six special districts joined the County as participating agencies in the preparation of the MJHMP update, including the 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 Santa Maria Valley Water Conservation District (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 City participated as a MAC member to prepare this LHMP as an annex to the 2022 MJHMP. The City was represented by Michael Baris, Emergency Services Coordinator, 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	**MAC Meeting #1 (virtual)** 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	**MAC Meeting #2 (virtual)** 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	**MAC Meeting #3 (virtual)** 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	**MAC Meeting #4 (virtual)** Collected feedback on 2017 mitigation strategies

Date	Purpose
October 2021	**MAC Meeting #4 (virtual) - continued** Conducted interactive exercise on mitigation strategies for key hazards unaddressed in previous MJHMP Discussed annex updates
January 2022	**MAC Meeting #5 (virtual)** Presented draft plan Discussed key MAC/LPT review needs and key issues Discussed annex updates to dovetail with plan update
March 2022	**MAC Meeting #6 (virtual)** Review and discuss public comments received on the draft plan Recommend a revised draft plan to decision-makers Review annex updates for review and approval

3.3 LOCAL PLANNING TEAM (LPT)

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

Table 3-2. City of Goleta Local Planning Team 2022

Department	Title	Name
Planning and Environmental Review Department	Advance Planning Manager	Anne Wells
Public Works Department	Environmental Services Coordinator	Melissa Nelson
Neighborhood Services Department	Emergency Services Coordinator	Michael Baris
Public Works Department	Project Manager	Teresa Lopes
Finance Department	Accountant	Brenda Robinson
City Manager's Department	City Manager	Michelle Greene
County Fire	Fire Marshal	Rob Hazard
Santa Barbara Sheriff's Office	Goleta Chief of Police	Lt. Rich Brittingham
Neighborhood Services Department	Director of Neighborhood Services	Jaime Valdez

The Goleta LPT members worked directly with the Santa Barbara 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 City 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
December 2021	LPT meeting (12/16/21) with consultant team to discuss ongoing mitigation strategies and identify areas to improve within the plan
January and February 2022	Reviewed new maps and local vulnerabilities. Provided input on the status of 2017 LHMP mitigation strategies. Reviewed draft mitigation strategies and provide feedback. Reviewed and finalized 2022 LHMP
March 2022	LPT meeting to discuss the final draft of the local annex LPT presented a staff report to the public and Goleta City Council regarding the LPT's efforts in updating the City's annex

3.4 PUBLIC OUTREACH AND ENGAGEMENT

As a participating agency in the 2022 MJHMP update, the City 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 City'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 March 2022, a staff report was brought to the Goleta City Council and the public announcing the intent to submit the LHMP draft to FEMA and CalOES. The opportunity to review documents was announced through social media and the City's website. The community was welcome to submit written or verbal comments to the City's Emergency Services Coordinator. In addition, the opportunity for the community to be heard was permitted during the City Council meeting before the adoption of this plan.

Additionally, the City of Goleta conducts ongoing public outreach by utilizing several platforms to educate the public about hazards in the community, relevant programs to safeguard and protect

themselves from disaster, and actions they can take to prepare themselves for events. Below is a list of the different platforms used and a summary of some of the programs:

- Ready SBC Website
- Social Media (Facebook, Twitter, NextDoor)
- Meetings/Workshops including noticing through GovDelivery System
- Public Surveys
- Community Emergency Response Team Training (CERT)
- Monthly Community Online Newsletter, *The Monarch Press*

4.0 CAPABILITY ASSESSMENT

The City LPT identified current capabilities and mechanisms available for implementing hazard mitigation activities. This section presents a discussion of the roles of key departments, administrative and technical capacity, fiscal resources, and summaries of relevant planning mechanisms, codes, and ordinances.

4.1 DEVELOPMENT TRENDS AND DEMOGRAPHICS

The City is located about eight miles west of the City of Santa Barbara, with a swath of unincorporated urban area between the two cities, and is adjacent to the Santa Barbara Airport and the University of California at Santa Barbara (UC Santa Barbara). Located along the coast, the town has 7.9 square miles of land area, comprising a total of 5,075 acres. Goleta is in an excellent position, as it develops its policies and governance through planning and regulatory development, to institutionalize mitigation into its government operations.

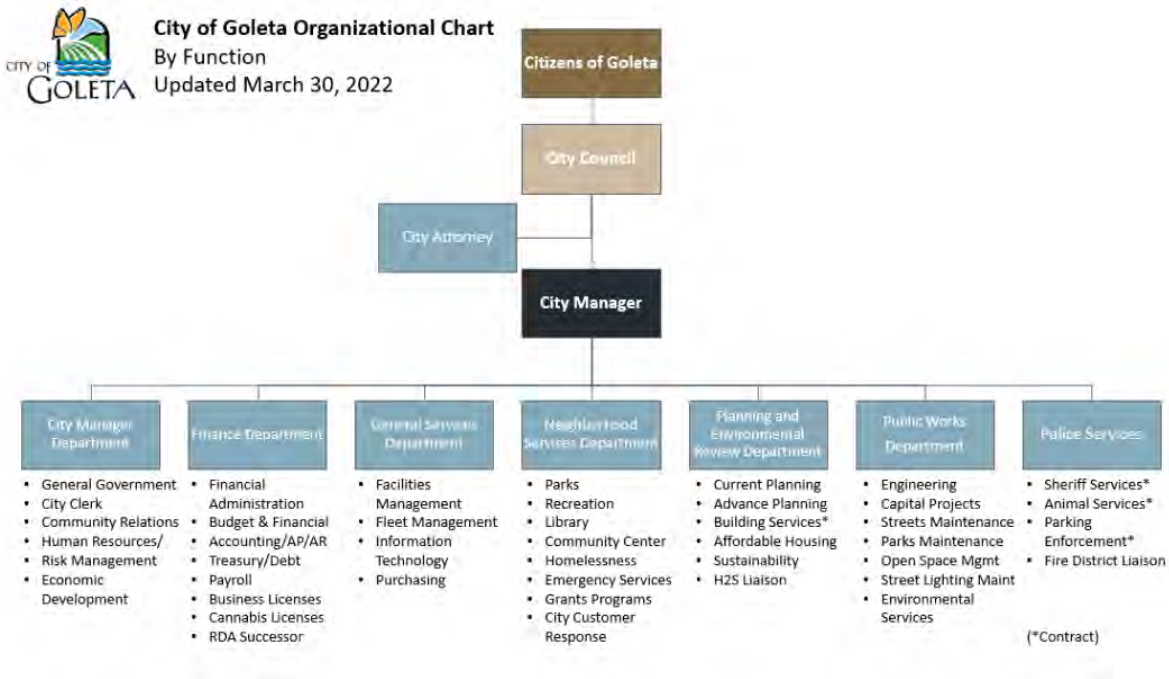
The City of Goleta is a mostly suburban residential community with high-tech entrepreneurial business areas. The City is located in the commercial and industrial heart of the County and has in recent years drawn many high technology companies to the area. The City is now home to approximately 80 research and development firms in the hi-tech field including those that specialize in electronics, telecommunications, medical research, national security, and remote sensing manufacturing that contribute significantly to the local economy. The City is also a regional shopping hub with several “big box” retailers not found elsewhere in the south coast area.

According to 2019 U.S. Census Bureau data, the City is home to 32,413 residents. This population is projected to grow to 34,884 residents by 2050 (SBCAG 2018). The average household size in the City is 3.73 and the median household income is $92,195. Approximately 51.8 percent of City of Goleta residents identify as White, 34.7 percent identify as Hispanic, and 13.5 percent identify as Asian, Black, Mixed, or Other (US Census Bureau 2019)

4.2 KEY DEPARTMENTS

The following is a summary of existing departments in Goleta and their responsibilities related to hazard mitigation planning and implementation, as well as existing planning documents and regulations related to mitigation efforts within the community. 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, floodplain managers, surveyors, personnel with GIS skills and scientists familiar with hazards in the community. The organizational chart below presents the structure of the City's government:



4.2.1 Goleta City Council

- Provides a vision, adopts policies and regulations, and approves funding requests/budgets over all aspects of City government

4.2.2 Goleta City Manager's Office (Office of Emergency Services)

- Provides the leadership and supervision that, in turn, implements the policies and decisions of the Goleta City Council, thereby ensuring the delivery of services to the community. The City Manager oversees law enforcement and acts as a liaison to the County Fire District.
- City Manager serves as OEM Director. As noted above, Goleta is a relatively new city and has employed a full-time emergency management staff member since October 2018. The City Neighborhood Services Department is responsible for emergency preparedness and EOC operations and will be responsible for the implementation of emergency management programs for the City. Currently, Fire and Law Enforcement services are contracted through Santa Barbara County Fire and the Santa Barbara County Sheriff's Office.
- Various staff within the City Manager's Office, Public Works Department, and Neighborhood Services Department prepare grant applications for the City.

4.2.3 City of Goleta Finance Department

The Finance Department will have a role in the implementation of the actions identified in this plan:

- Provides services associated with cost tracking and financial management of Grant Funded and other capital improvement projects.
- Assures all aspects of City financing, funding, and expenditures are within legal, prescribed guidelines and regulations. The Department tracks and audits expenditures.

4.2.4 City of Goleta Planning and Environmental Review Department (includes Building Inspection, Code Enforcement andGIS)

- The Department is responsible for updating the City's General Plan and Coastal Land Use Plan.
- Guides the physical development of the City through the implementation of the General Plan/Coastal Land Use Plan, Zoning Code and Building Codes and is committed to enhancing the quality of life in the community by planning for sound infrastructure and public services, protecting the environment, and promoting high quality social and economic growth.
- Enforces Title 17 Zoning of the Goleta Municipal Code.
- Implements and/or enforces programs, plans, ordinances, and policies of the City over a wide range of activities related to code enforcement.
- Regulates land uses and land development under plans, policies, and regulations adopted by the City Council. Enforces local, state, and federal requirements for land development, building construction, and specific uses. Recommends additions and revisions to existing ordinances, plans, and policies when necessary.

4.2.5 Public Works/Engineering/Parks and Open Space Maintenance

- Enforces Floodplain Management Ordinance
- Oversee flood control and infrastructure development and improvement projects
- Provides a variety of engineering services including the review and inspection of privately constructed public facilities, infrastructure, and subdivisions; design and inspection of publicly funded infrastructure improvements; management and monitoring of existing and projected traffic conditions throughout the City; preparation of the City's long-term Capital Improvement Program. Engineering also provides fiscal management for the City's Parks and Open Space Maintenance, Community Facility Districts, and Development Impact Fees (currently only transportation impact).
- Implements and enforces programs, plans, policies, and regulations over land development and redevelopment to assure adequate and maintainable infrastructure.
- Public Works Department, Public Works Operations is a first responder in disaster emergencies.

4.2.6 City of Goleta Public Safety –Police Services

Through a contract with the County, the Sheriff's Department protects the community through the enforcement of laws and the analysis/reduction/elimination of risks and, in times of emergency, provides for the orderly and rapid implementation of emergency plans. The Sheriff's Department is a first responder in natural and manmade emergencies.

4.2.7 City of Goleta Public Safety – Fire Services

- The City's fire services are covered through the Santa Barbara County Fire Protection District. The County Fire Department serves and safeguards the community through a professional, efficient, and effective system of services, which protect life, environment, and property.
- Implements programs, policies, and regulations over a wide range to reduce the loss of life, environment, and property. The Fire Department is a first responder in natural and manmade emergencies.

4.3 ADMINISTRATIVE AND TECHNICAL CAPACITY

The administrative and technical capabilities of the City, as shown in Table 4-1, include staff, personnel, and department resources available to implement the actions identified in Section 7.0, Mitigation Plan of this LHMP. 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. The City's department heads multitask in many areas. The City of Goleta has an Emergency Services Coordinator position to oversee all factors of Emergency Management within the City.

Table 4-1. City of Goleta Administrative and Technical Capacity

Personnel Resources	Yes/No	Department/Position
Planner/engineer with knowledge of land development/land management practices	Yes	Public Works Department
Engineer/professional trained in construction practices related to buildings and/or infrastructure	Yes	Public Works Department
Planner/engineer/scientist with an understanding of natural hazards	Yes	Public Works Department
Personnel skilled in GIS	Yes	Planning and Environmental Review
Full-time building official	Yes	Contractor, Willdan in Planning and Environmental Review
Floodplain manager	Yes	Public Works Department

Personnel Resources	Yes/No	Department/Position
Emergency manager	Yes	Neighborhood Services Department
Grant writer	Yes	Neighborhood Services & Public Works Departments
Other personnel	N/A	
GIS Data Resources (Hazard areas, critical facilities, land use, building footprints, etc.)	Yes	Planning and Environmental Review / Contractor
Warning Systems/Services (Reverse 9-11, cable override, outdoor warning signals)	Yes	City Manager's Office (PIO)
Other	N/A	

4.4 LEGAL AND REGULATORY CAPABILITIES

The legal and regulatory capabilities of the City are shown in Table 4-2, including existing ordinances and codes that affect the physical or built environment of Goleta. Examples of legal and/or regulatory capabilities can include the City's 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. City of Goleta Legal and Regulatory Capability

Regulatory Tool (ordinances, codes, plans)	Yes/No
General Plan	Yes
Zoning ordinance	Yes
Subdivision ordinance	Yes
Growth management ordinance	No
Floodplain ordinance	Yes
Other special-purpose ordinances (stormwater, steep slope, wildfire)	Yes, Community Wildfire Protection Plan
Building code	Yes
Fire code	Yes
Fire department ISO rating	Through a contract with Santa Barbara County Fire Department
Erosion or sediment control program	Yes
Stormwater management program	Yes
Site plan review requirements	Yes

Regulatory Tool (ordinances, codes, plans)	Yes/No
Capital improvements plan	Yes
Economic development plan	Yes
Local emergency operations plan	Yes
Other special plans	
Flood insurance study or other engineering studies for streams	Yes
Elevation certificates (for floodplain development)	Yes

4.5 FINANCIAL RESOURCES

Goleta's FY 2020-2021 General Fund revenue increased over the prior year's (2019-2020) budget from $28.35 million to $28.80 million. The Fiscal Year 2020-2021 General Fund budget included over $11.7 million for General Government, Neighborhood & Public Safety Services, and Planning and Environmental Services. The General Fund balance is an important element that can show Goleta's financial strength.

Table 4-3 shows specific financial and budgetary tools available to the City such as community development block grants; capital improvements project funding; authority to levy taxes for specific purposes; fees for water, sewer, gas, or electric services; ability to incur debt through general obligations bonds; and withholding spending in hazard-prone areas.

Table 4-3. City of Goleta Fiscal Capability

Financial Resources	Accessible or Eligible to Use (Yes/No)	Has This Been Used for Mitigation in the Past?	Comments
Community Development Block Grants (CDBG)	Yes	Yes	San Jose Creek Flood Control Project
Capital improvements	Yes	Yes	
Authority to levy taxes for specific purposes	Yes	No	
Fees for water and sewer service	Yes	No	
Incur debt through general obligation bonds	No	No	
Incur debt through special tax bonds	No	No	

Financial Resources	Accessible or Eligible to Use (Yes/No)	Has This Been Used for Mitigation in the Past?	Comments
Incur debt through private activity bonds	No	No	
Federal Grant Programs (Hazard Mitigation Grant Program)	Yes	Yes	

4.6 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 City can capitalize on its existing educational capacities, even non-hazard related such as school partnerships, 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*, the City conducts community outreach to its citizens on special events and community information updates. Information about community hazards and actions is provided on the City's website and social media platforms.

4.7 RELEVANT PLANS, POLICIES, AND ORDINANCES

The City has a range of guidance documents and plans for each of its departments. These include a general plan, public works, and public utility plans, capital improvement plans, and emergency management plans. The City uses building codes, zoning ordinances, subdivision ordinances, and various planning strategies to address how and where development occurs. One of the essential ways the City guides its future is through policies laid out in the General Plan/Coastal Land Use Plan. The LHMP directly informs these plans and is used to evaluate the need for adjustments or updates to existing plans and programs. The City considers the LHMP's assessment of capabilities, hazards, and vulnerabilities to inform planning, capital improvements, programs, decision-makers, and the public. The City also implements mitigation actions through the City's general plan, capital improvement program, maintenance programs, grant programming, community outreach, and budget process.

4.7.1 City of Goleta Economic Development Strategic Plan

Goleta's Economic Development Strategic Plan ("EDSP") seeks to accomplish two primary goals: job creation and job retention. It attempts to leverage local strengths and capitalize on local opportunities. Its goals are to create a diverse employment base and a balanced approach to economic development; to establish a plan to increase tourism; to improve access to financial capital

and human resources; to establish the City of Goleta as a "green tech" and sustainable community; to increase and expand local partnerships; to continue to improve and enhance the City's permitting process; and to focus economic development on Old Town and update the Old Town Revitalization Plan. The Plan also guides decisions related to land use and economic development and outlines strategies to retain, enhance and expand the City's business base.

Amongst the many themes within the General Plan, *Protecting Health and Safety* is most relevant toward striving to maintain the environments necessary to minimize health and safety hazards – including hazardous materials, flooding, geological hazards, and excessive noise. Similar to the Strategic Plan, the Economic Development Plan acknowledges the need to re-invest in and to revitalize Old Town. Its goal is to secure funding to complete the San Jose Creek Flood Control Project since the existing infrastructure inhibits economic development efforts. Moreover, it justifies such an investment by proposing that the additional loan, insurance costs, and requirements create a difficult re-investment environment. The Economic Plan also emphasizes the need to work with the County Flood Control District to explore additional funding options to create improvements to the San Jose Flood Control Channel and other similar projects.

In summary, by providing an economic perspective on the need to reduce areas susceptible to hazards – such as floods – greater impetus may be delivered for the funding of such mitigation projects. This would result in a more attractive economic environment, which would, in turn, result in the revitalization of Old Town. The last EDSP was completed in 2009, and the City is in the process of updating the document.

4.7.2 City of Goleta Emergency Operations Plan and Threat Analysis

The City of Goleta recognizes that the planning process must address each hazard that threatens the City and addressed major threats in a December 2021 revised plan. There are three broad categories of hazards: natural, technological or man-made, and national security. The section of the Emergency Operations Plan consists of a series of threat assessments, which individually or jointly could require evacuation and/or sheltering of the population. They are:

Earthquake. Within the larger jurisdictional area of Santa Barbara County – which includes the City of Goleta- numerous faults are located both on- and off-shore. The economic impact on the City would be considerable in terms of loss of employment and loss of tax base. Expected ramifications include long-term homelessness, significant disruptions to business and local commerce, and reduced government resources. Damages are expected along U.S. Highway 101, State Route-154, Highway 150, Santa Barbara airport, local railroads, harbor facilities, and other critical facilities and utilities.

When notified of a short-term earthquake prediction, the area at risk is responsible to inform all cities within the County. (A notification procedure is listed in the EOP). Resources would then be concentrated in this area. Agencies would inspect and prepare those facilities and systems which are essential to conduct emergency operations, advise and provide guidance to the public on precautions, and take any other precautions necessary.

Hazardous Material. The increasing volume and variety of hazardous materials that are generated, stored, or transported within Santa Barbara County is a problem of great concern to public officials and the community. The threat of a major hazardous material incident in Santa

Barbara County exists from four different sources. These are commercial vehicles, rail and air transportation, pipeline, fixed facility, and clandestine dumping. With regards to emergency response actions, the authority is vested in the Santa Barbara County Certified Unified Program Agency, or CUPA, which is the agency responsible for the development and implementation of the Santa Barbara County Hazardous Materials Emergency Response Plan. The Santa Barbara County Area Plan includes information on agency responsibilities, evacuation procedures, cleanup funding, emergency medical resources, as well as an inventory of supplies and communications equipment.

Flooding. The Goleta Valley is subject to flooding from the overflow of local streams, which along with their respective evacuation routes are identified through flood maps. Although there are nine major dams in Santa Barbara County with known populations in their inundation areas, the City of Goleta did not identify dam failure as a major threat to its population.

Wildfire. Annually, the County experiences fires that often burn "out of control" and can damage the watershed and structures. County, city fire departments, State and federal agencies have developed emergency response actions associated with wildfire disasters. Copies of these plans are on file in the City of Goleta's Emergency Operating Center.

Hydrogen Sulfide. Hydrogen sulfide is a gas that can cause odors from natural seeps, well drilling, agricultural irrigation, and oil industry activities. Exposure can cause respiratory symptoms and can eventually be fatal.

4.7.3 City of Goleta Municipal Codes for Flood Risk

The City of Goleta participates in the National Flood Insurance Program. To minimize the risk of flooding, the City of Goleta has alerted property owners that the Flood Plain Management Ordinance applies to their property. It intends to avoid exposing new development to flood hazards. As part of this strategy, the Flood Hazard Overlay Map is developed, which reflects the boundaries of special flood hazard areas as shown on the current Federal Emergency Management Agency (FEMA) maps on file with the office of the City Clerk. Whether or not any proposed development is subject to the provisions of Chapter 15.10, Floodplain Management, of the Goleta Municipal Code, is determined by the City's Public Works Director.

Various municipal codes refer to flood risk, including:

GMC 15.10.020 Findings of Fact. This municipal code acknowledges flood hazard areas and the potential impact on the City of Goleta. It states the potential losses include loss of life and property, health and safety hazards, disruption of commerce and governmental services, extraordinary public expenditures for flood protection and relief, and impairment of the tax base. It also acknowledges that flood losses are caused by the cumulative effect of obstructions in areas of special flood hazards which increase flood heights and velocities.

GMC 15.10.030 Statement of Purpose. This refers to the purpose of Chapter 15, which is to promote public health, safety, general welfare, and to minimize public and private losses due to flood conditions in specific areas by provisions designed: to protect human life and health; to minimize publicly funded expenditures; to help maintain a stable tax base with minimal interruption to business; and to inform buyers of flood hazard areas.

GMC 15.10.040 Methods of Reducing Flood Losses. This section includes provisions for restricting uses dangerous to health, safety, and property due to water or erosion hazards, which may result in increases in erosion or flood heights or velocities; requiring that uses vulnerable to floods are protected against flood damage; controlling the alteration of natural floodplains, stream channels, and natural protective barriers which help accommodate or channel flood waters; controlling filling, grading and dredging which may increase flood damage; and preventing or regulating the construction of flood barriers which will unnaturally divert flood water or which may increase flood hazards in other areas.

GMC 15.10.070 Basis for Establishing the Areas of Special Flood Hazard. This section states that all areas of special flood hazard identified by the Federal Insurance Administration of the Federal Emergency Management Agency in the Flood Insurance Study dated September 1978 and the Flood Insurance Rate Map (FIRM), dated March 15, 1979, and all subsequent amendments and/or revisions, are adopted.

GMC 15.10.220 Coastal High Hazard Areas. Requirements for new construction along coastal high hazard areas are listed in this section. Primarily, it states that all new developments and substantial improvements within these areas be elevated on adequately anchored pilings or columns, with the lowest horizontal structural member being at or above the base flood level. Furthermore, it requires that new construction be located landward of the reach of mean high tide; excavation of dunes is not permitted; and structural support cannot be defined by fill. The floodplain administrator would obtain and maintain structure certification with section 15.10.220.A.

GMC 15.10.160 Standards of Construction. This section provides details on the structural requirements to minimize flooding. They include standards for anchoring and elevations as adopted by the jurisdiction, the Federal Insurance Administration, and the Federal Emergency Management Agency.

4.7.4 Repetitive Loss Properties

Repetitive loss properties are defined as property that is insured under the NFIP that has filed two or more claims over $1,000 each within any consecutive 10-year period since 1978. The City is unaware of any repetitive loss properties within the City of Goleta.

4.7.5 City of Goleta Stormwater Management Plan

In the State of California, the State Water Resources Control Board (SWRCB) and the various Regional Water Resource Control Boards (RWRCBs) implement mandates of the Federal Clean Water Act and the National Pollutant Discharge Elimination System (NPDES) permit program. During one of their studies, the SWRCB determined that urban runoff is a leading cause of pollution through the state and a contributor to pollutants of concern (POC), such as nutrients, pathogens, hydrocarbons, metals, trash, and pesticides to waterways. In compliance with various federal and state requirements, the City as a municipality and operator of a separate stormwater system (MS4) has prepared the Stormwater Management Plan (SWMP) to guard against the detrimental effects on human health and the surrounding ecosystems.

The City's SWMP was approved by the Central Coast Regional Water Quality Control Board (CCRWQCB) (Water Board) on February 4, 2010. The goal of the SWMP for the City of Goleta

is to reduce the discharge of storm water pollutants into water bodies and to protect and improve water quality within the city.

Illicit Discharge and Detection and Elimination

The goal of this control measure is to identify and eliminate sources of illicit discharge and illegal dumping. The BMPs proposed by the City of Goleta include mapping of the storm drainage system and the adoption of a new storm water discharge ordinance that will address all forms of illicit discharges, including all animal waste, and/or waste disposal which affect water quality.

Construction Site Runoff Control

The purpose of construction site runoff controls is to prevent soil and construction waste from entering storm water. It is required that construction sites implement best management practices and emergency response plans in order to protect surrounding creeks and watersheds.

Post-Construction Stormwater Management in New Development and Redevelopment

One of the most effective ways to reduce pollution from urban runoff is through Low Impact Development (LID) design strategies. Once a project is built, it is complex and expensive to correct runoff problems. The goal of the program is to integrate basic and practical storm water management techniques into new development and redevelopment projects to protect water quality.

The City of Goleta will also develop regional watershed management plans. Regional watershed management plans will decrease pollution from development and will help decrease pollution from any debris generating events. Pollution Prevention/Good Housekeeping for Municipal Operation

The City examines any actions that will reduce the amount and type of pollution that 1) collects on public streets, open spaces, storage areas, and infrastructure that is discharged into local waterways; and 2) results from actions that may environmentally damage land development and flood management practices or affect the maintenance of storm and sewer systems. Performing proper and timely maintenance on storm water systems may allow the City to avoid costly repairs from age and neglect.

In summary, though these new standards reflect the compliance of water quality standards by the City of Goleta, their effects are also translated into a reduction of flood risk. This is evidenced through stormwater drainage maintenance and repair, public outreach efforts on pollution and overall stormwater events, and the development of new pre- and post-construction regulations. Alongside pollution prevention controls and good housekeeping, it is expected that not only would residents be better protected from contaminated waters, but it would also establish the best management practices that would minimize the risk of flooding.

Full Trash Capture

The purpose of this program is to prevent all trash pollution from entering City watersheds and creeks through installation of full trash capture systems or equivalent measures such as cleanup programs, litter removal, and more.

4.7.6 City of Goleta Strategic Plan and Capital Improvement Plan

The City of Goleta's Strategic Plan is used as an important organization and management tool to help establish priorities, connect staff actions to Council goals, and inform the public of the City's vision for the community.

The 2019-2021 Strategic Plan includes safety objectives such as continuing CERT training and reviewing current evacuation plans and procedures. Goals include increasing visibility for pedestrian and traffic safety and improving fire service response times.

4.7.7 City of Goleta General Plan/Coastal Land Use Plan

Safety Element

The City of Goleta has adopted several policies identified in the Safety Element in the Goleta General Plan. The LHMP is incorporated by reference in the Safety Element. The City of Goleta's primary objectives are to avoid siting of development or land use activities in hazardous areas, and if required, apply appropriate mitigation measures to lessen or minimize exposure to hazards. Additional significant Safety Element objectives include:

- Minimizing the risk of potential short- and long-term hazards associated with the operation of the Venoco Ellwood facilities and other oil and gas extraction, processing, and transportation facilities.
- Attaining a high level of emergency preparedness to limit damage and risks to public safety from natural and industrial hazards and to have effective and efficient emergency recovery procedures in place to minimize social, environmental, and economic disruption following an emergency.
- Working with the City of Santa Barbara to minimize the risk of potential hazards associated with aircraft operations at the Santa Barbara Airport.
- Minimizing the potential for loss of life, property, economic and social disruption resulting from earthquakes or seismically induced hazards through the adoption of updated California Building Code requirements and requiring geotechnical studies for new construction where appropriate.

Land Use Element

The Land Use Element of the General Plan suggests that the City would like to concentrate development within the City limits and the Urban Growth Boundary line. Its Sphere of Influence is coterminous with the City Limits and Urban Growth Boundary. Therefore, growth patterns in the near future would be infill. The preference of not expanding the Sphere of Influence is mandated in the General Plan so that agricultural, watershed and open space lands are not prematurely or unnecessarily converted to other non-agricultural or non-open space uses without public debate and a vote of the people. The protection of such lands not only ensures the continued viability of agriculture, but also contributes to flood control and protection of wildlife, environmentally sensitive areas, and irreplaceable natural resources.

The Land Use Element contains several policies that promote hazard mitigation. New development is restricted from areas where natural conditions are likely to pose a substantial threat to public

safety or produce excessive maintenance costs. To ensure all residents do not lack necessary utilities, all new development is not allowed unless adequate public services are available to serve the development. The City will also investigate the potential for changing land use designations and zoning districts for properties subject to flooding and with limited access to open space as needed through amendments to the Land Use Element as needed. As part of this LHMP update, there have been no changes to land use vulnerabilities that would require amendments to the Land Use Element.

Since the last update of the City's LHMP in 2017, the City adopted a new zoning code in March 2020. During that process, Goleta's Planning and Environmental Review Department reviewed land use and population data and found no significant changes have occurred relative to the City's vulnerability to hazards. Some additional measures were put into place such as stream-side protection requirements that would reduce flood hazards. Among other changes were additional protection relative to airport safety. For example, within the approach zone certain uses were prohibited such as storage of hazardous materials.

Further, minimal development has occurred consistent with the adopted Land Use Element and has primarily compromised infill development and redevelopment within the City limits. There has been no expansion of the City boundary or its Sphere of Influence (SOI) and no comprehensive changes to the Land Use Element that would result in substantial densification. As a result, the City's level of vulnerability to hazards analyzed in Section 6.0, Vulnerability Assessment, has not substantially changed due to land use, development, or population growth.

4.8 OPPORTUNITIES FOR MITIGATION CAPABILITY IMPROVEMENTS

The City 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 City 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 City to expand or improve on these policies and programs to further protect the community:

- **Regulatory Opportunities**: As part of this update, the City will comply with AB 2140 by amending its Safety Element to incorporate the LHMP by reference. The City will consider the LHMP in policy, land use plans, and programs, including wildfire management and coastal hazard and sea level rise planning.
- **Administrative/Technical Opportunities**: The City continues to improve its resilience to ensure emergency response operations are sustained during a hazardous event, including improvements to public safety facilities and planning. The City aims to improve its resilience to ensure emergency response operations are sustained during a hazardous event, including seismic upgrades to critical facilities such as the Goleta Community Center, updating its Community Wildfire Protection Plan (CWPP), and developing a new fire station in western Goleta to improve emergency response. The City aims to address hydrologic issues through continued improvements to its drainage and stormwater management infrastructure. Enhancements to hazard training for staff in partnership with the County and other agencies or

stakeholders would improve the City's ability to mitigate hazards with the latest knowledge and resources.

- **Outreach Opportunities**: Enhanced community outreach, emergency notifications, and trainings would further enhance the City's capabilities to respond to and recover from hazards. The City could expand outreach through digital tools such as social media, participate in the Great California ShakeOut, and increase FireWise outreach events and media coverage. Community outreach especially to the City's Spanish-speaking population, emergency notifications, and trainings would further enhance the City's capabilities to respond to and recover from hazards.
- **Fiscal Opportunities**: The City can update its CIP to include hazard mitigation actions from the LHMP and related documents such as Economic Development Strategic Plan. The City will continue to seek grants (e.g., HMGP, BRIC) to fund these CIP projects and related projects in the City's mitigation strategy. The City can seek opportunities to partner with the County and/or other stakeholder agencies in grant applications to address regional hazards more effectively. The City could also consider expanding its fiscal capabilities through its annual budget process and other revenue measures (e.g., raising taxes, property assessments, bonds).

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 City of Goleta LHMP. The intent is to confirm and update the description, location and extent, and history of hazards facing the City 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 City.

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 City refined the list of hazards applicable to the City 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 City'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. Applicable hazard information from the City's 2017 LHMP was incorporated during the development of this section. A comprehensive treatment of hazards and their descriptions may be found in Chapter 5.0 of the Santa Barbara County 2022 MJHMP.

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 City. The City 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 City 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 Goleta LPT as their top priorities (Appendix A). A brief rationale for each hazard is included below. This assessment of key hazards in the City is provided in addition to the 2022 MJHMP's comprehensive assessment of regional hazards that may affect the City.

Table 5-1. City of Goleta Local Priority Hazards

Hazard Type and Ranking	Score	Planning Consideration Based on Hazard Level
Wildfires	11	Significant
Earthquakes	11	Significant
Flooding	9	Moderate
Coastal Hazards	4	Low
Tsunamis	4	Low

To continue compliance with the DMA of 2000, the City 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 City in subsections below. After reviewing the County's hazard ranking, the City's LPT decided to remove several hazards (e.g., windstorm, hailstorm, tornado, oil spill, terrorism, civil disturbance, etc.) from the detailed analysis given the low significance of these hazards for the City. The remaining hazards were ranked based on the planning consideration for them, and it was decided that Wildfires Earthquakes, and Flooding all required significant planning consideration, while Coastal Hazards and Tsunamis only require limited planning consideration. Based on these rankings, the City's LHMP focuses on the most significant hazards facing the community: Wildfires, Earthquakes, Flooding and to a lesser extent, Coastal Hazards and Tsunamis. While other hazards (including Agricultural Pests, Aircraft Crash, Civil Disturbance, Cyber Threat, Dam Failure, Drought, Energy Shortage & Resiliency, Extreme Heat/Freeze, Geologic Hazards, Hazardous Material Releases, Invasive Species, Landslides, Mudflow and Debris Flow, Natural Gas Pipeline Rupture and Storage Facility Incidents, Oil Spills, Pandemic/Public Health Emergencies, and Train Accidents) have the potential to occur within the City, these hazards are covered in greater detail in the 2022 MJHMP.

For example, the City identified power outages/public safety power shutoffs as a potential hazard in the City. The most recent public safety power shutoffs in the City occurred on January 18, 2021, and are likely to happen again as Southern California Edison improves its infrastructure and wildfire conditions become year-round concerns. Power outages can be life-threatening for residents that rely on life-sustaining technology like oxygen concentrators. Power is often shut off during high heat weather events and other natural hazard events, such as wildfire and flood. Power outages and

public safety power shutoffs would threaten residents that are sensitive to heat. This hazard is discussed further in section 5.6.1, *Energy Shortage and Resiliency,* within the MJHMP.

5.3 WILDFIRE

5.3.1 Description of Hazard

Wildfires can be classified as either a wildland fire or a wildland-urban interface (WUI) fire. The former involves situations where wildfire occurs in an area that is relatively undeveloped except for the possible existence of basic infrastructures such as roads and power lines. A WUI fire includes situations in which a wildfire enters an area that is developed with structures and other human developments. In WUI fires, the fire is fueled by both naturally occurring vegetation and the urban structural elements themselves. According to the National Fire Plan issued by the U.S. Departments of Agriculture and Interior, the wildland-urban interface is defined as "*…the line, area, or zone where structures and other human development meet or intermingle with undeveloped wildland or vegetative fuels.*" WUI areas in the City include developed single-family neighborhoods immediately adjacent to the foothills of the Santa Ynez Mountains and Los Padres National Forest (refer to Figure 5-2 of the MJHMP).

Certain conditions must be present for a wildfire hazard to occur; a large source of fuel must be present, the weather must be conducive (generally hot, dry, and windy), and fire suppression sources must not be able to easily suppress and control the fire. The cause of a majority of wildfires is human-induced 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. Weather as manifested in temperature, humidity, and wind (both short and long term) affect the probability, severity, and duration of wildfires. The climate, topography, and vegetation in Santa Barbara County are conducive to wildfires.

5.3.2 Location and Extent of Hazard in the City of Goleta

Santa Barbara County Fire has synthesized data at a more local level to convey communities at risk. To help protect people and their property from potential catastrophic wildfire, the National Fire Plan directs funding to be provided for projects designed to reduce the fire risks to communities. A fundamental step in achieving this goal was the identification of communities that are at high risk of damage from wildfire. These high-risk communities identified within the WUI were published in the Federal Register in 2001. At the request of Congress, the Federal Register notice only listed those communities neighboring federal lands. The list represents the collaborative work of the 50 states and five federal agencies using a standardized process, whereby states were asked to submit all communities within their borders that met the criteria of a structure at high risk from wildfire. The list of federally regulated (communities that adjoin federal lands) communities at risk within Santa Barbara County includes the City of Goleta.

The City of Goleta ranked the wildfire hazard as being a significant planning concern for the City. For example, Goleta has significant fire risk due to the invasive Eucalyptus trees in open spaces and existing development along the foothills creating a significant wildland-urban interface area. A complete description of wildfire hazards within the County is provided in Section 5.3.1 of the MJHMP.

5.3.3 History of Hazard in the City of Goleta

Because Santa Barbara County is prone to wildfires, there is a long history of wildfires in the County. However, not all of these fires threatened the City of Goleta. Over the last ten years, Santa Barbara County experienced 9 major fires. Three of these fires had the potential to impact the City of Goleta (refer to Figure 5-4 of the MJHMP):

- The Alisal Fire in 2021 burned 16,970 acres, shut down Highway 101, and forced dozens of people to evacuate. The fire destroyed 12 homes and damaged one other. OEM issued an evacuation order for about 300 residents in the Alisal Fire burn area (CBS Los Angeles 2021).
- The Whittier Fire in 2017 burned over 18,000 acres above Camp Whittier on the north slope of the Santa Ynez near Lake Cachuma primarily within the Los Padres National Forest and private ranchlands. The fire was active for 167 days. In total, 16 homes and 30 outbuildings were destroyed. One home and six outbuildings were damaged. Thousands of campers in and around the Cachuma Lake Recreation area and nearby Paradise Road had to flee, leaving eerie ghost towns of pitched tents and picnic lunches on the tables as they fled (Santa Maria Times 2021).
- The Sherpa Fire burned over 7,400 acres in Santa Barbara County, west of Goleta, for 27 days (National Interagency Fire Center 2021). The blaze prompted evacuation orders for El Capitan and Refugio State Beaches as well as for the ranches in El Capitan Canyon. The fire destroyed the water system for El Capitan State Beach, which remained closed for weeks. At the peak of the fire, 2,000 firefighters were on site to try to contain the fire (Santa Maria Times 2021).
- The Holiday Fire burned 113 acres in July of 2018. The fire highly impacted Goleta with residents being evacuated north of Patterson and Cathedral Oaks. The direct impacts associated with the fire led to the creation of the Emergency Services Coordinator position within the City. The cause of the fire was due to a combination of strong sundowner winds, unkept vegetation, and electrical utility equipment.
- The Gap Fire burned almost 10,000 acres and began to the northeast of Goleta in 2008. 5,000 people would be displaced due to evacuation orders, and 150,000 Southern California Edison customer were without power.

5.3.4 Probability of Occurrence

Vegetation and topography are significant elements in the identification of the fire threat zones. A substantial amount of the vegetation in Santa Barbara is commonly called chaparral, it is a dense and scrubby bush that has evolved to persist in a fire-prone habitat. Chaparral plants will

eventually age and die; however, they will not be replaced by new growth until a fire rejuvenates the area. Chamise, manzanita, and ceanothus are all examples of chaparral which are quite common in Santa Barbara County and the foothills above Goleta.

Santa Barbara County was subject to 42 major wildfires over 88 years, resulting in a 48 percent chance of occurrence in any given year. Fire threat is a combination of two factors: 1) fire frequency or the likelihood of a given area burning, and 2) potential fire behavior. These two factors are combined to create four threat classes ranging from Moderate to Extreme. While the probability for the City of Goleta is likely lower due to the Pacific Ocean to the south and agricultural orchards to the north, the threat remains Moderate. However, portions of western Goleta are adjacent to High and Very High threat areas.

5.3.5 Climate Change Considerations

Climate change plays a significant role in wildfire hazards. The changing conditions from wet to dry can create more fuel; the increased possibility of high winds increase risk and present a challenge, and drought conditions could hinder the ability to contain fires. Large wildfires also have several indirect effects beyond those of a smaller, local fire. These may include air quality and health issues, road closures, business closures, and other forms of losses. Furthermore, large wildfires increase the threat of other disasters such as landslides and flooding.

5.4 EARTHQUAKE & LIQUEFACTION

5.4.1 Description of Hazard

The City of Goleta ranked the earthquake hazard as being a significant planning concern for the City. An earthquake is caused by a release of strain within or along the edge of the Earth's tectonic plates producing ground motion and shaking, surface fault rupture, and secondary hazards, such as ground failure. The severity of the motion increases with the amount of energy released decreasingwith distance from the causative fault or epicenter and is amplified by soft soils. After just a few seconds, earthquakes can cause massive damage and extensive casualties.

Most people are familiar with the Richter scale, a method of rating earthquakes based on strength using an indirect measure of released energy. The Richter scale is logarithmic. Each one-point increase corresponds to a 10-fold increase in the amplitude of the seismic shock waves and a 32-fold increase in energy released. For example, an earthquake registering 7.0 on the Richter scale releases over 1,000 times more energy than an earthquake registering 5.0.

Table 5-2. Richter Scale

Richter Magnitudes	Earthquake Effects
Less than 3.5	Generally not felt but recorded.
3.5-5.4	Often felt, but rarely causes damage.

Richter Magnitudes	Earthquake Effects
5.5-6.0	Slight damage to well-designed buildings. Can cause major damage to poorly constructed buildings over small regions.
6.1-6.9	Can be destructive in areas up to about 100 kilometers across residential areas.
7.0-7.9	Can cause serious damage to larger areas.
8 or greater	Can cause serious damage in areas several hundred kilometers across.

Peak ground acceleration (PGA) is a measure of the strength of ground shaking. Larger peak ground accelerations result in greater damage to structures. PGA is used to depict the risk of damage from future earthquakes by showing earthquake ground motions that have a specified probability (10%,5%, or 2%) of being exceeded in 50 years return period. These values are often used for reference in construction design, and in assessing relative hazards when making economic and safety decisions.

Liquefaction is the phenomenon that occurs when ground shaking causes loose, saturated soils to lose strength and act as a viscous fluid. Liquefaction causes two types of ground failure: lateral spread and loss of bearing strength. Lateral spreads develop on gentle slopes and entail the sidelong movement of large masses of soil as an underlying layer liquefies. Loss of bearing strength occurs when the soil supporting structures liquefy, causing the structures to settle; resulting in potential damage.

5.4.2 Location and Extent of Hazard in the City of Goleta

As previously mentioned, Santa Barbara County is located in a high seismic activity zone in the Transverse Range geologic province. The movement of continental plates manifests primarily on the San Andreas Fault system. The San Andreas Fault is situated seven miles northeast of Santa Barbara County; active faults in the San Andreas Fault system that fall within Santa Barbara County include the Nacimiento, Ozena, Suey, and Little Pine faults. Other active faults in the region include the Big Pine, Mesa, Santa Ynez, Graveyard-Turkey Trap, More Ranch, Pacifico, Santa Ynez, and Santa Rose Island faults. The Santa Barbara County Comprehensive Plan Seismic Safety and Safety Element provides descriptions of all faults in Santa Barbara County. This list includes historically active, active, potentially active, and inactive faults, as well as their location and fault length. Maps included in this plan are based on data provided by the County of Santa Barbara, consistent with the MJHMP that this report is an annex to. Actual shaking during an earthquake will vary depending on the location and nature of the fault rupture. Figure 5-1 shows the probability of areas of the county experiencing 2 percent shaking within the next 50 years. These values are often used for reference in construction design, and in assessing relative hazards when making economic and safety decisions.

After earthquakes, some regions may be prone to liquefaction. On level ground, liquefaction results in water rising to the ground surface. On sloping ground, liquefaction will usually result in slope

failure such as the event at the Sheffield Dam in the aftermath of the 1925 Santa Barbara earthquake. Liquefaction risk is considered high if there are soft soils (Types D or E) present.

The National Earthquake Hazards Reduction Program (NEHRP) rates soils from hard to soft and gives the soils ratings from Type A through Type E. The hardest soils are rated Type A, and the softest soils are rated Type E. The majority of the soils in Santa Barbara County are types A-C, with some areas having type D. There have been no Type E soils identified. Liquefaction risk is also determined by the depth to groundwater. Most of the low coastal plan and valley bottoms are underlain by alluvium and given a moderate rating with respect to liquefaction potential.

5.4.3 History of Hazard in the City of Goleta

Santa Barbara County is located in a high seismic activity zone and as such has a long history of earthquakes. Although most seismic activity in California occurs on the San Andreas Fault system, most historic seismic events in the Santa Barbara region have been centered offshore on an east-west trending fault between Santa Barbara and the Channel Islands. Several smaller earthquakes have taken place in the past years, including two magnitude 2.0 earthquakes in March 2021 in the Santa Ynez Valley and a magnitude 2.3 earthquake in April 2021 near the City of Lompoc (Earthquake Track 2021). These approximate magnitude 2.0 earthquakes are fairly common in the county.

While more extensive discussion of previous earthquakes in Santa Barbara County is available in the Seismic and Safety Element of the Santa Barbara County Comprehensive Plan, Table 5-9 of the MJHMP provides an overview of significant events within the last 50 years. Figure 5-10 of the MJHMP displays historical epicenters of earthquakes located in Santa Barbara County since 1700.

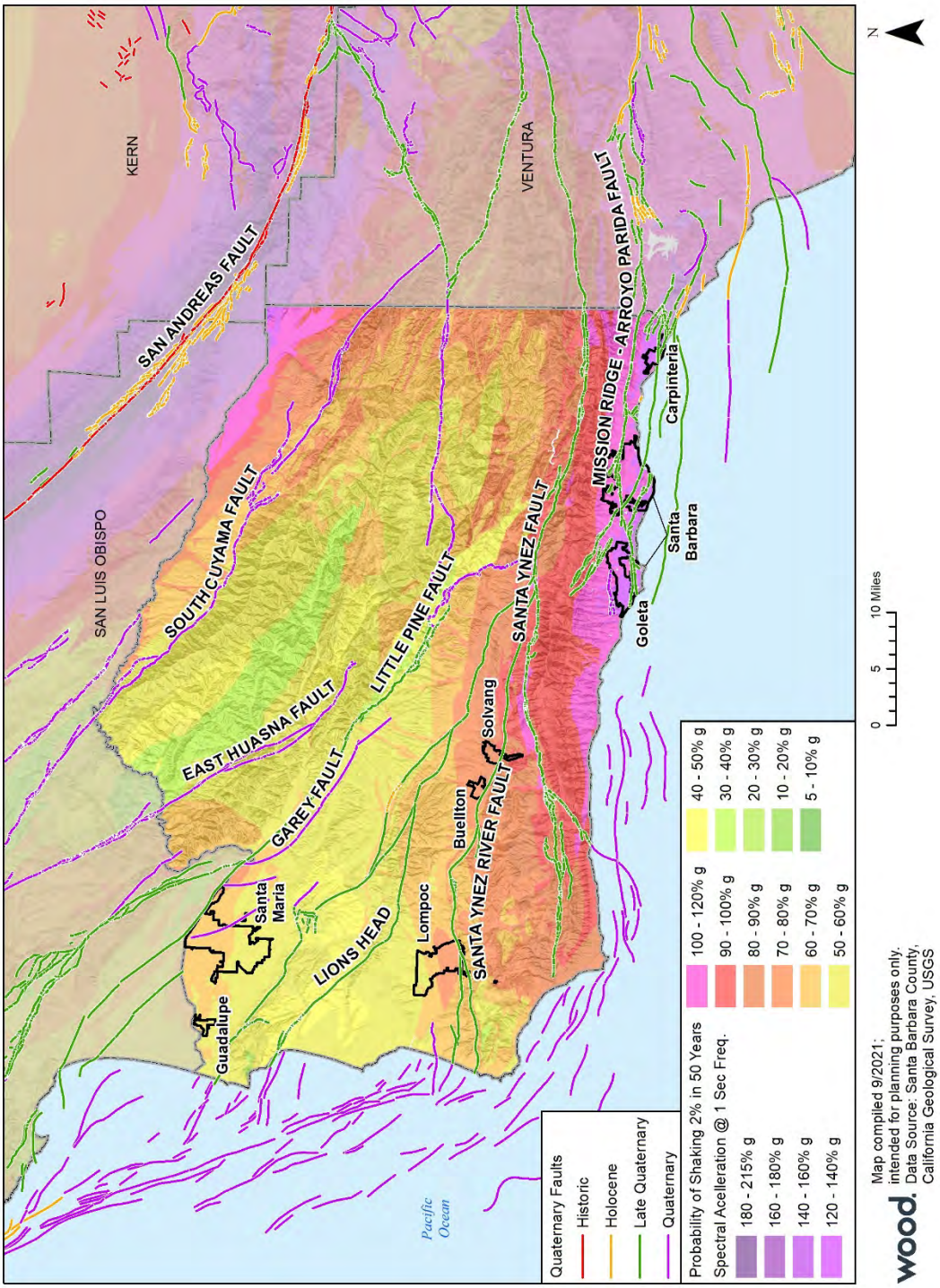
5.4.4 Probability of Occurrence

The USGS and their partners, as part of the latest Uniform California Earthquake Rupture Forecast Version 3, have estimated the chances of having large earthquakes throughout California over the next 30 years. Statewide, the rate of earthquakes around magnitude 6.7 (the size of the 1994 Northridge earthquake) has been estimated to be one per 6.3 years (more than 99 percent likelihood in the next 30 years); in southern California, the rate is one per 12 years (93 percent likelihood in the next 30 years) (refer also to Table 5-10 of the MJHMP).

5.4.5 Climate Change Considerations

While climate change is not expected to directly affect earthquake frequency or intensity; it could exacerbate indirect or secondary impacts of earthquakes. For example, climate change could increase the frequency and intensity of extreme precipitation events, which in turn increases the probability of landslides and liquefaction events during an earthquake if the earthquake coincided with a wet cycle (California Natural Resources Agency 2018).

Figure 5-1. Santa Barbara County Probability of Shaking 2% in 50 Years



5.5 FLOOD

5.5.1 Description of Hazard

A flood is a general and temporary condition of partial or complete inundation on land that is normally dry. Several factors determine the severity of floods, including rainfall intensity and duration, antecedent moisture conditions, surface permeability, and geographic characteristics of the watershed such as shape and slope.

A large amount of rainfall in a short time can result in flash flood conditions, as can a dam failure or other sudden spill. The National Weather Service's definition of a flash flood is a flood occurring in a watershed where the time of travel of the peak of flow from one end of the watershed to the other is less than six hours.

Another form of flooding occurs when coastal storms produce large ocean waves that sweep across coastlines making landfall. Storm surges inundate coastal areas, destroy dunes, and cause flooding. If a storm surge occurs at the same time as high tide, the water height will be even greater. The County historically has been vulnerable to storm surge inundation associated with tropical storms and El Nino events.

5.5.2 Location and Extent of Hazard in the City of Goleta

The geographical location, climate, and topography of Santa Barbara County make the county prone to flooding. In regions such as Santa Barbara, without extended periods of below-freezing temperatures, floods usually occur during the season of highest precipitations or during heavy rainfalls after long dry spells. Additionally, due to the Mediterranean climate and the variability of rainfall, streamflow throughout the County is highly variable and directly impacted by rainfall. Watercourses can experience a high amount of sedimentation during wet years and high amounts of vegetative growth during dry and moderate years.

The drainages in the southern part of the County are characterized by high intensity, short duration runoff events, due to the relatively short distance from the top of the Santa Ynez Mountains to the Pacific Ocean. In particular, the City experiences flooding along Hollister Road between Los Carneros and Highway 217. Runoff from high intensity, short-duration storm events can cause inundation of overbank areas, debris including sediment, rock, downed trees in the water that can plug culverts and bridges, erosion and sloughing of banks, and loss of channel capacity due to sedimentation.

The City is traversed by the floodplains of creeks that drain the Santa Ynez Mountains, with the degree of flood hazard varying substantially by community and creek. Las Vegas Creek has been channelized and San Jose Creek has been partially channelized, reducing but not eliminating, flood hazards. Other creeks such as Maria Ygnacia Creek in the Goleta Valley remain in a more natural condition with the corresponding potential for flood hazards. Flood control debris basins have been constructed on many of these creeks to intercept sediment and debris, reducing the potential for plugging of downstream creek channels and associated flood hazards.

Another contributing factor to flooding is the county's location along the Pacific Ocean. With its 110 miles of coastline, low-lying portions of communities in the county are susceptible to wave attack,

coastal flooding, and storm surge. In particular, Goleta Beach County Park is subject to wave attacks, coastal flooding, and storm surges. Additionally, portions of the City are subject to flooding due to flash flooding, urban flooding, river channel overflow, and downstream flooding.

5.5.3 History of Hazard in the City of Goleta

Flooding has been a major problem throughout Santa Barbara County's history. Santa Barbara County has several hydrologic basins that have different types of flooding problems, including over bank riverine flooding, flash floods, tidal flooding/tsunamis, and dam failure. The most common flooding in Santa Barbara is due to riverine flooding and flash flood events.

Between 1906 and 2018, Santa Barbara County experienced 22 significant inland flood events. Eight of these floods received Presidential Disaster Declarations. Section 5.3.4 of the MJHMP describes the floods, including information concerning the nature of the flooding and the extent of the damages.

The most damaging flood in the City occurred on January 10, 1995. In Goleta, debris clogged culverts under Los Carneros Road and Highway 101, causing the Los Carneros and San Pedro creeks to overtop the highway and flow down Calle Real. Homes in the vicinity were flooded with up to three feet of mud and debris. Significant localized flooding also occurred in the commercial district known as Old Town Goleta. This flood and mudslide affected approximately 510 properties along the South Coast and caused roughly $50 million of damage (County Flood Control 1995; Santa Barbara Bucket Brigade 2019).

5.5.4 Probability of Occurrence

The 100-year flood is a flood that has a one percent chance in any given year of being equaled or exceeded. The 500-year flood is the flood that has a 0.2 percent chance of being equaled or exceeded in any given year.

5.5.5 Climate Change Consideration

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. For example, what is currently a 200-year storm, or one that has a 1 in 200 chance of occurring in a given year, by 2100 would increase in frequency by 40 to 50 years (to a 1 in 150/160 chance in a given year). This means that the 100-year and 500-year floodplains may expand, and the current floodplains may become 40- to 50-year floodplains (Santa County Barbara Planning and Development Department 2021). The frequency and intensity of heavy rainstorms are projected to increase, causing fluvial flooding along the City's creeks, although overall annual precipitation levels are expected to increase only slightly. For discussion regarding the impacts of climate change on coastal flooding and sea level rise, see Section 5.1.4, *Coastal Hazards*.

5.6 COASTAL HAZARDS

5.6.1 Description of Hazard

Erosion is a natural process that alters existing geomorphic features. Erosion can occur due to several factors, including winter storms, tidal action, wind-generated high surf, wave action, and rising sea levels.

Coastal storms produce large ocean waves that sweep across low-lying coastlines making landfall. Storm surges can inundate coastal areas, destroy dunes, and cause flooding. If a storm surge occurs at the same time as high tide, the water height will be even greater. Historically, the county has also been vulnerable to storm surge inundation associated with El Niño events and a related increase in storm severity.

5.6.2 Location and Extent of Hazard in the City of Goleta

The impacts from wave runup and erosion affect portions of the western Goleta coastline and areas south of Goleta around the Santa Barbara Airport and unincorporated Goleta Beach area.

Existing coastal hazards along the county's 110-mile-long shoreline tend to be concentrated along the South Coast due to extensive existing shoreline development. The South Coast has a long history of exposure to coastal hazards from bluff retreat to coastal erosion and flooding. Low-lying areas such as Goleta Beach County Park have experienced coastal flooding due to storms surges and wave attacks. Bluff erosion is another serious local hazard with annual bluff erosion rates generally varying from 6 inches to one foot per year, depending upon location. Wave attack and coastal erosion at Goleta Beach County Park have been a long-running policy dispute regarding how to manage this vulnerable public facility. In response to these coastal hazards, private property owners and local governments have erected rock revetments and seawalls to attempt to protect public and private improvements from coastal hazard damage. The UPRR has also installed both concrete seawalls and rock revetments to protect the railroad tracks along the South Coast from Carpinteria to Gaviota. The long-term effects of such coastal protection structures are subject to debate, as well as their secondary impacts on natural coastal processes and sand supply.

5.6.3 History of Hazard in the City of Goleta

Historical coastal erosion is a recurring and ongoing hazard in south county and is particularly severe along the City's coastline and adjoining areas in the unincorporated community of Isla Vista. Following severe coastal storms, such as the El Niño's of 1983 and in 2015/2016, serious beach erosion and damage occurred at Goleta Beach County Park. Subsequent storms in 2017 destroyed recently installed geotextile revetment structures and severe erosion at the Park. Coastal erosion hazards have resulted in the adoption of required city and County blufftop setbacks for development in coastal communities generally require a minimum of 75 years of structural life. In the City of Goleta, the majority of coastline adjoins the Ellwood-Mesa Open Space Area.

5.6.4 Probability of Occurrence

Coastal flooding from tidal inundation and wave attack and associated erosion of coastal bluffs and beaches occurs during many winters but is most pronounced during past major El Niño events, which have return intervals of 2 to 7 years. Although many private coastal properties and public facilities have been protected by rock revetments or seawalls, coastal flooding, beach and bluff erosion continue in areas such as the City. While the existing probability of occurrence is typically confined to El Niño seasons or major storm events, as discussed below, climate change and sea level rise are projected to increase in frequency and severity of occurrence.

5.6.5 Climate Change Considerations

Climate change is both a present threat and a slow-onset disaster. It acts as an amplifier of existing hazards. Extreme weather events have become more frequent over the past 40 to 50 years and this trend is projected to continue. Rising sea levels, changes in rainfall distribution, and intensity are expected to have a significant impact on coastal communities, including portions of Goleta. Sea level rise (SLR) is defined as the rising of the level of the sea as a result of the so-called greenhouse effect or global warming. SLR can occur through one or more of three processes that include eustasy, isostasy, or thermal expansion. SLR coupled with increased frequency, severity, and duration of high tide and storm events related to climate change will result in more frequent and severe extreme events along the coast. These events could expose the coast to severe flooding and erosion, damage to coastal structures and real estate, and salinity intrusion into delta areas and coastal aquifers (Projecting Future Sea Level, A Report from the California Climate Change Center, 2006).

5.7 TSUNAMI

5.7.1 Description of Hazard

The City of Goleta ranked the tsunami hazard as being a limited planning concern for the City, but it is worth mentioning as a subset of earthquake hazards. A tsunami is a series of long waves generated in the ocean by a sudden displacement of a large volume of water. Underwater earthquakes can cause this displacement. Tsunami waves travel at speeds averaging 450 to 600 miles per hour. As a tsunami nears the coastline, its speed diminishes, its wavelength decreases, and its height increases. Depending on the type of event that creates the tsunami, as well the remoteness of the event, the tsunami could reach land within a few minutes or after several hours. Low-lying areas could experience severe inland inundation of water and deposition of debris more than 3,000 feet inland.

5.7.2 Location and Extent of Hazard in the City of Goleta

Areas prone to tsunami hazards in the county are limited to coastal areas and offshore areas. The cities of Santa Barbara and Carpinteria are most susceptible to tsunami hazards, given that they are located on or near several offshore geological faults, the more prominent faults being the Mesa Fault, the Santa Ynez Fault in the mountains, and the Santa Rosa Fault (refer to Section 5.3.3 of the MJHMP). Other unnamed faults in the offshore area of the Channel Islands may present tsunami

hazards. These faults have been active in the past and can subject the entire county coastal area to seismic action at any time.

5.7.3 History of Hazard in the City of Goleta

Thirteen possible tsunamis have been observed or recorded in the county from local earthquakes between 1812 and 1988; however, there have been no recorded locally generated tsunamis since 1988. Additionally, these tsunami events were poorly documented, and the precise extent of environmental and public impacts is uncertain (refer to Section 5.3.9 of the MJHMP).

5.7.4 Probability of Occurrence

The University of Southern California (USC) Tsunami Research Group has modeled areas in the county that could potentially be inundated in the event of a tsunami. In 2001, the Tsunami Research Group concluded the walls of the basin that form the Santa Barbara Channel are susceptible to submarine slope failures in at least two mapped locations (USC 2001). This model is based on potential earthquake sources and hypothetical extreme undersea, near-shore landslide sources. The data was mapped by the California Geological Survey and Cal OES for Tsunami Evacuation Planning. The maps and data are compiled with the best currently available scientific information and represent areas that could be exposed to tsunami hazards during a tsunami event. The tsunami inundation map helps to assist cities and counties in identifying their tsunami hazard areas. Figure 5-20 shows tsunami hazard areas of Santa Barbara County and Figure 5-21 provides a closer look at tsunami hazard areas of Santa Barbara County's south coast. Given, there is a medium probability of an earthquake, which would result in high impacts including potential tsunami events in the City, the City is has a low risk of future tsunami events.

5.7.5 Climate Change Considerations

Tsunamis are created by earthquakes or other earth movements. To date, no direct relationship has been made between climate change and the occurrences of earthquakes or other earth movements.

6.0 VULNERABILITY ASSESSMENT

The vulnerability assessment builds on the hazard assessment provided in Section 5.0 to estimate losses where data is available and consider a specific list of critical facilities identified within the City of Goleta. The City identified 70 critical facilities to be included in the Vulnerability Assessment portion of the LHMP. These facilities primarily included utilities, government, and educational structures. Of the available data, it was shown that these buildings are worth approximately $22,948,787 in total building value (i.e., structural and content value) (Table 6-1). No values were able to be obtained for some major facilities, so the actual value may be much more than this amount.

Table 6-1. Critical Facilities in the City of Goleta

Type	Name	Address	Total Building Value
Power Plant	Ellwood	30 Las Armas Rd	-
Food Market	Camino Real Marketplace	704 Market Place Dr	-
Shelter	SB AHR Shelter Main Office	5473 Overpass Rd	$309,034
RMP Facilities	Raytheon Vision Systems	75 Coromar Dr	-
RMP Facilities	Venoco S. Ellwood Onshore Oil And Gas Plant	7979 Hollister Ave	-
Animal Shelter	Sb Ahr Dog Kennel (Old)	5473 Overpass Rd	$155,070
Clinic	Goleta Valley Hospital	351 South Patterson Ave	-
Clinic	Sansum Clinic-Patterson	122 S. Patterson Ave	-
Clinic	Buena Vista Care Center	160 South Patterson Ave	-
EMS Station	Santa Barbara County Fire Department Station 14	320 Los Carneros Rd	-
EMS Station	Santa Barbara County Fire Department Station 12	5330 Calle Real	-
EMS Station	Santa Barbara County Fire Department Station 11	6901 Frey Way	-
EMS Station	American Medical Response Station 5	104 South Patterson Avenue	-
Nursing Home	Mariposa At Ellwood Shores	190 Viajero Dr	-
Nursing Home	Maravilla	5486 Calle Real	-
Nursing Home	Buena Vista Care Center	160 S Patterson Ave	-
Education	Ellwood Elementary	7686 Hollister Ave	-
Education	Learning Tree Preschool	401 N. Fairview Ave	-
Education	Dos Pueblos Senior High	7266 Alameda Ave	-
Education	La Patera Elementary	555 N. La Patera Ln	-
Education	Kellogg Elementary	475 Cambridge Ave	-
Education	Brandon Elementary	195 Brandon Dr	-
Education	Santa Barbara Charter	6100 Stow Canyon Rd	-
Education	Goleta Valley Junior High	6100 Stow Canyon Rd	-
Education	Montessori Center School	401 N Fairview Ave # 1	-
Education	Coastline Christian Academy	5950 Cathedral Oaks Rd	-
Education	Waldorf School of Santa Barbara	7421 Mirano Dr	-
Fire Station	Fire Station #14	320 Los Carneros Rd	$452,156
Fire Station	Fire Station #14 Generator House	320 Los Carneros Rd	$17,401
Government	Goleta Valley Community Center	5679 Hollister Avenue	$15,000,000
Government	City Of Goleta Corporation Yard Building/Public Works	6735 Hollister Avenue	$2,000,000
Government	Goleta City Hall	130 Cremona Drive	-
Highway Patrol	California Highway Patrol - Santa Barbara	6465 Calle Real	-
Library	Goleta Library	500 N. Fairview Avenue	$5,000,000

Type	Name	Address	Total Building Value
Sheriff	Sheriff Hollister Substation	5827 Hollister Ave	$7,140
Sheriff	Sheriff Calle Real Marketplace Substation	7042 Marketplace Drive	$7,986
Sheriff	Santa Barbara County Sheriff's Department - City of Goleta Substation	130 Cremona Drive, City Hall - Bottom Floor - Suite B	-
Bridge	Bridge	HWY 101 / 'WINCHESTER CREEK'	-
Bridge	Bridge	SR-217 / 'HOLLISTER AVE'	-
Bridge	Bridge	'LOS CARNEROS Rd / 'US HIGHWAY 101'	-
Bridge	Bridge	'CATHEDRAL OAKS Rd / 'US HIGHWAY 101'	-
Bridge	Bridge	'GLEN ANNIE ROAD' / 'GLEN ANNIE CREEK'	-
Bridge	Bridge	'HOLLISTER AVE' / 'MARIA YGNACIO CREEK'	-
Bridge	Bridge	'HOLLISTER AVE' / 'SAN JOSE CREEK'	-
Bridge	Bridge	'STOW CANYON RD' / 'SAN PEDRO CREEK'	-
Bridge	Bridge	'LOS CARNEROS RD' / 'CARNEROS CREEK'	-
Bridge	Bridge	'CALLE REAL RD' / 'LAS VEGAS CREEK'	-
Bridge	Bridge	'PATTERSON AVE' / HWY 101	-
Bridge	Bridge	N HWY 101 - W SR217 CONNECTR' / 'UPRR HWY 101'	-
Bridge	Bridge	HWY 101 / 'CARNEROS CREEK'	-
Bridge	Bridge	HWY 101 / 'GLEN ANNIE CREEK'	-
Bridge	Bridge	'E217-S101 CONNECTR' / 'UPRR HWY 101 OFFRMP'	-
Bridge	Bridge	HWY 101 NB ONRAMP' / 'TECOLOTITO CREEK'	-
Bridge	Bridge	'STORKE ROAD' / HWY 101	-
Bridge	Bridge	'FAIRVIEW AVE' / HWY 101	-
Bridge	Bridge	HWY 101 / 'LAS VEGAS CREEK'	-
Bridge	Bridge	HWY 101 -FAIRVIEW AVE' / 'LAS VEGAS CREEK'	-
Bridge	Bridge	HWY 101 / 'SAN PEDRO CREEK'	-
Bridge	Bridge	PATTERSON AVE / UPRR	-
Bridge	Bridge	'CALLE REAL' / 'SAN JOSE CREEK'	-
Bridge	Bridge	'CATHEDRAL OAKS RD' / 'SAN PEDRO CREEK'	-

Type	Name	Address	Total Building Value
Bridge	Bridge	'CATHEDRAL OAKS RD' / 'CARNEROS CREEK'	-
Bridge	Bridge	'CATHEDRAL OAKS RD' / 'GLEN ANNIE CREEK'	-
Bridge	Bridge	'LOS CARNEROS RD' / 'TECOLOTITO CREEK'	-
Bridge	Bridge	'SHIRRELL WAY' / 'LAS VEGAS CREEK'	-
Bridge	Bridge	'STORKE RD' / UPRR	-
Bridge	Bridge	'LOS CARNEROS RD' / UPRR	-
Bridge	Bridge	'CATHEDRAL OAKS RD' / UPRR	-
Bridge	Bridge	HWY 101 / San Jose Creek	-
Bridge	Bridge	HWY 101 NB / San Jose Creek	-

Using a GIS and the mapped extents of the hazards affecting the City, it was determined which critical facilities are exposed to which hazards depending on whether they fall within the mapped hazard area. The results of the exposure analysis are included in this section. A further description of the threats and methodologies used in this analysis is provided in Chapter 6.0, *Vulnerability Assessment* of the 2022 MJHMP. As the City continues to assess its vulnerability, the collection of better and more complete data will help to improve the risk assessment process to direct planning and mitigation decisions.

Table 6-2. Summary of Potential Impacts on Critical Facilities

Hazard Type	Specific Risk	Count	% of Critical Facilities Impacted	Exposure ($)
Flood	FEMA 1% Chance Flood Zone	15	21%	$15,007,140
	FEMA 0.2% Chance Flood Zone	3	4%	$-
Coastal Hazards	Sea Level Rise (200 cm)	2	3%	$-
Tsunami		0	0	$0
Wildfire	Low Wildfire Threat	3	4%	$-
	Moderate Wildfire Threat	1	1%	$2,000,000
Earthquake	Low Liquefaction Potential	17	24%	$7,986

Hazard Type	Specific Risk	Count	% of Critical Facilities Impacted	Exposure ($)
	Moderate Liquefaction Potential	3	4%	$-
	High Liquefaction Potential	50	71%	$22,940,801
	Regional Ground Shaking	70	100%	$22,948,787

6.1 WILDFIRE

The county has extensive areas within mapped Fire Hazard Severity Zones and Wildland-Urban Interface (WUI) areas. These hazard areas generate vulnerability for life and structures, including critical facilities, throughout the county, but most severely within rural foothills areas where dry vegetation, steep slopes, and difficult access combine to create a high probability of wildfire. Based on these maps, the City has 4 acres (0.8 percent) within Very High Wildfire Threat areas, 52 acres (1.02 percent) within High Wildfire Threat areas, 599 acres (11.86 percent) within Moderate Wildfire Threat areas, and 267 acres (5.28 percent) within Low Wildfire Threat areas. These vulnerable areas are home to 1,709 residents and are valued at $876,655,035.

Based on the GIS analysis conducted for the 2022 MJHMP, in Goleta, 652 properties with a total value of over $876 million are vulnerable to wildfire. Most of these areas are residential with limited vulnerabilities in commercial, agricultural, and industrial areas. In Goleta, approximately 1,709 residents live in high, moderate, or low wildfire threat areas. This information is summarized in Table 6-3 below.

Table 6-3. City of Goleta at Risk to Wildfire Threat

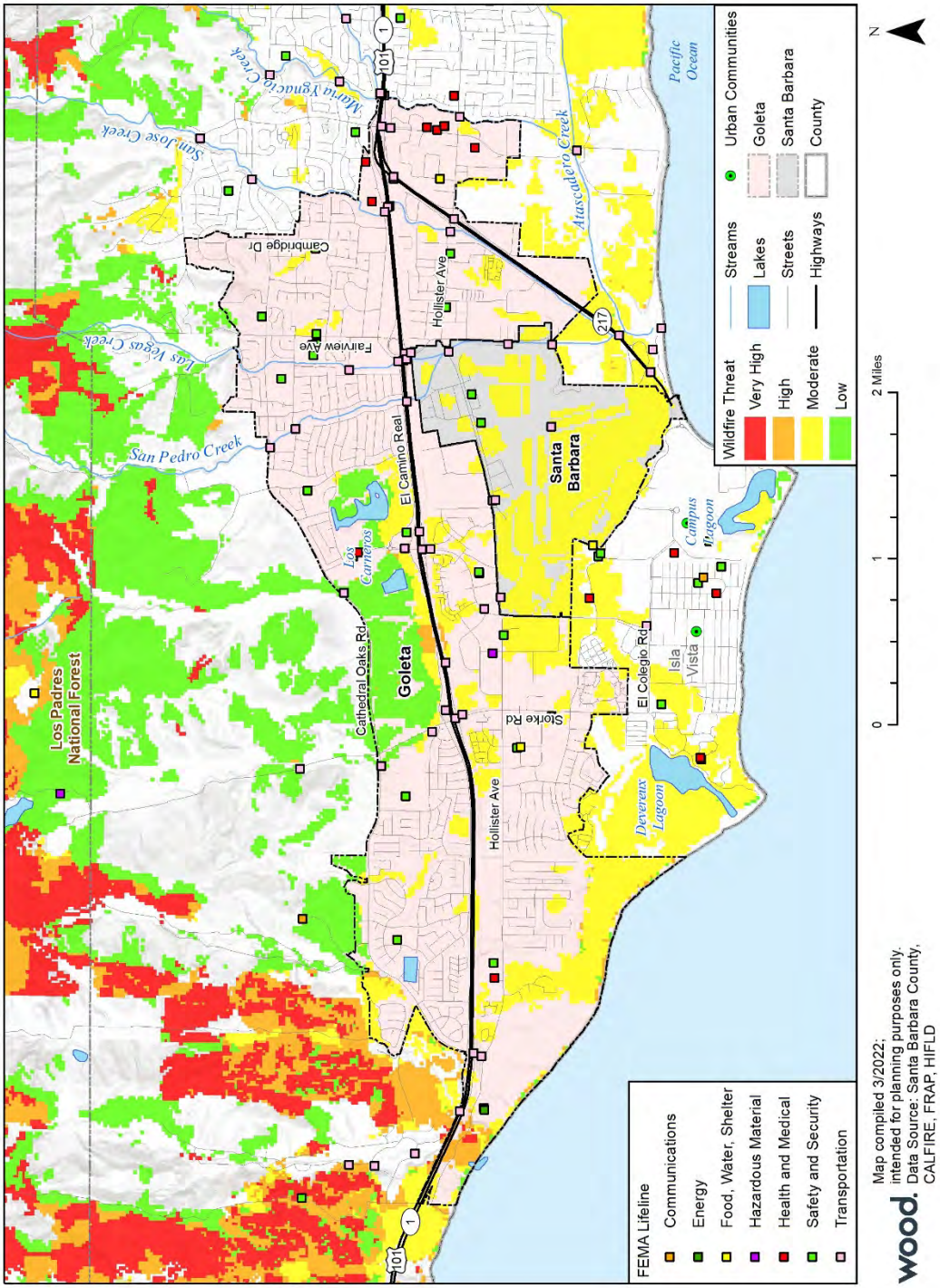
Property Type	Improved Parcel Count by Wildfire Threat Level						Total Value	Population
	Extreme	Very High	High	Moderate	Low	Total		
Agricultural	0	0	0	1	2	3	$1,126,116	
Commercial	0	0	0	12	0	12	$132,850,720	
Exempt	0	0	0	3	2	5	$2,520,690	
Industrial	0	0	0	6	0	6	$24,089,715	
Mixed Use	0	0	0	0	0	0	$0	0
Residential	0	0	1	624	1	626	$716,067,794	1,709
Improved Vacant	0	0	0	0	0	0	$0	
Total	**0**	**0**	**1**	**646**	**5**	**652**	**$876,655,035**	**1,709**

Four of the City's critical facilities fall within moderate or low wildfire threat areas, as listed in Table 6-4 (see also, Section 6.3.1, *Wildfire* of the 2022 MJHMP).

Table 6-4. City of Goleta Critical Facilities Vulnerable to Wildfire

Type	Name	Hazard Source/Type	Total Building Value
EMS Station	Santa Barbara County Fire Department Station 14	Low Wildfire Threat	-
Government	City of Goleta Corporation Yard Building/Public Works	Moderate Wildfire Threat	$2,000,000
Bridge	Bridge	Low Wildfire Threat	-
Bridge	Bridge	Low Wildfire Threat	-

Figure 6-1. City of Goleta Critical Facilities within Wildfire Threat Zones



6.2 EARTHQUAKE & LIQUEFACTION

Chapter 6.0, *Vulnerabilities Assessment* of the 2022 MJHMP addresses regional seismicity under two scenarios that include the City of Goleta. The 2,500-year scenario considers general seismicity from multiple faults in the region and a 7.0 magnitude event. The methodology utilizes probabilistic seismic hazard contour maps developed by the U.S. Geological Survey (USGS) for the 2018 update of the National Seismic Hazard Maps that are included with Hazus-MH. A deterministic scenario was also prepared to predict the outcome of a specific earthquake event. The deterministic scenarios used USGS provided ShakeMap datasets to model a Magnitude 7.4 earthquake of the Red Mountain Fault. This scenario assesses the effect that an earthquake sourced from this fault would generate in terms of damages and losses for the chosen area of interest (i.e., southern Santa Barbara County, including the City). Figure 6-1 is the ShakeMap produced for this scenario.

As described in the MJHMP, regional losses to people and property would include the City. As shown in the Red Mountain Fault ShakeMap scenario, the south and central parts of the county would perceive much stronger shaking and would likely receive the most severe damage when compared to the rest of the county. The entire City would perceive severe to extreme shaking and would likely receive moderate/heavy to very heavy damage. Direct effects of ground shaking could damage buildings and create dangerous debris and unstable structures. Displaced residents would likely seek shelter in the City, including residents from outside the City. Further, fires often occur after an earthquake. Because of the number of fires and the lack of water to fight the fires, they can often burn out of control.

Unreinforced masonry building type structures consist of buildings made of unreinforced concrete and brick, hollow concrete blocks, clay tiles, and adobe. Buildings constructed of these materials are heavy and brittle and typically provide little earthquake resistance. In small earthquakes, unreinforced buildings can crack, and in strong earthquakes, they tend to collapse. The City does not have any known unreinforced masonry buildings.

The City lies in an area with low, moderate, and high liquefaction severity classes. Regional earthquakes could cause liquefaction in the City, which could damage buildings and utilities when soils become unstable. Based on the GIS analysis conducted for the 2022 MJHMP, the City has 9,125 improved parcels valued at over $7 billion in the liquefaction severity zones. Based on this analysis, which accounts for residents only and not workers, 23,303 residents are living in this hazard zone within the City. While liquefaction would not likely affect all areas uniformly during an earthquake, this analysis indicates the extent and scale of vulnerabilities to liquefaction during a large earthquake.

Table 6-5. City of Goleta at Risk to Liquefaction Hazard by Property Type

Property Type	Improved Parcel Count	Total Value	Population
High Liquefaction Hazard			
Agricultural	4	$1,189,658	
Commercial	288	$782,936,722	
Exempt	32	$457,565,106	
Industrial	153	$746,789,160	

Property Type	Improved Parcel Count	Total Value	Population
Mixed Use	6	$31,031,524	16
Residential	3,949	$1,800,461,862	10,781
Improved Vacant	1	$18,060	
Total High Liquefaction	**4,433**	**$3,819,992,092**	**10,797**
Moderate Liquefaction Hazard			
Agricultural	1	$84,492	
Commercial	6	$25,050,458	
Exempt	0	$0	
Industrial	8	$28,461,538	
Mixed Use	0	$0	0
Residential	325	$120,414,996	887
Improved Vacant	0	$0	
Total Moderate Liquefaction	**340**	**$174,011,484**	**887**
Low Liquefaction Hazard			
Agricultural	3	$1,337,856	
Commercial	54	$413,071,582	
Exempt	13	$49,557,904	
Industrial	25	$397,769,283	
Mixed Use	0	$0	0
Residential	4,256	$2,426,929,638	11,619
Improved Vacant	1	$193,778	
Total Low Liquefaction	**4,352**	**$3,288,860,041**	**11,619**
Total Liquefaction Hazard	**9,125**	**$7,282,863,616**	**23,303**

As listed in Table 6-6, 53 critical facilities in the City would be vulnerable to damage or destruction from liquefaction during a significant regional earthquake (see also, Section 6.2.1, *Earthquake (Groundshaking)* and Section 6.3.3, *Liquefaction (Earthquake)* of the 2022 MJHMP).

Table 6-6. City of Goleta Critical Facilities Vulnerable to Liquefaction

Type	Name	Hazard Type/Source	Total Building Value
Power Plant	Ellwood	Moderate	-
Shelter	Sb Ahr Shelter Main Office	High	$309,034
RMP Facilities	Raytheon Vision Systems	High	-
RMP Facilities	Venoco S. Ellwood Onshore Oil And Gas Plant	Moderate	-
Animal Shelter	Sb Ahr Dog Kennel (Old)	High	$155,070
Clinic	Goleta Valley Hospital	High	-
Clinic	Sansum Clinic-Patterson	High	-
Clinic	Buena Vista Care Center	High	-

Type	Name	Hazard Type/Source	Total Building Value
EMS Station	Santa Barbara County Fire Department Station 14	High	-
EMS Station	Santa Barbara County Fire Department Station 12	High	-
EMS Station	American Medical Response Station 5	High	-
Nursing Home	Maravilla	High	-
Nursing Home	Buena Vista Care Center	High	-
Education	Learning Tree Preschool	High	-
Education	La Patera Elementary	High	-
Education	Kellogg Elementary	High	-
Education	Santa Barbara Charter	High	-
Education	Goleta Valley Junior High	High	-
Education	Montessori Center School	High	-
Education	Coastline Christian Academy	High	-
Education	Waldorf School Of Santa Barbara	High	-
Fire Station	Fire Station #14	High	$452,156
Fire Station	Fire Station #14 Generator House	High	$17,401
Government	Goleta Community Center	High	$15,000,000
Government	City Of Goleta Corporation Yard Building/Public Works	High	$2,000,000
Government	Goleta City Hall	High	-
Highway Patrol	California Highway Patrol - Santa Barbara	High	-
Library	Goleta Library	High	$5,000,000
Sheriff	Sheriff Hollister Substation	High	$7,140
Sheriff	Santa Barbara County Sheriff's Department - City Of Goleta Substation	High	-
Bridge	Bridge	Moderate	-
Bridge	Bridge	High	-
Bridge	Bridge	High	-
Bridge	Bridge	High	-
Bridge	Bridge	High	-
Bridge	Bridge	High	-
Bridge	Bridge	High	-
Bridge	Bridge	High	-
Bridge	Bridge	High	-
Bridge	Bridge	High	-
Bridge	Bridge	High	-
Bridge	Bridge	High	-
Bridge	Bridge	High	-
Bridge	Bridge	High	-
Bridge	Bridge	High	-

Type	Name	Hazard Type/Source	Total Building Value
Bridge	Bridge	High	-
Bridge	Bridge	High	-
Bridge	Bridge	High	-
Bridge	Bridge	High	-
Bridge	Bridge	High	-
Bridge	Bridge	High	-
Bridge	Bridge	High	-
Bridge	Bridge	High	-
Bridge	Bridge	High	-

Figure 6-2. City of Goleta Critical Facilities and Earthquake Groundshaking Potential (Red Mountain Fault 7.4 Magnitude ShakeMap)

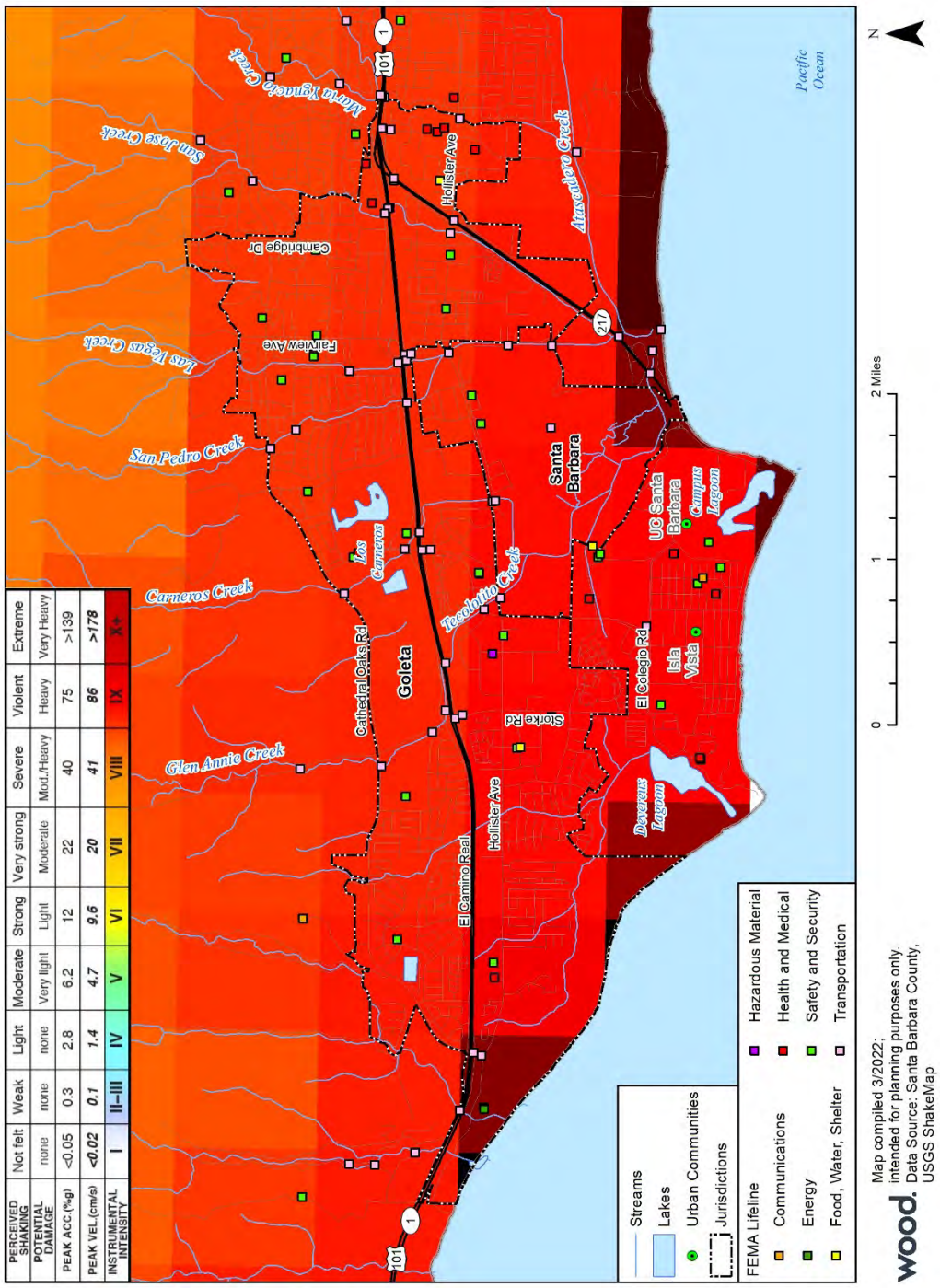
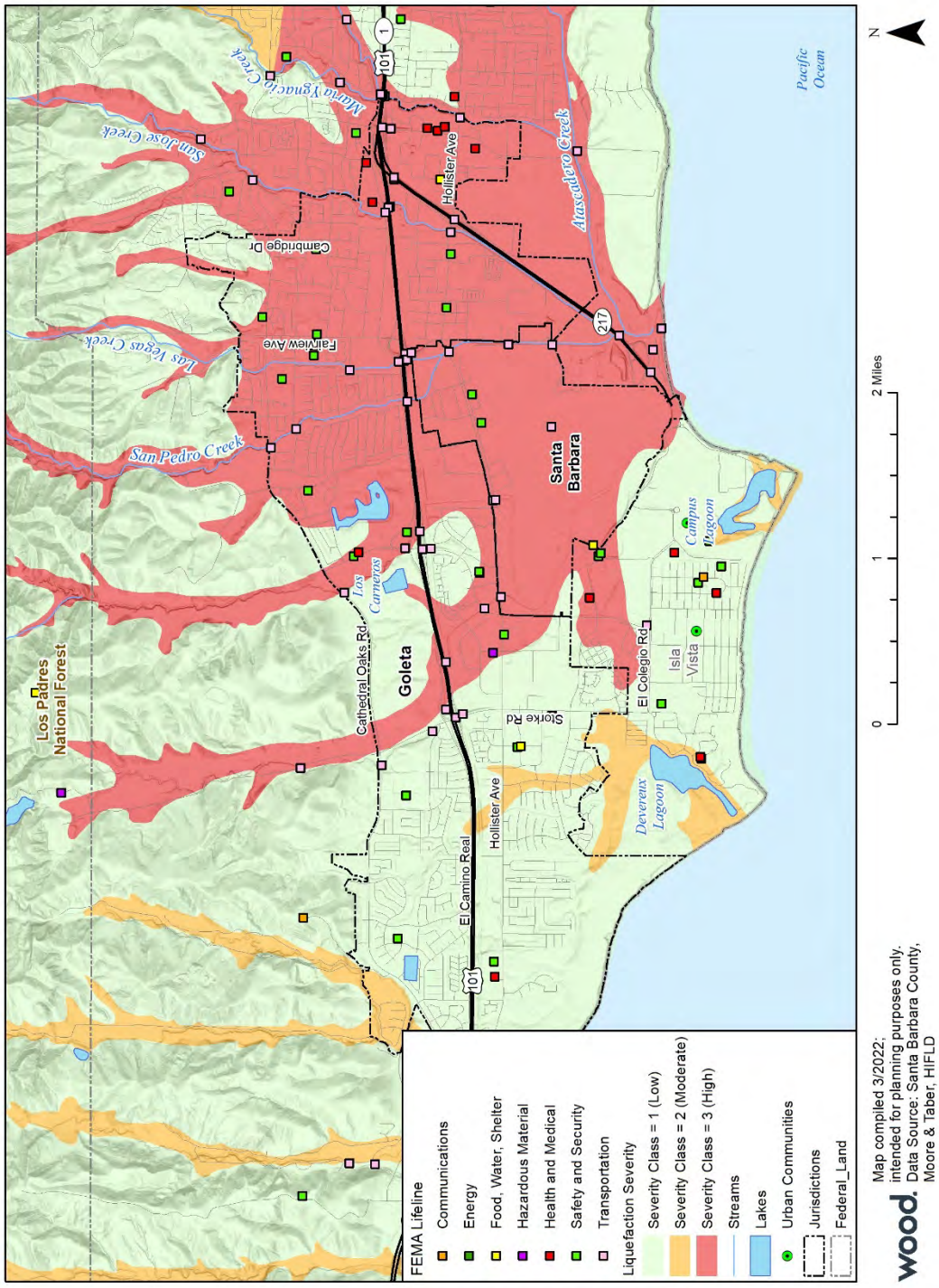


Figure 6-3. City of Goleta Critical Facilities and Liquefaction Potential



6.3 FLOOD

The geographical location, climate, and topography of the Goleta Valley make some areas of the City prone to flooding. Flooding presents a hazard to development in floodplains. In addition to the damage to properties, flooding can also cut off access to utilities, emergency services, transportation, and may impact the overall economic well-being of an area. Emergency response can be interrupted by damaged roads and infrastructure. Fire can break out as a result of dysfunctional electrical equipment. Hazardous materials can also get into floodways, causing health concerns and polluted water supplies. During a flood, the drinking water supply can be contaminated. Climate change is expected to increase the frequency and intensity of heavy rainstorms that cause riverine flooding.

Based on the GIS analysis conducted for the 2022 MJHMP, the City has 721 improved parcels valued at over $710 million in the 1-percent annual chance floodplain. Based on this analysis, which accounts for residents only and not workers, 1,466 residents are living in the 1-percent annual chance floodplain throughout the City. An additional 486 improved parcels and over $520 million in value fall within the 0.2-percent annual chance floodplain. Areas of the City vulnerable to the 0.2-percent annual chance riverine flood are home to 1,152 residents. Development in the 0.2-percent annual chance floodplain is typically not regulated, thus a large flood event could be extremely damaging in the City. This information is summarized in Table 6-7 below.

Table 6-7. City of Goleta FEMA Floodplain Exposure and Loss

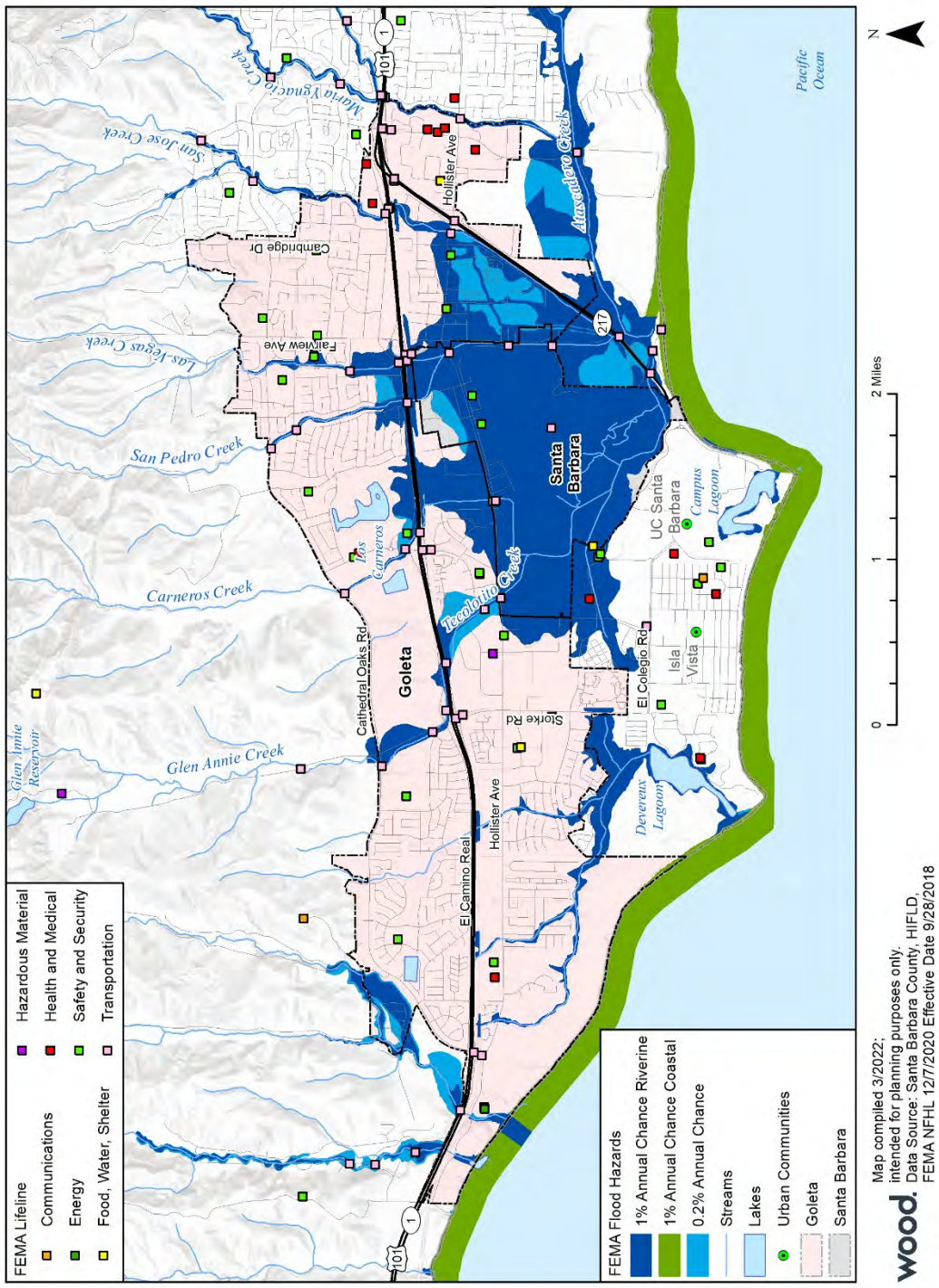
Property Type	Improved Parcel Count	Total Value	Estimated Loss	Population
Riverine 1% Annual Chance Floodplain Exposure and Loss				
Agricultural	2	$507,008	$126,752	
Commercial	129	$234,516,140	$58,629,035	
Exempt	3	$5,616,882	$1,404,221	
Industrial	50	$226,743,688	$56,685,922	
Mixed Use	3	$4,200,488	$1,050,122	
Residential	534	$239,159,219	$59,789,805	
Total	**721**	**$710,743,424**	**$177,685,856**	1,466
Riverine 0.2% Annual Chance Floodplain Exposure and Loss				
Commercial	19	$59,458,240	$14,864,560	
Exempt	2	$136,540	$34,135	
Industrial	43	$174,133,500	$43,533,375	
Residential	422	$286,461,527	$71,615,382	
Total	**486**	**$520,189,807**	**$130,047,452**	1,152

As listed in Table 6-8, 15 critical facilities in the City with a total value of $15,007,140 would be vulnerable to damage or destruction from 1-percent or 0.2-percent annual chance flood (Figure 6-4; see also, Section 6.3.3, *Flood* of the 2022 MJHMP).

Table 6-8. City of Goleta Critical Facilities at Risk to Flood Hazard

Type	Name	FEMA Flood Chance	Total Building Value
Education	Learning Tree Preschool	1% Chance	-
Government	Goleta Community Center	1% Chance	$15,000,000
Highway Patrol	California Highway Patrol - Santa Barbara	1% Chance	-
Sheriff	Sheriff Hollister Substation	1% Chance	$7,140
Bridge	Bridge	0.2% Chance	-
Bridge	Bridge	1% Chance	-
Bridge	Bridge	1% Chance	-
Bridge	Bridge	1% Chance	-
Bridge	Bridge	0.2% Chance	-
Bridge	Bridge	1% Chance	-
Bridge	Bridge	1% Chance	-
Bridge	Bridge	1% Chance	-
Bridge	Bridge	1% Chance	-
Bridge	Bridge	1% Chance	-
Bridge	Bridge	0.2% Chance	-
Bridge	Bridge	1% Chance	-
Bridge	Bridge	1% Chance	-
Bridge	Bridge	1% Chance	-

Figure 6-4. City of Goleta Critical Facilities in FEMA Flood Hazard Zones



6.4 COASTAL HAZARDS

Approximately 100 acres of the City are susceptible to sea level rise by 2030 (10.2 inches) and 145 acres by 2060 (27.2 inches). Based on the GIS analysis conducted for the 2022 MJHMP, the City has 173 improved parcels valued at over $184 million in sea level rise coastal hazard zones. Based on this analysis, which accounts for residents only and not workers, 278 residents are living in this hazard zone within the City.

Table 6-9. City of Goleta at Risk to Sea Level Rise Coastal Hazards by Property Type

Property Type	Improved Parcel Count	Total Value	Population
2030 Sea Level Rise			
Commercial	5	$877,542	
Industrial	4	$1,373,228	
Residential	9	$1,237,410	25
Total 2030 Sea Level Rise	**18**	**$3,488,180**	**25**
2060 Sea Level Rise			
Commercial	5	$877,542	
Industrial	5	$1,400,375	
Residential	9	$1,237,410	25
Total 2060 Sea Level Rise	**19**	**$3,515,327**	**25**
200cm Sea Level Rise			
Commercial	19	$14,209,396	
Exempt	1	$0	
Industrial	32	$70,455,265	
Mixed Use	1	$1,030,196	3
Residential	83	$91,977,432	227
Total 200cm Sea Level Rise	**136**	**$177,672,289**	**229**
Total Sea Level Rise Hazard	**173**	**$184,675,796**	**278**

While no critical facilities are susceptible to sea level rise by 2030 or 2060, two facilities would be susceptible to 200 cm of sea level rise (Table 6-10) (see also, Section 6.3.6, *Coastal Hazards* of the 2022 MJHMP).

Table 6-10. City of Goleta Critical Facilities Vulnerable to Coastal Hazards

Type	Name	2030	2060	200 cm	Total Building Value
Power Plant	Ellwood	No	No	Yes	-
RMP Facilities	Venoco S. Ellwood Onshore Oil And Gas Plant	No	No	Yes	-

Coastal flooding resulting from sea level rise is also documented in the 2015 City of Goleta Coastal Hazards Vulnerability and Fiscal Impact Report. The report identifies the following specific vulnerabilities in the City.

- The Bacara Resort and Spa Beach House, in addition to the coastal public access to Haskell's Beach, are vulnerable to all existing hazards, including creek flooding, coastal erosion, and coastal flooding. The estimated replacement and relocation costs are approximately $420,000.
- The two active Lease 421 oil wells are threatened by existing coastal hazards.
- The existing coastal armoring is severely outdated and derelict, and the structure will continue to erode and become a nuisance over time. The cost of removing this structure is approximately $1 million. The City's financial liability is approximately 25 percent of this amount or equates to approximately $250,000.
- The City faces a serious potential threat from oils spills, both from active and inactive wells. The costs of mitigating these issues are high. The estimates range from $7.9 million to $63.2 million for capping and/or recapping the existing wells.
- The low-lying Placencia neighborhood and nearby roads are already susceptible to substantial flooding during closed Goleta Slough conditions and creek flooding.
- FEMA has mapped 640 acres or 12 percent of the City in an existing 100-year creek flood hazard zone.

6.5 TSUNAMI

Tsunami vulnerable areas of the City include 1 improved parcel which is home to 3 residents and is valued at $186,506. No critical facilities are vulnerable to this tsunami hazard zone (see also, Section 6.3.9, *Tsunami* of the 2022 MJHMP).

7.0 MITIGATION STRATEGY

In preparation for the 2022 LHMP update, the City's LPT made no revisions to the countywide goals and objectives because they continue to reflect the needs of the City; see also, Chapter 7.0, *Mitigation Plan* of the 2022 MJHMP. This section contains the City's updated and most current mitigation strategy as of 2022.

7.1 MITIGATION PRIORITIES

7.1.1 Goals and Objectives

The City'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.

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

Since 2017, the City has incorporated the LHMP goals, objectives, and mitigation actions into its local plans and processes, including the General Plan Safety Element by reference, specific hazard planning efforts (e.g., Strategic Plan), the City's grant pursuits, and capital improvement planning. Ongoing monitoring and evaluation of the LHMP by the City ensured mitigations are implemented and tracked. Key mitigation actions completed since 2017 include improving the resilience of coastal structures, including rehabilitating the Lake Los Carneros Outlet Structure, improving stormwater infrastructure in on San Pedro Creek and Avenida Gorrion, and making substantial progress in developing Fire Station 10 to serve western Goleta. The City's LPT reviewed the mitigation actions listed in the 2017 LHMP to determine the status of each action. Once reviewed, deferred projects from 2017 were renumbered to reflect 2022 updates (see Table 7-1).

Table 7-1. Status of City of Goleta Previous Mitigation Actions

Mitigation Action No.	Mitigation Action Description	Status	Comments	In 2022 Update?
2011 LHMP				
2011-1	San Jose Creek/Hollister Ave Bridge Replacement Project	In Progress	The City of Goleta approved a Mitigated Negative Declaration (MND) for the project in August 2015. The final design, right of way, and permitting phases are currently underway. The final design is at the 95% development stage. Construction is anticipated in 2025	X
2011-2	Lake Los Carneros Outlet Structure Rehabilitation	Completed		

Mitigation Action No.	Mitigation Action Description	Status	Comments	In 2022 Update?
2011-3	Join the NFIP Community Rating System (CRS)	Completed	The City of Goleta joined the National Flood Program in 2018. Verified by the FEMA Community Status Book	
2011-4	San Pedro Creeks Culvert Modifications	Completed	Capacity improvements were made in 2016 to the San Pedro and Las Vegas Creeks through the replacement of culverts at Calle Real and Hwy 101 as well as replacement UPRR bridges over the two creeks. The project was led by Santa Barbara County Flood Control and Caltrans.	
2011-5	Develop New Fire Station in Western Goleta (Fire Station 10)	In Progress	The CA Coastal Commission approved the project in Sept 2020 and project projected to go to bid for construction in the first half of 2023. Construction projected to begin in late 2023.	X
2011-6	Avenida Gorrion New Storm Drain	Completed	Completed in 2016	
2017 LHMP				
2016-1	Cathedral Oaks/Camino Laguna Vista Storm Drain	In Progress	Renamed to Covington Drainage System Improvements	X
2016-2	Misc. Old Town Drainage Improvements	In Progress	Drainage improvements are a constant project City staff have ongoing. No specific project is identified in Old Town currently. Therefore, this action is not included in the 2022 LHMP	
2016-3	Goleta Community Center – Seismic Upgrades	In Progress	A 2021 survey showed that the main auditorium cannot be used for safety reasons. Funding for ADA and seismic concerns was awarded to the City in May 2020. Design work has begun for these improvements.	X

7.3 MITIGATION APPROACH

Similar to the 2022 MJHMP, the City LPT used a STAPLEE methodology developed by FEMA to allow emergency managers to apply consistent analysis to the range of mitigation options available. Once the available mitigation actions were identified by the City LPT, each was evaluated against the STAPLEE criteria to assist in prioritizing each measure. The STAPLEE criteria include the following:

- **Social:** Will the measure be accepted by the community? Does the measure adversely affect or inequitably benefit any segment of the population? (e.g., disadvantaged communities, vulnerable populations, different groups or areas)?
- **Technical:** How effective will the action be at protecting lives and preventing injuries? How significant will the action be at eliminating or reducing damage to structures and infrastructure? Would the action solve the root problem rather than a symptom?
- **Administrative:** Does the county have the personnel and administrative capabilities to implement and manage the project (i.e., adequate staffing and operational capabilities to implement the project)?
- **Political:** Will the measure have political and/or public support? Does the measure have a local champion to lead its development and implementation?
- **Legal:** Does the jurisdiction have the legal authority to implement the action? Is it legal? Is there potential for a legal challenge?
- **Economic:** Are the costs to implement the action commensurate with the benefits achieved? Is there funding available? Will the action contribute to the local economy?
- **Environmental:** Does the action comply with environmental regulations? Will there be negative environmental consequences from the action?

The City LPT used STAPLEE criteria to evaluate and prioritize the mitigation actions included in the LHMP. Each mitigation action was assigned a numeric rank (-1, 0, or 1) for each of the evaluation criteria, as follows

1 = Highly effective or feasible

0 = Neutral or not applicable

-1 = Ineffective or not feasible

Based on the evaluation score of each STAPLEE Criteria, mitigation actions received a cumulative score. The cumulative score indicates the priority of mitigation actions and put the City's mitigation actions in priority order:

Per the DMA requirements, an emphasis was placed on the importance of benefit-cost analysis in determining action priority. Other criteria used to assist in evaluating the benefit-cost of a mitigation action included:

- Does the action address hazards or areas with the highest risk?
- Does the action protect lives?
- Does the action protect infrastructure, community assets, or critical facilities?
- Does the action meet multiple objectives (Multiple Objective Management)?
- What will the action cost?
- What is the timing of available funding?

The process of identification and analysis of mitigation options allowed the City LPT to come to a consensus and to collectively prioritize recommended mitigation actions. During the City's planning

process, emphasis was placed on the importance of a benefit-cost review in determining project priority; however, this was not a quantitative analysis.

Benefit-cost was considered in the development of the Mitigation Implementation Plan detailed below in Section 7.4. Each action developed for this plan contains a description of the proposed project, expected project benefits, the entity or entities with primary responsibility for implementation, a cost estimate (if available), potential funding sources (if known or available), and a conceptual implementation schedule. Development of these project details relative to the STAPLEE Criteria for each action led to the determination of priority for each action. Cost-effectiveness will be further considered in greater detail through formal benefit-cost analyses when seeking FEMA mitigation grant funding for eligible actions associated with this plan.

The intent of prioritizing mitigation actions is to help the City focus and concentrate its efforts; however, it should be noted that when and if specialized grants and/or funds are made available that could finance a mitigation action, the City may adjust the ranking to enable them to implement the mitigation action.

This plan also carries forward some mitigation actions developed during the 2017 and 2011 planning processes (refer to Section 7.2, *Status of Previous Mitigation Actions*). The City LPT reviewed their existing mitigation actions and reported on the progress made toward implementation to decide whether any incomplete actions should be carried forward for continued or future implementation or be deleted. In some cases, mitigation actions were adjusted to reflect new situations or priorities. These measures were previously prioritized using the STAPLEE approach in 2017; however, to account for changes to goals and objectives and changes to hazard priorities for this plan, the MAC re-evaluated the priority of all measures included in Section 7.4.

Table 7-2 presents the prioritized list of mitigation actions that will be considered and implemented. See attached STAPLEE scoring matrix that informed this plan update.

Table 7-2. 2022 City of Goleta Mitigation Actions and Prioritization

ID No.	Action Title	Total Score	Priority
1	Goleta Community Center Seismic Upgrades	12	1
2	Develop New Fire Station in Western Goleta	11	2
3	Ellwood Mesa Neighborhood Hazard Fill Reduction Project	11	3
4	Lake Los Carneros Master Plan and Dam Improvement Project	11	4
5	Evergreen Park Drainage Repair Improvements	7	5
6	Update to Goleta Community Wildfire Protection Plan	6	6
7	San Jose Creek/Hollister Ave Bridge Replacement Project	5	7
8	Covington Drain System Improvements	5	8
9	Cathedral Oaks Crib Wall Repair	4	9
10	Ellwood Beach Drive Drainage Infrastructure Replacement	4	10

7.4 IMPLEMENTATION PLAN

All of the mitigation actions below have been incorporated into the City's Capital Improvement Program, which is reviewed annually to determine if additional projects are needed to address potential hazards.

2022-1. Goleta Community Center Seismic Upgrades

The seismic project is in the final design phase. This project is also one of multiple concerns being addressed in a wider community center upgrade project.

Mitigation Priority and Performance	
Priority	1
Hazards Mitigated	Earthquake
Estimated Timeline	2024
Estimated Cost/Funding Source	$5,300,000/ BRIC and Hazard Mitigation Grant Program (HMGP) grants
Responsible Agency/Department	City Public Works Department and Neighborhood Services
Comments	

2022-2. Develop New Fire Station in Western Goleta

This is a joint City/County project. It has long been documented that fire service in Western Goleta does not meet the National Fire Protection Association (NFPA) guidelines for emergency response time and population to firefighter ratio. A new fire station is needed in Western Goleta to provide adequate fire protection services.

The project consists of the design and construction of a new fire station, approximately 11,600 square feet in size, with associated landscaping and appurtenant facilities on a City-owned parcel located at 7952 Hollister Avenue. The site is adjacent to the Cathedral Oaks Interchange and across the street from Sandpiper Golf Course. It is anticipated that the new fire station will be a three-bay, single-story building and have a community meeting room. Site improvements will include an emergency generator, an above-ground fueling facility, eight visitor parking spaces, and a landscaped pedestrian path and striped bike path along Hollister Avenue.

Mitigation Priority and Performance	
Priority	2
Hazards Mitigated	All
Estimated Timeline	2024
Estimated Cost/Funding Source	$24,000,000/ Fire Facility Development Impact Fees and other developer mitigation fees, statewide loans, and local tax options
Responsible Agency/Department	Department of Neighborhood Services (lead), County Fire Protection District
Comments	

2022-3. Ellwood Mesa Neighborhood Hazard Fill Reduction Project

The project will address extremely high levels of downed, dead, flammable vegetation, including large Eucalyptus trees. Over 90 acres of Eucalyptus forest abut residential neighborhoods and a focused program of chipping and mowing to reduce wildfire risk is proposed. The project will also ensure wildlife resources are protected, including habit for monarch butterflies.

Mitigation Priority and Performance	
Priority	1
Hazards Mitigated	Wildfire
Estimated Timeline	2023
Estimated Cost/Funding Source	$1,700,000/ FEMA grants, CalFire grants
Responsible Agency/Department	City Public Works Department
Comments	

2022-4. Lake Los Carneros Master Plan and Dam Improvement Project

The project will address long term safety of the earthen dam at Lake Los Carneros. Lake Los Carneros Dam is an impoundment structure that creates standing water for Lake Los Carneros in Goleta. It creates a recreation amenity and protected wildland habitat. It serves as a retention basin for flood control.

The design lifespan of the operational appurtenances has passed and replacement is necessary. Burrowing animals and concrete erosion have also contributed to the threats facing the dam. The project will address these risks.

A full master improvement plan for Lake Los Carneros can be found on the City website.

Mitigation Priority and Performance	
Priority	4
Hazards Mitigated	Flooding, Earthquake
Estimated Timeline	2026
Estimated Cost/Funding Source	$1,500,000/ BRIC and Pre-Disaster Mitigation (PDM) and Flooding Mitigation Assistance (FMA) grants; City CIP funding
Responsible Agency/Department	City Public Works Department
Comments	

2022-5. Evergreen Park Drainage Repair Improvements Project

The project consists of the complete replacement of the existing 24 inch corrugated metal pipe storm drain system starting at the 12 ft curb opening drainage inlet at the intersection of Padova and San Rossano Drive and extending approximately 250 ft south into Evergreen Park where it outlets into an existing concrete lined ditch. Past winter storms showed evidence that the existing pipe system was failing with a sink hole which developed near the existing 36 Inch junction structure at the down-drain section of the drainage system. Field investigations determined the bottom of the existing 24 inch pipe had completely corroded away and runoff entering into the system was running beneath the pipe undermining the entire system. As a result, the entire pipe system and all

junction structures will need to be removed and replaced. To protect the public using the park, the sink hole and down-drain portion of the drainage system has been fenced off.

Mitigation Priority and Performance	
Priority	5
Hazards Mitigated	Flooding, Earthquake
Estimated Timeline	2023
Estimated Cost/Funding Source	$178,000 / City CIP General Fund
Responsible Agency/Department	Public Works Department
Comments	

2022-6. Update to the Goleta Community Wildfire Protection Plan (CWPP)

Goleta's most recent CWPP was completed in 2012. CWPPs identify and prioritize areas for wildfire fuel reduction, and the science and equipment available to measure these areas have increased in capability. An updated CWPP will guide future actions taken to mitigate wildfire risk in Goleta and the surrounding area.

This project is in its first stages.

Mitigation Priority and Performance	
Priority	6
Hazards Mitigated	Wildfire
Estimated Timeline	2025
Estimated Cost/Funding Source	$200,000/ CalFire grants
Responsible Agency/Department	Public Works Department
Comments	

2022-7. San Jose Creek/Hollister Avenue Bridge Replacement Project

This project will construct capacity improvements to the San Jose Creek Channel that will increase the design storm from a 25-year to a 100-year storm event. The new channel will be 50 feet wide with vertical walls and an articulated concrete revetment bottom. The revetment will include a fish passage. The project will require the reconstruction of the entire channel and the replacement of the Hollister Avenue Bridge over San Jose Creek. The channel work has been completed. This second phase of the project will replace the Hollister Avenue Bridge over San Jose Creek. The new bridge will have a 100-year storm flow capacity and will be designed to fit with the San Jose Creek project.

The project will reduce flooding and related impacts within Old Town Goleta by increasing the capacity of the channel to accommodate a 100-year storm event. The project will result in a redrawing of the FEMA flood plain maps to remove approximately 200 parcels from the flood plain.

- Construction of channel improvements completed.
- Obtain permits

- Construct bridge project

Mitigation Priority and Performance	
Priority	7
Hazards Mitigated	Flooding, Earthquake
Estimated Timeline	2025
Estimated Cost/Funding Source	$22,000,000/ Federal Highway Bridge Program (HBP) funds. The project will be funded 88.53% by the HBP
Responsible Agency/Department	Public Works Department – Engineering Planning and Environmental Review Department – Building and Safety
Comments	

2022-8. Covington Drainage System Improvements

This is a City flood control project proposed. Insufficient capacity of the existing storm drain system causes repeated flooding in the area. Installation of a new storm drain line will reduce or eliminate flooding during storm events.

- Identify funding
- Design and construct the project

Mitigation Priority and Performance	
Priority	8
Hazards Mitigated	Flooding
Estimated Timeline	2026
Estimated Cost/Funding Source	$3,700,000/ Pre-Disaster Mitigation (PDM) and Flood Mitigation Assistance (FMA) grants; City CIP funding
Responsible Agency/Department	City Public Works
Comments	

2022-9. Cathedral Oaks Crib Wall Repair

The project includes repairing the crib walls and multi-purpose path along the north side of Cathedral Oaks Road damaged during past storm events. A Geotechnical Engineering firm performed a comprehensive and systematic full-scale geotechnical investigation of the two crib walls along the northern side of Cathedral Oaks Road to determine the potential failure mechanisms related to the crib wall design and construction.

There have been structural damages to the crib wall structure and backfill due to 2017 (January) winter storms. High-intensity rainfall caused runoff to infiltrate backfill and caused extensive damage to wall backfill, including material loss and scouring of wall structure embedment.

Unknown limits of damage to backfill, and potential for wall failure to affect Cathedral Oaks Road and bike path resulting in the decision to close both facilities. The roadway has subsequently been reopened. The bike path remains closed.

The project is in the conceptual design phase.

Mitigation Priority and Performance	
Priority	9
Hazards Mitigated	Flooding
Estimated Timeline	2024
Estimated Cost/Funding Source	$8,000,000/ HWA's Emergency Restoration (ER) program and FEMA Disaster Relief (DR) funds
Responsible Agency/Department	City Public Works Department
Comments	City Project No. 9053

2022-10. Ellwood Beach Drive Drainage Infrastructure Replacement

The project consists of reconstruction of the drainage system and repair of eroded slope at the end of Ellwood Beach Drive. The existing downdrain pipe at the end of the Ellwood Beach Drive is nonfunctioning causing drainage to bypass the down drain pipe and erode the existing slope. The existing downdrain system must be removed and a new downdrain constructed including repair of the eroded slope area. Existing pipes may need to be upsized to handle runoff. The project is located within the Coastal Zone and within an ESHA area. Environmental review and coordination with California Coastal Commission are integral tasks of the project. The system must be replaced to prevent further erosion which if left unaddressed could extent into the existing sidewalk and building located immediately adjacent to the project.

Mitigation Priority and Performance	
Priority	10
Hazards Mitigated	Flooding
Estimated Timeline	2024
Estimated Cost/Funding Source	$350,000/ Pre-Disaster Mitigation (PDM) and Flood Mitigation Assistance (FMA) grants; City CIP funding
Responsible Agency/Department	City Public Works Department
Comments	

7.4.1 Climate Change Induced Mitigation Actions

Over the next five years, the City will also be examining mitigation actions considering the findings and recommendations resulting from predicted climate change conditions identified in the 2015 Draft City of Goleta Coastal Hazards Vulnerability Assessment and Fiscal Impact Report, the findings of which are summarized below:

- Existing creek hazards (FEMA) are the highest hazard in the City. Coastal flooding will be exacerbated by SLR, however future climate impacts on creek flooding are not available.
- Coastal flooding damages to structures in Goleta could increase dramatically by 416% between the time horizons of 2060 and 2100.
- Adaptation costs to elevate and accommodate coastal flooding by 2100 ($175 million) exceed damages ($14 million) and cleanup (approximately $5 million) by an order of magnitude.

- The Storke Ranch neighborhood becomes exposed around 2100 when Goleta and Devereux Sloughs come together.
- Coastal flooding impacts the light manufacturing sector the greatest between 2 and 5 feet of SLR from 2060 to 2100.

Recommendations:

- Conduct coastal confluence modeling to better assess future vulnerabilities associated with stream flood hazards exacerbated by sea level rise to provide projections of future flood extents and depths.
- Engage in regional inlet management discussions with the City of Santa Barbara and the County of Santa Barbara.
- Establish a repetitive loss policy to trigger eminent domain in combination with a Transfer of Development (TDR) Program. Once a property had multiple flood insurance claims the policy would take effect.
- Adjust building codes to allow for increased building heights by additional freeboard based on sea level rise projections for parcels projected to be impacted by flooding after 2060.
- Implement the Short-Lived Climate Pollutant Reduction Act requirements. This will lessen the City's contribution to greenhouse gases and climate change.

Adaptation strategies are discussed in detail in Section 5 of the 2015 City of Goleta Coastal Hazards Vulnerability Assessment and Fiscal Impact Report.

8.0 PLAN MAINTENANCE

8.1 MONITORING, EVALUATING, AND UPDATING THE PLAN

Since the last LHMP in 2017, the LPT has monitored, evaluated, and updated the plan on a continuing and as-needed basis. The City was very successful in implementing the 2017 mitigation actions as noted in Table 7-1. The remaining mitigation actions outlined in the 2017 LHMP are ongoing at the time of this 2022 update.

The City of Goleta will be responsible for ensuring that this annex is monitored on an ongoing basis. The City will continue to participate in the countywide MAC and attend the annual meeting organized by the County Office of Emergency Management 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 City's LHMP will be forwarded to the County Office of Emergency Management for inclusion in further updates to the MJHMP.

Major disasters affecting the City of Goleta's community, legal changes, notices from Santa Barbara County (lead agency for the County-wide Plan), and other significant events may trigger revisions to this plan or the convening of the LPT. The City LPT, in collaboration with the Santa Barbara County Office of Emergency Management, 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 City is committed to revising the plan at a minimum of every five years. The City's Emergency Services Coordinator or the City'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 the multi-jurisdictional plan, including this annex.

8.2 IMPLEMENTATION THROUGH EXISTING PLANS AND PROGRAMS

The City 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., General Plan, building codes, floodplain management ordinance). The General Plan/Coastal Land Use Plan and the LHMP annex are complementary documents that work together to achieve the goal of reducing risk exposure to the City's citizens. An update to the General Plan may trigger an update to the LHMP. 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 City incorporates the LHMP by reference into its General Plan Safety Element. Under AB 2140, the City may adopt its current, FEMA-approved LHMP into the Safety Element of the General Plan. This adoption makes the City eligible to be considered for part or all of its local-share costs on eligible Public Assistance funding to be provided by the state through the California Disaster Assistance Act (CDAA) (see Section 2.0, *Plan Purpose and Authority* for the adopting resolutions). The LHMP has also been prepared to support the City's Emergency Operations Plan and Threat Analysis, including completion of Fire Station No. 10 to serve western Goleta and updating the City's CWPP. The City's Municipal Codes for Flood Risk and Stormwater Management Plan apply in concert with the City's zoning ordinance and building codes to reduce flooding hazards from land use. The LHMP includes several mitigations addressing flood control infrastructure to support the City's efforts to reduce flooding hazards.

The information contained within this LHMP, including results from the Vulnerability Assessment and the Mitigation Strategy, is used by the City to help inform updates and the development of local plans, programs, and policies. The City may utilize the hazard information when developing and implementing the City's capital improvement programs and the Planning and Environmental Review Department, including its Building Division, may utilize the hazard information when reviewing a site plan or other type of development applications. Further, the City incorporates the LHMP by reference into its General Plan/Coastal Land Use Plan Safety Element. Under AB 2140, the City

may adopt its current, FEMA-approved LHMP into the Safety Element of its General Plan/Coastal Land Use Plan. This adoption makes the City eligible to be considered for part or all of its local-share costs on eligible Public Assistance funding to be provided by the state through the California Disaster Assistance Act (CDAA) (see Section 2.0, *Plan Purpose and Authority* for the adopting resolutions).

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 City will provide the opportunity for the public to comment on the updates. A public notice (in English and in Spanish) will be published before the meeting to announce the comment period and meeting logistics. Moreover, the City 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 the Neighborhood Services Director using the following information:

Jaime Valdez
City of Goleta
Attn: Neighborhood Services Dept./Emergency Services
130 Cremona Drive #B
Goleta, CA 93117
jvaldez@cityofgoleta.org
(805) 961-7500

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City of Guadalupe
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 City of Guadalupe (City) 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 City. The LHMP was last comprehensively updated in 2017 as an annex to the 2017 MJHMP. Since 2017, the City has:

- Incorporated the LHMP goals, objectives, and mitigation actions into its local plans and processes, including the General Plan Safety Element by reference and specific hazard planning efforts (e.g., Stormwater Management Program, CERT trainings).
- Used the LHMP's assessment of capabilities, hazards, and vulnerabilities to inform planning, capital improvements, programs, decision-makers, and the public.
- Implemented mitigation actions through the City's general plan, capital improvement program, maintenance programs, grant programming, community outreach, and budget process.
- Reviewed and evaluated mitigation annually.

This update to the LHMP builds on and refines the MJHMP's assessment of hazards and vulnerabilities countywide to develop a mitigation plan for the City. The City participated in the 2022 MJHMP Mitigation Advisory Committee (MAC) and Local Planning Team (LPT), reviewed all portions of the MJHMP pertaining to the City, 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 City is a participating agency in the County's MJHMP update.

The City'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 City. Vulnerability assessments summarize the identified hazards' impact on the City. 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 City's 2022 LHMP.

[INSERT CITY 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 City'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 Mitigation Advisory Committee (MAC) and the second is the Local Planning Team (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 Santa Maria Valley Water Conservation District (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 City participated as a MAC member to prepare this LHMP as an annex to the 2022 MJHMP. The City was represented by Michael Cash, Chief of Police and Director of Public Safety 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	**MAC Meeting #1 (virtual)** 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	**MAC Meeting #2 (virtual)** 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	**MAC Meeting #3 (virtual)** 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	**MAC Meeting #4 (virtual)**

Date	Purpose
	Collected feedback on 2017 mitigation strategies Conducted interactive exercise on mitigation strategies for key hazards unaddressed in previous MJHMP Discussed annex updates
January 2022	**MAC Meeting #5 (virtual)** Presented draft plan Discussed key MAC/LPT review needs and key issues Discussed annex updates to dovetail with plan update
March 2022	**MAC Meeting #6 (virtual)** Review and discuss public comments received on the draft plan Recommend a revised draft plan to decision-makers Review annex updates for review and approval

3.3 LOCAL PLANNING TEAM (LPT)

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

Table 3-2. City of Guadalupe Local Planning Team 2022

Department	Name	Title
Police	Michael Cash	Chief of Police & Director of Public Safety
Emergency Services	Zach Jones	Former Emergency Services Coordinator
Public Works	Shannon Sweeney	Public Works Director
Administration	Todd Bodem	City Administrator

The Guadalupe LPT members worked directly with the Santa Barbara 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 City 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
January and March 2022	Reviewed new maps and local vulnerabilities. Provided input on the status of 2017 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 City 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 City'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 April 2022, the LHMP was completed and made available for public review, concurrent with review by FEMA and CalOES. In addition, the opportunity for the community to be heard was permitted during the City Council meeting before the adoption of this plan.

4.0 CAPABILITY ASSESSMENT

Guadalupe is located in northern Santa Barbara County within the Santa Maria Valley. The City lies about 10 miles west of the City of Santa Maria. It is 85 feet above sea level and contains a land area of 1.31 square miles. The City lies approximately three miles from the Pacific Ocean along State Route (SR) 1, which runs through the center of the downtown central business district. Surrounding the city on the East, West, and South are several square miles of flat, open agricultural land.

According to 2019 U.S. Census Bureau data, the City is home to 7,719 residents. This population is projected to grow to 9,873 residents by 2050, which is the highest growth rate projected in the county (SBCAG 2018). The average household size in Guadalupe is 3.93 and the median household income is $48,680 (US Census Bureau 2019). Guadalupe boasts one of the lowest crime rates in California. Guadalupe is home to two museums; the Guadalupe Cultural Arts & Educational Center and the Guadalupe Historical Society. Several events are held each year in downtown Guadalupe, including various festivals and parades. Guadalupe is the gateway to the Guadalupe Dunes, which supports passive recreation and resource conservation on the coastline outside the City. Guadalupe Dunes County Park is a popular place for fishing. The Dunes Center provides hiking with a variety

of natural wonders. The City is surrounded by agricultural land and agriculture is the primary economic driver in Guadalupe.

The City'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 t provides Guadalupe's fiscal capabilities that may apply to providing financial resources to implement identified mitigation action items.

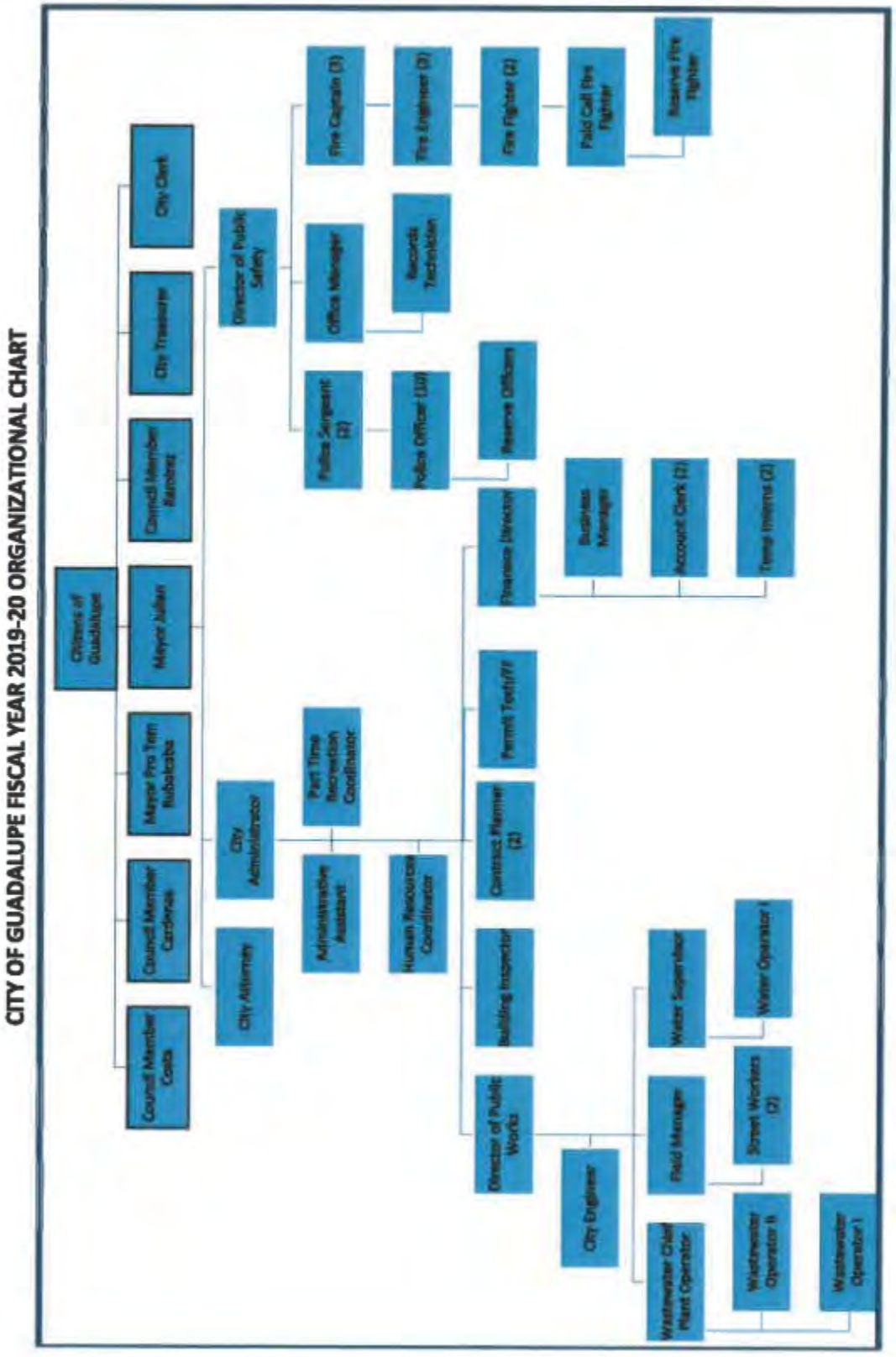
4.1 EXISTING INSTITUTIONS, PLANS, POLICIES, AND ORDINANCES

The Mayor and City Council are elected by the voters of the City of Guadalupe. The City Council exercises the legislative powers of the City and other City officials oversee the daily operations. The Council appoints the City Administrator. City administration includes the officials appointed by the City Council and officials elected by the citywide vote, including the City Clerk, Treasurer, Director of Public Safety (Police and Fire Chief,) Public Works supervisor, Finance Director, Human Services Director, Parks and Recreation Director, Contracted City Planner, Contracted City Engineer and Contracted City Attorney. Guadalupe has a Mayor and four Council members. The City of Guadalupe's organizational chart is listed in this section. Department heads under contract are noted as (C). Primary City Departments involved in activities related to hazard mitigation include the following:

4.1.1 Fire Department:

- Administration: Develop, implement and monitor policies, procedures, budgets, fees, automatic aid agreements, mutual aid agreements, and liaison with other City departments and outside agencies.
- Fire and Life Safety Program: Manage Building and Planning Departments, coordinate adoption of codes and ordinances, review site and building plans for fire code compliance, develop and present public education programs and manage the City's General Code Compliance program.
- Operations and Emergency Medical Services: Maintain the department's personnel, apparatus, equipment, and fire stations in a state of readiness to respond to the community's needs, develop and implement standard operating procedures for various types of emergency responses, respond to all types of emergencies, and train and interact with neighboring jurisdictions and regional agencies. Manage the department's EMT program, respond to medical emergencies and other calls for service, and participate with other community and regional health care providers to reduce public illness and injury.

Chart 1-1. City of Guadalupe Organizational Chart



- Emergency Planning and Management: Coordinate the City's Disaster Preparedness Program, liaison with all City departments and divisions, as well as other public and private organizations. Develop, coordinate and implement hazard-specific response plans, and maintain the operational readiness of the City's Emergency Management Team, the Emergency Operations Center (EOC), and other key elements.

4.1.2 Building and Planning Department (Contract Services):

- Coordinate adoption and amending of building, plumbing, electrical, and mechanical codes. Develop building ordinances.
- Review site and building plans for compliance with building codes and ordinances.
- Damage assessment of structures from multiple causes to facilitate repairs and future occupancy
- Develop and maintain City general plan, zoning ordinances, and development standards.
- Oversight of City development process assuring compliance with zoning and general plan, including environmental impact reports, design review, historic preservation, landscape review, habitat conservation, floodway prohibitions, and floodplain development standards.

4.1.3 Public Works Department:

- Maintains City infrastructure (assets) ranging from streets to parks to buildings, and infrastructure
- Responds to City emergencies, including EOC response in disasters and assisting police and fire departments with traffic and perimeter control efforts, traffic collision clean up, and evacuation routing.
- Operates, maintains, and enhances both the water distribution and sewer collection systems within the City of Guadalupe. Also has oversight of solid waste management program. Solid waste collection is done through a private contractor.
- Responsible for planning and implementation associated with the following City plans:
  - Water Quality Emergency Notification Plan
  - Water Division Emergency Response Plan
  - Sewer Overflow Response & Prevention Plan
  - Wastewater Treatment Plant (WWTP) Operations Plan

4.1.4 Engineering Department (Contract Service):

- Reviews engineering on private and public grading, floodways, retention basins, transportation infrastructure, and structures to assure compliance with federal, state, and local laws, regulations, and ordinances on seismic and structural stability.
- Develops engineering ordinances and policies that help protect and preserve City infrastructure
- Evaluates all circulation elements for projected traffic impacts

- Determines needed infrastructure improvements, drainage systems, water systems, and water/sewer treatment capabilities
- Provides response personnel for evaluation of damaged infrastructure and rescue situations.
- Provides technical assistance as needed in the City's EOC
- Coordinates other response agencies assisting with damage assessment

4.1.5 Police Department:

- Responds to safety concerns involving threats and/or damage to life or property. Acts as the enforcement entity for violations of state and local laws and ordinances
- Primary emergency responders to acts of civil disobedience and public disorders and terrorism.
- Security and support personnel during emergency rescue and management
- Investigative services for crimes that occur within the city
- Participates in the development of emergency response plans and implements the emergency response plans and policies, focusing on evacuation procedures and traffic control

4.2 ADMINISTRATIVE AND TECHNICAL CAPACITY

The administrative and technical capabilities of Guadalupe, as shown in Table 4-1, include staff, personnel, and department resources available to implement the actions identified in Section 7.0, Mitigation Plan of this LHMP. 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. Guadalupe's department heads multitask in many areas because of budgetary constraints. The City of Guadalupe has an Emergency Manager position to oversee all factors of Emergency Management within the City. While the former Emergency Manager was involved with this LHMP update, this position is currently open.

Table 4-1. City of Guadalupe Administrative and Technical Capacity

Personnel Resources	Yes/No	Department/Position
Planner/engineer with knowledge of land development/land management practices	Yes	Building/Business Manager
Engineer/professional trained in construction practices related to buildings and/or infrastructure	Yes	Public Works/ Public Works Director
Planner/engineer/scientist with an understanding of natural hazards	Yes	Police Department/ Emergency Manager
Personnel skilled in GIS	Yes	Public Works/ Public Works Director
Full-time building official	No	

Personnel Resources	Yes/No	Department/Position
Floodplain manager	No	
Emergency manager	Yes	Police Department/ Emergency Manager
Grant writer	No	
Other personnel	No	
GIS Data Resources (Hazard areas, critical facilities, land use, building footprints, etc.)	No	
Warning Systems/Services (Reverse 9-11, cable override, outdoor warning signals)	Yes	Police Department/ Emergency Manager & Everbridge Mass Notification System
Other		

4.3 LEGAL AND REGULATORY CAPABILITIES

The legal and regulatory capabilities of the City are shown in Table 4-2, including existing ordinances and codes that affect the physical or built environment of Guadalupe. Examples of legal and/or regulatory capabilities can include the City's building codes, zoning ordinances, subdivision ordnances, 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. City of Guadalupe: Legal and Regulatory Capability

Regulatory Tool (ordinances, codes, plans)	Yes/No
General Plan	Yes
Zoning ordinance	Yes
Subdivision ordinance	Yes
Growth management ordinance	No
Floodplain ordinance	Yes
Other special-purpose ordinances (stormwater, steep slope, wildfire)	Yes
Building code	Yes
Fire code	Yes
Fire department ISO rating	4
Erosion or sediment control program	No
Stormwater management program	No

Site plan review requirements	Yes
Capital improvements plan	Yes
Economic development plan	Yes
Local emergency operations plan	Yes
Other special plans	No
Flood insurance study or other engineering studies for streams	No
Elevation certificates (for floodplain development)	No
Emergency operations plan	Under development

4.4 GIS, COMPUTER AND COMMUNICATION TECHNOLOGY

The City Fire Department is trained in fire, rescue, EMS, and hazardous material. Guadalupe is fully functional on the internet and is in the process of website development. The City has a basic website that is operational.

The City has a dedicated television channel available for community service information (non-commercial) through its contract with Charter Cable TV. This channel is available for both pre-recorded and live information broadcasts.

Table 4-3 shows specific financial and budgetary tools available to Guadalupe such as community development block grants; capital improvements project funding; authority to levy taxes for specific purposes; fees for water and sewer services; impact fees for developers for new development; ability to incur debt through general obligations bonds; Guadalupe Redevelopment Agency and withholding spending in hazard-prone areas.

4.5 FINANCIAL RESOURCES

The City's major economic drivers for its revenue base are sales tax, population growth, employment, construction, property values, and commercial activities. During the ongoing COVID-19 pandemic, which began in 2020, the national, state, and local economy has been very slow. As a result, the City has seen a significant decrease in revenues and has experienced a reduction in services and staff. California's budget has diminished rapidly due to decreased tax revenues. The overall health of California's economy has a significant influence on local cities and counties, as local government appropriations are usually the first to have their appropriations diminished due to downturns in the economy.

The General Fund balance is an important element that can show the City's financial strengths or weaknesses. The revenue budget for the City contains more than 50 line items representing different sources, each governed by a distinct set of conditions particular to that revenue source. The largest revenue factor and the core of the resource base that enables the City's provision of community services is the local revenue portion of Guadalupe's General Fund. The City's revenue base is determined by different community conditions such as the current population, employment and income, economic activity within the City, and the growth of invested value from residential and commercial construction, business investment in plant and equipment, and demand for local real

property. National, state, and regional economic conditions can also affect the City's revenue base by creating demand for community goods and services produced within Guadalupe. The largest expenditure categories are for operations and maintenance.

Table 4-3. City of Guadalupe Fiscal Capability

Financial Resources	Accessible or Eligible to Use (Yes/No)	Has This Been Used for Mitigation in the Past?	Comments
Community Development Block Grants (CDBG)	Y	Y	The City has recently formed a resilience committee that will oversee these types of grants.
Capital improvements	Y	N	
Authority to levy taxes for specific purposes	N	N	
Fees for water and sewer service	Y	N	The City currently charges for water and sewer
Incur debt through general obligation bonds	N	N	
Incur debt through special tax bonds	N	N	
Incur debt through private	N	N	
Federal Grant Programs (Hazard Mitigation Grant Program)	Y	Y	

4.6 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 City can capitalize on its existing educational capacities, even non-hazard related such as school partnerships, 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*, the City conducts community outreach to its citizens on special events and community

information updates. Public safety training seminars are conducted on an annual basis to respond to natural and man-made disasters.

4.7 RELEVANT PLANS, POLICIES, AND ORDINANCES

The City of Guadalupe has a range of guidance documents and plans for each of its departments. These include a General Plan, with the 2019-2027 Housing Element. The City uses building codes, zoning ordinances, subdivision ordinances, and various planning strategies to address how and where development occurs. One of the essential ways the City guides its future is through policies laid out in the General Plan. The LHMP directly informs these plans and is used to evaluate the need for adjustments or updates to existing plans and programs. The City considers the LHMP's assessment of capabilities, hazards, and vulnerabilities to inform planning, capital improvements, programs, decision-makers, and the public. The City also implements mitigation actions through the City's general plan, capital improvement program, maintenance programs, grant programming, community outreach, and budget process.

4.7.1 Integrated Regional Multi-Hazard Emergency Response Plan for the Cities of Santa Maria and Guadalupe

The Integrated Regional Multi-Hazard Emergency Response Plan for the Cities of Santa Maria and Guadalupe is constructed to delineate the planning area's procedures and policies when responding to a major emergency event. This includes any significant threat or potential disaster which could impact the health, safety, and property of the public within the planning area. Emphasis is placed on saving lives, preserving property, and minimizing the effects of the disaster. While emergency response and recovery activities are contingent upon the type and extent of the disaster, this plan is flexible enough to be used in all emergencies, including weather events. The hazards identified for Guadalupe include Earthquakes, Flood/Dam Failures, Hazardous Materials, and Transportation accidents. The Plan was adopted in 2016.

4.7.2 City of Guadalupe General Plan

Land Use Element

The City of Guadalupe is still developing and designates its land use zones to reflect the character of the City. Industrial uses support the local employment and are planned with appropriate buffer zones to create a pleasant environment. Commercial zones are divided into two types, with the central business district that encourages pedestrian circulation and a general commercial district that allows for more vehicles and is geared towards tourist services.

Residential areas are designed and planned by housing densities. When defining the residential zoning, the City of Guadalupe finds a delicate balance between urban areas and open spaces. The Agricultural Land Use designation is involved primarily with active agricultural uses while the Open Space Land Use designation is a combination of grazing activities, sensitive environmental habitats, and passive recreational areas.

The Public Facilities/Parks Land Use category is concerned with water, sewage, drainage, school, parks, and fire protection services to provide for continued development and expansion of the City

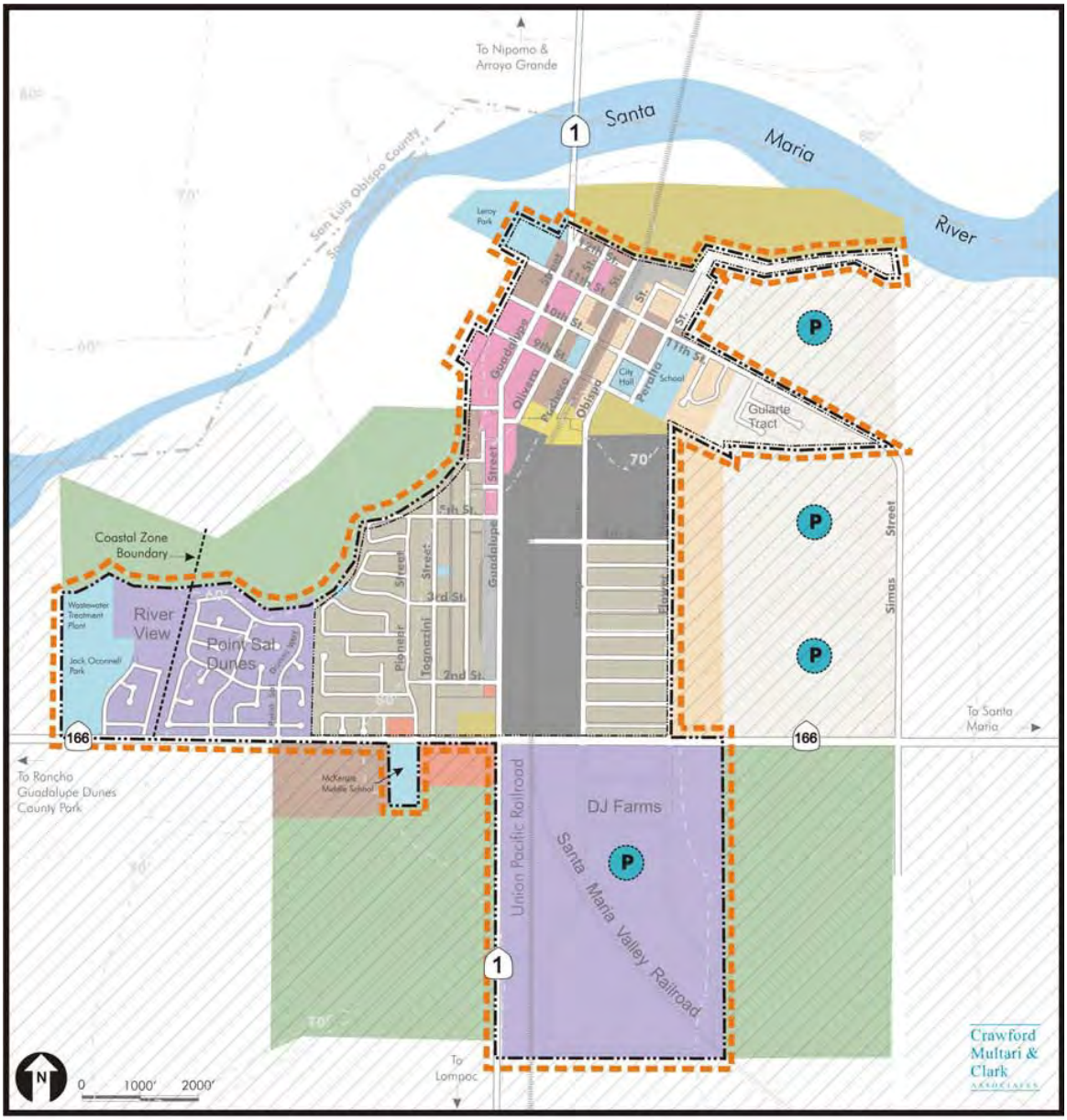
of Guadalupe. The quality and adequacy of public facilities are two of the most important factors of an expanding economy and the growth of a community. The Point Sal Dunes Specific Plan reserves open space along the Santa Maria River, and for parks.

Since the last update of the City's LHMP in 2017, land use and population in the City have not substantially changed. Modest development has occurred consistent with the adopted Land Use Element and has primarily comprised infill development and redevelopment within the City limits. There has been no expansion of the City boundary or its Sphere of Influence (SOI) and no comprehensive changes to the Land Use Element that would result in substantial densification. Further, City population has not substantially changed. As a result, the City's level of vulnerability to hazards analyzed in Section 6.0, *Vulnerability Assessment*, has not substantially changed due to land use, development, or population growth since the last update of the LHMP.

Housing Element

The 2019-2027 Housing Element Update provides a comprehensive analysis of Guadalupe's demographic, economic, and housing characteristics as required by State Law. The housing component of the general plan requires local governments to balance the need for growth, including the need for additional housing, against other competing local interests. In 2017, Guadalupe's housing stock consisted of approximately 1,983 residential units. Of these, 77 percent were single-family houses or condos, 23 percent were multi-family units including 1 percent mobile homes and trailers. From 2010 to 2017, the City had an increase in housing units from 1,810 units in 2010 to 1,983 units in 2017, a 9.6 percent increase in units. Over that same time frame, the population grew from 5,659 in 2017 to 7,313 in 2017, an 8 percent increase. Guadalupe is committed to affordable homes for residents with an emphasis on increased energy efficiency in new and existing homes. In October 2017, graduate students from the City and Regional Planning Department of the California Polytechnic State University, San Luis Obispo, conducted a citywide walking survey to identify the general structural conditions of homes in Guadalupe. The 2017 housing survey revealed that most of the housing stock (81 percent) was in sound condition. A very small proportion was considered dilapidated and in need of replacement. The general trend depicts the increase in overall quality of housing until 2010 when new additions to the housing stock halted. This increase in quality could be partially due to rehabilitation grant programs funded by the now-defunct Guadalupe Redevelopment Agency and partially due to newly constructed housing.

Figure 4-1. General Plan Land Use Map



Legend

- Neighborhood Residential (1-6 units/acre)
- Medium Density Residential (10 units/acre)
- High Density Residential (20 units/acre)
- Sphere of Influence
- City Limits
- Redevelopment Project Boundary
- Light Industrial
- General Industrial
- Public Facility
- Central Business District
- General Commercial
- P — New Parks (location approximate)
- Open Space
- Agriculture
- Parcels Subject to Williamson Act Contracts (2001)
- Specific Plan

Figure 4-1: General Plan Land Use Diagram

Residential development in the City is constrained by environmental factors, including City boundaries and limits, protected agriculture, coastal zone proximity, flood zones, and seismic faults. About 60 acres in Guadalupe lies within the coastal zone. The City annexed this land in 1990 and prepared a local coastal plan (LCP) that was certified by the California Coastal Commission. The uses for the site include a community park, single-family residences, open space, and the City's wastewater treatment plan. The Alquist-Priolo Earthquake Fault Zoning Act (Public Resources Code Section 2621, et seq.) restricts development on the surface traces of known active faults mapped by the State Geologist. However, the San Simeon Earthquake in 2003 did affect many buildings in Guadalupe, primarily because they are Unreinforced Masonry buildings (URM). The City has areas within 100-year and 500-year flood zones, but none of these lands are currently developed or are considered for future development.

Safety Element

The Safety Element is designed to allow for planning that will prevent development in areas that may be at risk to natural and human-made hazards. Such hazards include seismic activity, flooding, fire hazard areas, and noise impact areas. The overall goal is to protect public health, welfare, and safety from the potential hazards of flooding, earthquakes, and fire. The LHMP is incorporated by reference in the Safety Element.

Seismic Activity

There are no known faults within the City of Guadalupe. The closest faults are the Pezzoni fault, approximately 10 miles south of Guadalupe, and the Santa Maria fault, approximately 8 miles to the east. Safety measures related to seismic activity and earthquakes involve prevention of damage and restitution of services. Building requirements should follow recommendations set forth by the California Building Code, which establishes building requirements for all new structures based on predicated earthquake intensities.

The City of Guadalupe will utilize the Goals, Objectives, and Policies as outlined in the City's General Plan, including Goal SF 4, Protection from seismic hazards and associated soil and ground instability.

Flooding

Policies to mitigate the risks of floods include:

- Policy SF 2.1.1: Review new development for compliance with Building Construction standards outlined in California Code of Regulations, Title 19, Appendix G
- Policy SF 2.1.2: Locate, when feasible, new essential public facilities outside of flood hazard zones.
- Policy SF 2.1.3: Protect the community from flooding through levee failure.
- Policy SF 2.2.1: Implement National Flood Insurance Program (NFIP) activities.

Figure 4-2. Regional Seismic Hazards

Fire

Fire protection is an important safety consideration for the City of Guadalupe. Fire capabilities of new developments must be carefully planned to give maximum service at minimum cost. Land use, circulation, water, and fire service are all important factors of service costs and system adequacy.

The City recognizes the importance of circulation, to minimize response time to fires and other emergencies, and submits all subdivision plans to the Fire Chief for review and approval.

Policies to encourage quicker and better fire response include:

- Program SF 6.1.2.1: Require new development to provide adequate access to emergency vehicles, including adequate widths, turning radii, hard standing areas, and vertical clearance.
- Program SF 6.1.2.2: Develop a plan to widen critical rights-of-way that do not provide adequate clearance for emergency vehicles. For areas that are not feasibly accessible to

emergency vehicles, develop a continency plan to reach and evacuate people in need of treatment.

- Program SF 6.1.2.3: Implement a text message alert system for natural and manmade hazards near and within the City, including text-to-911capabilities.
- Program SF 6.1.2.4: Maintain emergency response times to under 15 minutes (the national average) within the City limits.

4.7.3 Zoning and Subdivision Ordinances

The State of California has empowered all cities and counties to adopt zoning ordinances. The City of Guadalupe adopted a zoning ordinance in August 2020. Local land use controls include the Zoning Ordinance, which shapes the form and intensity of land use and residential development. Consistent with the General Plan, the City's Zoning Ordinance allows a range of zones and dwelling unit densities. Zoning ordinance regulations related to hazard mitigation relate to the risk assessment for hazards within the City, including flooding. Examples of zoning regulations for hazard mitigation include development within the floodplain of the Santa Maria River to prevent undue damage or destruction of development from flood water.

The City of Guadalupe has a five-member Planning Commission, which is an advisory body to the City Council. The Commission was established under State Law to provide relief in special cases where the exact application of the terms of the ordinance would be unduly restrictive and cause hardship, in addition to generally reviewing zoning and subdivision proposals. The Planning Commission hears and decides upon the interpretation and the application of the provisions of the Zoning and Subdivision Ordinances. Although the Commission has certain discretionary powers in making its decisions, the Commission must always abide by and comply with the powers granted to it by the local Zoning and Subdivision Ordinances and the state's enabling acts. Additionally, the Planning Commission may recommend actions to the City Council and the Planning Commission's actions may be appealed to the City Council.

4.7.4 The Storm Water Management Program

The California Regional Water Quality Control Board for the Central Coast Region (Water Board) adopted the Post-Construction Requirements (PCRs) in July 2013. As of March 6, 2014, development projects that create or replace 2,500 square feet or more of impervious surfaces (roofs or pavement) must incorporate specified measures to reduce runoff. Projects that create or replace less than 5,000 square feet of impervious surface qualify as small, Tier 1 Projects. Projects that create or replace 5,000 square feet or more of impervious surface except for detached single-family homes, and single-family homes that create or replace 15,000 square feet or more of impervious surface, require a more comprehensive Stormwater Control Plan (SCP), either Tier 2 or Tier 2 and 3. The City of Guadalupe is utilizing the County of Santa Barbara Project Clean Water's Stormwater Technical Guide as a guide in determining which Tier(s) apply to proposed projects.

The City of Guadalupe's Public Works Department continually maintains the City's storm water system. The system has approximately 2.1 miles of underground storm water system piping; approximately 1.1 miles of an open ditch that fronts agricultural properties and receives field runoff as well as storm runoff; approximately 0.5 miles of an open ditch that carries excess water

which accumulates in an area known as Guadalupe Wetlands/ Lake and also receives agricultural runoff; 83 drop inlets; 3 box culverts with runs of approximately 125 ft.; and 22 manholes equipped with drop inlets and four outlet sites. This is what functions as the City of Guadalupe's current storm water system.

4.7.5 Building Codes

The State of California has adopted the California Building Codes, which is enforced in the City of Guadalupe. The California Uniform Statewide Building Code is based on the International Building Code with state amendments. The City has adopted the California Building Codes with local amendments. A copy is available for review in the City's Building & Planning Department.

The City provides for and enforces state, City, and County Codes for building residential and commercial structures, enforcing environmental codes and guidelines for maintaining existing structures.

The City of Guadalupe Fire Department has an ISO rating of 4. The ISO is an insurer-supported organization that provides advisory insurance underwriting and rating information to insurers. The ISO uses a rating scale of 1 to 10 with 1 being the highest rating given.

4.7.6 Floodplain Management Ordinance

Chapter 15.12 of the City Municipal Code outlines the City's Floodplain Management Ordinance. The City of Guadalupe refers to the Santa Barbara County Floodplain Ordinance by reference. It is important to note, however, that many parts of the City flood due to storm water infrastructure, not because of their proximity to the 100-year floodplain.

The FIRMs were developed through the NFIP and were last updated in September 2005 and made available in GIS format as Digital Flood Insurance Rate Maps. These are shown in Section 5.3.3 which discusses the location and extent of the flooding hazard throughout Santa Barbara County. The FIRMs are used by both the public and private sectors to determine flood insurance requirements and rates and to administer the City's Floodplain Management Ordinance.

Floodplain districts identified in the FIRMs include the following flood hazard zones and definitions:

- **Zone A** is the flood insurance rate zone that corresponds to the 100-year floodplains that are determined in the Flood Insurance Study by approximate methods. Because detailed hydraulic analysis is not performed for such areas, no Base Flood Elevations or flood hazard factors are determined.
- **Zone AO** is the flood insurance rate zone that corresponds to areas of 100- year shallow flooding where depths are between one (1) and three (3) feet; average depths of inundation are shown, but no flood hazard factors are determined.
- **Zone A1-A30** is the flood insurance rate zone that corresponds to areas of 100-year flood; base flood elevations and flood hazard factors are determined.
- **Zone B** is the flood insurance rate zone that corresponds to areas between limits of the 100-year flood and 500-year flood, or certain areas subject to 100-year flooding with average

depths less than one (1) foot or where the contributing drainage area is less than one square mile; or areas protected by levees from the base flood.

- **Zone C** is the flood insurance rate zone that corresponds to areas of minimal flooding.

All potential development projects located within floodplains must follow an established development review process. Developments involving drainage ditches or watercourses in floodplains must receive federal, state, and local review and permits as required by the Floodplain Administrator and the Guadalupe Municipal Code.

4.7.7 National Flood Insurance Program (NFIP) and Repetitive Loss (RL) Properties

The City is part of the National Flood Insurance Program (NFIP). The NFIP aims to reduce the impact of flooding on private and public structures. It does so by providing affordable insurance to property owners and by encouraging communities to adopt and enforce floodplain management regulations. These efforts help mitigate the effects of flooding on new and improved structures. Repetitive loss properties are defined as property that is insured under the NFIP that has filed two or more claims over $1,000 each within any consecutive 10-year period since 1978. The City of Guadalupe has no "Repetitive Loss" properties that are insured under the NFIP. The City has several "Repetitive Loss" properties within the community, but none are insured under the NFIP.

The primary water flow that affects these "Repetitive Loss" properties originates outside of the jurisdiction of the City of Guadalupe and 100% of the flow pathway is also outside of the City's jurisdiction. The City has been in communication with the various jurisdictional authorities, which include, but are not limited to: U. S. Army Corps of Engineers, Santa Barbara County Flood Control, State Regional Water Quality Control Board, U.S. Fish and Wildlife Service, CA Department of Fish & Game, and the owners of private property outside of the City's jurisdiction. As of this date, several options have been discussed, however, none of the options have been implemented, due to the projected costs identified, a lack of revenue sources to fund any of these options and the existing permitting process which is very onerous and in essence serves to dissuade anyone from embarking down that pathway.

4.7.8 SEMS Multi-Hazard Functional Plan

In early October 2004, the City of Guadalupe submitted its Standardized Emergency Management System (SEMS) Multi-Hazard Functional Plan to the State of California for approval. The Plan discusses mitigation in the form of training and exercises, which are essential at all levels of government to make emergency operations personnel operationally ready. All emergency plans should include provisions for training. The objective is to train and educate public officials, emergency response personnel, and the public. The best method for training staff to manage emergency operations is through exercises. Exercises are conducted regularly to maintain the readiness of operational procedures.

Exercises provide personnel with an opportunity to become thoroughly familiar with the procedures, facilities, and systems that will be used in emergencies. There are several forms of exercises:

- Tabletop exercises provide a convenient and low-cost method designed to evaluate policy, plans, and procedures and resolve coordination and responsibilities. Such exercises are a good way to see if policies and procedures exist to handle certain issues.
- Functional exercises are designed to test and evaluate the capability of an individual function such as evacuation, medical, communications, or public information.
- Full-scale exercises simulate an actual emergency. They typically involve complete emergency management staff and are designed to evaluate the operational capability of the emergency management system. Hazard Assessment

All City employees had completed the Introductory SEMS/NIMS training and plans are in progress for advanced SEMS/NIMS training based on job responsibilities. However, through attrition, there are some employees in need of the introductory course which will be corrected over time.

4.8 OPPORTUNITIES FOR MITIGATION CAPABILITY IMPROVEMENTS

The City 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 City 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 City to expand or improve on these policies and programs to further protect the community:

- **Regulatory Opportunities**: As part of this update, the City will comply with AB 2140 by amending its Safety Element to incorporate the LHMP by reference. The City will consider the LHMP in policy, land use plans, and programs, including flood management. For example, the seeks to prepare a master drainage study to identify and resolve flood issues in the City.
- **Administrative/Technical Opportunities**: The City continues to improve its resilience to ensure emergency response operations are sustained during a hazardous event, including seismic upgrades to unreinforced masonry buildings and improvements to public safety facilities and planning. Enhancements to hazard training for staff in partnership with the County and other agencies or stakeholders would improve the City's ability to mitigate hazards with the latest knowledge and resources. The City aims to address hydrologic issues through continued improvements to its drainage and stormwater management infrastructure. As an ongoing commitment to improvements, Public Safety staff will reinspect building for shelters and safe places for family reunification centers. Food storage and distribution centers will be selected along with medical triage preparation sites.
- **Outreach Opportunities**: Enhanced community outreach, emergency notifications, and trainings would further enhance the City's capabilities to respond to and recover from hazards. The City could expand outreach through digital tools such as social media, participate in the Great California ShakeOut, and increase FireWise outreach events and media coverage.
- **Fiscal Opportunities**: The City can update its CIP to include hazard mitigation actions from the LHMP. The City will continue to seek grants (e.g., HMGP, BRIC) to fund these CIP projects and

related projects in the City's mitigation strategy. The City can seek opportunities to partner with the County and/or other stakeholder agencies in grant applications to address regional hazards more effectively. The City could also consider expanding its fiscal capabilities through its annual budget process and other revenue measures (e.g., raising taxes, property assessments, bonds).

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 City of Guadalupe LHMP. The intent is to confirm and update the description, location and extent, and history of hazards facing the City 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 City.

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 City refined the list of hazards applicable to the City and confirmed the hazard prioritization. The following sections provide the results of this effort.

5.2 HAZARD SCREENING/PRIORITIZATION

As described in the 2022 MJHMP, the City is susceptible to natural and human-caused hazards. This LHMP update identifies and screens these hazards. Screening hazards intends to help prioritize which hazards present the greatest risks to the community. 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 City. The City 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 City 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 Guadalupe LPT as their top seven. A brief rationale for each hazard is included below. This assessment of key hazards in the City is provided in addition to the 2022 MJHMP's comprehensive assessment of regional hazards that may affect the City.

Table 5-1. City of Guadalupe Local Priority Hazards

Hazard Type and Ranking	Score	Planning Consideration Based on Hazard Level
Pandemic/Public Health Emergency	10	Significant
Earthquake	9	Significant
Extreme Heat and Windstorm	6	Significant
Dam/Levee Failure	6	Moderate
Train Accident	7	Moderate
Flooding	5	Moderate
Agricultural Pests	3	Low

5.3 PANDEMIC/PUBLIC HEALTH EMERGENCY

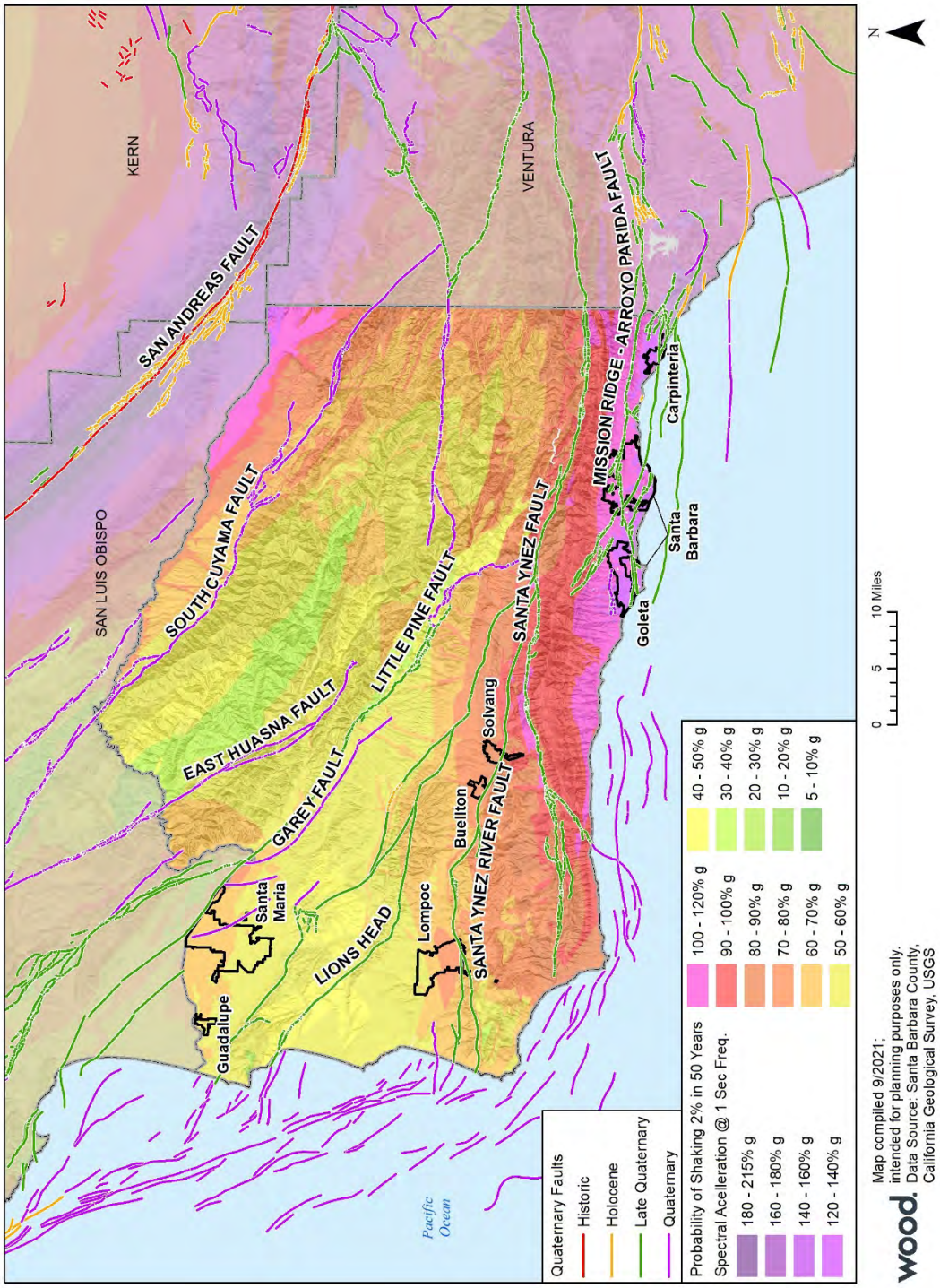
The City, as well as the county, state, nation, and the entire world, is vulnerable to outbreaks, epidemics, and pandemics caused by either newly emerging or existing diseases spread person to person, through a vector such as a mosquito, or both. A significant public health emergency can have a considerable impact on the population, the economy, and essential public services (e.g., fire and police protection, medical services, etc.). Populations identified by the county as especially vulnerable to human health hazards include undocumented persons, senior citizens, senior citizens living alone, persons with existing chronic health conditions, persons experiencing houselessness, overcrowded households and neighborhoods, low-resourced ethnic minorities people of color, households in poverty, communities with a high-pollution burden, and those without health insurance. Undocumented or non-English speaking individuals may be less able to understand such pandemic-related instructions or receptive to responding to government outreach, while lower-income households may lack the means to comply with the direction. Trends of the COVID-19 pandemic further revealed vulnerable groups within Santa Barbara County population, including residents of Guadalupe.

Guadalupe residents' health care needs are often met regionally by medical resources in Santa Maria and Lompoc. As demonstrated by the Covid-19 pandemic, health care resources were strained throughout the county. Further, hospitality, retail, tourism, and hospitality industries have been adversely affected economically through reduced activity and a limited workforce, including business in the City.

5.4 EARTHQUAKE & LIQUEFACTION

A more complete description of the earthquake and liquefaction hazards is found in Chapter 5.0, *Hazard Assessment* of the 2022 MJHMP. Santa Barbara County officials have indicated that the City of Guadalupe is located in Seismic Zone 4, which is the highest potential status for earthquake activity in the state of California. Problems that may occur as a result of a light-to-heavy damaging earthquake include building collapse (particularly un-reinforced masonry structures) causing mass injuries, hazardous materials releases, major fires, utility disruptions, major natural gas leaks, communication disruptions, need for evacuation and rescue, command and coordination problems, roadway and transportation system disruptions, and hospital/school disruptions, to list a few. In general, the most common injuries are a result of unsecured nonstructural items.

Figure 5-1. Santa Barbara County Probability of Shaking 2% in 50 Years



Most of the downtown consists of unreinforced masonry (URM) buildings. The City has identified 24 buildings within the city limits that are URM, two of which are city-owned. In 2007, the City Redevelopment Agency allocated approximately $3 million in RDA funds in the form of grants to assist owners of URM buildings in retrofitting their buildings to seismic safety standards. At this time, the owners of 23 of the 24 buildings are participating in the URM Retrofit Grant Program.

In addition to the threat to URM buildings, many of the non-URM buildings in the City are more than 50 years old and are subject to damage due to an earthquake. While the retrofits are in progress, the threat to buildings and their occupants remains a strong concern. Public facilities and a significant portion (>70%) of the residential occupancies within the City are old construction and have a potential for incurring serious damage in the event of an earthquake.

The City lies within a high liquefaction potential zone. When liquefaction of the soil does occur, buildings and other objects on the ground surface may tilt or sink, and lightweight buried structures (such as pipelines) may float toward the ground surface. Liquefied soil may be unable to support its weight or that of structures, which could result in loss of foundation bearing or differential settlement. Liquefaction may also result in the development of cracks in the ground surface followed by the emergence of a sand/water mixture, typically referred to as a sand-boil. In areas underlain by thick deposits of saturated, loose granular sediment (such as alluvial valleys or beaches), subsidence as much as several feet may result.

Both direct and indirect consequences of a major earthquake will severely stress the resources of the City and will require a high level of self-help, coordination, and cooperation. Out-of-city assistance from other local, regional, state, federal and private agencies may be delayed since earthquakes tend to be large regional events.

5.5 EXTREME HEAT & WINDSTORM

Extreme heat is defined by FEMA as temperatures that hover 10 °F or more above the regional average high temperature or over 100 °F in California and last for at least three days or even as long as several weeks (FEMA 2021b). Extreme heat is a function of heat and relative humidity. A heat index describes how hot the heat-humidity combination makes the air feel. As relative humidity increases, the air seems warmer than it is because the body is less capable of cooling itself or regulating heat via evaporation of perspiration. As the heat index rises, so do health risks such as heat exhaustion, sunstroke, and heatstroke. Extreme heat can also threatens human health from potentially high levels of ground-level ozone in urban environments. Those at the greatest risk of heat-related stress and injuries include the elderly, small children, individuals who work outside, patients with chronic medical conditions, those on prescription medication therapy, and people with weight and alcohol problems, especially during heat waves in areas where moderate climate usually prevails. Extreme heat occurs when temperatures rise significantly above normal levels, and the key metric is the number of extreme heat events per year and heatwave duration. “Extreme heat” is a relative term—temperatures of 100 °F are normal in places like Palm Springs, but almost unprecedented in the City.

As described in Section 5.4.1, *Extreme Heat/Freeze* of the MJHMP, in any given year, the City can be subject to extreme heat conditions. The hottest months are usually summer from June to September. As temperatures rise due to climate change, the City will face a greater risk of death

from dehydration, heatstroke/exhaustion, heart attack, stroke, and respiratory distress caused by extreme heat, as well as increased stress on water quantity and quality, degraded air quality, and increased potential for more severe or catastrophic natural events such as heavy rain, droughts, and wildfire. Extreme heat has also been shown to accelerate wear and tear on the natural gas system and electrical infrastructure.

As described in Section 5.4.2, *Windstorm* of the MJHMP, Santa Barbara County is at risk of windstorms at any given time during the calendar year. The City is located in a particularly windy region of the County, approximately 5 miles inland from the Guadalupe Dunes shoreline. Santa Barbara County is known to experience Santa Ana winds that can adversely affect the City. High winds can damage infrastructure and exacerbate wildfire risks (see also, Section 5.3.1, *Wildfire* of the MJHMP).

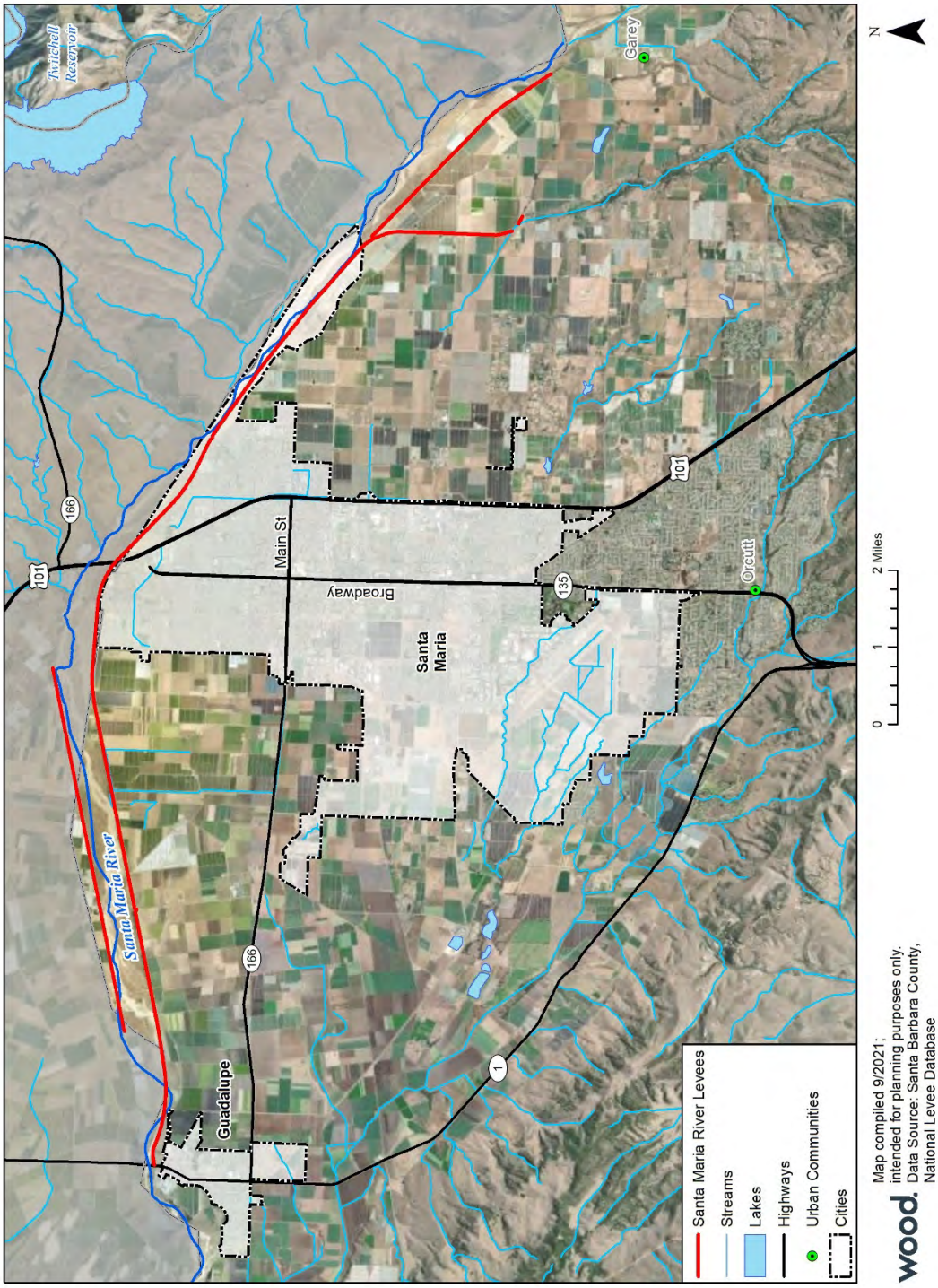
5.6 DAM/LEVEE FAILURE

The Santa Maria River travels along the northern border of the City. There is an existing levee along the south side of the river, which ends at the intersection of Highway 1. Along the northern border of the City, west of Highway 1, there is no levee structure and the primary protection from river flooding in that area is the difference in elevation between the river and adjacent properties. The estimated difference in elevation between the river and adjacent properties ranges from approximately 10 to 15 feet. The lack of a levee structure leaves the commercial, residential, agricultural, and open space properties within this area at risk of flooding should there be major rains or a failure of the Twitchell Dam. The City is continuing to investigate the possibility that an old landfill site may be present just outside of the city limits, as indicated by the Santa Barbara County Environmental Health Department. This site is generally located north of the City limits, in the vicinity of Peralta Street, between existing commercial and agricultural uses and the Santa Maria River Levee. Should the existing levee fail, the resultant flooding could unearth the old landfill contents and distribute them throughout the area. Further research is ongoing as to the status of this suspected landfill site.

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. The facilities that may qualify for temporary housing and/or temporary shelters are within the identified inundation zone and thus are not available. The City does not have a suitable relocation facility and thus evacuations will require re-location outside of the City. The City's contract Engineer will review flood protection considerations when new projects go through the City's approval process, the Planning Commission, and City Council.

Figure 5-2. Location of Santa Maria River Levee Segments



5.7 TRAIN ACCIDENT

The Union Pacific Railroad bisects the City from north to south paralleling Highway 1 adjacent to the main downtown corridor of the City. The railroad carries both passengers and cargo through the City daily. While the City has only had two derailment incidents, the potential for train-related incidents is ever-present, and some of the cargo carried by the trains include hazardous materials. The coast route of the Union Pacific Railroad passes through the City of Guadalupe and the County of Santa Barbara west and south of Santa Maria. Several northbound and southbound freight trains pass through the area daily. Materials shipped include explosives, compressed and liquefied gases, petroleum products, agricultural chemicals, industrial chemicals, radioactive materials, hazardous wastes, and military ordinance and rocket fuels destined to Vandenberg SFB.

Another concern is that in some areas of the City, the trains pass in very close proximity to residential and commercial occupancies (in some cases within +-35 feet), which provides a potential threat to the occupants of these structures. Because the railroad passes through the downtown corridor of the City, should a train carrying hazardous materials be involved in an incident and those materials are released, the entire City could be at significant risk. In addition, any incident along the railroad right-of-way could adversely affect the ability of emergency services to respond to calls for service promptly. The long-term closure of Highways 1 or 166 could also significantly affect the City's economy as we are dependent on tourism to generate sales tax dollars.

5.8 FLOODING

The general topography of Guadalupe and the Santa Maria Valley is flat resulting in minor to moderate flooding issues following heavy rainfall in a short period. When heavy rains occur and/or the Santa Maria River is close to breaching its banks, Guadalupe residents near Pioneer Street are must evacuate as a result of the intense flooding. Numerous flood control retention basins have been constructed by the City of Santa Maria, Santa Barbara County Flood Control, and private developers. These retention basins have been successful in mitigating a majority of the local flooding resulting from rainfall. There are still areas that are subject to flooding when heavy rains occur. Additionally, during periods of heavy prolonged rainfall, these retention basins become large, open bodies of water which must be monitored by police, park rangers, and flood control personnel to prevent persons from dangerously entering the basins for recreational purposes. In 2005, the City Council adopted Ordinance 2005-10 which added Section 10-4 to the Municipal Code regulating access and use of retention basin facilities.

The City of Guadalupe sustained flood damage in February 1993, February 1998, March 2001, December 2010, and March 2011 due to heavy rains. A Local Emergency was declared on February 5, 1998, March 21, 2001, and December 19, 2010, following substantial storm flooding. As the City continues to grow and approach build-out, the increase in the impervious landscape will exacerbate the flooding problems; however, new development may also help attenuate flood hazards. For example, the Santa Barbara County Public Works Department recorded rainfall of 3.97 inches on 12/16/2010. In January of 2021, the City of Guadalupe recorded nearly the same amount of rainfall within the same period, yet no flooding occurred. This is potentially due to the new development that was built on Pioneer Street, which now allows for improved ground

absorption and water runoff. Flooding can still present a problem in this area if maintenance is not performed regularly, such as cleaning storm drains before rains.

A Wetlands Lake with undersized culverts affects Gularte Tract and Mary Buren Elementary School, City Hall, and the entire downtown core of the City. The most concerning areas for storm-related flooding are the 800 – 900 block of Pioneer Street, 4700 Block of 11th Street, the wastewater treatment plant, and most of the western portion of the City bordering the Santa Maria River. This threat is due to the area's low elevation relative to the Santa Maria River and the lack of a levee structure between the river and this area. The majority of the western portion of the City faces a moderate to high risk of flooding due to the lack of a levee structure between the Santa Maria River and the properties. Another concern that has been identified that increases the flooding threat is the recent wildfires in the watershed east of the Santa Maria Valley. These fires have removed vegetation from rural land and resulted in increased runoff rates, and a significant portion of this runoff and sediment that would travel down the Santa Maria River, increasing the threat to the City.

5.9 AGRICULTURE PESTS & OTHER AGRICULTURAL HAZARDS

The agriculture industry is a major factor in the City's economy. The City is surrounded by agricultural activities, employing hundreds, if not thousands of people, which contributes significantly to the local economy. The City is home to a multi-million dollar produce processing facility that employs several hundred community residents. There are several different threats to the agricultural industry locally. The threats include but are not limited to pest infestation, disease, intentional vandalism and terrorism, the fallout from the Diablo Canyon Power Plant, and adverse weather. With agriculture being such a vital industry to the community, the loss of any portion of this industry would be devastating to the local economy and it is in the City's best interest to work toward protecting this vital industry.

The agricultural industry uses large quantities of ammonia to operate their refrigeration systems, and there are significant quantities of fertilizers and pesticides stored and dispensed in the community. Anhydrous ammonia is an efficient and widely used source of nitrogen fertilizer. However, it is one of the most potentially dangerous chemicals used in agriculture. Ammonia gas is colorless and has a sharp, penetrating odor. When used as an agricultural fertilizer, it is compressed into a liquid. In the liquid state, it is stored in specially designed tanks strong enough to withstand internal pressures of at least 250 pounds per square inch (psi). During warm weather, the temperature of the liquid anhydrous ammonia in the tank increases and the liquid expands, causing the vapor pressure in the tank to increase. When pressure is released, liquid anhydrous ammonia quickly converts to a gas. When injected into the soil, the liquid ammonia expands into a gas and is readily absorbed in the soil moisture. Similarly, in contact with the eyes, skin, or mucous membranes, ammonia will cause rapid dehydration and severe burns.

5.10 HAZARDOUS MATERIALS RELEASE

Highway 1 and Highway 166 pass through the community and local and interstate trucks regularly pass through the City. One of the primary threats to the community from these trucks is the large quantities of diesel fuel they carry and the proximity of the highways to storm drainage systems that serve the region. Highway 166 East is a major connector between U.S. 101 and the San Joaquin

Valley. In addition, Highway 166 East is a designated transportation route for explosives and rocket fuels destined for Vandenberg Space Force Base (SFB). Other commodities transported on these routes include but are not limited to compressed and liquefied gases, petroleum products, agricultural chemicals, industrial chemicals, and hazardous wastes.

In addition, any long-term closure of Highways 1 or 166 due to an incident related to these highways will severely limit access to the City by mutual aid providers and disaster relief assistance. The closure of Highways 1 or 166 could also significantly affect the City's economy as we are dependent on tourism to generate sales tax dollars.

Pipelines also pose a risk to the City. ConocoPhillips operates a large pipeline that transports up to 84,000 barrels of crude oil per day (3.5 million gallons) from the Sisquoc Pump Station westward toward the Santa Maria Pump Station where the oil is heated, then into the City of Santa Maria, then north to the Santa Maria Refinery in Arroyo Grande, 8 miles north of Guadalupe. This single pipeline (some segments are 10 inches wide; some are 12 inches in diameter) enters the City's east side along Battles Road then turns north at "Suey Junction" (a valve station west of Depot Street near the Minami Community Center) and travels north along Railroad Avenue and continues beyond the City, crossing the river. The maximum pressure for this pipeline is 800 pounds per square inch.

Oil and gas fields also pose a risk to the City. Thousands of wells have been dug throughout the region, with many abandoned since. Hydrogen Sulfide (H2S) gas is found in high concentrations in the Santa Maria and Guadalupe oil fields. H2S is a colorless, acidic gas, almost as toxic as hydrogen cyanide and between 5 and 6 times more toxic than carbon monoxide. H2S gas is heavier than air. Because of this, H2S gas becomes concentrated close to the ground, accumulating in low areas such as well cellars and ditches. The principal threat of Hydrogen Sulfide gas to human life is poisoning by inhalation. Whenever H2S gas is present, respiratory protection is of extreme importance. The sense of smell cannot be relied upon to indicate either the presence or concentration of the H2S gas.

The City of Guadalupe Fire Department works closely with local industry and monitors and audits risk management and prevention programs. The City of Guadalupe Fire Department is also involved with Hazardous Material guidelines per CUPA (County Fire Hazardous Material Unit) established Business Plans are complied with. Regular site visits are also performed with CUPA.

6.0 VULNERABILITY ASSESSMENT

The vulnerability assessment builds on the hazard assessment provided in Section 5.0 to estimate losses where data is available and consider a specific list of critical facilities identified within the City of Guadalupe. The City identified 17 critical facilities to be included in the Vulnerability Assessment portion of the LHMP. These facilities primarily included utilities, government, and educational structures. Of the available data, it was shown that these buildings are worth approximately $42,500,000 in structural value (Table 6-1).

Table 6-1. Critical Facilities in the City of Guadalupe

Type	Name	Address	Total Building Value
Communications	Guad AC		-
Utilities	Pioneer St. Sewer Lift Station	800 Pioneer St	$2,500,000
Utilities	Laguardia St. Sewer Lift Station	4200 Laguardia	$2,500,000
Wastewater Treatment Plant	Wastewater Plant	5200 West Main Street	$25,000,000
Water Tank	Pioneer St Water Tank	500 Block Of Pioneer St	$5,000,000
Water Tank	Obispo St. Water Tank & Equipment	303 Obispo Street	$5,000,000
RMP Facilities	Apio Cooling	4595 West Main Street	-
RMP Facilities	Puritan Ice Company	4585 West Main Street	-
Clinic	Marian Community Health Clinic-Guadalupe	4723 W. Main St	-
Clinic	Community Health Centers Of The Central Coast- Guadalupe	4581 10th St	-
EMS Station	Guadalupe Fire Department Station 2	1025 Guadalupe Street	-
EMS Station	Guadalupe Fire Department Station 1	918 Obispo Street	-
Senior Center	Guadalupe Senior Citizens Center	4545 10th Street	$2,500,000
Education	Mary Buren Elementary	1050 Peralta St.	-
Education	Kermit Mckenzie Junior High	4710 W. Main St.	-
Education	Guadalupe Preschool	120 Tognazzini Ave.	-
Police	Guadalupe Police Department	4490 10th Street	-

Using a GIS and the mapped extents of the hazards affecting the City, it was determined which critical facilities are exposed to which hazards depending on whether they fall within the mapped hazard area. The results of the exposure analysis are included in this section. A further description of the threats and methodologies used in this analysis is provided in Chapter 6.0, *Vulnerability Assessment* of the 2022 MJHMP. As the City continues to assess its vulnerability, the collection of better and more complete data will help to improve the risk assessment process to direct planning and mitigation decisions.

Table 6-2. Summary of Potential Impacts to Critical Facilities

Hazard Type	Specific Risk	Count	% of Critical Facilities Impacted	Exposure ($)
Flood	FEMA Flood Zone	0	0	$0
Dam Inundation/Levee Failure	Twitchell Dam Failure	17	100%	$42,000,000
Wildfire	Low to Moderate Fire Wildfire Threat	2	12%	$5,000,000

Hazard Type	Specific Risk	Count	% of Critical Facilities Impacted	Exposure ($)
Earthquake	High Liquefaction Potential	17	100%	$42,000,000
	Regional Ground Shaking	17	100%	$42,000,000

6.1 EARTHQUAKE & LIQUEFACTION

Chapter 6.0, *Vulnerabilities Assessment* of the 2022 MJHMP addresses regional seismicity under two scenarios that include the City of Guadalupe. The 2,500-year scenario considers general seismicity from multiple faults in the region and a 7.0 magnitude event. The methodology utilizes probabilistic seismic hazard contour maps developed by the U.S. Geological Survey (USGS) for the 2018 update of the National Seismic Hazard Maps that are included with Hazus-MH. A deterministic scenario was also prepared to predict the outcome of a specific earthquake event. The deterministic scenarios used USGS provided ShakeMap datasets to model a Magnitude 7.2 earthquake of the San Luis Range would generate in terms of damages and losses for the chosen area of interest (i.e., northern Santa Barbara County, including the City). Figure 6-1 is the ShakeMap produced for this scenario.

As described in the MJHMP, regional losses to people and property would include the City. As shown in the San Luis Range ShakeMap scenario, the north and central parts of the county would perceive much stronger shaking and would likely receive the most severe damage when compared to the rest of the county. The entire City would perceive severe to extreme shaking and would likely receive moderate/heavy to very heavy damage. Direct effects of ground shaking could damage buildings and create dangerous debris and unstable structures. Displaced residents would likely seek shelter in the City, including residents from outside the City. Further, fires often occur after an earthquake. Because of the number of fires and the lack of water to fight the fires, they can often burn out of control.

The City lies in an area with a high liquefaction severity class. Regional earthquakes could cause liquefaction in the City, which could damage buildings and utilities when soils become unstable. Based on the GIS analysis conducted for the 2022 MJHMP, the City has 1,957 improved parcels valued at over $522 million in the high liquefaction severity zone. Based on this analysis, which accounts for residents only and not workers, 7,243 residents are living in this hazard zone within the City. While liquefaction would not likely affect all areas uniformly during an earthquake, this analysis indicates the extent and scale of vulnerabilities to liquefaction during a large earthquake.

Table 6-3. City of Guadalupe at Risk to the High Liquefaction Hazard by Property Type

Property Tyle	Improved Parcel Count	Total Value	Population
Agricultural	0	$0	
Commercial	68	$33,802,616	
Exempt	19	$2,149,334	

Property Tyle	Improved Parcel Count	Total Value	Population
Industrial	24	$50,745,388	
Mixed Use	1	$1,279,578	4
Residential	1,842	$433,781,642	7,239
Improved Vacant	3	$248,620	
Total	**1,957**	**$522,007,177**	**7,243**

As listed in Table 6-4, all critical facilities in the City would be vulnerable to damage or destruction from ground shaking and liquefaction during a significant regional earthquake (Figure 6-2; see also, Section 6.2.1, *Earthquake (Groundshaking)* and Section 6.3.3, *Liquefaction (Earthquake)* of the 2022 MJHMP).

Table 6-4. City of Guadalupe Critical Facilities Vulnerable to Liquefaction

Type	Name	Hazard Type/Source	Total Building Value
Communications	Guad AC	Twitchell Dam Failure	-
Utilities	Pioneer St. Sewer Lift Station	Twitchell Dam Failure	$2,500,000
Utilities	Laguardia St. Sewer Lift Station	Twitchell Dam Failure	$2,500,000
Wastewater Treatment Plant	Wastewater Plant	Twitchell Dam Failure	$25,000,000
Water Tank	Pioneer St Water Tank	Twitchell Dam Failure	$5,000,000
Water Tank	Obispo St. Water Tank & Equipment	Twitchell Dam Failure	$5,000,000
RMP Facilities	Apio Cooling	Twitchell Dam Failure	-
RMP Facilities	Puritan Ice Company	Twitchell Dam Failure	-
Clinic	Marian Community Health Clinic-Guadalupe	Twitchell Dam Failure	-
Clinic	Community Health Centers Of The Central Coast- Guadalupe	Twitchell Dam Failure	-
EMS Station	Guadalupe Fire Department Station 2	Twitchell Dam Failure	-
EMS Station	Guadalupe Fire Department Station 1	Twitchell Dam Failure	-
Senior Center	Guadalupe Senior Citizens Center	Twitchell Dam Failure	$2,500,000
Education	Mary Buren Elementary	Twitchell Dam Failure	-
Education	Kermit Mckenzie Junior High	Twitchell Dam Failure	-
Education	Guadalupe Preschool	Twitchell Dam Failure	-
Police	Guadalupe Police Department	Twitchell Dam Failure	-

Figure 6-1. City of Guadalupe Critical Facilities and Earthquake Groundshaking Potential (San Luis Range 7.2 Magnitude ShakeMap)

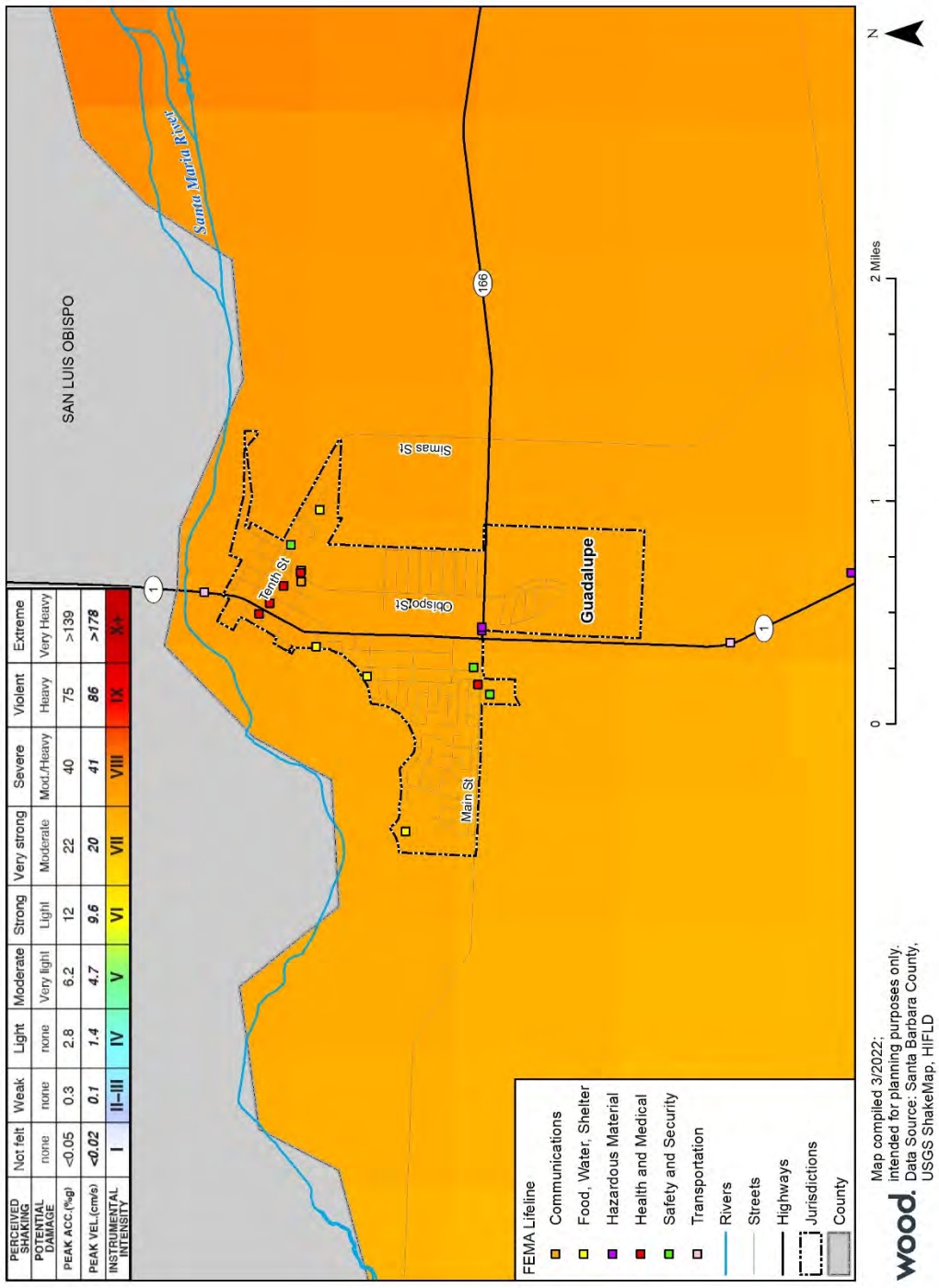
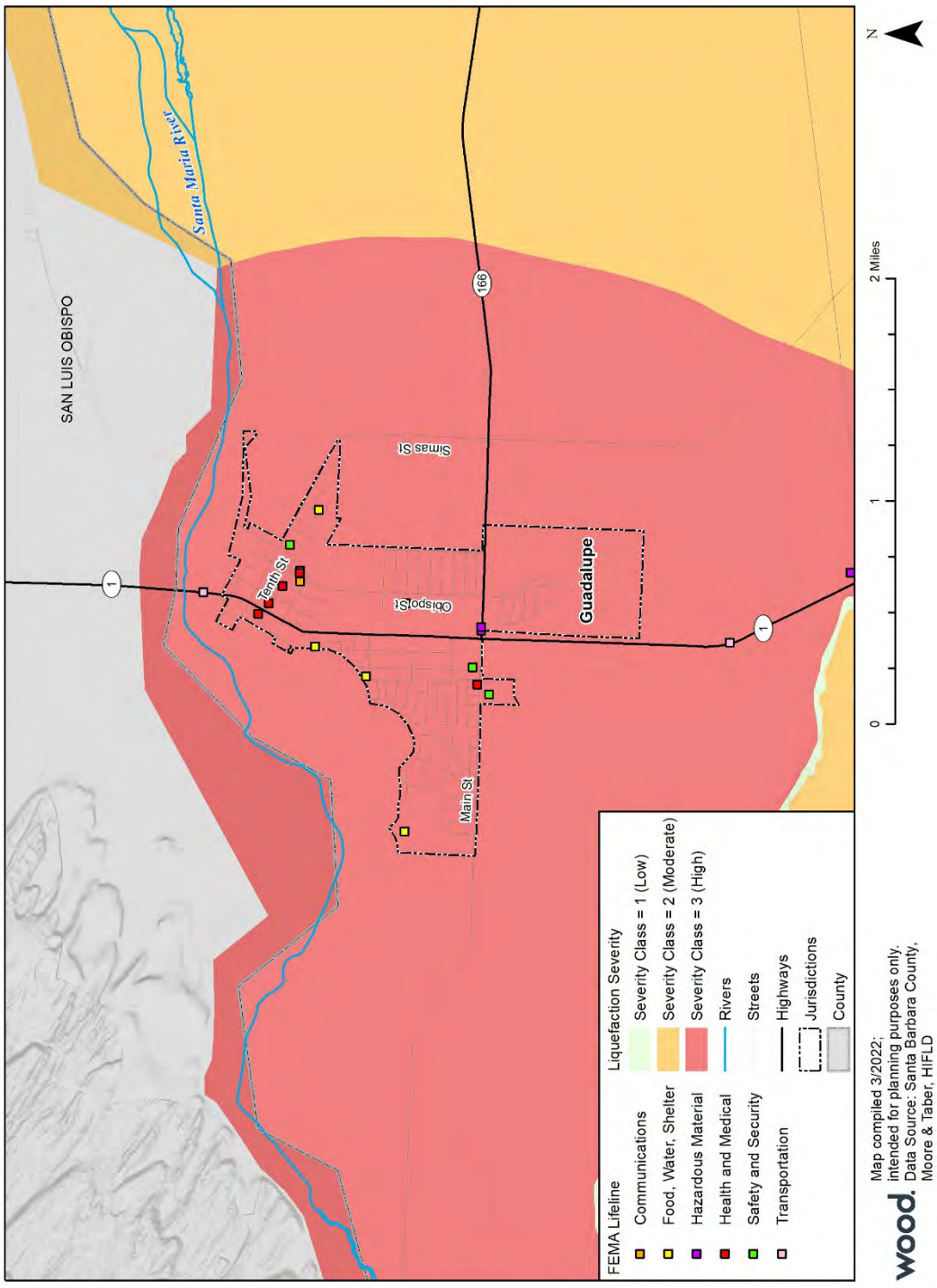


Figure 6-2. City of Guadalupe Critical Facilities and Liquefaction Potential



6.2 EXTREME HEAT & WINDSTORM

Extreme heat poses the greatest danger for the City's outdoor laborers who support the county's agriculture economy. Exertional heat illness occurs across a wide age range and in numerous industries and occupations, including the following: agriculture, construction, firefighting, warehousing, delivery, and service work. Outdoor laborers are exposed to extreme temperatures and at higher risk of heat-related illnesses than other populations of the county. The elderly, children, people with certain medical conditions, and the houseless are also vulnerable to exposure. However, any populations working or recreating outdoors during periods of extreme cold or heat are exposed, including otherwise young and healthy adults and houseless populations. Adults and young people are commonly out in temperatures of extreme heat, whether due to commuting for work or school, conducting property maintenance such as lawn care, or for recreational reasons.

Windstorms could have a considerable impact on the population, built environment, lifeline infrastructure, and the economy of the City. Severe winds can directly impact the City by damaging or destroying buildings, knocking over trees, and damaging power lines and electrical equipment. Secondary impacts of damage caused by wind events often result from damage to communication, transportation, or medical infrastructure. High winds can lead to Public Safety Power Shutdowns (PSPS) that can impact the local economic drivers and key services. During severe wind events, electricity transmission lines can be damaged or turned off by Pacific Gas and Electric Company (PG&E), causing widespread power outages and hardships for City residents. Downed power and communications transmission lines, coupled with disruptions to transportation, create difficulties in reporting and responding to emergencies. These indirect impacts of a wind event put tremendous strain on a community. In the immediate aftermath, the focus is on emergency services. Vulnerable groups are especially exposed to the indirect impacts of high winds, particularly the loss of electrical power. These populations include the elderly or disabled, especially those with medical needs and treatments dependent on electricity. Nursing homes, community-based residential facilities, and other special needs housing facilities are also vulnerable if electrical outages are prolonged since backup power generally operates only minimal functions for a short period.

6.3 DAM/LEVEE FAILURE

Failure of Twitchell Dam would inundate portions of the cities of Santa Maria and Guadalupe, as well as Highway 1, with relatively little evacuation time. Based on the GIS analysis conducted for the 2022 MJHMP, Guadalupe, 1,957 properties with a total value of over $522 million are vulnerable to the catastrophic flooding that would occur if the Twitchell Dam and levee system on the Santa Maria River failed. In Guadalupe, approximately 7,243 residents within the inundation zone may need to be evacuated, cared for, and possibly permanently relocated. This information is summarized in Table 6-5 below.

Table 6-5. City of Guadalupe at Risk to Dam Inundation Hazard

Property Type	Improved Parcel Count	Total Value	Population
Commercial	68	$33,802,616	
Exempt	19	$2,149,334	
Industrial	24	$50,745,388	

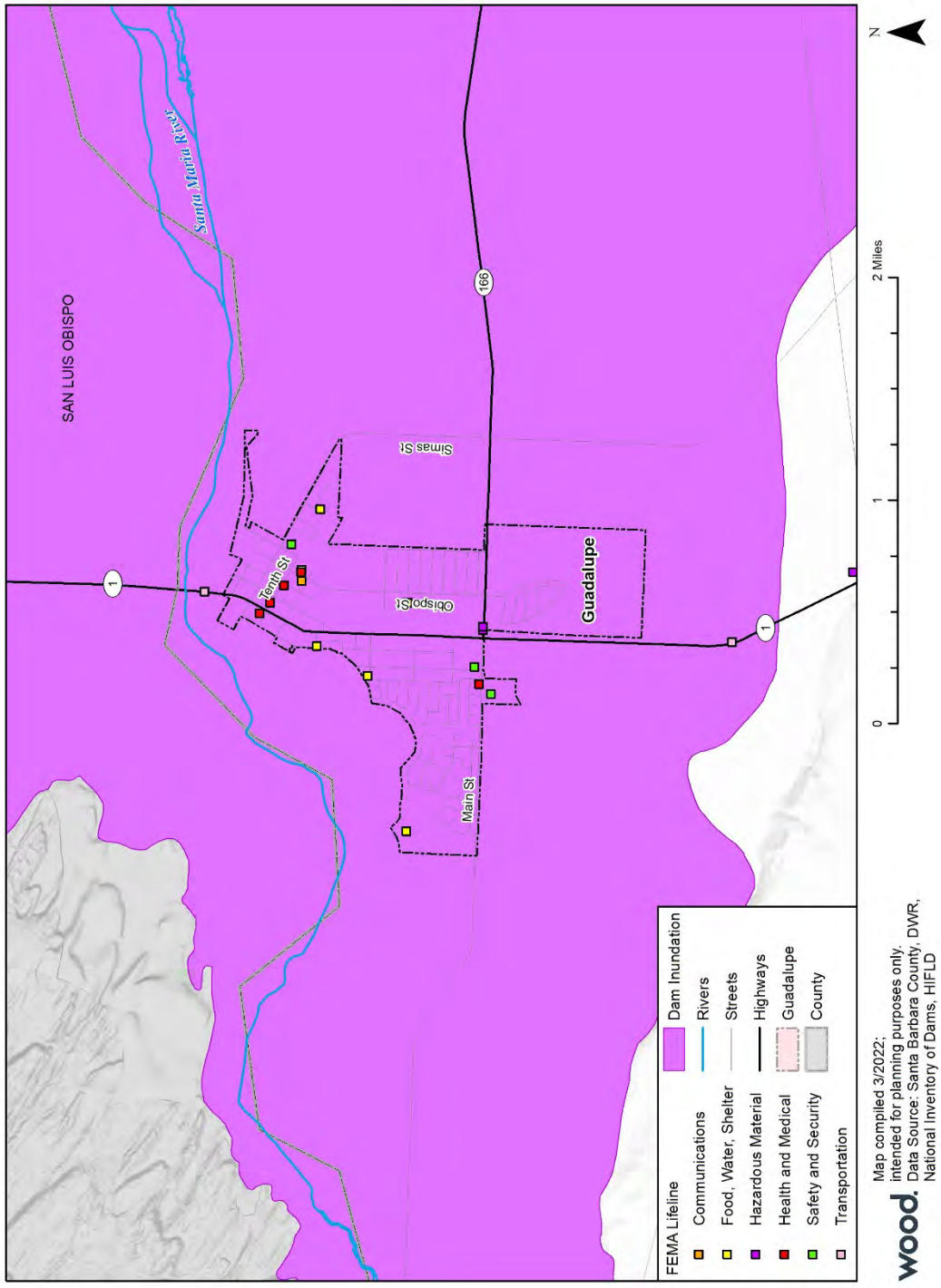
Property Type	Improved Parcel Count	Total Value	Population
Mixed Use	1	$1,279,578	4
Residential	1,842	$433,781,642	7,239
Improved Vacant	3	$248,620	
Total	**1,957**	**$522,007,177**	**7,243**

Further, as listed in Table 6-6, all critical facilities in the City would be vulnerable to damage or destruction from flooding due to dam and levee failure (see also, Section 6.6.3, *Dam Failure* and Section 6.6.8, *Levee Failure* of the 2022 MJHMP).

Table 6-6. City of Guadalupe Critical Facilities Vulnerable to Inundation from Dam/Levee Failure

Type	Name	Hazard Type/Source	Total Building Value
Communications	Guad AC	Twitchell Dam Failure	-
Utilities	Pioneer St. Sewer Lift Station	Twitchell Dam Failure	$2,500,000
Utilities	Laguardia St. Sewer Lift Station	Twitchell Dam Failure	$2,500,000
Wastewater Treatment Plant	Wastewater Plant	Twitchell Dam Failure	$25,000,000
Water Tank	Pioneer St Water Tank	Twitchell Dam Failure	$5,000,000
Water Tank	Obispo St. Water Tank & Equipment	Twitchell Dam Failure	$5,000,000
RMP Facilities	Apio Cooling	Twitchell Dam Failure	-
RMP Facilities	Puritan Ice Company	Twitchell Dam Failure	-
Clinic	Marian Community Health Clinic-Guadalupe	Twitchell Dam Failure	-
Clinic	Community Health Centers Of The Central Coast- Guadalupe	Twitchell Dam Failure	-
EMS Station	Guadalupe Fire Department Station 2	Twitchell Dam Failure	-
EMS Station	Guadalupe Fire Department Station 1	Twitchell Dam Failure	-
Senior Center	Guadalupe Senior Citizens Center	Twitchell Dam Failure	$2,500,000
Education	Mary Buren Elementary	Twitchell Dam Failure	-
Education	Kermit Mckenzie Junior High	Twitchell Dam Failure	-
Education	Guadalupe Preschool	Twitchell Dam Failure	-
Police	Guadalupe Police Department	Twitchell Dam Failure	-

Figure 6-3. City of Guadalupe Critical Facilities in Twitchell Dam Inundation Zone



6.4 FLOOD

Approximately 2 acres (0.25 percent) of the City lies within the FEMA 1 percent annual chance flood zone. No improved parcels lie within a FEMA flood zone. No critical facilities are vulnerable to this flood hazard zone (Figure 6-4; see also, Section 6.3.3, *Flood* of the 2022 MJHMP).

6.5 WILDFIRE

The county has extensive areas within mapped Fire Hazard Severity Zones and Wildland-Urban Interface (WUI) areas. These hazard areas generate vulnerability for life and structures, including critical facilities, throughout the county, but most severely within rural foothills areas where dry vegetation, steep slopes, and difficult access combine to create a high probability of wildfire. Based on these maps, the City has 21 acres (2.8 percent) within High Wildfire Threat areas, 68 acres (8 percent) within Moderate Wildfire Threat areas, and 71 acres (8.4 percent) within Low Wildfire Threat areas. Most of these areas are residential with limited vulnerabilities in commercial and industrial areas.

Based on the GIS analysis conducted for the 2022 MJHMP, in Guadalupe, 103 properties with a total value of over $34 million are vulnerable to wildfire. In Guadalupe, approximately 397 residents live in high, moderate, or low wildfire threat areas. This information is summarized in Table 6-7 below.

Table 6-7. City of Guadalupe at Risk to Wildfire Threat

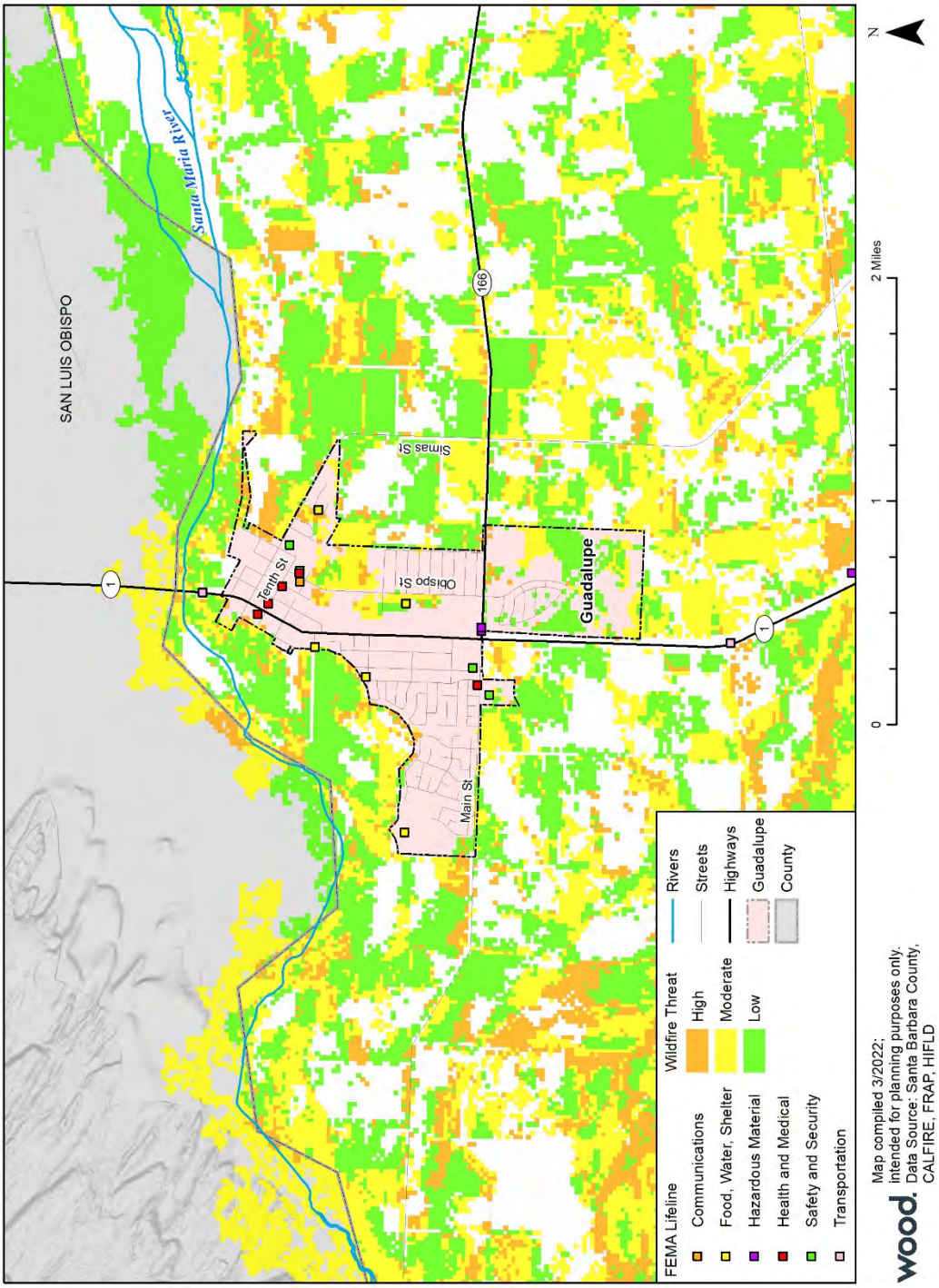
Property Type	Improved Parcel Count by Wildfire Threat Level						Total Value	Population
	Extreme	Very High	High	Moderate	Low	Total		
Agricultural	0	0	0	0	0	0	$0	
Commercial	0	0	0	1	0	1	$1,050,296	
Exempt	0	0	0	0	0	0	$0	
Industrial	0	0	0	1	0	1	$1,134,365	
Mixed Use	0	0	0	0	0	0	$0	0
Residential	0	0	7	74	20	101	$32,554,110	397
Improved Vacant	0	0	0	0	0	0	$0	
Total	**0**	**0**	**7**	**76**	**20**	**103**	**$34,738,771**	**397**

Two of the City's critical facilities fall within either low or moderate wildfire threat areas, as listed in Table 6-8 (see also, Section 6.3.1, *Wildfire* of the 2022 MJHMP).

Table 6-8. City of Guadalupe Critical Facilities Vulnerable to Wildfire

Type	Name	Hazard Source/Type	Total Building Value
Water Tank	Obispo St. Water Tank & Equipment	Low Wildfire Threat	$5,000,000
Education	Kermit Mckenzie Junior High	Moderate Wildfire Threat	-

Figure 6-4. City of Guadalupe Critical Facilities within Wildfire Threat Zones



The City's MAC and LPT members acknowledged that the WUI and fire threat data assessed for this update is developed on a statewide basis and does not consider the placement of local neighborhoods within the geography. Based on these maps, Guadalupe falls within wildfire hazard zones. However, on a local level, the City's LPT does not consider the above-listed critical facilities to be at risk of wildfire. The City is surrounded by cultivated agricultural operations on flat terrain, which have a slim chance of spreading wildfires into the City.

7.0 MITIGATION STRATEGY

In preparation for the 2022 LHMP update, the City's LPT made no revisions to the countywide goals and objectives because they continue to reflect the needs of the City; see also, Chapter 7.0, *Mitigation Plan* of the 2022 MJHMP. This section contains the City's updated and most current mitigation strategy as of 2022.

7.1 MITIGATION PRIORITIES

7.1.1 Goals and Objectives

The City'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.

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

Since 2017, the City has incorporated the LHMP goals, objectives, and mitigation actions into its local plans and processes, including the General Plan Safety Element by reference, specific hazard planning efforts (e.g., Stormwater Management Program), the City's grant pursuits, and capital improvement planning. Ongoing monitoring and evaluation of the LHMP by the City ensured mitigations are implemented and tracked. Key mitigation actions completed since 2017 include ongoing CERT trainings, but others have been deferred to the 2022 LHMP. The City's LPT reviewed the mitigation actions listed in the 2017 LHMP to determine the status of each action. Once reviewed, deferred projects from 2017 were renumbered to reflect 2022 updates (see Table 7-1).

Table 7-1. Status of Previous Mitigation Actions

Mitigation Action #	Mitigation Action Description	Status	Comments	In 2022 Update?
2016-1	Community Emergency Response Team (CERT) Training	Ongoing		X
2016-2	Develop the previously proposed combination Public Works and Fire facility, and upgrade the facility design to serve as a fire station to accommodate existing and future staffing.	Deferred		X
2016-3	Disaster Early Warning System and Evacuation Plan	Deferred		X
2016-4	Prepare Drainage Study and Master Plan	Deferred		X
2016-5	Earthquake retrofit program for Unreinforced Masonry Buildings.	Deferred		X
2016-6	Mitigation of Repetitive Flooding	Deferred		X

7.3 MITIGATION APPROACH

A simplified Benefit-Cost Review was applied to both deferred and new 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 Planning Team. 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. Community Emergency Response Team (CERT) Training

Work with the City of Santa Maria, Alan Hancock College, and the Orfalea foundation to schedule CERT training courses for Guadalupe residents. Advertise the training courses on the City's government access channel and in the Santa Maria Times. Coordinate with Senior Citizens groups, downtown merchants, and property owners to ensure they are notified of training courses. Conduct training courses twice a year at different times and locations. CERT is a positive and realistic approach to emergency and disaster situations where citizens may initially be on their own and their actions can make a difference. While people will respond to others in need without the training, one goal of the CERT program is to help them do so effectively and efficiently without placing themselves in unnecessary danger. In the CERT training, citizens learn to identify community hazards, including seismic, flood, extreme weather, hazard materials release, and other applicable hazards. Community members would learn to manage utilities and put out small fires, treat the three medical killers by opening airways, controlling bleeding, and treating for shock, provide basic medical aid, search for and rescue victims safely, organize themselves, and spontaneous volunteers to be effective, and collect disaster intelligence to support first responder efforts.

Mitigation Priority and Performance	
Priority	Medium
Hazards Mitigated	Earthquake, Dam/Levee Failure, Train Accident, Wildfire, Flood, Agriculture, Hazardous Materials, Windstorm/Extreme Heat
Estimated Timeline	Ongoing

Mitigation Priority and Performance	
Estimated Cost/Funding Source	$20,000 annually/ FEMA Hazard Mitigation Program/Building Resilient Infrastructure and Communities Grant, Orfalea Foundation Grant, General fund for time and materials
Responsible Agency/Department	City of Guadalupe Fire Department
Cost-Benefit Consideration	Cost Beneficial - The relatively low cost of instituting CERT training and other education programs should easily be offset by damages avoided if only a portion of the community participates in training.
Comments	This project was adapted from 2016-1 (GEN 1 from 2004) included as part of the 2017 LHMP. This is a Medium priority as the City has limited staff available to present the program regularly.

2022-2. Public Safety Facility

Develop the previously proposed combination Public Works and Public Safety Facility to provide emergency response and resilience in the City, and upgrade the facility design to serve to accommodate existing and future staffing.

Mitigation Priority and Performance	
Priority	Medium
Hazards Mitigated	Earthquake, Dam/Levee Failure, Train Accident, Wildfire, Flood, Agriculture, Hazardous Materials, Extreme Heat, Windstorm
Estimated Timeline	2027
Estimated Cost/Funding Source	$3 million/ FEMA Hazard/Pre-Disaster Mitigation Grant, General Fund, special revenue funds, State Grants, Federal Grants, Santa Barbara County funding, Private Grants
Responsible Agency/Department	City of Guadalupe Fire Department, Building Department, Public Works Department
Cost-Benefit Consideration	Highly Cost Beneficial. This facility would provide a new location for Public Works personnel and equipment and provide a new and safer facility for the Fire Department operations.
Comments	This project was adapted from 2016-2 (GEO 1 from 2004) included as part of the 2017 LHMP. This is a Medium priority as we will need to identify funding to modify the existing plans to expand the scope of the project. There is currently no funding identified, and no real prospects for funding soon for this project. An original estimate was obtained for the project without the proposed alterations and that was approximately $3 million.

2022-3. Disaster Early Warning System and Evacuation Plan

Develop a Disaster Early Warning System and Evacuation Plan in the event of a major earthquake, levee failure, flood, train derailment, wildfire, or hazardous materials leak. Explore strategies to develop an early warning/public emergency notification system. Finish development of a comprehensive evacuation plan.

Mitigation Priority and Performance	
Priority	High
Hazards Mitigated	Earthquake, Dam/Levee Failure, Train Accident, Wildfire, Flood, Agriculture, Hazardous Materials

Mitigation Priority and Performance	
Estimated Timeline	2025
Estimated Cost/Funding Source	$TBD/ General Fund, FEMA Hazard/Pre-Disaster Mitigation Grant, Brownfield Act, Federal Grants, State Grants, and Private Grants.
Responsible Agency/Department	City of Guadalupe Fire Department, Public Safety Department, Building Department, Public Works Department
Cost-Benefit Consideration	Highly Cost Beneficial – The cost of developing an early warning and evacuation plan would easily be offset by the reduction in injuries and potential loss of life if residents were not immediately informed of a disaster and if no evacuation plan were in place. A disaster early warning plan could include working in conjunction with the Santa Barbara County Sheriff's Department to prepare a database of all phone numbers in Guadalupe, both residential and commercial so that a Reverse 911® system could be used in the event of an emergency, including the voluntary registration of cell phone numbers into the Reverse 911® System database. The acquiring of a general community warning system such as a siren or public address system could prove to be very costly and is currently beyond the capability of the City's General Fund. While this type of system is beneficial, it does come with a significant amount of labor-intensive public education. Another option is a low-power AM or FM radio station, which could be used to provide emergency messages to the community
Comments	This project was adapted from 2016-3 (GEO 2/HML 1/TDR 1 from 2004) included as part of the 2017 LHMP. This is a high priority as there have been several threats to the community identified in this plan which would benefit from the warning system. The threats to the community identified and that would be of benefit from the acquisition of this type of system could be categorized as "Low Occurrence, High Consequence". A potential funding source has been identified which makes it very viable.

2022-4. Prepare Drainage Study and Master Plan

Prepare a Drainage Study and Master Plan for the City that would identify drainage strengths and weaknesses in the City and surrounding areas. The study would show potential vulnerabilities and potential mitigation measures. Preparation of a Drainage Master Plan would identify existing facilities and potential upgrades and provide the Planning Commission and the City Council with usable guidelines on drainage before granting new project approval. A Drainage Master Plan would also identify potential drainage vulnerabilities and suggest mitigation measures.

Mitigation Priority and Performance	
Priority	Low
Hazards Mitigated	Earthquake, Dam/Levee Failure, Flood
Estimated Timeline	2027
Estimated Cost/Funding Source	$TBD/ General Fund, FEMA Hazard/Pre-Disaster Mitigation Grant, CREF, Recreational, Duneship trails to the beach, County Levee, and bike path funding.
Responsible Agency/Department	City Engineer, Public Works, County Flood Control, and Flood Consultant.
Cost-Benefit Consideration	Cost Beneficial – This strategy can be cost-beneficial. Extreme flooding and erosion can cause huge losses and create safety hazards for residents and transient visitors. Preparation of a Drainage Study and Master Plan would identify potential vulnerabilities and subsequently implement mitigation measures that can be expected to produce benefits significantly higher than

Mitigation Priority and Performance	
	the cost of a Drainage Study. Erosion of levee which serves as a future bike path. Erosion of floodplain leading to dunes which serve as a future trail to the beach. Wetlands preservation and development of recreational walkways, riding trails, and educational nature continuum to dunes, beach, and levee.
Comments	This project was adapted from 2016-4 (FLD 1 from 2004) included as part of the 2017 LHMP. This is a low priority as there is no funding available for this planning process, and even less funding available to implement the results of the planning process. We will continue to monitor the marketplace for funding, and once identified, we will pursue the funding.

2022-5. Earthquake retrofit program for Unreinforced Masonry Buildings

Follow up on all URM buildings to ensure they meet the December 31, 2012 retrofit deadline. Notify URM building owners and tenants that after the deadline, all URM buildings that are not in compliance will have to be vacated and will be posted and research legal authorities.

Mitigation Priority and Performance	
Priority	High
Hazards Mitigated	Earthquake
Estimated Timeline	2022
Estimated Cost/Funding Source	$TBD/ Follow up work will be financed by City General Fund using existing Staff. Funding for URM building retrofits after December 31, 2010, will be from private sources acquired by the building owners.
Responsible Agency/Department	Fire Department and Building Department with support from Planning Department, Engineering Department, Police Department, Public Works Department, City Administrator, City Council, Contract City Attorney, unreinforced masonry building owners, and local business merchants.
Cost-Benefit Consideration	Highly Cost Beneficial: The City committed approximately $3 million in Redevelopment Agency funds in the form of grants to assist URM building owners with seismic retrofitting of their buildings. The State of California has established a deadline of December 31, 2012, for completion of the seismic retrofitting of URM buildings. The City has an obligation to its residents and visitors to ensure that those URM buildings that are not retrofitted are posted "Unsafe to Occupy" and their continued use prohibited both for their safety and to comply with State Law. Follow up through legal actions as appropriate using the services of the Contract City Attorney may also be necessary
Comments	This project was adapted from 2016-5 (GEO 3 from 2004) included as part of the 2017 LHMP. This is a high priority as the entire downtown core of the City consists of URM buildings. While the City Redevelopment Agency has provided grant funding to assist the property owners in getting the retrofitting completed, the need to ensure the retrofitting of the URM buildings is brought to closure is vital to the economic survival of our community.

2022-6. Mitigation of Repetitive Flooding of the 800-900 blocks of Pioneer Street and the LeRoy Park area, and protection of the northwest portion of the City from flooding

Working with federal, state, and local officials, along with the private property owners of the affected areas, develop and implement a plan to extend the Santa Maria River Levee west from the Highway 1 bridge (where it currently terminates) to at least the western city limits. As an alternative, continue the extension of the levee to include the Guadalupe Dunes County Park to protect access to the beach.

Develop alternatives to the construction of the levee extension as a temporary alternative until the levee extension project can be accomplished.

Mitigation Priority and Performance	
Priority	High
Hazards Mitigated	Flood, Dam/Levee Failure
Estimated Timeline	2027
Estimated Cost/Funding Source	$TBD/ There are no specific funding sources identified that are available at this time. Potential sources for funding could include, Federal Grants, FEMA Disaster Mitigation Funds, FEMA Hazard/Pre-Disaster Mitigation Grant, State Grants and Disaster Mitigation Funds, County Disaster Mitigation Funds, Private Grants, and other federal funding allocations.
Responsible Agency/Department	City Administrator, with support from federal, state, and local entities
Cost-Benefit Consideration	Highly Cost Beneficial: The City has incurred several disaster declarations due to flooding from the Santa Maria River and the lack of a protective levee structure along the City's northern border, west of Highway 1. The City's wastewater treatment plant is very vulnerable to inundation from the river flow, and damage to that facility would be catastrophic to the community. In addition, the recent storm damage to the access road to the Guadalupe Dunes County Park has virtually eliminated vehicle access to the parking area for the park and has significantly reduced the number of visitors to the beach, as they must now walk nearly one mile from the temporary parking area to the beach. This reduction in visitors has adversely affected the City's tourism revenues (sales tax) associated with patronization of the local stores and restaurants.
Comments	This project was adapted from 2016-6 included as part of the 2017 LHMP. This is a high priority as the City has experienced repeated losses in the 800 block of Pioneer Street due to flooding from storms. This area is in desperate need of both immediate (temporary) and permanent (long-term) solutions to the flooding problems. The ideal solution would be the extension of the Santa Maria River Levee west from its current terminus at the Highway 1 bridge, to the western City limits. However, that process will be very protracted and expensive as there are numerous federal, state, and local entities that must be involved and approve the project. Even a short-term solution such as a pilot channel in the river to move the flow of the river to the north side of the riverbed requires extensive review and permitting from numerous federal, state, and local entities. In addition to the onerous permitting process, any solution, temporary or permanent is going to involve tens of millions, if not hundreds of millions of dollars to bring to fruition. That funding is not currently available, and in this current economy, it is unlikely to become available any time soon

8.0 PLAN MAINTENANCE

8.1 MONITORING, EVALUATING, AND UPDATING THE PLAN

Since the last LHMP in 2017, the LPT has monitored, evaluated, and updated the plan on a continuing and as-needed basis. The City was successful in implementing the 2017 mitigation actions as noted in Table 7-1. The remaining mitigation actions outlined in the 2017 LHMP are ongoing at the time of this 2022 update.

The City of Guadalupe will be responsible for ensuring that this annex is monitored on an ongoing basis. The City will continue to participate in the countywide MAC and attend the annual meeting organized by the County Office of Emergency Management 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 City's LHMP will be forwarded to the County Office of Emergency Management for inclusion in further updates to the MJHMP.

Major disasters affecting the City of Guadalupe's community, legal changes, notices from Santa Barbara County (lead agency for the County-wide Plan), and other significant events may trigger revisions to this plan or convening of the LPT. The City of Guadalupe LPT, in collaboration with the Santa Barbara County Office of Emergency Management, 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 City is committed to revising the plan at a minimum of every five years. The City's Director of Public Safety or the City'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 City 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., General Plan, building codes, floodplain management ordinance). The General Plan and the LHMP annex are complementary documents that work together to achieve the goal of reducing risk exposure to the City's citizens. An update to a general plan 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 City incorporates the LHMP by reference into its General Plan Safety Element. Under AB 2140, the City may adopt its current, FEMA-approved LHMP into the Safety Element of the General Plan. This adoption makes the City eligible to be considered for part or all of its local-share costs on eligible Public Assistance funding to be provided by the state through the California Disaster Assistance Act (CDAA) (see Section 2.0, *Plan Purpose and Authority* for the adopting resolutions). The LHMP has also been prepared to support the City's effort to prepare a master drainage plan and evacuation plan. The Floodplain Management Ordinance applies in concert with the City's zoning ordinance and building codes to reduce flooding hazards from land use. The LHMP also includes several mitigations addressing earthquake retrofits to support the City's efforts to reduce groundshaking hazards.

The information contained within this LHMP, including results from the Vulnerability Assessment and the Mitigation Strategy, is used by the City to help inform updates and the development of local plans, programs, and policies. The City may utilize the hazard information when developing and implementing the City's capital improvement programs and the Planning and Building Divisions may utilize the hazard information when reviewing a site plan or other type of development applications.

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 City 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 City 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 Michael Cash, Chief of Police & Director of Public Safety using the following information:

Michael Cash, Chief of Police & Director of Public Safety
City of Guadalupe
918 Obispo Street
Guadalupe, CA 93434
mcash@ci.guadalupe.ca.us
(805) 219-9444

9.0 REFERENCES

The City of Guadalupe General Plan, available at City Hall

City of Lompoc
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 City of Lompoc (City) 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 City.

The LHMP was last comprehensively updated in 2017 as an annex to the 2017 MJHMP. Since 2017, the City has:

- Incorporated the LHMP goals, objectives, and mitigation actions into its local plans and processes, including the General Plan Safety Element by reference and specific hazard planning efforts (e.g., Stormwater Management Plan).
- Used the LHMP's assessment of capabilities, hazards, and vulnerabilities to inform planning, capital improvements, programs, decision-makers, and the public.
- Implemented mitigation actions through the City's general plan, capital improvement program, maintenance programs, grant programming, community outreach, and budget process.
- Reviewed and evaluated mitigation actions before and after disasters, including the Canyon Fire and the multi-year drought.

This 2022 update of the LHMP builds on and refines the MJHMP's assessment of hazards and vulnerabilities countywide to develop a mitigation plan for the City. The City participated in the 2022 MJHMP Mitigation Advisory Committee (MAC) and Local Planning Team (LPT), reviewed all portions of the MJHMP pertaining to the City, 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, *Planning Process* below). The City is a participating agency in the County's MJHMP update.

The City'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 City. Vulnerability assessments summarize the identified hazards' impact on the City. 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 in 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 City's 2022 LHMP.

[INSERT CITY RESOLUTION(S) ADOPTING PLAN UPDATE]

[INSERT CITY 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 City'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 Mitigation Advisory Committee (MAC) and the second is the Local Planning Team (LPT).

All eight incorporated cities and the six special districts joined the County as participating agencies in the preparation of the MJHMP update, including the 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 Santa Maria Valley Water Conservation District (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 City participated as a MAC member to prepare this LHMP as an annex to the 2022 MJHMP. The City was represented by Steve Terrones, Battalion Chief, 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	**MAC Meeting #1 (virtual)** 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	**MAC Meeting #2 (virtual)** 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	**MAC Meeting #3 (virtual)** 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	**MAC Meeting #4 (virtual)** 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	**MAC Meeting #5 (virtual)** Presented draft plan Discussed key MAC/LPT review needs and key issues Discussed annex updates to dovetail with plan update
March 2022	**MAC Meeting #6 (virtual)** Review and discuss public comments received on the draft plan Recommend a revised draft plan to decision-makers Review annex updates for review and approval

3.3 LOCAL PLANNING TEAM (LPT)

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

Table 3-2. City of Lompoc Local Planning Team 2022

Department	Name	Title
Fire Department	Brian Fallon	Fire Chief
Administration	Dean Albro	City Manager
Administration	Erin Keller	Senior Administrative Analyst
Police Department	Kevin Martin	Chief of Police
Fire Department	Scott Nunez and Cody Lee	Battalion Chiefs
Water	Jose Valdez	Water Distribution Supervisor

The Lompoc LPT members worked directly with the Santa Barbara 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 City 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

Meeting Dates	Summary of Activity
	Met with County OEM and consultant staff (12/15/22) to discuss LHMP priorities and mitigation approaches.
January and March 2022	Reviewed new maps and local vulnerabilities. Provided input on the status of 2017 LHMP mitigation strategies. Reviewed draft mitigation strategies and provide feedback. Reviewed and finalized 2022 LHMP

3.4 PUBLIC OUTREACH AND ENGAGEMENT

As a participating agency in the 2022 MJHMP update, the City 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 City'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.

Emergency preparedness information is also regularly distributed to the residents and businesses via the City's website.

In May 2022, the LHMP was completed and made available for public review, concurrent with review by FEMA and CalOES. In addition, the opportunity for the community to be heard was permitted during the City Council meeting before the adoption of this plan.

The City utilizes several platforms to educate the public about hazards in the community, relevant programs to safeguard and protect themselves from disaster, and actions they can take to prepare themselves for events. The relevant programs are also identified in Section 4.7. Below is a list of the different platforms used and a summary of some of the programs:

- Ready SBC
- Disaster Preparedness
- Emergency Management
- Wildfire Action Plans
- Ready-Set-Go
- Disaster Preparedness for Pets

- Earthquake
- Smoke Alarm Facts
- Hot Weather Safety
- LISTOS
- Social Media
- Public Events
- Public Service Announcements (Radio and Television
- Drought Education
- Flood emergency awareness
- C.E.R.T. Program
- Aware & Prepare

4.0 CAPABILITY ASSESSMENT

The City LPT identified current capabilities and mechanisms available for implementing hazard mitigation activities. This section presents a discussion of the roles of key departments, administrative and technical capacity, fiscal resources, and summaries of relevant planning mechanisms, codes, and ordinances.

4.1 COMMUNITY PROFILE AND DEMOGRAPHICS

Physical Features

Lompoc is part of California's Central Coast. Rolling hills surround the Valley on the north, south, and east. The Valley is open at its western end to the Pacific Ocean on the undeveloped Gaviota Coast. The Pacific Ocean is 8 miles from downtown Lompoc. The Santa Ynez River runs east to west through the Valley while Burton Mesa, a chaparral forest with sandy soil, lies to the north. The hills to the south are mined for diatomaceous (fossil) earth.

Lompoc is 98 feet above mean sea level and has a mild climate. A northwest breeze is common (average hourly wind speed: (6.1 m.p.h.). There is moderate rainfall, daily fog, and no snow.

Lompoc is located in the mid-western portion of the county, adjacent to Vandenberg Space Force Base (VSFB), and is separated from the rest of the county by the Purisima, Santa Rita, Santa Rosa, and White hills. The Santa Ynez River also traverses the Lompoc Valley in a westerly direction and eventually drains into the Pacific Ocean. This area includes the City of Lompoc and the communities of Vandenberg Village and Mission Hills. Vandenberg Village is located in the Lompoc Valley at the westerly end of the Santa Ynez River Basin and is bordered by VSFB to the west and the City of Lompoc to the south. Vandenberg Village has a population of approximately 6,988 (2019) and is 5.2 square miles. The low to the medium-density residential core is surrounded primarily by agriculture and open space.

History Snapshot

The first settlers in the Lompoc Valley were the Chumash Indians. The Chumash and their predecessors lived in the Lompoc Valley for nearly 10,000 years before European contact. The establishment of La Purisima Mission in 1787 marked the earliest European settlement in the Lompoc Valley. The original mission, located at what is now the foot of F Street in downtown Lompoc, was destroyed by an earthquake in 1812. Remnants of the mission can be seen at this site which has been preserved as a State Historical Landmark. The mission was rebuilt over several years beginning in 1813 at its current location on the north side of the Valley. The Mission, the most authentically restored in the mission system, is now a State Park.

The Lompoc Land Company was formed and incorporated in August of 1874 to purchase almost 43,000 acres to establish a temperance colony. The City of Lompoc was incorporated on August 13, 1888. Several wharves were constructed during this period serving as shipping points for incoming supplies and outgoing agricultural produce until the turn of the century when the railroad replaced shipping as the primary means of commercial transportation.

The completion of the coastal railroad between San Francisco and Los Angeles in 1901, and the subsequent extension of a spur into Lompoc, provided the impetus for growth in the Valley. Fields were cleared and leveled for agricultural production of specialized crops including flower seeds. The flower seed industry so dominated agricultural production that the area was dubbed the "Valley of Flowers." The Johns-Manville Corporation and others began the mining of diatomaceous earth in the southern hills. The mining industry continues to be a major employer.

In 1941, Camp Cooke was established as an Army training base which was renamed Vandenberg Air Force Base in 1958; the base is currently named Vandenberg Space Force Base (VSFB). VSFB was the first missile base of the United States Air Force. The Space Shuttle program was slated to begin launches in the late 1980s. However, when the Challenger exploded during take-off in 1986, the West Coast Shuttle Program was terminated, leaving Lompoc in a severe recession.

The Lompoc Valley responded to the Shuttle disaster by focusing on tourism as a means of fighting its way through the recession. By focusing on the natural beauty of the Valley, its flower industry, the pristine Central Coast, and by developing a successful downtown mural program, the City has built an excellent tourism industry that is to this day a primary component of the Lompoc economy. Today, the City is dubbed "The City of Arts and Flowers."

Economy and Employment

Lompoc Valley enjoys a healthy and diversified economy. Home to VSFB, which contributes $1.7 billion to the regional economy and is the largest employer in Lompoc and is the powerhouse driving the county's economy. A study from 2004 evaluated the impact of VSFB in terms of population, output, jobs, labor income, and taxes generated using data from fiscal year 2004. The report accounted for both direct impacts created by the base and additional impacts that occurred concerning base activity with a multiplier effect of 1.92, which means every dollar spent by VSFB generates another 92 cents in business.

Located on nearly 100,000 acres outside of Lompoc, VSFB's impact is stable due to its role as a classified military installation for rocket and missile launches. As of 2019, VSFB had 5,441 residents and supports over 18,000 military members, family members, contractors, and civilian employees.

Allan Hancock College fire, police, and emergency services training academies are located in Lompoc. The $46 million Public Safety Training Center project includes a City donation of 39 acres of land adjacent to the college for a total of almost 100 acres that will be dedicated to the academies, a high-speed driving course, and further expansion. It should be noted Allan Hancock College is the alternate seat of government and alternate EOC for the City in the event City Hall and the EOC are unable to be used.

Major employers in Lompoc Valley include:

- VSFB
- Lompoc Unified School District
- Lockheed Martin Corporation
- U.S. Department of Justice (Lompoc Federal Correctional Complex)
- City of Lompoc
- Lompoc Valley Medical Center
- Boeing
- World Minerals
- Retail operators: Wal-Mart, Home Depot, etc.
- Entrepreneurs, especially boutique winemakers

Lompoc Valley's agricultural roots have shifted to value-added products such as flower seed research and development, and wine production. Over the past decade, Lompoc's affectionately termed "Wine Ghetto" has become a production center for some of the finest wines in the country. In less than five years, the number of Lompoc's premium artisanal wines grew from five to 30 labels. There are now 34 labels produced in 15 wineries across town. Local winemaker camaraderie continues to spawn innovation and de facto winery incubators continue to launch new wine labels.

As Lompoc's boutique wineries grow, they move into larger facilities and hire more employees. A few years ago, Brewer-Clifton moved into a new 12,000 square-foot production facility. Loring Winery and Pali Winery constructed a 30,000 square-foot wine facility for processing, operational offices, case good storage, barrel rooms, and fermentation rooms. More recently, Flying Goat Cellars purchased a 3,600 square-foot industrial condo for wine production at JM Development's new industrial condos on West Laurel. Several other wine facilities in the works will create more growth opportunities with more available production space.

Other targeted industries for the city include the Internet, entertainment technology, and multimedia. Citywide broadband service has positioned Lompoc to develop as a media and communications center with at least three competitors offering service. The city seeks to attract production talent, digital production companies, and pre-and post-production operations.

On the local level, Allan Hancock College Film & Video Production Program, with a 30+ year history, and the City's state-of-the-art TAP TV media studio provides training grounds for an emerging technology workforce. City sponsorship of the Santa Barbara International Film Festival also enhances student opportunities through the festival screenwriting and filmmaking contests and field trips to the movies. The City partners with the Santa Barbara County Film Commission to promote the area for film locations. The production of commercials and films such as "Sideways"

contributes to the community's economic vitality. Film location managers increasingly take an interest in business-friendly Lompoc and the surrounding area. Most recently, "There Will Be Blood" and "Grindhouse" were filmed on Jalama Road and used Lompoc facilities.

On the manufacturing side, Goleta-based Far West Technology recently expanded into Lompoc and created six new full-time jobs for the packaging of dosimetry products. Raytheon Vision Systems opened a manufacturing division in Lompoc rather than expand its Goleta headquarters. The 55,600 square foot facility in Lompoc employs 30 workers who develop and manufacture infrared sensors for scientific, commercial, and government applications. Expansion of the Raytheon facility in Lompoc is now underway.

In 2013, DenMat, a leading manufacturer of high-quality dental products, moved its world headquarters from Santa Maria into an 81,000 square-foot building near the Lompoc airport. A privately held company, DenMat supplies dental products and equipment to dental professionals across the nation and in more than 60 countries around the world. They also offer a full-service Dental Laboratory featuring the popular Lumineers and Snap-On Smile brands. As an accredited continuing education provider, DenMat offers educational courses for dentists and their staff in locations nationwide. DenMat has a workforce of 400 employees.

Lompoc is seeing significant growth in cannabis-related development, including retail, delivery, cultivation, manufacturing, processing, distribution, and testing. Some of the manufacturing businesses utilize volatile solvents.

The recent housing boom attracted many young professionals from Los Angeles and Santa Barbara. Non-residential investment is now paving the way for job opportunities with industrial, commercial, and public infrastructure growth. Lompoc's comparative advantage in housing prices, information technology, and overall quality of life will continue to attract a young, edgy technology workforce. Additionally, the city continues to develop a wide spectrum of workforce training opportunities in the valley.

Population & Growth

According to 2019 U.S. Census Bureau data, the City is home to 44,188 residents. This population is projected to grow to 50,720 residents by 2050 (SBCAG 2018). The average household size in the City is 2.91 and the median household income is $53,309. Approximately 56.3 percent of City of Lompoc residents identify as Hispanic, 31.6 percent identify as White, and 12.1 percent identify as Asian, Black, Mixed, or Other(US Census Bureau 2019).

Development and Redevelopment are occurring at a fast pace throughout Lompoc. Annexation of unincorporated territory into the city limits occurs on occasion, usually when a property owner wishes to develop land in a manner that requires urban services. Current development and expansion areas include:

- Eastern Boundary River Terrace – wildland interface
- Western Boundary Bailey Avenue Specific Plan Area – potential for agricultural drift and residual soil contamination
- Northern Boundary Burton Ranch – wildland interface

As described further in Section 4.8, *Relevant Plans, Policies, and Ordinances*, urban growth in Lompoc is restricted by the Sphere of Influence and Urban Limit Line, which delineates the City's future boundaries and service area. To ensure that residents of Lompoc have access to basic needs, the City will only allow development in areas where adequate public facilities and services, such as water, utilities, and fire/police protection, are available at the time of development. This approach to population growth ensures that the City's hazard mitigation capabilities serve both existing and future residents.

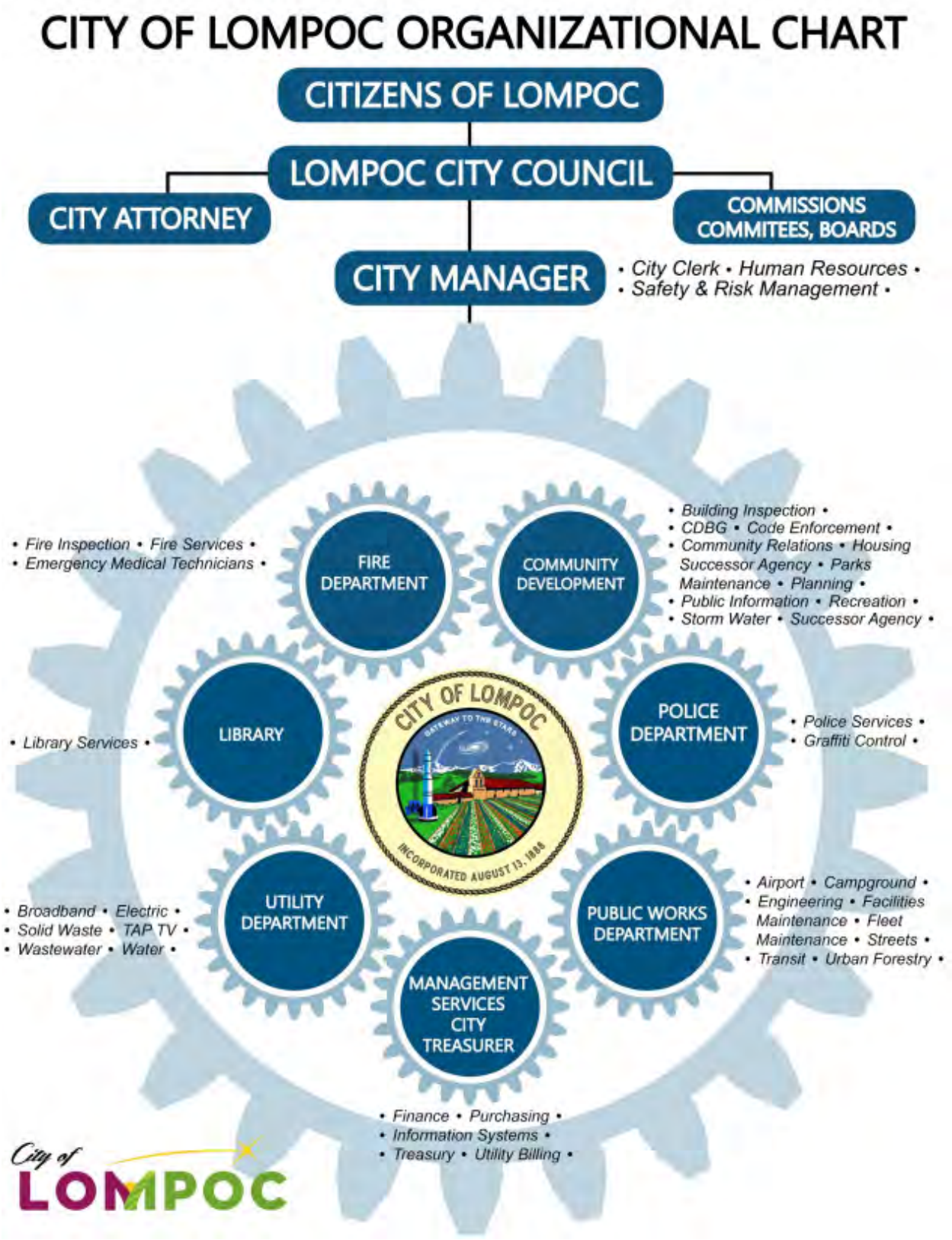
Infrastructure

The infrastructure of the City of Lompoc supports the industries and the residents of the City. The Public Works Department maintains major roads and local streets. City's Airport is a General Aviation airport located within the city limits. Groundwater is the primary source of potable water for City residents. The City has experienced excessive drought conditions over the last 5 years and is severely taxing its water resources. The City distributes electricity to the citizen and industries in the City.

4.2 KEY DEPARTMENTS

The City utilizes the Council-Manager form of local governance, which includes an elected Mayor and four Council Members, and an appointed City Manager. The Mayor is elected every two years and the four council members are elected every four years.

The City Council is Lompoc's legislative body, setting policy, approving budgets, and setting tax rates. Council Members also hire the City Manager, who is responsible for the day-to-day administration of the City and serves as the Council's chief advisor. The City Manager prepares a recommended budget, recruits and hires most of the City's staff, and carries out the council's policies. While the City Manager may recommend policy decisions, he is ultimately bound by the actions of the Council. The Council Members also appoint the City Attorney. The City's organizational chart is provided below:


CITY OF LOMPOC ORGANIZATIONAL CHART
CITIZENS OF LOMPOC
LOMPOC CITY COUNCIL
CITY ATTORNEY
COMMISSIONS COMMITEES, BOARDS
CITY MANAGER
• City Clerk • Human Resources •
• Safety & Risk Management •
• Fire Inspection • Fire Services •
• Emergency Medical Technicians •
FIRE DEPARTMENT
COMMUNITY DEVELOPMENT
• Building Inspection •
• CDBG • Code Enforcement •
• Community Relations • Housing Successor Agency • Parks Maintenance • Planning •
• Public Information • Recreation •
• Storm Water • Successor Agency •
• Library Services •
LIBRARY
CITY OF LOMPOC
POLICE DEPARTMENT
• Police Services •
• Graffiti Control •
UTILITY DEPARTMENT
• Broadband • Electric •
• Solid Waste • TAP TV •
• Wastewater • Water •
PUBLIC WORKS DEPARTMENT
• Airport • Campground •
• Engineering • Facilities Maintenance • Fleet Maintenance • Streets •
• Transit • Urban Forestry •
MANAGEMENT SERVICES CITY TREASURER
• Finance • Purchasing •
• Information Systems •
• Treasury • Utility Billing •
City of LOMPOC

The following is a summary of the City's departments and their responsibilities related to hazard mitigation planning and implementation. Many of the programs and plans of these departments have a direct relationship to loss reduction, community resiliency, and hazard mitigation.

4.2.1 Fire Department

Mission Statement: The Lompoc Fire Department is dedicated to professionalism and a commitment to excellence, providing the citizens of Lompoc with the highest level of service possible, safeguarding life, property, and the environment.

Vision Statement: Our Team is a dynamic, innovative response force comprised of members who value and respect one another and the people we serve in the Lompoc Valley. Our vision is to improve the lives of our citizens through a legacy of skilled, compassionate, and resourceful public service.

Core Values:

- TEAMWORK: Applying the strengths of our team members collectively to achieving organizational goals and objectives.
- FAMILY: Considering our citizens and each other as family members.
- CUSTOMER FOCUS: Developing and delivering services based on our citizens' needs.
- RESPECT: Treating our citizens and each other with honor and decency.
- PROFESSIONALISM: Performing every task with excellence and skill.
- HUMILITY: Performing our jobs with pride and a sense of gratitude for the opportunity we have to serve.

FIRE, EMS, Building, and other Services coordinated and or provided by the Fire Department

- Administers automatic aid agreements, mutual aid agreements, and contracts.
- Life Safety Division: oversees the Building and Safety Services and Prevention, Community Risk Reduction sections, coordinates adoption of codes and ordinances, review site and building plans to confirm compliance with fire, building, and other related codes, develop and present public education programs and manage the City's weed abatement program.
- The Training Division's mission is to ensure that all department personnel maintain all knowledge, skills, and abilities essential to fulfilling our duty to the community. Per our Training and Succession Plans, the department funds attendance to training classes, seminars, conferences, and other avenues that meet or exceed training mandates, continuing education requirements, in-service skill competency, and that provide opportunities to develop new, innovative skill sets needed to meet our evolving service demands. Personnel is encouraged to engage in training that enhances their capabilities, prepares them for promotion, and which ensures that every service we provide is carried out with skill and excellence.
- Emergency Medical Services: Manage the department's EMT program, respond to medical emergencies and other calls for service, and participate with other community and regional health care providers to reduce public illness and injury.

- Operations Division: Maintain the department's personnel, apparatus, equipment, and fire stations in a state of readiness to respond to the community's needs, develop and implement standard operating procedures for various types of emergency responses, respond to all types of emergencies, and train and interact with neighboring jurisdictions and regional agencies.
- Emergency Management: Coordinate the City's Disaster Preparedness Program, liaison with all City departments and divisions, as well as other public and private organizations, develop, coordinate and implement hazard-specific response plans, and maintain the operational readiness of the City's Emergency Management Team, the Emergency Operations Center, and other key elements.

City Of Lompoc Emergency Operations Center

The purpose of the Emergency Operations Center - EOC is to provide a facility from which the City's response to an emergency can be effectively coordinated. The primary role of the EOC is to bring together all relevant information about the emergency to one location, organize that information in a useful format for the City's decision-making body, and facilitate the coordination of resources needed to mitigate the effects of the emergency. Concisely, the EOC processes emergency resources, policy, and priority setting. The EOC, however, doesn't provide tactical direction to the various field incident commands.

The City's EOC manages and provides mitigation planning for large-scale emergencies or disasters. It is organized into two distinct functional areas: 1) EOC Management Staff, who are comprised of the City Manager or designee, Public Information Officer, Legal Officer, and the Policy Decision Group; and 2) EOC General Staff, headed by the EOC Director and includes the Operations Section, Plans/Intelligence, Logistics, and Finance Section. The document discusses extensively the role of each staff member, describing how collaboration and coordination would occur, as well as the expected duties and procedures required during the event of an emergency. The EOC's hierarchy is also delineated in this section.

The City Manager, Director of Emergency Services, serves as EOC Director with the responsibility detailed in Lompoc City Code Section 1306. In contrast, City Management is responsible for the overall emergency policies and coordination through the joint efforts of governmental agencies and private organizations. Under the direction of the EOC Director, General Staff is responsible for the call-out and release of emergency response personnel and providing for appropriate shift coverage during emergency conditions. EOC management is responsible for setting overall objectives and the City's priorities. An EOC management priority is the development and implementation of an EOC Action Plan for each operational period.

At the start of an incident, each position (grouped in sections shown below) is handled by the first arriving director; as key personnel arrive, they are assigned EOC positions according to the Operations manual.

The *Operations Section Coordinator* (General Staff) is responsible for the receipt and coordination of information and requests related to the City's response to an incident. The Operations Coordinator reviews and makes changes to the Incident Action Plan as necessary and reports such changes to the EOC Director. Furthermore, he or she is assigned to primary response-oriented functions, such as Law enforcement, Fire Department, Utilities Director, Public Works Director, etc.

The *Planning/Intelligence Section* is responsible for the collection, evaluation, dissemination, and use of information regarding the incident, and the preparation and documentation of EOC Action Plans. This section also conducts planning meetings and summarizes the written incident action plan for incidents requiring extended operations. Intelligence collection and Resources Status are examples of the kinds of units, which may be formed within this section.

The *Logistics Section* is responsible for ensuring the logistical needs of the disaster are met. This section provides service and support, supplies, equipment, and medical support to the incident assigned personnel, and deals with transportation requirements of the incident. In addition, Logistics registers and coordinates the use of volunteers during an incident and receives and manages donations/services of individuals, private sector organizations, and others not included in the formal response structure.

The *Finance/Administration Section* is responsible for monitoring costs, procurements, contracts, and other financial considerations. Logistics is required to maintain records on personnel and equipment time, provide payments to vendors, and provide other support to incident personnel.

Following an incident, it may be necessary to convene a Multi-agency or Interagency Coordination Group as designated by County Resolution 97-346, to develop consensus on priorities, resource allocation, and response strategies. It will be responsible for interagency coordination, including 1) establishing overall priorities, 2) allocating scarce resources, 3) developing strategies for handling Multi-Agency and Multi-Jurisdictional response problems, 4) sharing information, and 5) facilitating communications.

In summary through the establishment of the Emergency Operations Center, the City expects to have a coordinated plan that details the procedures, duties, and hierarchy in response to an extraordinary hazardous event. As a result, they aim to reduce losses of life and property, as well as promote the resiliency and recovery efforts needed to minimize the threat of any [hazardous] incident in the area.

Volunteer Organizations: American Red Cross, Amateur Radio Emergency Services (ARES), Equine Evacuation, CERT, LISTOS, Voluntary Organizations Active in Disasters (VOAD), and area Faith-Based Organizations.

The Fire Department has a very robust Public Education and Emergency Preparedness program. The Fire Department web page provides the following information for the public:

- Ready SBC
- Disaster Preparedness on our website
- Emergency Management
- Wildfire Action Plans
- Ready-Set-Go
- Disaster Preparedness for Pets on our website
- Earthquake
- Smoke Alarm Facts
- Hot Weather Safety
- LISTOS

- Social Media
- Public Events
- Public Service Announcements (Radio and Television)
- Drought Education
- Flood emergency awareness
- C.E.R.T Program
- Aware & Prepare
- All others are not on the FD site

The City's Fire Department is responsible for Emergency Preparedness and Emergency Management and will use this LHMP in conjunction with the Comprehensive Emergency Management Plan (CEMP) to implement strategies, projects, and policies which lead to a more resilient and safer City.

4.2.2 Police Department

- Responds to safety concerns involving threats and/or damage to life or property. Acts as the enforcement entity for violations of State and local laws and ordinances.
- Primary emergency responders to acts of civil disobedience and public disorders. Support personnel for emergency rescue and management.
- Investigative services for criminal acts that result in personal injury/death and the destruction of property.
- Develops and implements emergency response plans and policies, focusing on evacuation procedures and traffic control.
- Primary responders to acts of terrorism, focusing on suspect intervention and facility and staff protection.
- Provides public safety communications center for both police and fire.
- Provides EOC facility.

4.2.3 Economic Development/Planning Division

- Develop and maintain City's general plan, zoning ordinances, and development standards.
- Oversight of City development process assuring compliance with zoning and General Plan, including environmental impact reports, design review, historic preservation, landscape review, habitat conservation, floodway prohibitions, and floodplain development standards.

The Planning and Economic Development Department plays an instrumental role in the Mitigation Advisory Committee ensuring this Local Hazard Mitigation Plan is consistent with other long-term and comprehensive planning efforts throughout the County. The Planning and Economic Development Department identifies development policies already in place which help reduce future damage to structures from natural hazards and would play a crucial role in creating new development policies as necessary to implement the identified mitigation strategies.

Economic Development/Planning wants to ensure the development it promotes is safely constructed and well-sited relative to the risk of the identified natural hazards.

4.2.4 Public Works Department

The Public Works Department and its various divisions are responsible for the construction/physical aspects of implementing structural mitigation projects throughout the City. Mitigation measures minimize the damage to the infrastructure in the event of a natural or man-made disaster. The Public Works Department comprises divisions performing functions that are directly related to hazard mitigation. The Public Works Department is organized into the following divisions: Aviation, Engineering, Facilities Maintenance, Fleet Maintenance, Park Maintenance, Streets, Transit, Urban Forestry, and Campground.

- Maintains certain City infrastructure and facilities (assets) including general aviation airport, streets, buildings, parks, and vehicle fleet but excluding city utility infrastructure and treatment plants. City utility infrastructure and treatment plants are maintained by the Utility Department.
- Responds to City emergencies, including EOC response in disasters. Assists Solid Waste, Police, and Fire Departments with hazardous materials response. Implements traffic and perimeter control efforts through the street department. Deploys heavy equipment assets for debris removal. Provides buses and drivers during evacuations

Engineering

- City Division is organized under the Public Works Department.
- Reviews design and construction for all City facilities within the public right of way including public grading, floodways, retention basins, storm drains, sewer line, water lines, streets, and bridges to assure compliance with Federal, State, and local ordinances on seismic and structural stability.
- Develops engineering ordinances and policies that help protect and preserve City infrastructure.
- Develops and implements mitigation strategies to avoid further damage to critical facilities or to reduce/avoid damage during future hazard events.
- Evaluates all circulation elements for projected traffic impacts to determine needed street infrastructure improvements.
- Provides response personnel for evaluation of damaged infrastructure
- Responds as part of the City's EOC Team.
- Coordinates other response agencies assisting with damage assessment.

Aviation

- Maintains the Airport in a state of readiness in the event the Airport is required to receive materials and supplies to mitigate the disaster.
- Develops strategies for use of the Airport for evacuation if required

Public Transit

- Ensures Public Transit Fleet is available for evacuation if needed during a disaster.

Streets

- Maintains streets to ensure they are open and passable to citizens during and in the aftermath of a disaster.

Fleet Maintenance

- Maintains and ensures the Fleet of city vehicles and equipment is operational in the event of a need during and after a disaster.

Facilities Maintenance

- Maintains all city facilities should they be required for evacuation or other purposes during and after a disaster.

Parks Maintenance

- Maintain Parks for the use of a gathering and potential living space for residents in the event of a disaster.

Urban Forestry

- Forestry maintenance in the city to minimize damage in the event of a disaster.

Campground

- Ensures campgrounds are maintained to receive evacuees in the event of a disaster.

4.2.5 Utilities Department

- Maintains City's Water, Wastewater, and Electrical supply and distribution.
- Responds as part of the City's EOC Team.

4.3 ADMINISTRATIVE AND TECHNICAL CAPACITY

The administrative and technical capabilities of the City, as shown in Table 4-1, include staff, personnel, and department resources available to implement the actions identified in Section 7.0, *Mitigation Strategy* of this LHMP. 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, floodplain managers, surveyors, personnel with GIS skills and scientists familiar with hazards in the community. Equipment and supplies are maintained by the Public Works Director.

Table 4-1. City of Lompoc Administrative and Technical Capacity

Personnel Resources	Yes/No	Department/Position
Planner/engineer with knowledge of land development/land management practices	Yes	Planning Manager Principal Planner Senior Environmental Coordinator
Engineer/professional trained in construction practices related to buildings and/or infrastructure	Yes	
Planner/engineer/scientist with an understanding of natural hazards	Yes	Senior Environmental Coordinator
Personnel skilled in GIS	Yes	
Full-time building official	Yes	
Floodplain manager	Yes	
Emergency manager	Yes	
Grant writer		
Other personnel		
GIS Data Resources (Hazard areas, critical facilities, land use, building footprints, etc.)	Yes	
Warning Systems/Services (Reverse 9-11, cable override, outdoor warning signals)	Yes	
Other		

4.4 LEGAL AND REGULATORY CAPABILITIES

The legal and regulatory capabilities of the City are shown in Table 4-2, including existing ordinances and codes that affect the physical or built environment of Lompoc. Examples of legal and/or regulatory capabilities can include the City's 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. City of Lompoc Legal and Regulatory Capability

Regulatory Tool (ordinances, codes, plans)	Yes/No
General Plan	Yes
Zoning ordinance	Yes
Subdivision ordinance	Yes
Growth management ordinance	No
Floodplain ordinance	Yes
Other special-purpose ordinances (stormwater, steep slope, wildfire)	Yes
Building code	Yes
Fire code	Yes
Fire department ISO rating	Class 3
Erosion or sediment control program	Yes
Stormwater management program	Yes
Site plan review requirements	Yes
Capital improvements plan	Yes
Economic development plan	No, but City has economic development goals and policies
Local emergency operations plan	Yes
Other special plans	
Flood insurance study or other engineering studies for streams	
Elevation certificates (for floodplain development)	

4.5 GIS, COMPUTER AND COMMUNICATION TECHNOLOGY

Lompoc has a comprehensive GIS system maintained by the Information Systems Department. Currently, parcels, zoning, and flood hazards have been mapped, including water, sewer, and storm drain. Hazard layers created for this plan will be incorporated into that system for future planning and updates. The City's GIS system is fully functional and can be used to provide the State of California Office of Emergency Services with preliminary damage assessments.

Through the Lompoc Police Department, the City has a fully functional 911 emergency telephone system, dispatch capabilities, and a reverse 911 system (Installed in April 2005) to issue warnings in advance of disasters.

The City has a website, which will be used to assist with communication necessary for the implementation and future updates of this plan.

4.6 FINANCIAL RESOURCES

The General Fund's fund balance is an important element that can show the City's financial strengths or weaknesses. The City operates under a biennial budget as is the custom for many Central Coast municipalities. The adopted Biennial Budget for FYs 2021-23 General Fund reflects a surplus of $2 million. The projected surplus is vital to restoring the General Fund's depleted unassigned fund balance. As of June 30, 2020, the City's unassigned fund balance was negative $0.2 million. The City Council's adopted General Fund Reserve Policy target is 25% of annual expenditures of approximately $11 million. While the surplus is a positive achievement for Lompoc, the General Fund will require an additional $9 million to follow the City's funding policy and restore the General Fund's Reserve Fund to the target of $11 million. Each budget for the next four budget cycles will attempt to restore full reserves.

Revenues in the General Fund are estimated to increase by $15.6 million or 20.9%, mainly attributed to the passing of the I2020 ballot measure, which added 1% to sales tax, and the continued growth of tax revenues paid by the Cannabis industry. The City's major economic drivers for its revenue base are service charges, sales tax, transient occupancy tax, population growth, employment, construction, property values, and commercial activities.

Lompoc's long-term financial and programmatic policies demonstrate the City's commitment to providing for the protection of the community from unreasonable risks.

Overall, the City has indirectly referenced mitigation and hazard reduction principles throughout many of the City's aforementioned documents, plans, and policies. Integrating more direct language referencing mitigation and hazard reduction will help to reinforce the City's commitment to these principles. The indirect references can also indicate that the responsibility for hazard reduction is shared among numerous departments within the City, making it a challenge to identify a particular department to take the lead in these efforts. To address this potential issue and increase community capabilities globally, continued participation in the MAC is recommended.

Table 4-3 shows specific financial and budgetary tools available to the City such as community development block grants; capital improvements project funding; authority to levy taxes for specific purposes; fees for water, sewer, gas, or electric services; ability to incur debt through general obligations bonds; and withholding spending in hazard-prone areas.

Table 4-3. City of Lompoc Fiscal Capability

Financial Resources	Accessible or Eligible to Use (Yes/No)	Has This Been Used for Mitigation in the Past?	Comments
Community Development Block Grants (CDBG)	Yes		
Capital improvements project funding	Yes		
Authority to levy taxes for specific purposes	Yes		Vote Required
Fees for water and sewer service	Yes		
Incur debt through general obligation bonds	Yes		Vote Required

Financial Resources	Accessible or Eligible to Use (Yes/No)	Has This Been Used for Mitigation in the Past?	Comments
Incur debt through special tax bonds	Yes		Vote Required
Incur debt through private activity bonds	No		
Federal Grant Programs (Hazard Mitigation Grant Program)	Yes		

4.7 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 City can capitalize on its existing educational capacities, even non-hazard related such as school partnerships, 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 City. The City participates in numerous community outreach programs to educate and inform the public prior to an emergency, disaster or hazardous event. The Fire Department educates every third grader within the City annually using the Fire Safety Trailer that incorporates home Escape Plans, Stay Low and Go, and general home fire safety practices. In conjunction with American Red Cross, the Fire Department participated in the "Sound the Alarm" program to install smoke detectors within the underserved communities in the City of Lompoc. Annually with the assistance of the Lompoc Valley School District, the "Every 15 Minutes – Anti-Drunk Driving" campaign is given to high school students prior to graduation and summer vacation. The C.E.R.T. is very successful in training community member to assist City staff in the event of an emergency and this group, along with the Fire Department, actively recruits during weekly Farmer's Markets and the summer Olde Town Market. Both the Water Department and the Electric Department provide conservation and emergency messages in the monthly billing cycles. The City Water Department also provides a "Low Water Use Garden" open to the public to education the community on drought resistant plants.

4.8 RELEVANT PLANS, POLICIES, AND ORDINANCES

The City has a range of guidance documents and plans for each of its departments that help govern the City of Lompoc. These include a General Plan, with a Housing Element, Public Works and Public Utilities Plans, Public Facilities Master Plan, Capital Improvement Plans, Storm Water Management Program, Parks & Recreation Master Plan, Redevelopment Project Guidelines, and Standardized Emergency Management Plan. The City uses building codes, zoning ordinances, subdivision

ordinances, and various planning strategies to address how and where development occurs. One of the essential ways the City guides its future is through policies laid out in the General Plan. The LHMP directly informs these plans and is used to evaluate the need for adjustments or updates to existing plans and programs. The City considers the LHMP's assessment of capabilities, hazards, and vulnerabilities to inform planning, capital improvements, programs, decision-makers, and the public. The City also implements mitigation actions through the City's general plan, capital improvement program, maintenance programs, grant programming, community outreach, and budget process.

The purpose of this section is to present pertinent plans, programs, codes, and policies that support risk education and reduction and/or help to implement mitigation measures. It is important to note that these plans, programs, codes, and policies were not only used to update the LHMP but were also evaluated to determine their effectiveness in risk education and reduction efforts. Additionally, information gleaned through the City's LHMP update process will be used in the plans; programs, codes, and policies update process. The plans, programs, codes, and policies will continue to provide the foundation and in some cases be a vehicle for the implementation of mitigation strategies. Below is a summary of the more significant relevant plans, programs, codes, and policies:

4.8.1 General Plan

The General Plan is a comprehensive statement of goals and policies relating to the development of the community, the management of potential hazards, and the protection of natural and cultural resources within its study area. The General Plan directs Lompoc's future by expressing community desires and by providing the basis for regulations to protect and enhance the community's quality of life for future generations. The summary below will document the portions of Lompoc's General Plan that are applicable to hazard mitigation.

Land Use Element

The Land Use Element of the General Plan establishes Lompoc's vision and fundamental land use philosophy, including directing development to the most suitable locations, and maintaining the environmental, social, physical, economic and public health and vitality of the area. The element therefore focuses on the organization of the community's physical environment into logical, functional, and visually pleasing patterns that are consistent with local social values. Of primary concern are the type, intensity, location, and character of land uses that will be permitted in the future.

Urban growth in Lompoc is restricted by the Sphere of Influence and Urban Limit Line, which delineates the City's future boundaries and service area. Growth is important to the future of Lompoc. The City encourages the development of undeveloped and vacant land within City boundaries. The City has also moved its Urban Limit Line in the 2030 General Plan indicating intent for modest growth. Additionally, in 2016 LAFCO approved the annexation of 10 acres to the North of the City. To ensure that residents of Lompoc have access to basic needs, the City will only allow development in areas where adequate public facilities and services, such as water, utilities, and fire/police protection, are available at the time of development. To maintain an adequate supply of clean water, the City will designate groundwater recharge areas as Open Space and protect those areas from incompatible uses. Other areas may be maintained as Open Space if they are

used to protect public health and safety and against natural and man-made hazards. Such areas may include regions in which topographic, geologic, or soil conditions indicate a significant danger to future occupants.

Since the previous update of the LHMP in 2017, new residential development has occurred consistent with the adopted Land Use Element and existing regulations and development standards. Growth in the City consists of infill development, some buildout of areas at the outer portion of the urban boundary (e.g., Bailey Avenue Sphere of Influence and Annexation Proposal), minor extension of rural residential development, and additional recreational land uses at the edge of the urban area. Residential land uses and development are generally limited to areas adequately serviced by the County, including utilities, services, and emergency response capabilities. Some development has included changes to land use and zoning (e.g., Summit View Homes Residential Development) and the City considers the adequacy of services for projected growth. Since new urban development generally lies within existing hazard mitigation capabilities and contributes to planned growth in the City's existing and planned urban service areas, vulnerability for new residents has not substantially changed since 2017.

Circulation Element

Policy 2.2 of the City's 2030 General Plan encourages regulatory agencies to designate routes away from urban and environmentally sensitive areas for the transportation of hazardous and explosive materials. Such a policy would help mitigate the negative effects on Lompoc's residents from future hazardous materials incidents.

Housing Element

Dilapidated residences and those that do not comply with the City's Uniform Building Code requirements are more likely to be negatively affected by natural hazards. Therefore, the City will provide funding for housing rehabilitation programs that encourage private and public capital participation, preserve the existing housing stock, and provide more housing opportunities within the City. The City has also funded a comprehensive Code Enforcement program with a full-time Code Enforcement Officer. Through this program, the City has compelled owners of dilapidated housing to improve its condition. When evaluating sites for housing, the City avoids environmental hazards or sensitive resource areas. The Housing Element for the 2014 – 2022 planning cycle was updated and adopted by the City Council on December 15, 2015. The California State Department of Housing and Community Development found the Housing Element in full compliance on December 29, 2015.

Public Services Element

To avoid a power outage in Lompoc, the City requires the undergrounding of existing overhead utility distribution lines in association with new development projects. To ensure that residents have access to basic needs, the City will only allow development in areas where adequate public facilities and services, such as water, utilities, and fire/police protection, are available at the time of development.

To minimize street flooding, the City will ensure that the storm drain system has the adequate capacity to handle runoff from a design standard storm and, where feasible, will expand the capacity of the system to control storm flows. New development will be required to minimize the

amount of off-site drainage by retaining storm waters for on-site percolation, providing adequate drainage facilities for remaining off-site flows, maintaining natural drainage channels, and avoiding alteration of off-site drainage courses.

The City of Lompoc participates in an automatic aid agreement with the Santa Barbara County Fire Department and in mutual aid agreements with VSFB, and the State of California. The City is concerned with promoting fire mitigation through its encouragement of public education regarding fire prevention, as well as safety and first aid medical procedure exercises. Fire mitigation is also performed by the City in that it amended the City Code to require the installation of automatic fire protection systems in all new buildings that exceed the fire protection and on-scene response capabilities of the fire department. The fire department is responsible for reviewing all development projects to determine if they adhere to fire safety requirements.

Safety Element

Lompoc is aware of the hazards that can affect the City. These hazards include flooding, liquefaction, steep slopes, seismic hazards, wildland fires, and hazardous material incidents. To mitigate the damages caused by these hazards, the City aims to avoid placing critical facilities in hazardous areas. Several hazard maps included in this Plan detail where these hazardous areas are located within the City. The City's Zoning Ordinance will incorporate specific standards for location, designing, and reviewing critical facilities. The City will also amend the Zoning Ordinance to require all publicly owned critical facilities to provide and maintain emergency electrical generating capability. An emergency warning system will be implemented in the City and, for event-specific risks brought to the City's attention, the City shall develop event-specific plans, procedures, or programs to manage the risk and maximize public safety. The LHMP is incorporated by reference in the Safety Element.

Flood

To mitigate damage that can result from floods, the City will designate the land within floodways for open space land uses. Development may be permitted on boundaries of the floodway provided that building setback requirements from the Santa Ynez River and other streams are met and finished floor elevations are at least two feet above the 100-year flood elevations. Any development that impairs the ability of the floodway to convey floods or compounds potential flooding will be prohibited. The City will also amend the Floodplain Management Ordinance to maintain consistency with Federal and State requirements, establish a regulatory floodway, regulate grading and filling activities that diminish the carrying capacity of the floodway, and establish building setbacks from the Santa Ynez River and other water bodies. Lompoc will coordinate with the Santa Barbara County Flood Control and Water Conservation District in mitigating flood impacts from new construction, and also with FEMA and the USDA Soil Conservation Service in flood protection activities. The City will create public awareness programs to educate residents on flood hazards and procedures to minimize injury and property damage before, during, and after a flooding event.

Wildfire

To help reduce the damage caused to development from wildfires, the City will determine the suitability and design of development in wildland fire hazard areas. Uses that increase the danger

of wildland fires will be restricted. Implementation Measure 14 requires the Zoning Ordinance to be amended to establish the minimum distance between buildings and wildland fire risk areas to be no less than 60 feet, unless the following conditions are met: properly built access roads; available water supply; construction with materials that are more fire-resistant than standard requirements; and construction and maintenance of fuel breaks. Implementation Measure 17 requires the Fire Protection Ordinance should also be amended to allow the Fire Chief to require that developments located in areas beyond the four (4) minute response time meet more stringent construction code requirements to provide necessary fire protection. The City will also require and review landscape plans for all development projects in wildland fire hazard areas for consistency with fire-resistant and drought-tolerant landscaping concepts.

Many of these policies and development standards are designed to reduce the risk of wildfire damage. They provide a foundation for implementing the identified wildfire mitigation strategies within this LHMP. Through participation in the Lompoc LPT, the Lompoc Fire Department will use this foundation to help implement the identified wildfire mitigation strategies as resources are available.

Seismicity

Lompoc lies in a seismically active region and the potential for future earthquakes to cause structural damage is high, particularly for unreinforced masonry buildings. Unreinforced masonry buildings have inherent brittleness because they lack anchorage and continuity ties that would hold the structural components together during an earthquake. Seismic strengthening of unreinforced masonry buildings promotes public safety by reducing the potential for building damage and collapse. However, sometimes seismic retrofitting is infeasible and demolition becomes the appropriate course of action. For example, the Ruskowski building in Old Town Lompoc was demolished in 2019 after being deemed unsafe due to unreinforced masonry. Additional known unreinforced masonry buildings remain downtown, primarily in the Old Town District on H Street, and Ocean Avenue. All seismically vulnerable buildings, including critical facilities and City-owned properties, will continue to be identified by the City and those buildings will be required to be reinforced to minimize the risk of personal injury during an earthquake such as renovations to Station 51 downtown. The City regards seismic retrofitting as a way to mitigate the damages caused by earthquakes. For City-owned facilities, the City can apply for funding under the Earthquake Safety and Public Buildings Rehabilitation Bond Act of 1990. All new buildings are constructed per current seismic safety design standards. Another earthquake mitigation action that the City promotes is public awareness programs, designed to create awareness of seismic hazards and procedures to minimize injury and property damage before, during, and after an earthquake.

Steep slopes are also a concern in Lompoc because development built on steep grades can be more susceptible to being impacted by an earthquake, landslides, and liquefaction. Therefore, the City may permit development on hillsides only where it can be demonstrated that geologic conditions are sound for construction purposes. Before development is allowed to be constructed on slopes, a Certified Engineering Geologist must prepare a report which includes recommendations for remedial measures to ensure the stability of natural and manufactured slopes within the area affected by the development. For areas with 20 percent slopes or greater, the stability of the slopes must be addressed by a Registered Soils Engineer. Liquefaction potential must also be evaluated by a Registered Soils Engineer for development in liquefaction hazard areas. The Zoning Ordinance

will be amended to require developers proposing structures on or adjacent to steep slopes to develop and implement hillside drainage plans to reduce the risk of further movement by existing landslides, to site new structures away from steep hillsides and the toes of existing landslide surfaces, and to perform site-specific slope stability investigations and analyses by a Registered Geotechnical Engineer. Critical facilities will not be permitted within areas prone to slope instability or liquefaction during an earthquake.

Hazardous Materials

To prevent hazardous material transportation incidents from affecting residential areas, open space buffers will be created between hazardous materials routes and residential neighborhoods. Also, residents within a quarter mile of new hazardous materials handling facilities will be notified immediately by the City emergency response organizations of any accidental occurrences such as spills, leaks, or eruptions that may affect the health, safety, and welfare of the public. The City will ensure that businesses and industries that use, store, and handle hazardous materials do so in compliance with applicable City policies as well as State and local laws, guidelines, and regulations, including permitted uses within manufacturing and industrial zones.

4.8.2 Comprehensive Emergency Management Plan

The City's Comprehensive Emergency Management Plan. meets all SEMS and NIMS requirements. The Plan discusses mitigation in the form of training and exercises, which are essential at all levels of government to make emergency operations personnel operationally ready. All emergency plans should include provisions for training. The objective is to train and educate public officials, emergency response personnel, and the public. Lompoc Fire Department provides EOC training for all employees at the Awareness and Field Level. In addition to the training, exercises should be conducted regularly to maintain the readiness of operational procedures. Exercises provide personnel with an opportunity to become thoroughly familiar with the procedures, facilities, and systems that will be used in emergencies. There are several forms of exercises:

- Tabletop exercises provide a convenient and low-cost method designed to evaluate policy, plans, and procedures, and resolve coordination and responsibilities. Such exercises are a good way to see if policies and procedures exist to handle certain issues.
- Functional exercises are designed to test and evaluate the capability of an individual function such as evacuation, medical, communications, or public information.
- Full-scale exercises simulate an actual emergency. They typically involve complete emergency management staff and are designed to evaluate the operational capability of the emergency management system.

4.8.3 Storm Water Management Program

The City maintains an approved Storm Water Management Program (SWMP), under the National Pollutant Discharge Elimination System (NPDES) Phase II Small Municipal Separate Storm Sewer System (MS4) program. The City's SWMP was approved on October 17, 2008, by the Central Coast Regional Water Quality Control Board.

The SWMP can be found on the City's website and addresses the six minimum control measures: Public Involvement / Participation; Public Education and Outreach; Illicit Connection and Discharge Detection and Elimination; Municipal Operations Control; Construction Site Control; and New

Development / Redevelopment Control). The SWMP and its related Storm Water Management Ordinance apply to all property within the City limits and property owned by the City, wherever it is located.

4.8.4 Zoning and Subdivision Ordinances

The State of California has empowered all cities and counties to adopt zoning ordinances. The City's original Zoning Ordinance was adopted in 1974. Local land use controls include the Zoning Ordinance, which shapes the form and intensity of land use and residential development. Consistent with the General Plan, the City's Zoning Ordinance allows a range of zones and dwelling unit densities. Zoning ordinance regulations related to hazard mitigation relate to the risk assessment for hazards within the City, including flooding.

The City has a five-member Planning Commission, which is an advisory body to the City Council. The Commission was established under State law to provide relief in special cases where the exact application of the terms of the ordinance would be unduly restrictive and cause hardship, in addition to generally reviewing zoning and subdivision proposals. The Planning Commission hears and decides upon the interpretation and the application of the provisions of the Zoning and Subdivision Ordinances. Although the Commission has certain discretionary powers in making its decisions, the Commission must always abide by and comply with the powers granted to it by the local Zoning and Subdivision Ordinances and the State's enabling acts. Additionally, the Planning Commission may recommend actions to the City Council and the Planning Commission's actions may be appealed to the City Council.

4.8.5 Building Codes

The State of California has adopted the current California Building Codes, which are enforced in the City. The California Uniform Statewide Building Code is based on the 2013 International Building Code with State amendments.

The City provides a full-service Building and Safety Section, which is responsible for enforcing State, City, and County Codes for building residential and commercial structures, enforcing environmental codes and guidelines for maintaining existing structures. In 1999, the City received the highest rating for its building code effectiveness in residential and commercial construction from the Insurance Services Office (ISO).

The ISO is an insurer-supported organization that provides advisory insurance underwriting and rating information to insurers. The ISO uses a rating scale of 1 to 10 with 1 being the highest rating given. The City's evaluation can be used as a basis for providing rating credits to individual property insurance policies.

The City's Potentially Hazardous Building Earthquake Safety Mitigation Program (Section 15.40.020 of the Lompoc Municipal Code) allows the City Building Official to continue to identify potentially hazardous buildings, including unreinforced masonry, within the City and notify the legal

owner(s) of every identified a potentially hazardous building that the building is considered to be a structure of the general type that historically has exhibited little resistance to earthquake motion. Owners of potentially hazardous buildings must comply with all State and local regulations and laws, including but not limited to the obligation to post a conspicuous sign at the entrance to the building.

4.8.6 Floodplain Management Ordinance

The City has an enforced Floodplain Ordinance requiring that all habitable floors must be built a minimum of two feet above the 100-year floodplain and the special flood hazard areas. It is important to note, however, that many parts of the City flood due to stormwater infrastructure – not because of their proximity to the 100-year floodplain.

Floodplain districts identified in the Flood Insurance Rate Maps FIRMs include the following flood hazard zones and definitions:

- **Zone A** is the flood insurance rate zone that corresponds to the 100-year floodplains that are determined in the Flood Insurance Study by approximate methods. Because detailed hydraulic analysis is not performed for such areas, no Base Flood Elevations or flood hazard factors are determined.
- **Zone AO** is the flood insurance rate zone that corresponds to areas of 100- year shallow flooding where depths are between one (1) and three (3) feet; average depths of inundation are shown, but no flood hazard factors are determined.
- **Zone A1-A30** is the flood insurance rate zone that corresponds to areas of 100-year flood; base flood elevations and flood hazard factors are determined.
- **Zone B** is the flood insurance rate zone that corresponds to areas between limits of the 100-year flood and 500-year flood; or certain areas subject to 100-year flooding with average depths less than one (1) foot or where the contributing drainage area is less than one square mile; or areas protected by levees from the base flood.
- **Zone C** is the flood insurance rate zone that corresponds to areas of minimal flooding.

All potential development projects located within floodplains must follow an established development review process. Developments involving drainage ditches or watercourses in floodplains must receive Federal, State, and Local review and permits as required by the Floodplain Administrator and the Lompoc Municipal Code.

4.8.7 National Flood Insurance Program (NFIP) and Repetitive Loss (RL) Properties

The City is part of the National Flood Insurance Program (NFIP). The NFIP aims to reduce the impact of flooding on private and public structures. It does so by providing affordable insurance to property owners and by encouraging communities to adopt and enforce floodplain management regulations. These efforts help mitigate the effects of flooding on new and improved structures. Repetitive loss properties are defined as property that is insured under the NFIP that has filed two or more claims above $1,000 each within any consecutive 10-year period since 1978. There are currently no repetitive loss properties in the City of Lompoc.

The City of Lompoc's Flood Insurance Rate Map (FIRM) numbers are 060334-720F, 736F, 737F, 738F, 739F, 743F. The FIRMs were revised in September 2005 and are used by both the public and private sectors to determine flood insurance requirements and rates and to administer the City's Flood Zone Management Ordinance.

4.8.8 Capital Improvement Plan

The City systematically plans, schedules, and finances capital projects to ensure cost-effectiveness and conformance with established policies and longer-term plans through a Capital Improvement Plan (CIP). This CIP is a six-year plan for maintaining and improving the City's infrastructure over the next three budget cycles. Although the CIP covers a six-year planning horizon, it will be updated every two years in conjunction with the budget process to reflect ongoing changes as new projects are added, existing projects are modified, and completed projects are removed from the program document. The first two years of the CIP generally form the basis of funding decisions for capital projects based on City Council priorities for Public Safety, Economic Development, Parks, Infrastructure, and Code Enforcement.

The City's need for a Capital Improvement Program has increased following the economically challenging years since 2008. The backlog of maintenance projects amounts to $123,815,014 over the life of the CIP and continues to grow as funding sources are not able to keep up with the demand. There are also new capital needs by our community to keep up adequate service levels within our City and Impact Fees will need to be studied and adjusted according to those needs. The next steps will include developing an ongoing strategy for planning, funding, and scheduling necessary maintenance and/or replacement of all capital assets.

4.9 OPPORTUNITIES FOR MITIGATION CAPABILITY IMPROVEMENTS

The City 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 City 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 City to expand or improve on these policies and programs to further protect the community:

- **Regulatory Opportunities**: As part of this update, the City will comply with AB 2140 by amending its Safety Element to incorporate the LHMP by reference. The City will consider the LHMP in policy, land use plans, and programs, including flood management. For example, the seeks to undertake wildfire scenario planning to identify and resolve wildfire vulnerabilities in the City.
- **Administrative/Technical Opportunities**: The City continues to improve its resilience to ensure emergency response operations are sustained during a hazardous event, including seismic upgrades and improvements to public safety facilities and planning. Enhancements to hazard training for staff in partnership with the County and other agencies or stakeholders would improve the City's ability to mitigate hazards with the latest knowledge and resources. The City aims to address hydrologic issues through flood risk attenuation along the Santa Ynez River.

- **Outreach Opportunities**: Enhanced community outreach, emergency notifications, and trainings would further enhance the City's capabilities to respond to and recover from hazards. The City could expand outreach through digital tools such as social media, participate in the Great California ShakeOut, and increase FireWise outreach events and media coverage.
- **Fiscal Opportunities**: The City can update its CIP to include hazard mitigation actions from the LHMP. The City will continue to seek grants (e.g., HMGP, BRIC) to fund these CIP projects and related projects in the City's mitigation strategy. The City can seek opportunities to partner with the County and/or other stakeholder agencies in grant applications to address regional hazards more effectively. The City could also consider expanding its fiscal capabilities through its annual budget process and other revenue measures (e.g., raising taxes, property assessments, bonds).

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 City of Lompoc LHMP. The intent is to confirm and update the description, location and extent, and history of hazards facing the City 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 City.

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 City LPT refined the list of hazards applicable to the City 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 City'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. Applicable hazard information from the City's 2017 LHMP was incorporated during the development of this section. A comprehensive treatment of hazards and their descriptions may be found in Chapter 5.0 of the Santa Barbara County 2022 MJHMP.

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

Table 5-1. City of Lompoc Local Priority Hazards

Hazard Type and Ranking	Score	Planning Consideration Based on Hazard Level
Wildfire	12	Significant
Earthquake	11	Significant
Drought and Water Shortage	11	Significant
Flood	8	Moderate
Dam Failure	8	Moderate

To continue compliance with the DMA of 2000, the City 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 City in subsections below. The City's LPT acknowledged other hazards are either not a threat, are highly unlikely within the City limits, or are adequately addressed by the 2022 MJHMP and do not require additional information to be relevant to the City's hazard setting; therefore, these hazards are not addressed further in the City's LHMP. These additional hazards are being addressed in the more comprehensive 2022 MJHMP.

5.3 HAZARD PROFILES

The following sections represent work done by the MAC and confirmed by the Lompoc LPT. The following material is intended to be an overview of the hazards; more information may be found in the State of California Multi-Hazard Mitigation Plan, the Lompoc General Plan, Safety Element, Seismic, and other documents.

5.3.1 Wildfire

Description of Hazard

Wildfires can be classified as either wildland fires or wildland-urban interface (WUI) fires. The former involves situations where wildfire occurs in an area that is relatively undeveloped except for the possible existence of basic infrastructure such as roads and power lines. A WUI fire includes situations in which a wildfire enters an area that is developed with structures and other human developments. In WUI fires, the fire is fueled by both naturally occurring vegetation and the urban structural elements themselves. According to the National Fire Plan issued by the U.S. Departments of Agriculture and Interior, the wildland-urban interface is defined as "…*the line, area, or zone where structures and other human development meet or intermingle with undeveloped wildland or vegetative fuels*."

Certain conditions must be present for a wildfire hazard to occur; a large source of fuel must be present, the weather must be conducive (generally hot, dry, and windy), and fire suppression sources must not be able to easily suppress and control the fire. The cause of a majority of wildfires is human-induced 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. Temperature, humidity, and wind (both short and long term) affect the probability, severity, and duration of wildfires.

Location and Extent of Hazard in Lompoc

The climate, topography, and vegetation in Santa Barbara County are conducive to wildfires. California Department of Forestry and Fire Protection, Fire and Resource Assessment Program (CDF-FRAP) was mandated to map areas of significant fire hazards based on fuels (vegetation), terrain, weather, and other relevant factors. These zones, referred to as Fire Hazard Severity Zones, define the application of various mitigation strategies to reduce the risk associated with wildland fires. The most current mapping efforts by CDF-FRAP were conducted in 2007. Figure 5-1 below shows the Fire Hazard Severity Zones located in Santa Barbara County.

History of Hazard in Lompoc

There have been no significant wildfires within the City (refer to Figure 5-4 of the MJHMP). There have been only 2 recent wildfires adjacent to Lompoc within the past 10 years, including the Miguelito Fire in 2015 and the Canyon Fire in 2016. The Miguelito Fire burned over 632 acres in the hills above the City of Lompoc. The Canyon Fire burned 12,742 acres on Vandenberg Space Force Base. The fires did not directly threaten Lompoc; however, the smoke and ash produced created air quality issues for hundreds of miles.

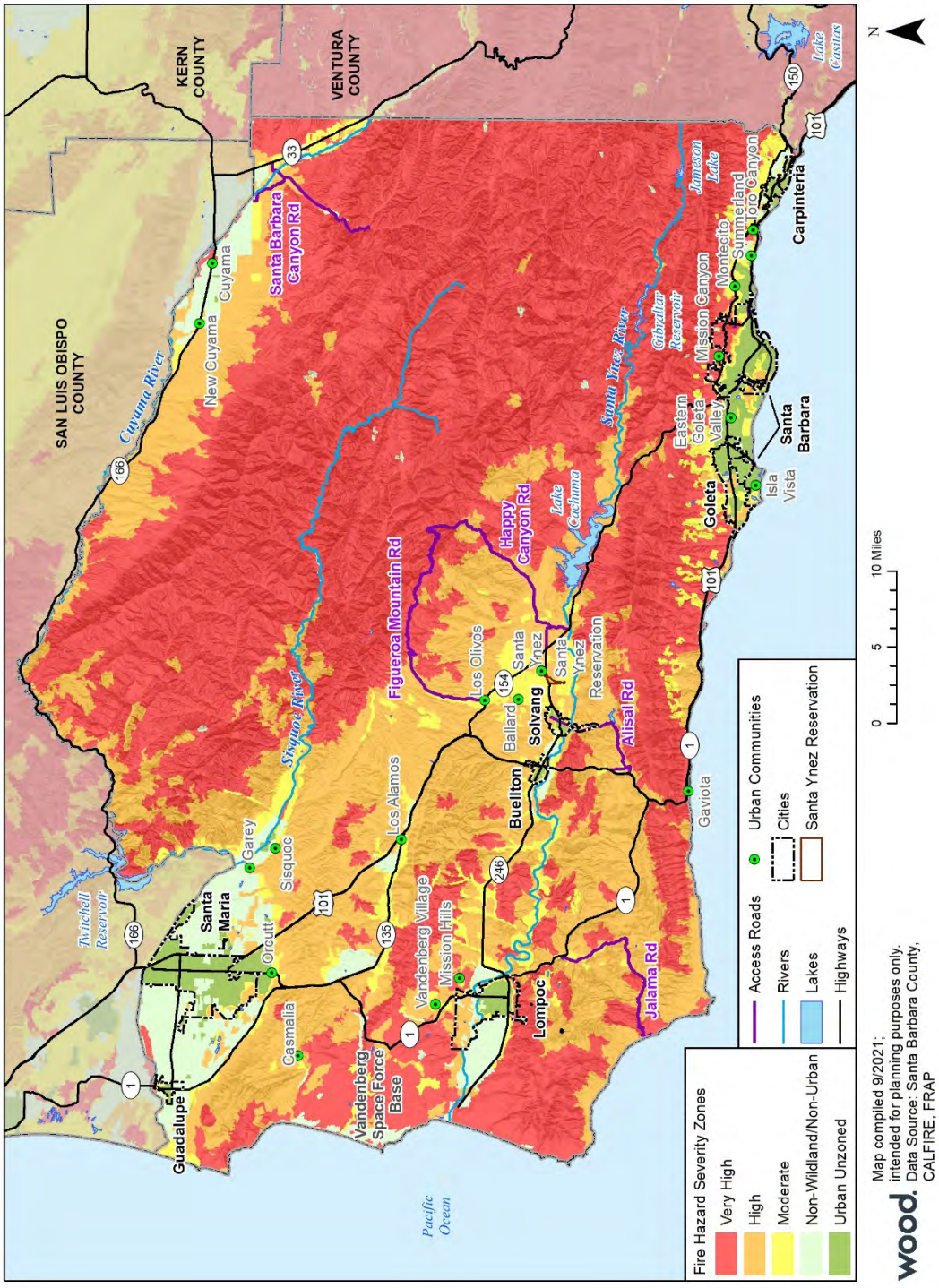
Probability of Occurrence

Vegetation and topography were significant elements in the identification of the fire threat zones. A substantial amount of the vegetation in Lompoc is commonly called chaparral; it is a dense and scrubby bush that has evolved to persist in a fire-prone habitat. Chaparral plants will eventually age and die; however, they will not be replaced by new growth until a fire rejuvenates the area. Chamise, Manzanita, and ceanothus are all examples of chaparral which are quite common in Lompoc.

Climate Change Considerations

Climate change plays a significant role in wildfire hazards. The changing conditions from wet to dry can create more fuel; the increased possibility of high winds increase risk and present a challenge, and drought conditions could hinder the ability to contain fires. Large wildfires also have several indirect effects beyond those of a smaller, local fire. These may include air quality and health issues, road closures, business closures, and other forms of losses. Furthermore, large wildfires increase the threat of other disasters such as landslides and flooding.

Figure 5-1. Santa Barbara County Fire Hazard Severity Zones



5.3.2 Earthquake & Liquefaction

Description of Hazard

An earthquake is caused by a release of strain within or along the edge of the Earth's tectonic plates producing ground motion and shaking, surface fault rupture, and secondary hazards, such as ground failure. The severity of the motion increases with the amount of energy released decreases with distance from the causative fault or epicenter and is amplified by soft soils. After just a few seconds, earthquakes can cause massive damage and extensive casualties.

Most people are familiar with the Richter scale, a method of rating earthquakes based on strength using an indirect measure of released energy. The Richter scale is logarithmic. Each one-point increase corresponds to a 10-fold increase in the amplitude of the seismic shock waves and a 32-fold increase in energy released. For example, an earthquake registering 7.0 on the Richter scale releases over 1,000 times more energy than an earthquake registering 5.0.

Table 5-2. Richter Scale

Richter Magnitudes	Earthquake Effects
Less than 3.5	Generally not felt but recorded.
3.5-5.4	Often felt, but rarely causes damage.
Under 6.0	Slight damage to well-designed buildings. Can cause major damage to poorly constructed buildings over small regions.
6.1-6.9	Can be destructive in areas up to about 100 kilometers across residential areas.
7.0-7.9	Can cause serious damage to larger areas.
8 or greater	Can cause serious damage in areas several hundred kilometers across.

Peak ground acceleration (PGA) is a measure of the strength of ground shaking. Larger peak ground accelerations result in greater damage to structures. PGA is used to depict the risk of damage from future earthquakes by showing earthquake ground motions that have a specified probability (10%,5%, or 2%) of being exceeded in 50-year return period. These values are often used for reference in construction design, and in assessing relative hazards when making economic and safety decisions.

Liquefaction is the phenomenon that occurs when ground shaking causes loose, saturated soils to lose strength and act as a viscous fluid. Liquefaction causes two types of ground failure: lateral spread and loss of bearing strength. Lateral spreads develop on gentle slopes and entail the sidelong movement of large masses of soil as an underlying layer liquefies. Loss of bearing strength occurs when the soil supporting structures liquefy, causing the structures to settle; resulting in potential damage.

Location and Extent of Hazard in the City of Lompoc

The City, like the rest of Santa Barbara County, is located in a high seismic activity zone. The City is located in the Transverse Range geologic province. The movement of continental plates manifests primarily along the San Andreas Fault system. The San Andreas fault is situated 7 miles northeast of Lompoc; active faults in the San Andreas Fault system that fall within Lompoc include the Nacimiento, Ozena, Suey, and Little Pine faults. Other active faults in the region include the Big Pine, Mesa, Santa Ynez, Graveyard-Turkey Trap, More Ranch, Pacifico, Santa Ynez, and Santa Rose Island faults. Additionally, the Santa Ynez River Fault runs through the southern portion of the City. A map of faults in the Santa Barbara County region is located below (Figure 5-2).

The City has areas of liquefaction that would cause severe damage in the downtown and lower eastside areas (Figure 5-3). The northern portion of the City is considered to have a low liquefaction potential and the southern portion of the City is considered to have a low to high liquefaction potential. After earthquakes, some regions may be prone to liquefaction. On level ground, liquefaction results in water rising to the ground surface. On sloping ground, liquefaction will usually result in slope failure.

History of Hazard in the City of Lompoc

Given that the City is located in a high seismic activity zone, it has a long history of earthquakes. Although most seismic activity in California occurs along the San Andreas Fault system, most historic seismic events in the Lompoc region have been centered offshore on an east-west trending fault. Refer to Figure 5-10 of the MJHMP for a depiction of historical epicenters of earthquakes located in the County.

On October 26, 2017, at 1:38 p.m., a magnitude 4.3 earthquake struck 19 miles off the coast of Lompoc. The quake was centered two miles deep in the Pacific Ocean. Some Lompoc residents reported a sharp jolt and a few seconds of shaking, but no damage was reported. Lompoc Valley Middle School (the only multistory school campus in the City) was evacuated because it has two stories (Lompoc Record 2017).

There is no historic evidence of liquefaction due to ground shaking in Santa Barbara County (Santa Barbara County Planning and Development Department 2015)

Probability of Occurrence

The United States Geological Survey (USGS) and their partners, as part of the latest Uniform California Earthquake Rupture Forecast Version 3 (USGS 2015), have estimated the chances of having large earthquakes throughout California over the next 30 years. Statewide, the rate of earthquakes around magnitude 6.7 (the size of the 1994 Northridge earthquake) has been estimated to be one per 6.3 years (more than 99 percent likelihood in the next 30 years); in southern California, the rate is one per 12 years (93 percent likelihood in the next 30 years). Southern California's rates are given in Table 5-3.

Table 5-3. Southern California Region Earthquake Likelihoods

Magnitude (greater than or equal to)	Average Repeat Time (years)	30-year likelihood of one or more events
5	0.24	100%
6	2.3	100%
6.7	12	93%
7	25	75%
7.5	87	36%
8	522	7%

Source: USGS 2015.

Climate Change Considerations

To date, no credible evidence has been provided that links climate to earthquakes; however, climate and weather do play a significant role in the response and recovery from earthquakes. Effects from climate change could create cascading complications and impacts.

Figure 5-2. Santa Barbara County Probability of Shaking 2% in 50 Years

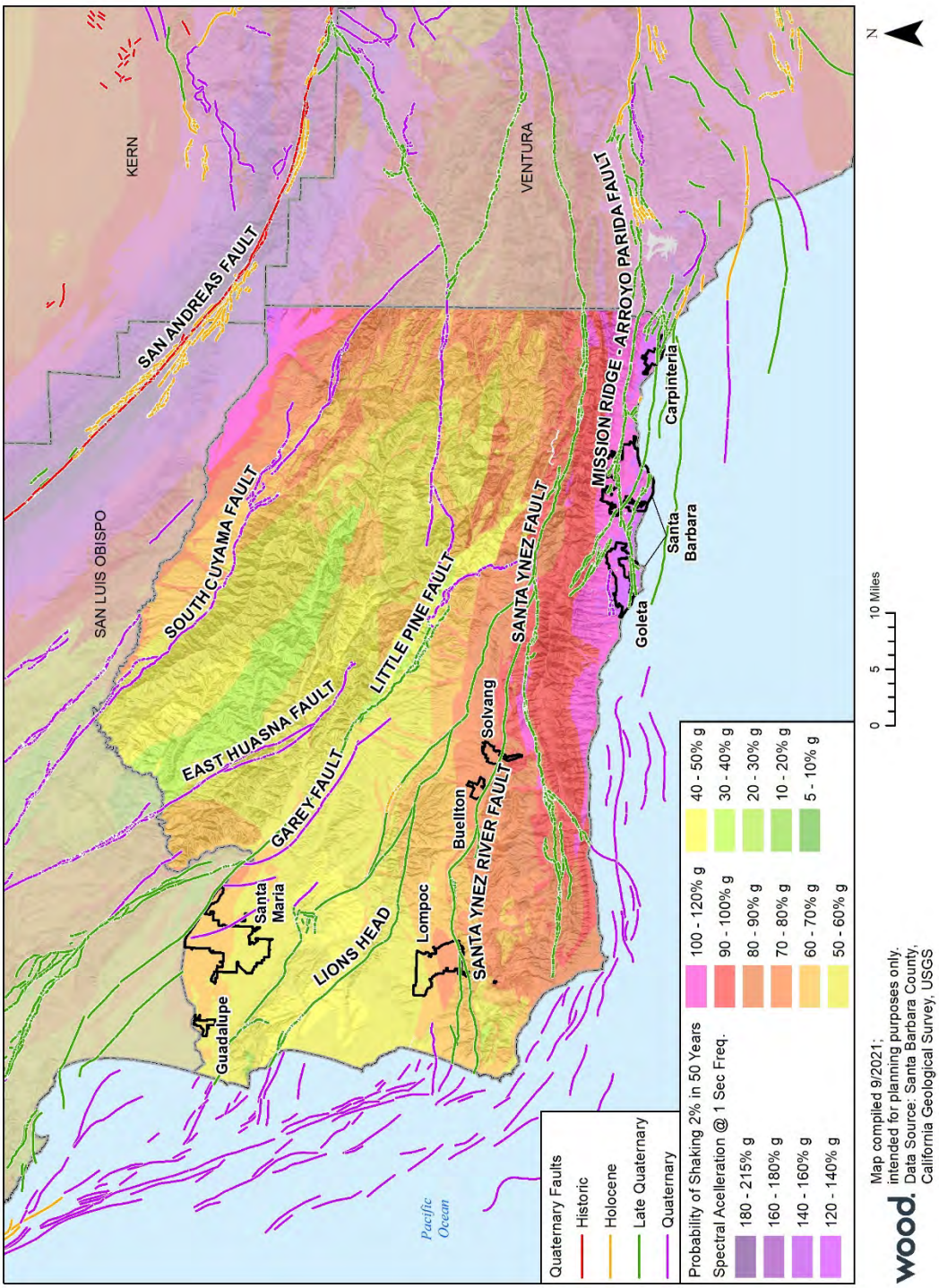
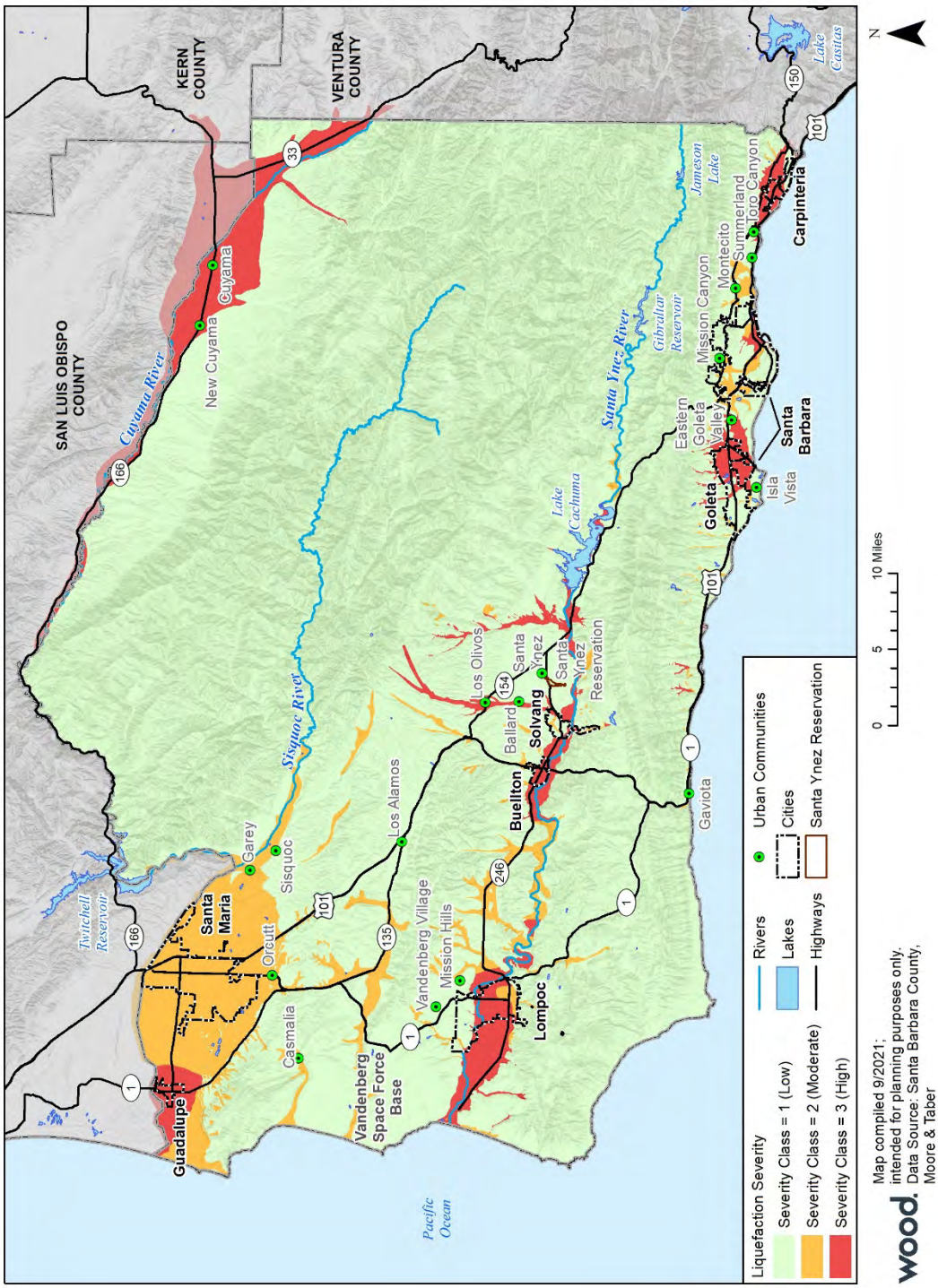


Figure 5-3. Santa Barbara County Liquefaction Severity



5.3.3 Drought and Water Shortage

Description of Hazard

Drought and water shortages are a gradual phenomenon and generally are not signified by one or two dry years. California's and the county's extensive system of water supply infrastructure (reservoirs, groundwater basins, and interregional conveyance facilities) generally mitigates the effects of short-term dry periods for most water users. However, drought conditions are present when a region receives below-average precipitation, resulting in prolonged shortages in its water supply, whether atmospheric, surface, or groundwater. A drought can last for months or years or may be declared after as few as 15 days. Drought can have secondary impacts. For example, drought is a major determinant of wildfire hazard, in that it creates a greater propensity for fire starts and larger, more prolonged conflagrations fueled by excessively dry vegetation, along with reduced water supply for firefighting purposes.

Location and Extent of Hazard in the City of Lompoc

The entire county is subject to drought conditions and water shortages. The effects of the drought are most visible in the Lompoc when looking at the current capacity and maximum storage of the two main water reservoirs in the county, Lake Cachuma and Twitchell. Experience with Lompoc droughts tells us that drought impacts are felt first by those most dependent on or affected by annual rainfall – fire departments, farmers engaged in agriculture, residents relying on wells, or other small water systems lacking reliable water sources. Drought and water shortages can happen and have significant impacts on the population and the economy. Significant economic impacts on Lompoc's agriculture industry can occur as a result of short- and long-term drought conditions; these include hardships to farmers, farmworkers, packers, and shippers of agricultural products. In some cases, droughts can also cause significant increases in food prices to the consumer due to shortages. Drought can also result in a lack of water and subsequent feed available to grazing livestock, potentially leading to a risk of livestock death and resulting in losses to Lompoc Valley's agricultural economy.

History of Hazard in the City of Lompoc

Three 20th-century droughts were of particular importance from a water supply standpoint—the droughts of 1929–1934, 1976–1977, and 1987–1992. More recent multiyear droughts occurred in 2007–2009 and 2012–2017 (DWR 2021). California's most recent multi-year drought occurred from 2012-2017. In January 2014, Santa Barbara County joined the State of California in declaring a local drought emergency, which was the first local emergency declaration of drought in the county's history (County of Santa Barbara 2014). This was the first time the state-imposed mandatory urban water use reduction requirements on water suppliers, and all of California's 58 counties declared local emergencies. Refer to Section 5.3.2 of the MJHMP for a detailed discussion of multi-year droughts that were identified as having significant impacts on the county.

Since August 2020, the period between 2012 and 2016 was one of the documented driest consecutive water years in the county with 50.83 inches in cumulative rainfall (County of Santa Barbara 2021a). Effects of the drought have lowered water storage at Lake Cachuma, one of the county's largest surface water reservoirs, with water storage at 48.4 percent of capacity in late 2021 (County Flood Control District 2021). Although the statewide drought of 2012–2016 was

ended by a wet Water Year in 2017, localized drought conditions persisted in the Central Coast region and were not ended until a wet Water Year in 2019 (DWR 2021). For example, the average rainfall in Lompoc is 17.6 inches; however, since 2016, the City has experienced significantly less than normal rainfall.

Probability of Occurrence

Droughts are a regularly recurring feature of Santa Barbara County weather that can be affected by overall regional or worldwide climactic patterns. El Niño and La Niña events are natural climate patterns over the Pacific Ocean often with global effects, with influence over the weather of the U.S. southwest that on average occur every two to seven years. The state recently experienced the 5-year significant drought event of 2012-2017; other notable historical droughts included 2007-09, 1987-92, 1976-77, and off-and-on dry conditions spanning more than a decade in the 1920s and 1930s. In any given year, the City can be subject to drought conditions and water shortages. However, out of the last 10 years, the county has been under a locally declared drought emergency for five years; therefore, it is likely drought and associated water shortages will continue and may increase due to climate change considerations, as described further below.

Climate Change Considerations

Climate change has the potential to make drought events more common in the county and City. Extreme heat creates conditions more conducive for the evaporation of moisture from the ground, thereby increasing the possibility of drought. A warming planet could lead to earlier melting of winter snowpacks, leaving lower stream flows and drier conditions in the late spring and summer. Snowpacks are important in terms of providing water storage and ensuring adequate supply in the summer when water is most needed. Changing precipitation distribution and intensity have the potential to cause more of the precipitation that does fall to run-off rather than be stored. The result of these processes is an increased potential for more frequent and more severe periods of drought.

5.3.4 Flood

Description of Hazard

A flood is a general and temporary condition of partial or complete inundation on land that is normally dry. Several factors determine the severity of floods, including rainfall intensity and duration, antecedent moisture conditions, surface permeability, and geographic characteristics of the watershed such as shape and slope. Other causes can include a ruptured dam or levee, rapid ice or snow melting in the mountains, under-engineered infrastructure, or even a poorly placed beaver dam that can overwhelm a river or channel and send water spreading over adjacent land or floodplains.

A large amount of rainfall in a short time can result in flash flood conditions, as can a dam failure or other sudden spill. The National Weather Service's definition of a flash flood is a flood occurring in a watershed where the time of travel of the peak of flow from one end of the watershed to the other is less than six hours. The City historically has been vulnerable to flooding during severe rainfall.

The City's Floodplain Ordinance requires all new construction to be built at least 200 feet from the top of the bank of the Santa Ynez River and all new buildings are constructed 2 feet above the

flood zone. When new projects go through the City's approval process, the Planning Commission, City Council, and City Engineer ensure the wastewater treatment plant is protected from flooding inundation.

Erosion of the banks of the Santa Ynez River has become a significant concern within the City. The continual progression of bank erosion poses potential threats to adjacent residences, properties, and public streets. Additionally, continued bank erosion is anticipated to damage the Riverbend Park bikeway within the next one to two large (10-year recurrence interval) storms.

To address the concern of this progressing bank erosion, the City has engaged a consulting team specializing in riverbank stabilization, to evaluate the feasibility, cost, and other considerations for stabilizing this reach of the riverbank. The City's consulting team has prepared concept-level designs, construction cost estimates, and Feasibility Studies that discuss project alternatives, environmental concerns, and design considerations. The City is currently seeking funding opportunities to complete the design and construction of this project.

Location and Extent of Hazard in the City of Lompoc

The geographical location, climate, and topography of Lompoc make the City prone to flooding (Figure 5-4). In the City, without extended periods of below-freezing temperatures, floods usually occur during the season of highest precipitations or during heavy rainfalls after long dry spells. Additionally, due to the Mediterranean climate and the variability of rainfall, streamflow throughout the City is highly variable and directly impacted by rainfall. Watercourses can experience a high amount of sedimentation during wet years and high amounts of vegetative growth during dry and moderate years.

The drainages in the northern part of the City are characterized by high-intensity, short-duration runoff events. Runoff from high intensity, short-duration storm events can cause inundation of overbank areas, debris including sediment, rock, downed trees in the water that can plug culverts and bridges, erosion and sloughing of banks, and loss of channel capacity due to sedimentation.

History of Hazard in the City of Lompoc

Flooding has been a major problem throughout the City's history. The City has several hydrologic basins that have different types of flooding problems, including overbank riverine flooding, flash floods, tidal flooding/tsunamis, and dam failure. The most common flooding in the City is due to riverine flooding and flash flood events.

Between 1995 and 2014, Lompoc experienced 5 significant floods. Two of these floods received Presidential Disaster Declarations. These floods, as well as information concerning the nature of the flooding and the extent of the damages, are summarized below. It should be noted there may have been significant flooding before 1995; documentation of flooding before 1995 is not available.

- **1995 –**The storms of 1995 brought widespread flooding to Lompoc. The most severe flooding occurred on the South Coast while the rest of the county was largely spared from serious damages. Estimated public and private damages were around $100 million and the area was declared a federal disaster area. (County Flood Control 1995). Many structures were reported flooded and/or damaged. Transportation in and out of Lompoc was cut off for several hours; some modes of transportation were not restored for several days.

- **2005 –** A powerful Pacific storm tapped into a subtropical moisture source to produce heavy rain and flash flooding across Southwestern California. Overall, rainfall totals ranged from 4 to 8 inches over coastal areas to between 10 and 20 inches in the mountains. In Lompoc, flash flooding and mudslides closed down Highway 101 at Bates Road. With such heavy rainfall, both the Santa Clara River and the Santa Ynez River exceeded their respective flood stages (NOAA 2005). In Lompoc, damages were estimated at $2 million.
- **March 2011 –** A severe winter storm occurred on March 19-21, 2011, that included flooding, debris flows, and mudflows throughout Santa Barbara County, including the City of Lompoc. The rainfall intensity maximum was 1.64 inches per hour at San Marcos Pass on March 20. The 2-day storm produced up to 11.5 inches of rainfall. The storm extremes were primarily located in the south county, especially Gibraltar and Cachuma. With all three primary Santa Ynez River-related county reservoirs full (as of March), the necessary water releases from Lake Cachuma added to the storm runoff to create relatively high discharge rates in the lower Santa Ynez River. This storm event resulted in moderate agricultural land flooding (approximately 200 acres) downstream of Lake Cachuma. Several County Flood Control debris basins, including the Bradley Basin in Santa Maria, were filled and sustained some damage (County Flood Control 2011). According to County Insurance Claims, the storm cost approximately $1.7 million in damages. Isolated flooding occurred on agricultural land in the Lower Santa Ynez River, and moderate damage occurred at some County-maintained Flood Control District debris basins (County Flood Control 2011).
- **March 2014 –** A strong winter storm caused significant damage to coastal properties on the south coast of Lompoc.
- **December 2014 –** A brief but intense rainfall, portions of which covered a limited area that exceeded a 200-year return period, caused damages county-wide, mostly in the form of downed trees, bank erosion, and sediment and debris deposition.

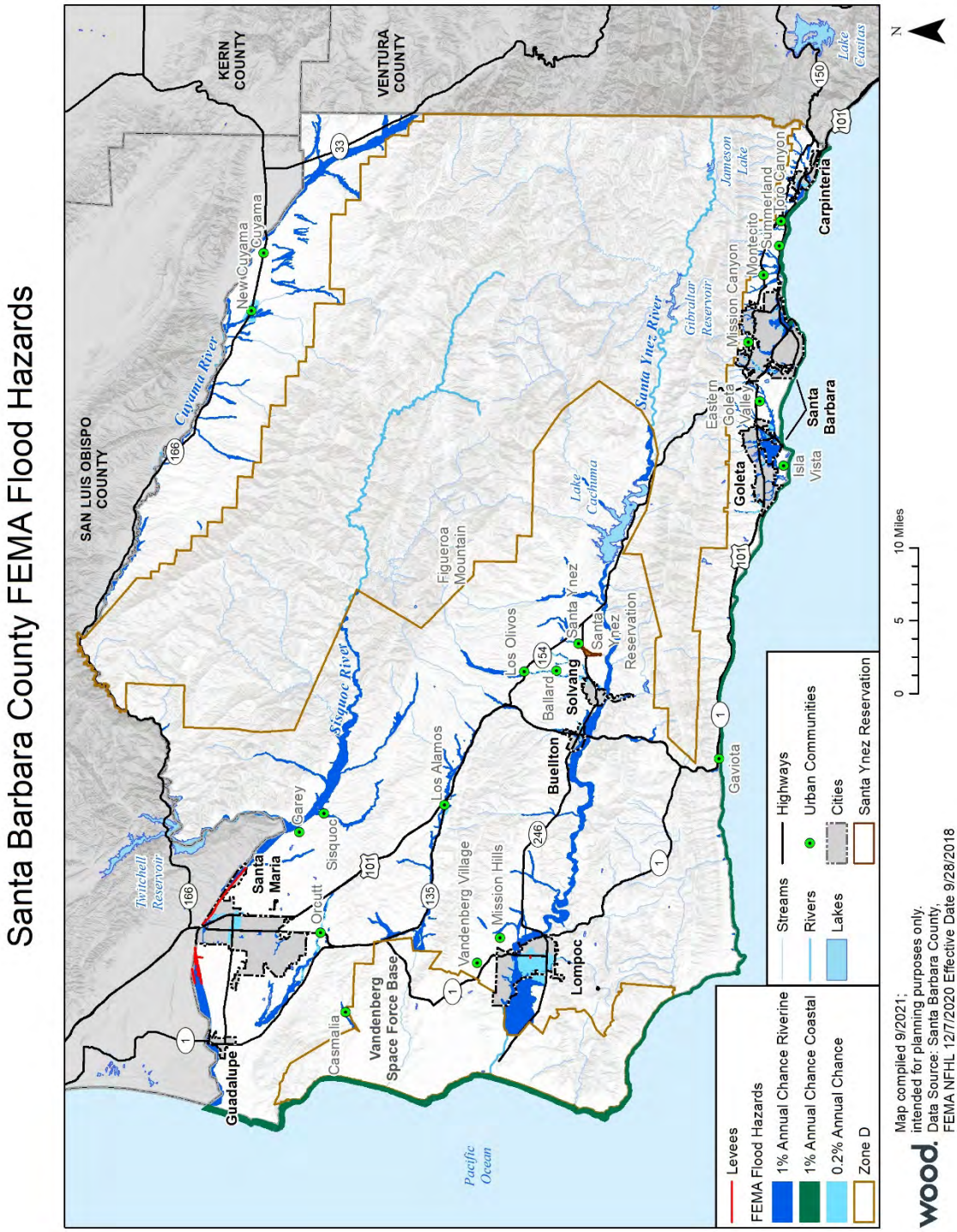
Probability of Occurrence

The 100-year flood is a flood that has a one percent chance in any given year of being equaled or exceeded. The 500-year flood is the flood that has a 0.2 percent chance of being equaled or exceeded in any given year.

Climate Change Consideration

Climate change is both a present threat and a slow-onset disaster. It acts as an amplifier of existing hazards. Extreme weather events have become more frequent over the past 40 to 50 years and this trend is projected to continue. Rising sea levels, changes in rainfall distribution, and intensity are expected to have a significant impact on coastal communities, including portions of Lompoc. This section presents a discussion of how climate change might impact the frequency, intensity, and distribution of flood hazards.

Figure 5-4. Santa Barbara County FEMA Flood Hazards



5.3.5 Dam Failure

Description of Hazard

Dams fail due to old age, poor design, structural damage, improper siting, landslides flowing into a reservoir, or terrorist actions. Structural damage is often a result of a flood, erosion, or earthquake. A catastrophic dam failure could inundate the area downstream. The force of the water is large enough to carry boulders, trees, automobiles, and even houses along a destructive path downstream. The potential for casualties, environmental damage, and economic loss is great. Damage to electric generating facilities and transmission lines could impact life support systems in communities outside the immediate hazard area.

Location and Extent of Hazard in the City of Lompoc

The Santa Ynez River travels through the northern portion of the City. The City of Lompoc lies approximately 33 miles west of the Bradbury Dam. Failure of any of the dams along the Santa Ynez River, including the Juncal, Gibraltar, and Bradbury dams, could result in substantial inundation and flooding within the City via the Santa Ynez River.

History of Hazard in the City of Lompoc

As described in Section 5.6.3 of the 2022 MJHMP, the county has experienced one incident of catastrophic dam failure, which occurred in the community of Mission Canyon. No historical dam failures have occurred within or in the vicinity of the City.

The DWR Division of Safety of Dams (DSOD) provides oversight of the design, construction, and maintenance of jurisdictional-sized and non-Federal dams. With DWR DSOD oversight, many potential dam issues have been addressed and/or resolved in the county (DWR DSOD 2021). Additionally, the USBR, responsible for oversight of federal dams in the county, has improved systems to ensure that peak releases during heavy inflows do not result in excessive downstream flows, which reduces the possibility of inundation from overflows (Santa Barbara County Planning and Development Department 2015).

Probability of Occurrence

Dam failure events are infrequent and usually coincide with the events that cause them, such as earthquakes, landslides, excessive rainfall, and snowmelt. There is a "residual risk" associated with dams; residual risk is the risk that remains after safeguards have been implemented. For dams, the residual risk is associated with events beyond those that the facility was designed to withstand. However, the probability of occurrence of any type of dam failure event is considered to be low in today's regulatory and dam safety oversight environment.

Climate Change Considerations

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.

6.0 VULNERABILITY ASSESSMENT

The vulnerability assessment builds on the hazard assessment provided in Section 5.0 of the LHMP and Chapter 5.0 of the 2022 MJHMP to estimate losses where data is available and consider a specific list of critical facilities identified within the City of Lompoc. This list of critical facilities presents the buildings and structures that are the City's primary concern for ensuring resiliency; they include both City-owned or operated facilities as well as some privately owned and operated facilities. Information for City-owned or operated facilities (building replacement cost and building content costs) were reviewed and updated as needed; where available the same information was reviewed and updated for the privately owned or operated facilities. The City identified 87 critical facilities, which primarily included utilities, government, and educational structures. Of the available data, it was shown that these buildings are worth approximately $16,866,163 in total building value (i.e., structural and content value) (Table 6-1). No values were able to be obtained for many major facilities, so the actual value is much more than this amount. Note that Fire Stations 51 & 52 are tracked as both EMS Stations and Fire Stations.

Table 6-1. Critical Facilities in the City of Lompoc

Type	Name	Address	Total Building Value
Government	Tap TV	700 North H Street	-
Utilities	GTE	205 West Pine Avenue	-
Government	City Electrical Receiving Station	1100 North D Street	-
Sub Station	PG & E Substation	1701 Industrial Way	-
Shelter	Good Samaritan Recovery	604 W Ocean Ave	-
Water Treatment Plant	Water Treatment Plant	501 East North Avenue	-
Hazmat	Household Hazardous Waste Collection Facility	1585 V St	-
RMP Facilities	Lompoc Water Treatment Plant	601 East North Avenue	-
Clinic	Lompoc Community Health Services	301 North R Street	$2,571,730
Clinic	Lompoc Wellness Center	1109 Chestnut Ave	$1,318,376
Clinic	Lompoc Mental Health Misc. Office	117 North B Street	$1,287,253
Clinic	Lompoc County Health Maintenance Bldg.	301 North R Street	$81,984
Clinic	Lompoc County Health Serv Furnace Bldg.	301 North R Street	$43,476
Clinic	Lompoc Skilled and Rehabilitation Center	1428 West North Avenue	-
Clinic	PHD Lompoc Clinic	301 North R St	-
Clinic	Community Health Centers of the Central Coast- Lompoc	425 West Central	-
Clinic	Lompoc Artificial Kidney Center	127 West Pine Avenue	-
Clinic	Sansum Clinic-Lompoc	1225 North H St	-
Clinic	Lompoc Valley Medical Center	508 East Hickory	-
Clinic	Valley Medical Group	136 N. Third St	-
Clinic	Lompoc Comprehensive Care Center	216 North Third Street	-

Type	Name	Address	Total Building Value
Clinic	Lompoc Skilled & Rehab Center	1428 West North Avenue	-
Clinic	Lompoc Community Health Center	1300 West Ocean Ave	-
Clinic	SB County Health Care Services	301 North R Street	-
Clinic	H Street Lompoc Valley Medical	1307 North H Street	-
Clinic	3rd Street Lompoc Valley Medical	136 N Third St	-
Clinic	Lompoc Convalescent Home	216 North Third Street	-
Clinic	Lompoc District Hospital	1515 East Ocean	-
Clinic	Sansum Clinic	1225 North H Street	-
EMS Station	Lompoc Fire Department Station 52	1100 North D Street	-
EMS Station	Lompoc Fire Department Station 51	115 South G Street	-
EMS Station	American Medical Response Station 7	701 East North Avenue	-
Nursing Home	Lompoc Skilled Nursing & Rehabilitation Center	1428 W North Ave	-
Nursing Home	Lompoc Valley Medical Center Comprehensive Care Center D/P SNF	216 N 3rd St	-
Nursing Home	Fountain Square of Lompoc	1420 West North Avenue	-
Senior Center	Dick DeWees Community and Senior Center	1120 W Ocean Ave	-
Veteran Services	Veterans Memorial Building	100 E. Locust Avenue	$2,561,254
Veteran Services	Lompoc Veterans Services Office	108 E. Locust Avenue	$122,380
Construction	V & J Rock Transport	1655 V St	-
Construction	Valley Rock Ready Mix Concrete	1217 W Laurel Ave	-
Construction	CalPortland Lompoc Ready Mix Plant	316 North A St	-
Child Center	United Boys & Girls Clubs of Santa Barbara County - Lompoc Unit	1025 W Ocean Ave	-
Child Center	Bright Beginnings Pre-School	500 E North Ave	-
Child Center	A Caring Place	813 E North Ave	-
Corrections	United States Penitentiary	3901 Klein Boulevard	-
Corrections	Federal Correctional Institution	3600 Guard Road	-
Corrections	Lompoc City Jail	107 Civic Center Plaza	-
Court	Lompoc Court Complex	115 Civic Center Plaza	$3,897,416
Education	Clarence Ruth Elementary	501 North W Street	-
Education	Miguelito Elementary	1600 West Olive Avenue	-
Education	La Canada Elementary	620 West North Avenue	-
Education	Lompoc High School	515 West College Avenue	-
Education	Lompoc Valley Middle School	203 South L Street	-
Education	La Purisima Catholic School	219 West Olive Avenue	-
Education	Alan Hancock College	1 Hancock Drive	-
Education	El Camino School	320 North H Street	-
Education	Lompoc Schools Admin Office	1301 North A Street	-

Type	Name	Address	Total Building Value
Education	Arthur Hapgood Elementary	324 South A Street	-
Education	Leonora Fillmore Elementary	1211 East Pine Avenue	-
Education	Mission Valley	1301 N. A St.	-
Education	La Honda Steam Academy	1213 N. A St.	-
Fire Station	Lompoc Fire Station 51	115 South G Street	-
Fire Station	Lompoc Fire Station 52	1100 North D Street	-
Flood Control	Flood Control Office And Shop	597 George Miller Drive	$80,848
Government	Lompoc Dept of Social Services Bldg.	1100 W. Laurel Ave.	$2,682,917
Government	Lompoc Admin. Bldg.	401 E. Cypress Street	$2,004,532
Government	V Street Purchasing Yard		-
Government	Lompoc City Corporate Yard	1300 West Laurel Avenue	-
Government	Lompoc Civic Auditorium	203 South L Street	-
Government	Lompoc City Hall	100 Civic Center Plaza	-
Government	D Street Transit Yard		-
Government	ADMHS OFFICES	648 North H Street	$213,997
Historic Site	Mission Vieja de la Purisima Site – F Street		-
Library	Lompoc Library	501 East North Avenue	-
Museum	Carnegie Library/ Lompoc Museum		-
Police	Police Station	107 Civic Center Plaza	-
Solid Waste	Lompoc City Landfill	700 Avalon St	-
Solid Waste	Solid Waste Yard		-
Airport	Lompoc City Airport	1801 North H Street	-
Bridge	Bridge	State Route 1 SB / Santa Ynez River	-
Bridge	Bridge	State Route 1 NB / Santa Ynez River	-
Bridge	Bridge	North Avenue / San Miguelito Channel	-
Bridge	Bridge	College Ave / San Miguelito Channel	-
Bridge	Bridge	Pine Avenue / San Miguelito Channel	-
Bridge	Bridge	Central Ave / San Miguelito Channel	-
Bridge	Bridge	Floradale Ave / Santa Ynez River	-
Government	Lompoc City Bus Yard	1300 West Laurel Avenue	-

Using a GIS and the mapped extents of the hazards affecting the City, it was determined which critical facilities are exposed to which hazards depending on whether they fall within the mapped hazard area. The results of the exposure analysis are included in this section. A further description of the threats and methodologies used in this analysis is provided in Chapter 6.0, *Vulnerability*

Assessment of the 2022 MJHMP. As the City continues to assess its vulnerability, the collection of better and more complete data will help to improve the risk assessment process to direct planning and mitigation decisions.

Table 6-2. Summary of Potential Impacts on Critical Facilities

Hazard Type	Specific Risk	Count	% of Critical Facilities Impacted	Exposure ($)
Wildfire	Low	1	1%	-
	Moderate Wildfire Threat	2	2%	-
	Very High Wildfire Threat	1	1%	-
Earthquake	Regional Groundshaking	87	100%	$16,866,163
	High Liquefaction Potential	58	67%	$6,993,328
	Moderate Liquefaction Potential	24	28%	$9,872,835
	Low Liquefaction Potential	5	6%	-
Flood	1% Chance FEMA Flood Zone	6	7%	-
	0.2% Chance FEMA Flood Zone	48	55%	$6,912,480
Dam Failure	Bradbury Dam Failure	47	54%	$294,845
Landslide	Class 7 and 10	11	13%	$2,683,634

6.1 WILDFIRE

The county has extensive areas within mapped Fire Hazard Severity Zones and Wildland-Urban Interface (WUI) areas. These hazard areas generate vulnerability for life and structures, including critical facilities, throughout the county, but most severely within rural foothills areas where dry vegetation, steep slopes, and difficult access combine to create a high probability of wildfire. the City has 684 acres (9.13 percent) within High Wildfire Threat areas, 1,666 acres (22.25 percent) within Moderate Wildfire Threat areas, and 919 acres (12.28 percent) within Low Wildfire Threat areas. Most of these areas are residential with limited vulnerabilities in agricultural, and industrial areas.

Based on the GIS analysis conducted for the 2022 MJHMP, in Lompoc, 182 improved properties with a total value of over $84 million are vulnerable to wildfire. Approximately 498 residents live in high, moderate, or low wildfire threat areas. This information is summarized in Table 6-3 below (see also, Section 6.3.1, *Wildfire* of the 2022 MJHMP). Figure 6-1 shows the fire threat in the City. Fire threat is a combination of two factors: 1) fire frequency or the likelihood of a given area burning, and 2) potential fire behavior. These two factors are combined to create four threat classes ranging from Moderate to Extreme.

Table 6-3. City of Lompoc at Risk of Wildfire Threat

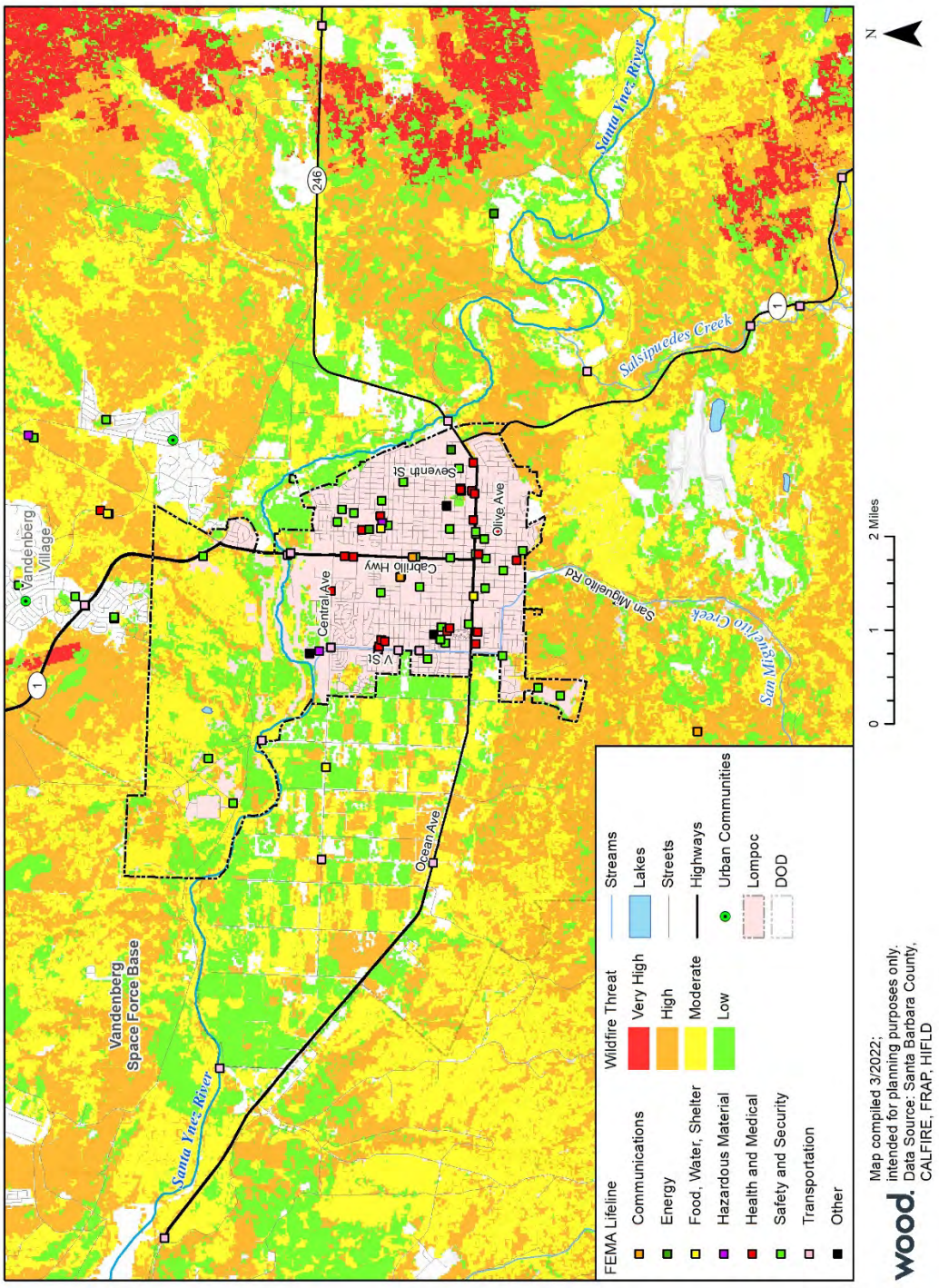
Property Type	Improved Parcel Count by Wildfire Threat Level						Total Value	Population
	Extreme	Very High	High	Moderate	Low	Total		
Agricultural	0	0	0	0	1	1	$4,214	
Commercial	0	0	0	0	0	0	$0	
Exempt	0	0	1	1	1	3	$4,206,432	
Industrial	0	0	0	0	3	3	$17,281,255	
Mixed Use	0	0	0	0	0	0	$0	0
Residential	0	0	59	49	63	171	$62,617,740	498
Improved Vacant	0	0	0	0	4	4	$100,000	
Total	**0**	**0**	**60**	**50**	**72**	**182**	**$84,209,641**	**498**

Four of the City's critical facilities with an unknown total value fall within low, moderate, or high wildfire threat areas, as listed in Table 6-4 (see also, Section 6.3.1, *Wildfire* of the 2022 MJHMP). The Federal Correctional Institution includes all associated facilities.

Table 6-4. City of Lompoc Critical Facilities Vulnerable to Wildfire

Type	Critical Facility	Hazard Source/Type	Total Building Value
Corrections	Federal Correctional Institution	Moderate Wildfire Threat	-
Bridge	Bridge	Low Wildfire Threat	-
Bridge	Bridge	High Wildfire Threat	-
Bridge	Bridge	Moderate Wildfire Threat	-

Figure 6-1. City of Lompoc Critical Facilities within Wildfire Threat Zones



6.2 EARTHQUAKE & LIQUEFACTION

Chapter 6.0, *Vulnerabilities Assessment* of the 2022 MJHMP addresses regional seismicity under two scenarios that include the City of Lompoc. The 2,500-year scenario considers general seismicity from multiple faults in the region and a 7.0 magnitude event. The methodology utilizes probabilistic seismic hazard contour maps developed by the U.S. Geological Survey (USGS) for the 2018 update of the National Seismic Hazard Maps that are included with Hazus-MH. A deterministic scenario was also prepared to predict the outcome of a specific earthquake event. The deterministic scenarios used USGS provided ShakeMap datasets to model a Magnitude 7.2 earthquake of the San Luis Range would generate in terms of damages and losses for the chosen area of interest (i.e., northern Santa Barbara County, including the City). Figure 6-2 is the ShakeMap produced for this scenario where is figure 6.2?.

As described in the MJHMP, regional losses to people and property would include the City. As shown in the San Luis Range ShakeMap scenario, the north and central parts of the county would perceive much stronger shaking and would likely receive the most severe damage when compared to the rest of the county. The entire City would perceive severe to extreme shaking and would likely receive moderate/heavy to very heavy damage. Direct effects of ground shaking could damage buildings and create dangerous debris and unstable structures. Displaced residents would likely seek shelter in the City, including residents from outside the City. Further, fires often occur after an earthquake. Because of the number of fires and the lack of water to fight the fires, they can often burn out of control.

Unreinforced masonry building type structures consist of buildings made of unreinforced concrete and brick, hollow concrete blocks, clay tiles, and adobe. Buildings constructed of these materials are heavy and brittle and typically provide little earthquake resistance. In small earthquakes, unreinforced buildings can crack, and in strong earthquakes, they tend to collapse. In 2019, the vacant Ruskowski Building in Downtown Lompoc was demolished. The two-story, 1903 unreinforced masonry building at 113 and 115 South H Street was last occupied in 1999. The building has been deemed uninhabitable since at least 1999 due to its deteriorated state and would be prohibitively expensive to restore safely. Additional buildings in Old Town Lompoc on H Street and Ocean Avenue are known to be constructed of unreinforced masonry as well.

The City's Potentially Hazardous Building Earthquake Safety Mitigation Program (Section 15.40.020 of the Lompoc Municipal Code) allows the City Building Official to continue to identify potentially hazardous buildings, including unreinforced masonry, within the City and notify the legal owner(s) of every identified a potentially hazardous building that the building is considered to be a structure of the general type that historically has exhibited little resistance to earthquake motion. Owners of potentially hazardous buildings must comply with all State and local regulations and laws, including but not limited to the obligation to post a conspicuous sign at the entrance to the building.

The City lies in an area with high, moderate, and low liquefaction severity classes. Regional earthquakes could cause liquefaction in the City, which could damage buildings and utilities when soils become unstable. Based on the GIS analysis conducted for the 2022 MJHMP, the City has 9,623 improved parcels valued at over $3 billion in liquefaction severity zones. Based on this analysis, which accounts for residents only and not workers, 26,231 residents are living in this

hazard zone within the City. While liquefaction would not likely affect all areas uniformly during an earthquake, this analysis indicates the extent and scale of vulnerabilities to liquefaction during a large earthquake.

Table 6-5. City of Lompoc at Risk to Liquefaction Hazard by Property Type

Property Type	Improved Parcel Count	Total Value	Population
High Liquefaction Hazard			
Agricultural	2	$255,282	
Commercial	150	$387,911,646	
Exempt	32	$63,390,150	
Industrial	113	$214,347,913	
Mixed Use	1	$363,728	3
Residential	5,582	$1,774,330,961	16,244
Improved Vacant	2	$617,442	
Total High Liquefaction	**5,882**	**$2,441,217,121**	**16,247**
Moderate Liquefaction Hazard			
Agricultural	0	$0	
Commercial	217	$131,773,392	
Exempt	35	$22,017,994	
Industrial	48	$33,101,940	
Mixed Use	3	$2,440,364	9
Residential	2,803	$666,935,552	8,157
Improved Vacant	3	$459,000	
Total Moderate Liquefaction	**3,109**	**$856,728,242**	**8,165**
Low Liquefaction Hazard			
Agricultural	0	$0	
Commercial	0	$0	
Exempt	2	$5,629,164	
Industrial	1	$72,620	
Mixed Use	0	$0	0
Residential	625	$219,709,787	1,819
Improved Vacant	4	$100,000	
Total Low Liquefaction	**632**	**$225,511,571**	**1,819**
Total Liquefaction Hazard	**9,623**	**$3,523,456,933**	**26,231**

As listed in Table 6-6, all critical facilities in the City with a known value of $16,866,163 would be vulnerable to damage or destruction from ground shaking and liquefaction during a significant regional earthquake (Figure 6-3; see also, Section 6.2.1, *Earthquake (Groundshaking)* and Section 6.3.3, *Liquefaction (Earthquake)* of the 2022 MJHMP).

Table 6-6. City of Lompoc Critical Facilities Vulnerable to Liquefaction

Type	Name	Address	Total Building Value
Government	Tap TV	700 North H Street	-
Utilities	GTE	205 West Pine Avenue	-
Government	City Electrical Receiving Station	1100 North D Street	-
Sub Station	PG & E Substation	1701 Industrial Way	-
Shelter	Good Samaritan Recovery	604 W Ocean Ave	-
Water Treatment Plant	Water Treatment Plant	501 East North Avenue	-
Hazmat	Household Hazardous Waste Collection Facility	1585 V St	-
RMP Facilities	Lompoc Water Treatment Plant	601 East North Avenue	-
Clinic	Lompoc Community Health Services	301 North R Street	$2,571,730
Clinic	Lompoc Wellness Center	1109 Chestnut Ave	$1,318,376
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Clinic	Lompoc County Health Maintenance Bldg.	301 North R Street	$81,984
Clinic	Lompoc County Health Serv Furnace Bldg.	301 North R Street	$43,476
Clinic	Lompoc Skilled and Rehabilitation Center	1428 West North Avenue	-
Clinic	PHD Lompoc Clinic	301 North R St	-
Clinic	Community Health Centers of the Central Coast- Lompoc	425 West Central	-
Clinic	Lompoc Artificial Kidney Center	127 West Pine Avenue	-
Clinic	Sansum Clinic-Lompoc	1225 North H St	-
Clinic	Lompoc Valley Medical Center	508 East Hickory	-
Clinic	Valley Medical Group	136 N. Third St	-
Clinic	Lompoc Comprehensive Care Center	216 North Third Street	-
Clinic	Lompoc Skilled & Rehab Center	1428 West North Avenue	-
Clinic	Lompoc Community Health Center	1300 West Ocean Ave	-
Clinic	SB County Health Care Services	301 North R Street	-
Clinic	H Street Lompoc Valley Medical	1307 North H Street	-
Clinic	3rd Street Lompoc Valley Medical	136 N Third St	-
Clinic	Lompoc Convalescent Home	216 North Third Street	-
Clinic	Lompoc District Hospital	1515 East Ocean	-
Clinic	Sansum Clinic	1225 North H Street	-
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EMS Station	Lompoc Fire Department Station 51	115 South G Street	-
EMS Station	American Medical Response Station 7	701 East North Avenue	-
Nursing Home	Lompoc Skilled Nursing & Rehabilitation Center	1428 W North Ave	-
Nursing Home	Lompoc Valley Medical Center Comprehensive Care Center D/P SNF	216 N 3rd St	-

Type	Name	Address	Total Building Value
Nursing Home	Fountain Square of Lompoc	1420 West North Avenue	-
Senior Center	Dick DeWees Community and Senior Center	1120 W Ocean Ave	-
Veteran Services	Veterans Memorial Building	100 E. Locust Avenue	$2,561,254
Veteran Services	Lompoc Veterans Services Office	108 E. Locust Avenue	$122,380
Construction	V & J Rock Transport	1655 V St	-
Construction	Valley Rock Ready Mix Concrete	1217 W Laurel Ave	-
Construction	CalPortland Lompoc Ready Mix Plant	316 North A St	-
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Child Center	Bright Beginnings Pre-School	500 E North Ave	-
Child Center	A Caring Place	813 E North Ave	-
Corrections	United States Penitentiary	3901 Klein Boulevard	-
Corrections	Federal Correctional Institution	3600 Guard Road	-
Corrections	Lompoc City Jail	107 Civic Center Plaza	-
Court	Lompoc Court Complex	115 Civic Center Plaza	$3,897,416
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Education	Miguelito Elementary	1600 West Olive Avenue	-
Education	La Canada Elementary	620 West North Avenue	-
Education	Lompoc High School	515 West College Avenue	-
Education	Lompoc Valley Middle School	203 South L Street	-
Education	La Purisima Catholic School	219 West Olive Avenue	-
Education	Alan Hancock College	1 Hancock Drive	-
Education	El Camino School	320 North H Street	-
Education	Lompoc Schools Admin Office	1301 North A Street	-
Education	Arthur Hapgood Elementary	324 South A Street	-
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Education	Mission Valley	1301 N. A St.	-
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Flood Control	Flood Control Office And Shop	597 George Miller Drive	$80,848
Government	Lompoc Dept of Social Services Bldg.	1100 W. Laurel Ave.	$2,682,917
Government	Lompoc Admin. Bldg.	401 E. Cypress Street	$2,004,532
Government	V Street Purchasing Yard		-
Government	Lompoc City Corporate Yard	1300 West Laurel Avenue	-
Government	Lompoc Civic Auditorium	203 South L Street	-
Government	Lompoc City Hall	100 Civic Center Plaza	-
Government	D Street Transit Yard		-

Type	Name	Address	Total Building Value
Government	ADMHS OFFICES	648 North H Street	$213,997
Historic Site	Mission Vieja de la Purisima Site – F Street		-
Library	Lompoc Library	501 East North Avenue	-
Museum	Carnegie Library/ Lompoc Museum		-
Police	Police Station	107 Civic Center Plaza	-
Solid Waste	Lompoc City Landfill	700 Avalon St	-
Solid Waste	Solid Waste Yard		-
Airport	Lompoc City Airport	1801 North H Street	-
Bridge	Bridge	State Route 1 SB / Santa Ynez River	-
Bridge	Bridge	State Route 1 NB / Santa Ynez River	-
Bridge	Bridge	North Avenue / San Miguelito Channel	-
Bridge	Bridge	College Ave / San Miguelito Channel	-
Bridge	Bridge	Pine Avenue / San Miguelito Channel	-
Bridge	Bridge	Central Ave / San Miguelito Channel	-
Bridge	Bridge	Floradale Ave / Santa Ynez River	-
Government	Lompoc City Bus Yard	1300 West Laurel Avenue	-

Figure 6-2. City of Lompoc Critical Facilities and Earthquake Groundshaking Potential (San Luis Range 7.2 Magnitude ShakeMap)

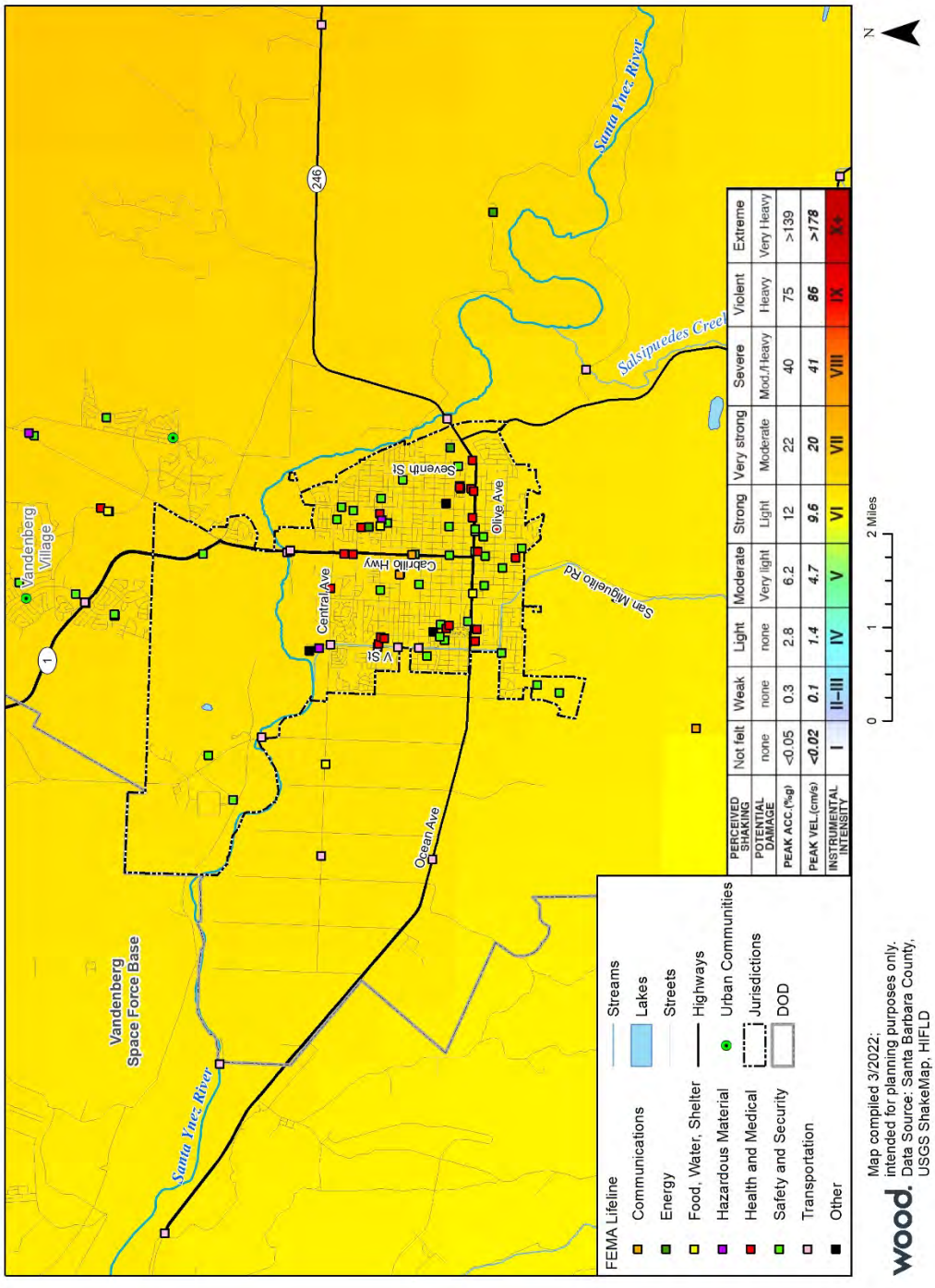
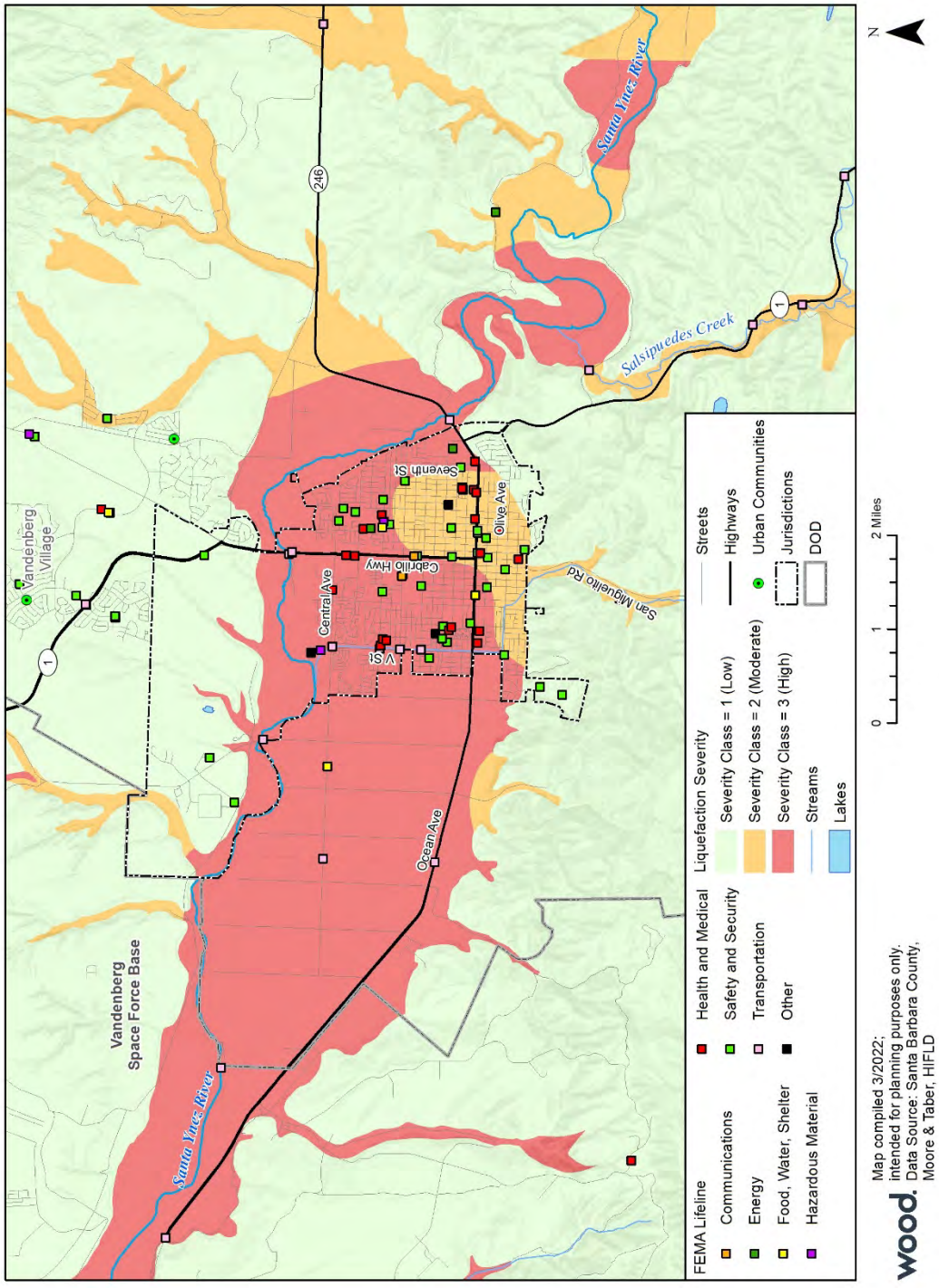


Figure 6-3. City of Lompoc Critical Facilities and Liquefaction Potential



6.3 FLOOD

The geographical location, climate, and topography of the Lompoc Valley make some areas of the City prone to flooding, particularly associated with the seasonal flooding of the Santa Ynez River. Flooding presents a hazard to development in floodplains. In addition to the damage to properties, flooding can also cut off access to utilities, emergency services, and transportation, and may impact the overall economic well-being of an area. Emergency response can be interrupted by damaged roads and infrastructure. Fire can break out as a result of dysfunctional electrical equipment. Hazardous materials can also get into floodways, causing health concerns and polluted water supplies. During a flood, the drinking water supply can be contaminated. Climate change is expected to increase the frequency and intensity of heavy rainstorms that cause riverine flooding.

Approximately 1,052 acres (14.05 percent) of the City are susceptible to the 1-percent annual chance of flood as identified by FEMA. Based on the GIS analysis conducted for the 2022 MJHMP, the City has 17 improved parcels valued at over $29 million in the 1-percent annual chance floodplain. Based on this analysis, which accounts for residents only and not workers, 44 residents are living in the 1-percent annual chance floodplain throughout the City. An additional 4,769 improved parcels and over $2.1 billion in value fall within the 0.2-percent annual chance floodplain. Areas of the City vulnerable to the 0.2-percent annual chance riverine flood are home to 12,676 residents. Development in the 0.2-percent annual chance floodplain is typically not regulated, thus a large flood event could be extremely damaging to the City. This information is summarized in Table 6-7 below.

Table 6-7. City of Lompoc FEMA Floodplain Exposure and Loss

Property Type	Improved Parcel Count	Total Value	Estimated Loss	Population
Riverine 1% Annual Chance Floodplain Exposure and Loss				
Exempt	1	$0	$0	
Industrial	1	$8,571,448	$2,142,862	
Residential	15	$20,471,777	$5,117,944	
Total 1% Chance	**17**	**$29,043,224**	**$7,260,806**	44
Riverine 0.2% Annual Chance Floodplain Exposure and Loss				
Agricultural	2	$255,282	$63,821	
Commercial	264	$426,557,026	$106,639,257	
Exempt	41	$67,457,306	$16,864,327	
Industrial	103	$178,369,310	$44,592,328	
Mixed Use	3	$864,202	$216,051	
Residential	4,353	$1,426,282,305	$356,570,576	
Improved Vacant	3	$849,442	$212,361	
Total 0.2% Chance	**4,769**	**$2,100,634,873**	**$525,158,718**	12,676
Total Flood Hazard	**4,786**	**$2,129,678,097**	**$532,419,524**	**12,720**

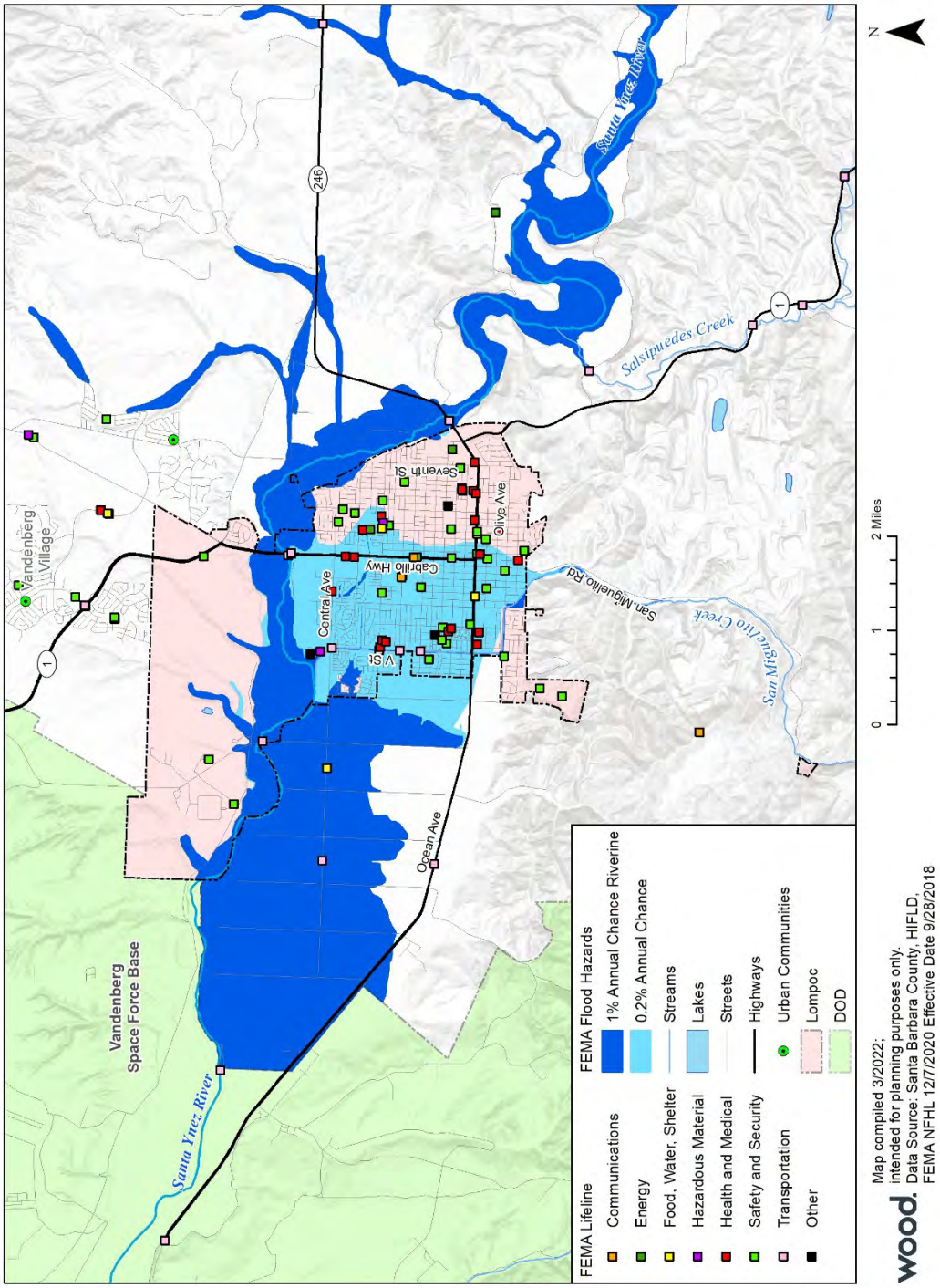
As listed in Table 6-8, 54 critical facilities in the City with a total known value of $6,912,480 would be vulnerable to damage or destruction from 1-percent or 0.2-percent annual chance of flood (Figure 6-4; see also, Section 6.3.3, *Flood* of the 2022 MJHMP).

Table 6-8. City of Lompoc Critical Facilities at Risk to Flood Hazard same twice listed issue

Type	Name	FEMA Flood Chance	Total Building Value
Government	Tap TV	0.2% Chance	-
Utilities	GTE	0.2% Chance	-
Government	City Electrical Receiving Station	0.2% Chance	-
Shelter	Good Samaritan Recovery	0.2% Chance	-
Water Treatment Plant	Water Treatment Plant	0.2% Chance	-
Hazmat	Household Hazardous Waste Collection Facility	0.2% Chance	-
RMP Facilities	Lompoc Water Treatment Plant	0.2% Chance	-
Clinic	Lompoc Community Health Services	0.2% Chance	$2,571,730
Clinic	Lompoc Wellness Center	0.2% Chance	$1,318,376
Clinic	Lompoc County Health Maintenance Bldg.	0.2% Chance	$81,984
Clinic	Lompoc County Health Serv Furnace Bldg.	0.2% Chance	$43,476
Clinic	Lompoc Skilled and Rehabilitation Center	0.2% Chance	-
Clinic	PHD Lompoc Clinic	0.2% Chance	-
Clinic	Community Health Centers of the Central Coast- Lompoc	0.2% Chance	-
Clinic	Lompoc Artificial Kidney Center	0.2% Chance	-
Clinic	Sansum Clinic-Lompoc	0.2% Chance	-
Clinic	Lompoc Skilled & Rehab Center	0.2% Chance	-
Clinic	Lompoc Community Health Center	0.2% Chance	-
Clinic	SB County Health Care Services	0.2% Chance	-
Clinic	H Street Lompoc Valley Medical	0.2% Chance	-
Clinic	Sansum Clinic	0.2% Chance	-
EMS Station	Lompoc Fire Station 52	0.2% Chance	-
EMS Station	Lompoc Fire Station 51	0.2% Chance	-
Nursing Home	Lompoc Skilled Nursing & Rehabilitation Center	0.2% Chance	-
Nursing Home	Fountain Square of Lompoc	0.2% Chance	-
Senior Center	Dick DeWees Community and Senior Center	0.2% Chance	-
Construction	V & J Rock Transport	0.2% Chance	-
Construction	Valley Rock Ready Mix Concrete	0.2% Chance	-
Child Center	United Boys & Girls Clubs of Santa Barbara County - Lompoc Unit	0.2% Chance	-
Child Center	Bright Beginnings Pre-School	0.2% Chance	-
Education	Clarence Ruth Elementary	0.2% Chance	-

Type	Name	FEMA Flood Chance	Total Building Value
Education	La Canada Elementary	0.2% Chance	-
Education	Lompoc High School	0.2% Chance	-
Education	Lompoc Valley Middle School	0.2% Chance	-
Education	La Purisima Catholic School	0.2% Chance	-
Education	El Camino School	0.2% Chance	-
Fire Station	Lompoc Fire Station 51	0.2% Chance	-
Fire Station	Lompoc Fire Station 52	0.2% Chance	-
Government	Lompoc Dept Of Social Services Bldg.	0.2% Chance	$2,682,917
Government	V Street Purchasing Yard	0.2% Chance	-
Government	Lompoc City Corporate Yard	0.2% Chance	-
Government	Lompoc Civic Auditorium	0.2% Chance	-
Government	ADMHS OFFICES	0.2% Chance	$213,997
Library	Lompoc Library	0.2% Chance	-
Museum	Carnegie Library/ Lompoc Museum	0.2% Chance	-
Airport	Lompoc City Airport	1% Chance	-
Bridge	Bridge	0.2% Chance	-
Bridge	Bridge	0.2% Chance	-
Bridge	Bridge	1% Chance	-
Bridge	Bridge	1% Chance	-
Bridge	Bridge	1% Chance	-
Bridge	Bridge	1% Chance	-
Bridge	Bridge	1% Chance	-
Government	Lompoc City Bus Yard	0.2% Chance	-

Figure 6-4. City of Lompoc Critical Facilities in FEMA Flood Hazard Zones Need figure



6.4 DAM FAILURE

Bradbury Dam is of the largest concern to the City of Lompoc. Failure of Bradbury Dam would inundate portions of the City with relatively little evacuation time. Based on the GIS analysis conducted for the 2022 MJHMP, in Lompoc, 6,253 improved properties with a total value of $2.4 billion are vulnerable to the catastrophic flooding that would occur if Bradbury Dam failed. Approximately 17,163 residents within the inundation zone may need to be evacuated, cared for, and possibly permanently relocated. This information is summarized in Table 6-9 below.

Table 6-9. City of Lompoc at Risk of Dam Inundation Hazard

Property Type	Improved Parcel Count	Total Value	Population
Agricultural	2	$255,282	
Commercial	164	$370,231,348	
Exempt	36	$61,446,914	
Industrial	150	$226,111,875	
Mixed Use	1	$363,728	3
Residential	5,897	$1,820,746,806	17,160
Improved Vacant	3	$628,442	
Total	**6,253**	**$2,479,784,395**	**17,163**

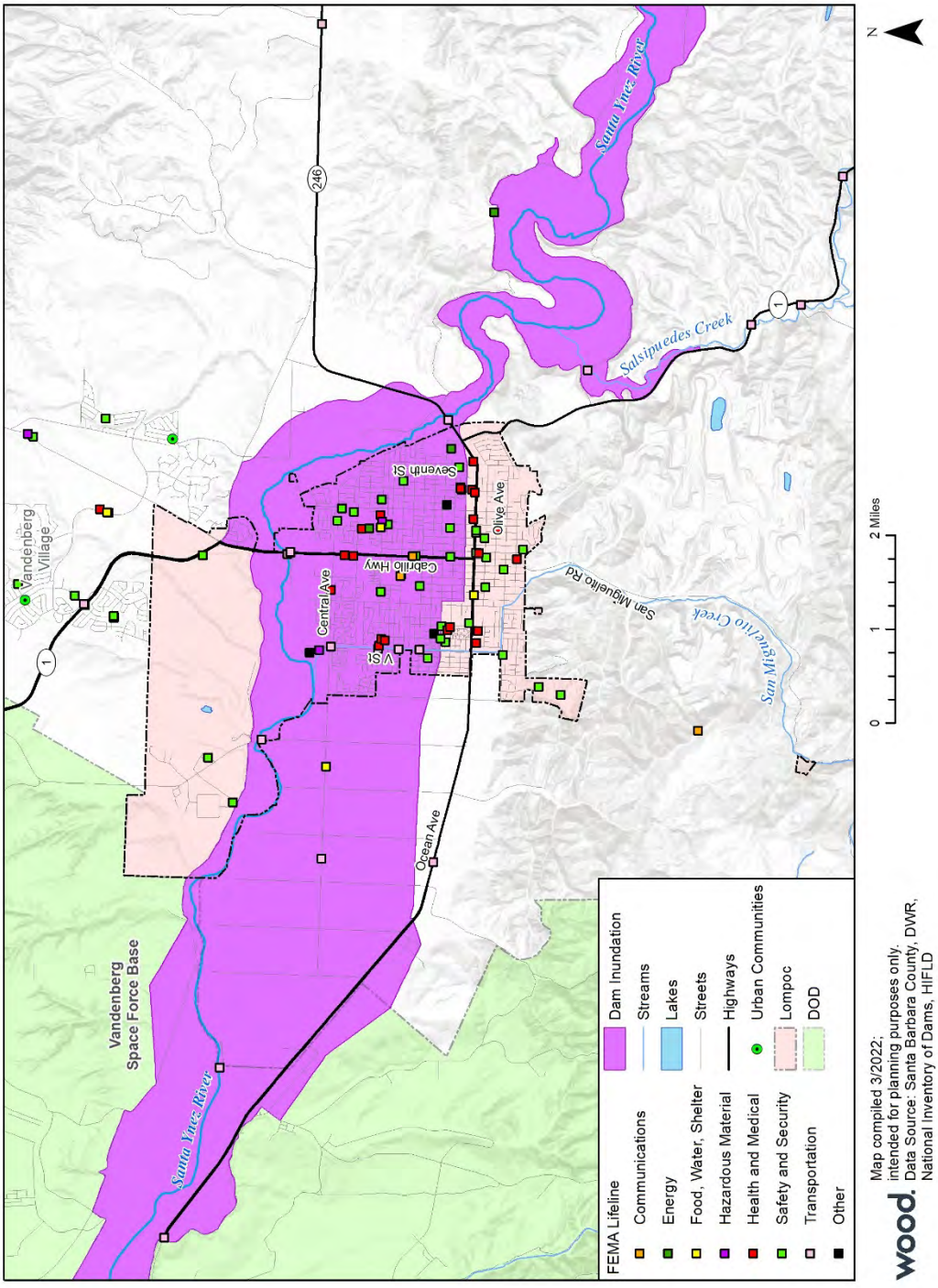
As listed in Table 6-10, 47 critical facilities in the City with a total known value of $294,845 would be vulnerable to damage or destruction from dam inundation (Figure 6-5; see also, Section 6.6.3, *Dam Failure* of the 2022 MJHMP).

Table 6-10. City of Lompoc Critical Facilities Vulnerable to Inundation from Dam Failure

Type	Name	Total Building Value
Government	Tap TV	-
Utilities	GTE	-
Government	City Electrical Receiving Station	-
Sub Station	PG & E Substation	-
Water Treatment Plant	Water Treatment Plant	-
Hazmat	Household Hazardous Waste Collection Facility	-
RMP Facilities	Lompoc Water Treatment Plant	-
Clinic	Lompoc Skilled and Rehabilitation Center	-
Clinic	Community Health Centers of the Central Coast- Lompoc	-
Clinic	Lompoc Artificial Kidney Center	-
Clinic	Sansum Clinic-Lompoc	-
Clinic	Lompoc Comprehensive Care Center	-
Clinic	Lompoc Skilled & Rehab Center	-
Clinic	H Street Lompoc Valley Medical	-
Clinic	Lompoc Convalescent Home	-

Type	Name	Total Building Value
Clinic	Sansum Clinic	-
EMS Station	Lompoc Fire Station 52	-
EMS Station	American Medical Response Station 7	-
Nursing Home	Lompoc Skilled Nursing & Rehabilitation Center	-
Nursing Home	Lompoc Valley Medical Center Comprehensive Care Center D/P SNF	-
Nursing Home	Fountain Square Of Lompoc	-
Construction	V & J Rock Transport	-
Construction	Valley Rock Ready Mix Concrete	-
Construction	CalPortland Lompoc Ready Mix Plant	-
Child Center	Bright Beginnings Pre-School	-
Child Center	A Caring Place	-
Education	Clarence Ruth Elementary	-
Education	La Canada Elementary	-
Education	Lompoc High School	-
Education	El Camino School	-
Education	Lompoc Schools Admin Office	-
Education	Leonora Fillmore Elementary	-
Education	Mission Valley	-
Education	La Honda Steam Academy	-
Fire Station	Lompoc Fire Station 52	-
Flood Control	Flood Control Office and Shop	$80,848
Government	D Street Transit Yard	-
Government	ADMHS OFFICES	$213,997
Library	Lompoc Library	-
Airport	Lompoc City Airport	-
Bridge	Bridge	-
Bridge	Bridge	-
Bridge	Bridge	-
Bridge	Bridge	-
Bridge	Bridge	-
Bridge	Bridge	-
Bridge	Bridge	-

Figure 6-5. City of Lompoc Critical Facilities in Dam Inundation Zone



6.5 LANDSLIDE

The City has 831 improved parcels that lie within Class 7, 9, or 10 landslide hazard zone, amounting to $251 million, and home to 2,395 residents (Table 6-11). However, Lompoc is a gently sloping area in a riverine flood plain where the risk of landslide is generally low. An increase in risk related to landslides would be man-made through excavation or other soil disturbance. While not a concern for the City, data related to areas within the landslide hazard zone is included to be consistent with the 2022 MJHMP.

Table 6-11. City of Lompoc Improved Properties at Risk to Landslide Summary

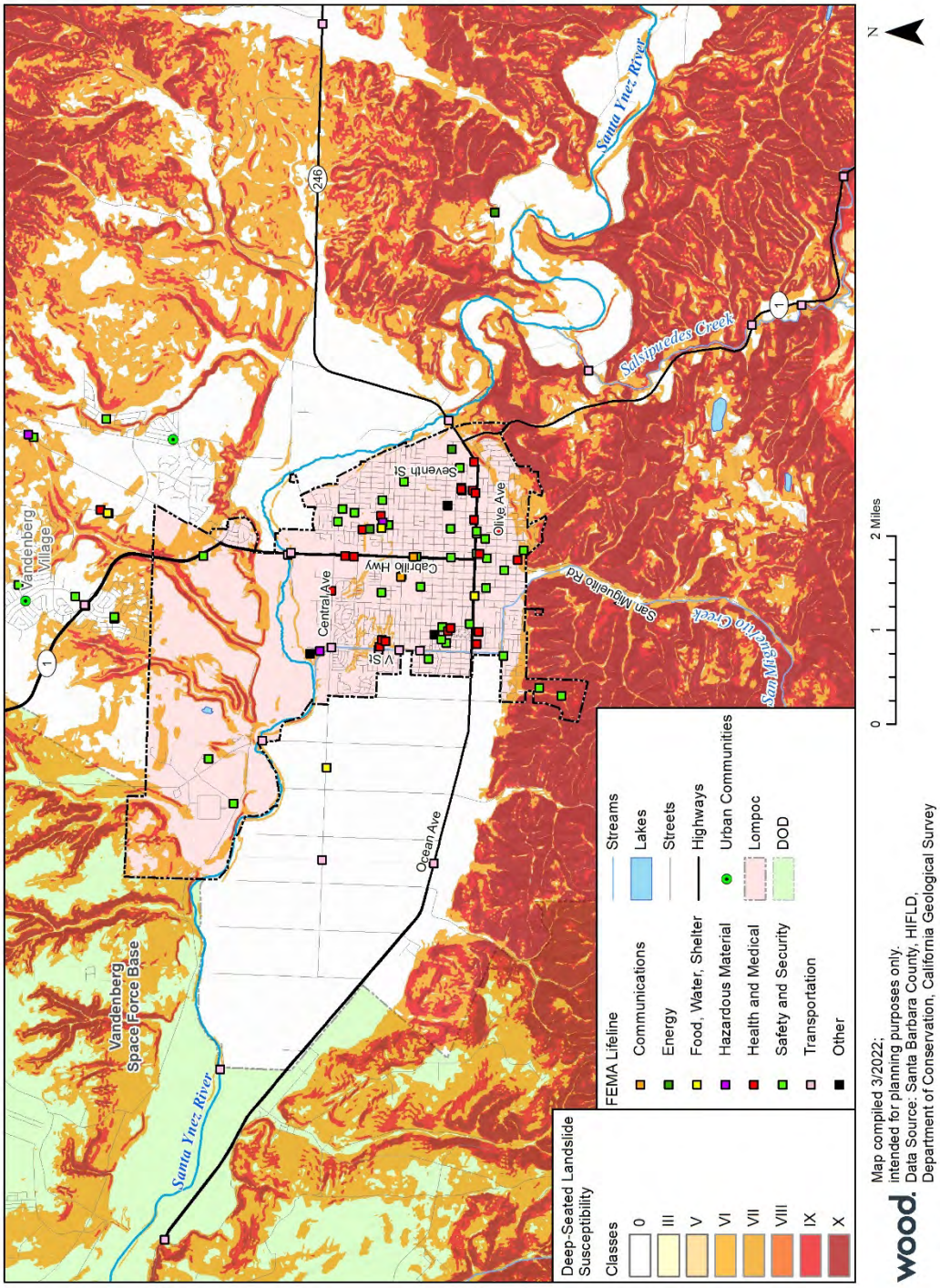
Class 7 Parcel Count	Class 9 Parcel Count	Class 10 Parcel Count	Total Improved Parcel Count	Total Value	Population
758	57	16	831	$251,613,721	2,395

Further, as listed in Table 6-12, 11 critical facilities in the City with a total known value of $2,683,634 would be vulnerable to damage or destruction from landslides (Figure 6-6; see also, Section 6.3.7, *Landslide* of the 2022 MJHMP).

Table 6-12. City of Lompoc Critical Facilities Vulnerable to Landslide

Type	Name	Landslide Severity Class	Total Building Value
Hazmat	Household Hazardous Waste Collection Facility	7	-
EMS Station	LOMPOC FIRE DEPARTMENT STATION 2	7	-
Veteran Services	Veterans Memorial Building	7	$2,561,254
Veteran Services	LOMPOC VETERANS SERVICES OFFICE	7	$122,380
Historic Site	Mission Vieja de la Purisima Site – F Street	7	-
Solid Waste	Lompoc City Landfill	7	-
Solid Waste	Solid Waste Yard	10	-
Bridge - Non-Scour Fair Condition	Bridge	7	-
Bridge - Non-Scour Good Condition	Bridge	7	-
Bridge - Non-Scour Good Condition	Bridge	7	-
Bridge - Non-Scour Good Condition	Bridge	7	-

Figure 6-6. City of Lompoc Critical Facilities within Landslide Susceptibility Zones



7.0 MITIGATION STRATEGY

In preparation for the 2022 LHMP update, the City's LPT made no revisions to the countywide goals and objectives because they continue to reflect the needs of the City; see also, Chapter 7.0, *Mitigation Plan* of the 2022 MJHMP. This section contains the City's updated and most current mitigation strategy as of 2022.

7.1 MITIGATION GOALS AND OBJECTIVES

The City'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. These preliminary goals, objectives, and actions were developed to represent a vision of long-term hazard reduction or enhancement of capabilities. To help further the development of these goals and objectives, the LPT compiled and reviewed current jurisdictional sources, including the City's planning documents, codes, and ordinances, and specifically discussed hazard-related goals, objectives, and actions as they related to the overall LHMP.

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

Since 2017, the City has incorporated the LHMP goals, objectives, and mitigation actions into its local plans and processes, including the General Plan Safety Element by reference, specific hazard planning efforts (e.g., Comprehensive Emergency Management Plan), the City's grant pursuits, and capital improvement planning. Ongoing monitoring and evaluation of the LHMP by the City ensured mitigations are implemented and tracked. Key mitigation actions underway since 2017 include inspecting Fire Station No. 51 for needed earthquake retrofits and enhanced outreach techniques.

The City's LPT reviewed the mitigation actions listed in the 2017 LHMP to determine the status of each action. Once reviewed, deferred projects from 2017 were renumbered to reflect 2022 updates (see Table 7-1).

Table 7-1. Status of City of Lompoc Previous Mitigation Actions

Mitigation Action No.	Mitigation Action Description	Status	Comments	In 2022 Update?
2016-1	Earthquake Retrofit Fire Station	In Progress	The Fire Station No. 51 building was inspected in 2014 but has not been retrofitted	X
2016-2	Continue to identify the most at-risk critical facilities in Lompoc and create a mitigation action plan for those facilities	In Progress		X
2016-3	Inform public about proper evacuation procedures.	In Progress		X
2016-4	Advise the public about the local flood hazard, flood insurance, and flood protection measures.	In Progress		X
2016-5	Create a wildfire scenario to estimate potential loss of life and injuries, the types of potential damage, and existing vulnerabilities within a community to develop Wildfire mitigation priorities.	In Progress		X
2016-6	Schedule an annual "what's new in mitigation" briefing for the City Council.	In Progress		X
2016-7	Continue City of Lompoc Water Wise outreach program	In Progress		X
2016-8	Santa Ynez Riverbank Stabilization-Riverside Location-Part 1	In Progress		X
2016-9	Santa Ynez Riverbank Stabilization-Riverside Location-Part 2	In Progress		X

7.3 MITIGATION APPROACH

A simplified Benefit-Cost Review was applied to both deferred and new 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 Planning Team. 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. Earthquake Retrofit Fire Station No. 51

A 2014 Seismic Evaluation of Fire Station No. 51 advised that the building is very likely to be partially or completely non-functional as a fire station due to aging facilities and retrofit needs. The City pursued funding for station retrofit and redesign in 2015 but was not awarded funding by CalOES (2019). In 2019, a Structural Condition Assessment indicated no imminent safety concern but did not evaluate seismic compliance issues. As such, structural retrofit, design, and upgrades continue to be needed for Fire Station No. 51 to support increased staffing, modern apparatus, workspace, restrooms and gender accommodations, training, and CIP requests.

Mitigation Priority and Performance	
Priority	Low
Hazards Mitigated	Earthquake
Estimated Timeline	18 months
Estimated Cost/Funding Source	$3,266,514/ BRIC
Responsible Agency/Department	Fire Department
Comments	This project was adapted from 2016-1 included as part of the 2017 LHMP. In 2019, CalOES denied funding due to ineligibility.

2022-2. Critical Facilities Review and Identification

Using GIS mapping of all Critical Facilities to facilitate analysis to identify vulnerable facilities.

Mitigation Priority and Performance	
Priority	High
Hazards Mitigated	Wildfire, Earthquake, Flood, Drought & Water Storage, Dam Failure
Estimated Timeline	24 months

Mitigation Priority and Performance	
Estimated Cost/Funding Source	$3,000/ Departmental budgets
Responsible Agency/Department	Fire Department
Comments	This project was adapted from 2016-2 included as part of the 2017 LHMP.

2022-3. Evacuation Procedure Public Outreach

Create an Education Campaign to Inform the public about proper evacuation procedures. The Campaign would use the city Web page, Social Media, Print, Audio, and Video Media. The Fire Department would include proper evacuation procedures in their CERT curriculum

Mitigation Priority and Performance	
Priority	High
Hazards Mitigated	Wildfire, Earthquake, Flood, Dam Failure
Estimated Timeline	Ongoing with new programs introduced quarterly
Estimated Cost/Funding Source	$50,000/ Departmental budgets
Responsible Agency/Department	Fire Department
Comments	This project was adapted from 2016-3 included as part of the 2017 LHMP.

2022-4. Flood Hazard Public Outreach

Inform the public at regularly scheduled Public Events as to local flood hazards, flood insurance, and flood protection measures. The events will be held at Home Depot CERT training, LISTOS training, and Ready SBC training. City webpage and Social Media will also be utilized.

Mitigation Priority and Performance	
Priority	High
Hazards Mitigated	Flood
Estimated Timeline	Ongoing
Estimated Cost/Funding Source	$2,000/ Departmental budgets
Responsible Agency/Department	Fire Department
Comments	This project was adapted from 2016-4 included as part of the 2017 LHMP.

2022-5. Wildfire Scenario Planning

Using GIS mapping of wildfire hazard areas to facilitate analysis and planning decisions through comparison with zoning, development, infrastructure, etc. Developing and maintaining a database to track community vulnerability to wildfire.

Mitigation Priority and Performance	
Priority	Moderate
Hazards Mitigated	Wildfire
Estimated Timeline	Ongoing
Estimated Cost/Funding Source	$5,000/ Departmental budgets
Responsible Agency/Department	Fire Department

Mitigation Priority and Performance	
Comments	This project was adapted from 2016-5 included as part of the 2017 LHMP.

2022-6. Annual City Council Briefing

Present to the City Council and Public the status of Mitigation Measures in progress and completed. Advise the City Council and Public of the effectiveness of the Mitigation and its cost-effectiveness.

Mitigation Priority and Performance	
Priority	High
Hazards Mitigated	Wildfire, Earthquake, Flood, Drought & Water Storage, Dam Failure
Estimated Timeline	Ongoing
Estimated Cost/Funding Source	$1,000/ Departmental budgets
Responsible Agency/Department	Fire Department
Comments	This project was adapted from 2016-6 included as part of the 2017 LHMP.

2022-7. Water-Wise Public Outreach

Inform and educate residents about water conservation programs and rebates to reduce water usage, and increase water efficiency

Mitigation Priority and Performance	
Priority	Moderate
Hazards Mitigated	Drought & Water Storage
Estimated Timeline	Ongoing
Estimated Cost/Funding Source	$10,000/ Departmental budgets
Responsible Agency/Department	Utilities Department
Comments	This project was adapted from 2016-7 included as part of the 2017 LHMP.

2022-8. Santa Ynez Riverbank Stabilization-Riverside Location Part 1

Mitigate bank erosion poses potential threats to adjacent residences, properties, and public streets. Construct a bank stabilization project to mitigate these threats.

Mitigation Priority and Performance	
Priority	Moderate
Hazards Mitigated	Flood
Estimated Timeline	24 months
Estimated Cost/Funding Source	$1.1 million/ FMA Grant
Responsible Agency/Department	Public Works Department
Comments	This project was adapted from 2016-8 included as part of the 2017 LHMP.

2022-9. Santa Ynez Riverbank Stabilization-Riverside Location Part 2

Design and construct a bank stabilization project. The continual progression of Santa Ynez Riverbank erosion poses potential threats to adjacent properties, city park facilities, and public streets. Additionally, continued bank erosion is anticipated to damage the Riverbend Park bikeway within the next one to two large (10-year recurrence interval) storms.

Mitigation Priority and Performance	
Priority	Moderate
Hazards Mitigated	Flood
Estimated Timeline	24 months
Estimated Cost/Funding Source	$2.4 million/ FMA Grant
Responsible Agency/Department	Public Works Department
Comments	This project was adapted from 2016-9 included as part of the 2017 LHMP.

2022-10. Riverbend Park Flood Hazard Assessment

Risk assessment study for flood hazard vulnerabilities present at Riverbend Park. City desires to improve and expand the recreational uses within Riverbend Park and the surrounding area if possible. Park is currently used as a soccer field, a bike park, and a baseball field. The park and surrounding area are located in flood Zone AE per FEMA FIRM Map 06083C0737G. Engage Engineering consultant to determine the feasibility of any flood mitigation efforts that could lead to the ability of the City to construct permanent park improvements such as lighting, sports field expansion, restrooms, concessions, etc.

Mitigation Priority and Performance	
Priority	Moderate
Hazards Mitigated	Flood
Estimated Timeline	2027
Estimated Cost/Funding Source	$500,000/FMA Grant
Responsible Agency/Department	City Public Works Department and Santa Barbara County Flood Control and Water Conservation District
Comments	

8.0 PLAN MAINTENANCE

8.1 MONITORING, EVALUATING, AND UPDATING THE PLAN

Since the last LHMP in 2017, the LPT has monitored, evaluated, and updated the plan on a continuing and as-needed basis. The City has made progress on implementing some of the 2017 mitigation actions as noted in Table 7-1. All mitigation actions outlined in the 2017 LHMP are ongoing at the time of this 2022 update.

The City Fire Department will be responsible for ensuring that this LHMP is monitored on an ongoing basis. The Fire Department will call the LPT together quarterly to review the mitigation actions outlined in this LHMP and discuss progress. During this meeting the LPT, while continuing to

collaborate with the County MAC team, will develop a list of hazards to be updated, added, or removed in future revisions of this LHMP.

The LHMP will be a discussion/work item on the City Staff Meeting Agenda. City Department heads and other emergency preparedness staff who serve in the County's EOC will focus on evaluating the LHMP in light of technological, budgetary, political changes, or other significant events that may occur during the year.

The City will continue to participate in the countywide MAC and attend the annual meeting organized by the County Office of Emergency Management 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 City's LHMP will be forwarded to the County Office of Emergency Management for inclusion in further updates to the MJHMP.

The City is committed to reviewing and updating this LHMP at least once every five years, as required by the DMA. Major disasters affecting the City, legal changes, and/or other events may trigger a meeting of the MAC. This group will be responsible for determining if the LHMP needs to be updated before the five-year mark. To remain eligible for mitigation grant funding from FEMA, the City is committed to revising the plan at a minimum of every five years. The City's Director of Public Safety or the City'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 City 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., General Plan, building codes, floodplain management ordinance). The General Plan and the LHMP annex are complementary documents that work together to achieve the goal of reducing risk exposure to the City's citizens. An update to a general plan 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 City incorporates the LHMP by reference into its General Plan Safety Element. Under AB 2140, the City may adopt its current, FEMA-approved LHMP into the Safety Element of the General Plan. This adoption makes the City eligible to be considered for part or all of its local-share costs on

eligible Public Assistance funding to be provided by the state through the California Disaster Assistance Act (CDAA) (see Section 2.0, *Plan Purpose and Authority* for the adopting resolutions). The LHMP has also been prepared to support the City's effort to evaluate wildfire scenarios. The Floodplain Management Ordinance applies in concert with the City's zoning ordinance and building codes to reduce flooding hazards from land use. The LHMP includes mitigations addressing flood control infrastructure to support the City's efforts to reduce flooding hazards.

The information contained within this LHMP, including results from the Vulnerability Assessment and the Mitigation Strategy, is used by the City to help inform updates and the development of local plans, programs, and policies. The City may utilize the hazard information when developing and implementing the City's capital improvement programs and the Planning and Building Divisions may utilize the hazard information when reviewing a site plan or other type of development applications.

8.3 ONGOING PUBLIC OUTREACH AND ENGAGEMENT

The public will continue to be involved whenever the LHMP is updated and as appropriate during the monitoring and evaluation process utilizing the robust Lompoc Fire Department Outreach program (refer to Section 3.4.2). Before the adoption of updates, the City will provide multiple opportunities for the public to comment on the revisions. Lompoc citizens will be made aware of public meetings via, the City webpage, print, audio, visual, and social media. Moreover, the City 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 Carol Brown, Battalion Chief, using the following information:

Brian Fallon
Fire Chief
City of Lompoc Fire Department
115 South G Street
Lompoc, CA. 93436
B_Fallon@ci.lompoc.ca.us
(805) 315-8153

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City of Santa Barbara

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 City of Santa Barbara (City) 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 City. The LHMP was last comprehensively updated in 2017 as an annex to the 2017 MJHMP. Since 2017, the City has:

- Incorporated the LHMP goals, objectives, and mitigation actions into its local plans and processes, including the General Plan Safety Element by reference and specific hazard planning efforts (e.g., Sea Level Rise Adaptation Plan).
- Used the LHMP's assessment of capabilities, hazards, and vulnerabilities to inform planning, capital improvements, programs, decision-makers, and the public.
- Implemented mitigation actions through the City's general plan, capital improvement program, maintenance programs, grant programming, community outreach, and budget process.
- Reviewed and evaluated mitigation actions before and after disasters, including the Thomas Fire and Montecito debris flow.

This 2022 update to the LHMP builds on and refines the MJHMP's assessment of hazards and vulnerabilities countywide to develop a mitigation plan for the City. The City participated in the 2022 MJHMP Mitigation Advisory Committee (MAC) and Local Planning Team (LPT), reviewed all portions of the MJHMP pertaining to the City, 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, *Planning Process* below). The City is a participating agency in the County's MJHMP update.

The City'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 City. Vulnerability assessments summarize the identified hazards' impact on the City. 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 City's 2022 LHMP.

[INSERT CITY RESOLUTION(S) ADOPTING PLAN UPDATE]

[INSERT CITY 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 City'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 Mitigation Advisory Committee (MAC) and the second is the Local Planning Team (LPT).

All eight incorporated cities and the six special districts joined the County as participating agencies in the preparation of the MJHMP update, including the 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 Santa Maria Valley Water Conservation District (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 City participated as a MAC member to prepare this LHMP as an annex to the 2022 MJHMP. The City was represented by Yolanda McGlinchey, Emergency Services Manager, 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	**MAC Meeting #1 (virtual)** 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	**MAC Meeting #2 (virtual)** 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	**MAC Meeting #3 (virtual)** 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	**MAC Meeting #4 (virtual)** 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	**MAC Meeting #5 (virtual)** Presented draft plan Discussed key MAC/LPT review needs and key issues Discussed annex updates to dovetail with plan update
March 2022	**MAC Meeting #6 (virtual)** Review and discuss public comments received on the draft plan Recommend a revised draft plan to decision-makers Review annex updates for review and approval

3.3 LOCAL PLANNING TEAM (LPT)

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

Table 3-2. City of Santa Barbara Local Planning Team 2022

Department	Name	Title
Airport	Aaron Keller	Airport Operations Manager
Public Works	Adam Hendel	Principal Engineer
Sustainability & Resilience	Alelia Parenteau	Interim Sustainability & Resilience Dept. Director
Attorney	Ariel Calonne	City Attorney
Public Works	Ashleigh Shue	Principle Engineer
Fire	Brady Beck	Fire Investigator III
Airport	Brian D'Amour	Interim Airport Director
Public Works	Catherine Taylor	Water Services Manager
Community Development	Christina Dye	Building Official
Fire	Christopher Braden	Wildland Fire Services Specialist - GIS
Finance	Doug Smith	Accounting Manager
Information Technology	Eric Just	GIS Coordintor
Waterfront	Erik Engebretson	Harbor Operations Manager
Parks & Recreation	Jazmin LeBlanc	Assistant Parks & Recreation Director
Public Works	Jeff Brent	Maintenance Supervisor II
Library	Jessica Cadiente	Library Director
Public Works	Jim Dewey	Streets Operations Infrastructure Manager
Police	Joshua Morton	Police Lieutenant
Finance	Keith DeMartini	Finance Director
Library	Kristina Hernandez	Library Services Manager
Fire	Liliana Encinas	Bilingual Public Outreach Coodinator
Sustainability & Resilience	Melissa Hetrick	Administrative Analyst II

Department	Name	Title
Administration	Rene Eyerly	Interim Assistance City Administrator
Community Development	Renee Brooke	City Planner
Parks & Recreation	Rich Hanna	Recreation Program Manager
Community Development	Rosie Dyste	Project Planner
Information Technology	Rudy Fidler	Information Technology Planner
Fire	Ryan DiGuilio	Fire Marshal
Airport	Sara Iza	Principal Project Manager
Fire/OES	Yolanda McGlinchey	Emergency Services Manager

The Santa Barbara LPT members worked directly with the Santa Barbara 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 City 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 (12/17/22) to discuss LHMP priorities and mitigation approaches.
April 9, 2021	City LHMP met to review documents and forms needed for the Consultant and County OEM
November 10, 2021	City LHMP to review City's Goals and Objectives Review Mitigation Projects, Defer, Complete, Delete or add new projects and review the template for projects from Consultant Review and revise Mitigation Strategies
January and March 2022	Reviewed new maps and local vulnerabilities. Provided input on the status of 2017 LHMP mitigation strategies. Reviewed draft mitigation strategies and provide feedback. Reviewed and finalized 2022 LHMP
January through April 2022	City's LHMP meet in various small meetings to complete: Updated Section 4 – Capability Assessment Reviewed and updated on Cost-Benefit Worksheet Mitigation Projects Review and make comment on City's Annex to the MJHMP

3.4 PUBLIC OUTREACH AND ENGAGEMENT

As a participating agency in the 2022 MJHMP update, the City 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 City'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.

Emergency preparedness information is also regularly distributed to the residents and businesses via the City's website.

In May 2022, the LHMP was completed and made available for public review, concurrent with review by FEMA and CalOES. The City's Draft LHMP was published on the City OES website for comment. Once approved the plan will be placed on the OES website. The opportunity to review documents was announced through social media, media release and the City's website. The community was welcome to submit written or verbal comments to the Emergency Services Manager. In addition, the opportunity for the community to be heard was permitted during the City Council meeting before the adoption of this plan.

4.0 CAPABILITY ASSESSMENT

The City LPT identified current capabilities and mechanisms available for implementing hazard mitigation activities. This section presents a discussion of the roles of key departments, administrative and technical capacity, fiscal resources, and summaries of relevant planning mechanisms, codes, and ordinances.

4.1 COMMUNITY PROFILE AND DEMOGRAPHICS

The City of Santa Barbara is located on the south coast of Santa Barbara County. Due to the Santa Ynez mountain range that blocks colder air from the north, Santa Barbara enjoys mild and pleasant weather. It sits at an elevation of roughly 50 feet above sea level and has a land area of 19 square miles. The City received its name when the California Mission Santa Barbara was founded there in 1786. The mission was known as the Queen of the Missions due to its beauty and the beauty of its surroundings.

Attractions in Santa Barbara include the Waterfront, Downtown retail, entertainment, and cultural districts, Santa Barbara Museums of Art and Natural History, the Santa Barbara Zoo, and special

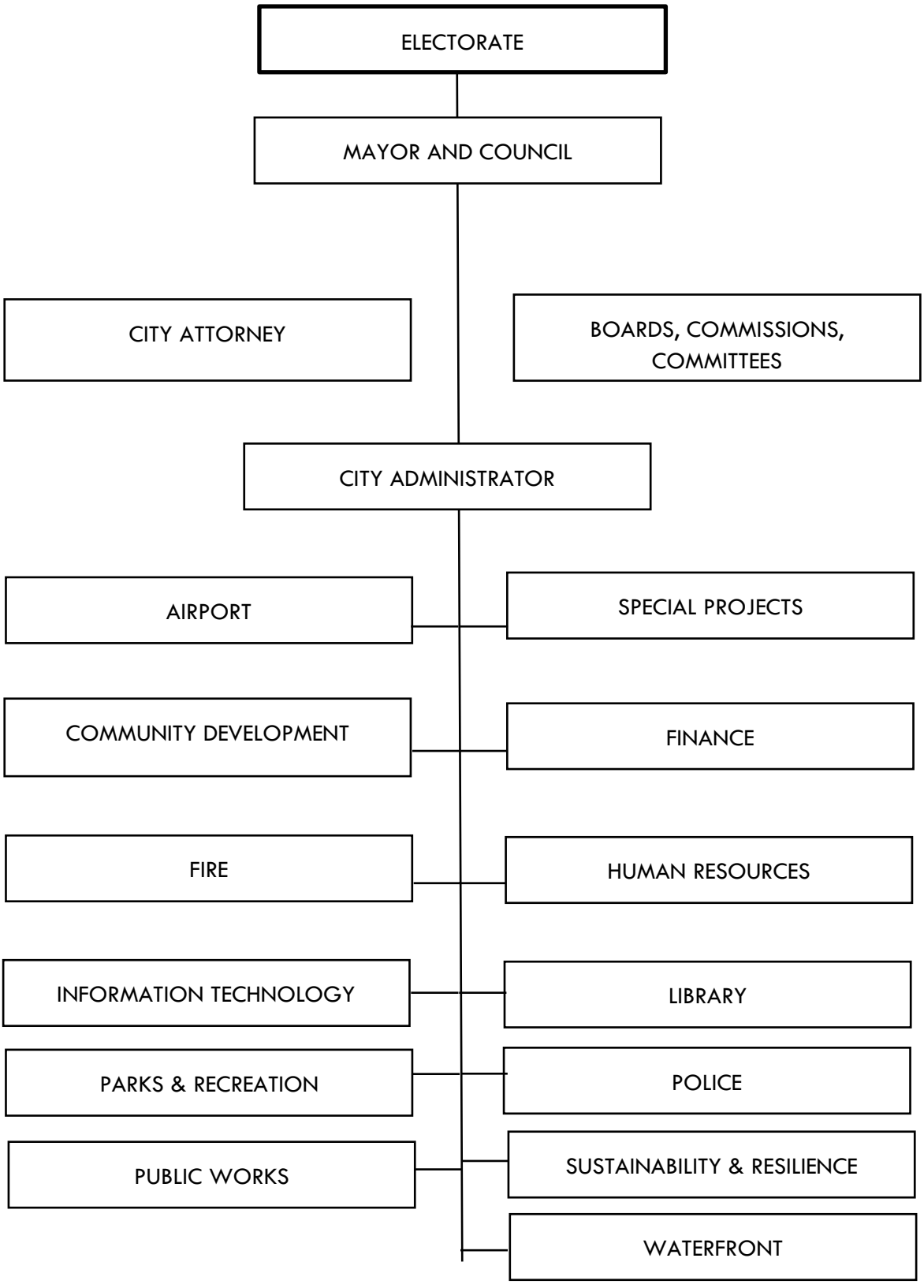
events such as Old Spanish Days – Fiesta Santa Barbara. Santa Barbara is the retail, tourism, government, education, and medical center of the County. It is home to the Santa Barbara Airport, which provides commercial services for Ventura, Santa Barbara, and San Luis Obispo Counties.

According to 2019 U.S. Census Bureau data, the City is home to 92,034 residents. This population is projected to grow to 98,655 residents by 2050 (SBCAG 2018). The average household size in the City is 2.45 and the median household income is $78,945. Approximately 56.2 percent of City of Santa Barbara residents identify as White, 36.50 percent identify as Hispanic, and 7.4 percent identify as Asian, Black, Mixed, or Other (US Census Bureau 2019).

4.2 KEY DEPARTMENTS

The City of Santa Barbara employs a Manager-Council form of governance. Santa Barbara City Council is comprised of one Mayor and six Council Members, all of whom are elected officials each serving a four-year term. The City of Santa Barbara's organization is comprised of fifteen departments. These departments are Airport; City Administrator; City Attorney; Community Development; Finance; Fire; Human Resources, Information Technology, Library; Mayor and Council; Parks and Recreation; Police; Public Works; Sustainability and Resilience and Waterfront Departments. In addition, Santa Barbara has 29 Advisory Boards, Commissions, and Committees whose job is to advise the City Council on a wide variety of subjects.

CITY OF SANTA BARBARA ORGANIZATION CHART



Departments involved in activities related to hazard mitigation include:

4.2.1 City Administrator's Office

The City Administrator's Office provides leadership, direction, and oversight to City departments to accomplish goals and objectives approved by the City Council, per the City Charter. The City Administrator manages all departments, provides training and development for all City employees, reviews the performance of all City departments, and assists the City Council in prioritizing goals. The City Administrator's Office also provides oversight to City TV on Channel 18.

In response to natural disasters, the City Administrator's Office serves as the primary point of contact to coordinate the entire flow of public information. This is accomplished through the use of media releases, press conferences, website updates, the City TV scroll, public information kiosks, and all other social media outlets. The Administrator's office works in conjunction with other emergency personnel to coordinate the public release of accurate, timely, and consistent information.

4.2.2 Santa Barbara Airport

The Santa Barbara Airport is one of the region's most important and visible assets. A recent University of California, Santa Barbara Economic Forecast Project study found that the Airport has a $500 million annual impact on the County. Since the 1930s, it has been the region's primary air transportation facility. Nearly 1 million passengers used the Airport in 2019; making it the busiest airport on the California coast between San Jose and Los Angeles. Consistent with national trends, air travel through the Santa Barbara Airport declined during the recent pandemic. However, passenger numbers have started to increase through the summer of 2020, and airline forecast studies show the passenger volume will grow over the next 10 years.

The Airport has recently completed a new master plan for development through 2025. The plan identifies Airport facility and capacity needs and prescribes improvements. The Airport must remain open during natural disaster situations to serve as a transportation point for the ingress and egress of personnel, equipment, and supplies during the recovery phase of a disaster. The Airport completed a master drainage plan to address flooding issues, and several of the recommended projects from the plan have been completed. The remaining flood control projects are listed in this document as potential projects for funding.

Approximately 400 of the 430 acres of the Goleta Slough Ecological Reserve are within Airport boundaries. As a steward of the slough, the Airport has made significant environmental improvements with plans for further restoration in the future.

In 2008, the Airport completed its airfield safety projects, which brought the runway safety areas up to federal standard and reduced the commercial runway flood hazard.

As mitigation for the Airfield Safety Projects, the Airport has spent nearly $9 million to improve or restore 40 acres of wetland habitat in the Goleta Slough. Ten of those acres were completed in 2010 after a 3-year study of bird behavior in tidal wetlands. The results of this study show that the restoration of tidal circulation has improved habitat for wildlife while reducing the risk of wildlife strikes on or near the airfield. This study has national significance as other airports may follow in

Santa Barbara's footsteps. Each restoration site is overseen in a 7-year maintenance and monitoring program to ensure success, no concerns followed the conclusion of the monitoring program in 2017.

4.2.3 City Attorney Department

The City Attorney's Office is responsible for legal representation and advice to the City Council, Boards, Commissions, and all City officers and staff. These responsibilities include advising the City Council and Planning Commission, as well as City staff, on thousands of matters each year. The office is also responsible for all City code enforcement and litigation services. The office is staffed by six attorneys and five support and paraprofessional staff.

4.2.4 Community Development Department

The Community Development Department is responsible for planning and zoning, building and safety, and housing and redevelopment for the City of Santa Barbara.

The Building & Safety Division is responsible for Building Inspection and Code Enforcement; Building Counter and Plan Review; and Records, Archives, and Clerical Services. One of the primary functions of this division is to ensure all new and remodeled structures, as well as additions to existing structures, are constructed to current health and safety codes, thus lessening the potential impact of hazards.

The Planning Division is responsible for Long Range Planning and Special Studies; Zoning Ordinance Information; Development / Environmental Review; and Design Review and Historic Preservation. This division mitigates natural and human-caused hazards for new and existing development through the implementation of the General Plan, Zoning Ordinance, California Environmental Quality Act (CEQA), the Local Coastal Plan, the Subdivision Map Act, and a variety of other California planning statutes.

The primary responsibilities of this division in mitigating hazards are through 1) developing General Plan and Coastal Zone goals, policies, and implementation actions that address natural and human-caused hazards(e.g., the Safety Element and the Coastal Land Use Plan); 2) mapping geology-related hazards and providing guidelines for site-specific geological investigations for various types of development projects via the Geology and Geohazards Master Environmental Assessment; 3) review and permitting of development consistent with hazard risk reduction and community resilience-related goals, polices, and procedures; and 4) enforcing existing development to ensure continued compliance with the Zoning Ordinance. In addition, all divisions of the Community Development Department are regularly trained to respond to disasters and assist with recovery efforts.

4.2.5 Finance Department

The Finance Department is responsible for providing financial expertise and guidance to the City Council and City Departments, managing the City's daily operations, and maintaining the financial integrity of the City. The Finance Department consists of five divisions, Administration, Accounting, Risk Management, Treasury, and General Services, which encompass sixteen programs.

4.2.6 Fire Department

The mission of the Fire Department is to serve and protect the community from the perils of fires, medical emergencies, environmental emergencies, and natural disasters. This will be accomplished through education, code enforcement, planning, prevention, emergency response, and disaster recovery. The Fire Department is responsible for managing the following programs, Fire Administration; Fire Prevention; Wildland; Office of Emergency Services; and Fire Operations.

Fire Administration provides leadership, policy direction, and administrative support to the entire department. Fire Prevention protects life, property, and the environment from the perils of fire, hazardous materials, and other disasters through proactive code enforcement, modern fire prevention methods, fire and arson investigation, and progressive public safety education, which provides fire and life safety education to the whole community to reduce the loss of life and property. Wildland Division ensures a safer community in the wildland-urban interface through analysis, defensible space, evacuation planning, education, enforcement and fuels modification The Office of Emergency Services coordinates the City's response to a disaster, educates residents to prepare and operates the City Emergency Operations Center, located at Fire Station 1; Fire Operations saves and protects lives, property, and the environment of the Santa Barbara community by preventing the impact of future events through proactive planning, public education, and occupancy fire code inspections.

In 2004, the City adopted the Wildland Fire Plan as a comprehensive, coordinated plan to mitigate the impact of wildland fire. The plan has recently been designated as the City's Community Wildfire Protection Plan. The Plan identifies and ranks the City's high fire hazard areas based on hazard and risk, identifies policies and actions to reduce the community's threat from wildland fire, and provides a process to prioritize and fund implementation of wildland fire projects. The Plan covers a wide range of areas including defensible space requirements and landscape guidelines, public education and outreach programs, evacuation preplanning, Codes modification and enforcement, fire protection services, post-fire rehabilitation, biomass utilization, and vegetation management programs on both private and public lands. To implement elements of that plan, the City adopted the Wildland Fire Suppression Assessment District (WFSAD) in 2006. The WFSAD provides an alternate funding source for defensible space chipping, vegetation road clearance, vegetation fuels management projects, and voluntary defensible space evaluations for residents located in the Foothill and Extreme Foothill high fire hazard areas. In cooperation with residents of the district, the program has removed hundreds of tons of flammable vegetation, thereby reducing the threat of wildfire and enhancing evacuation routes throughout the district.

City of Santa Barbara Office of Emergency Services Division

The City of Santa Barbara's Office of Emergency Services (OES) is a Division of the Fire Department. The OES office consists of an Emergency Services Manager and a Bilingual Public Outreach Coordinator. The purpose of OES is to develop and implement plans for the protection of persons and property within the City of Santa Barbara in the event of a disaster and to coordinate Emergency Services functions of the City with all other public agencies and affected nonprofits, corporations, and non-governmental organizations.

The City of Santa Barbara's Emergency Services Organization is managed by the Emergency Services Council (ESC). The City Administrator serves as the Director of Emergency Services and acts

as chair of the ESC. Other members of the ESC include the Police Chief; Fire Chief; Public Works Director; and representatives of each City department, service, or division designated by the City Administrator. The Emergency Services Manager is responsible for the development and maintenance of emergency plans, per the Standardized Emergency Management System (SEMS), organization and coordination of emergency programs and training, and is a member of the ESC.

The City of Santa Barbara's Emergency Services Organization is comprised of all officers and employees of the City, together with those volunteer forces enrolled to aid the City during a disaster, and all groups, organizations, and persons who may by agreement or operation of law, including persons pressed into service under the provisions of Section 9.116.060(3) of the Santa Barbara Municipal Code be charged with duties incident to the protection of life and property in the City during such disaster. This includes, but is not limited to, School Districts, Santa Barbara Community College District, Santa Barbara Metropolitan Transit District, American Red Cross, and Amateur Radio Emergency Services (ARES).

The City of Santa Barbara revised its Standardized Emergency Management System Emergency Operations Plan (SEMS EOP) in August 2019 to ensure the most effective and economical allocation of resources for the maximum benefit and protection of the civilian population in an emergency. The EOP was developed in conjunction with the Santa Barbara County Operational Area, as part of the California Standardized Emergency Management System (SEMS) and the National Incident Management System (NIMS). The EOP addresses emergency responses associated with natural disasters, technological incidents, and national security. The objective of the plan is to establish an effective organization capable of responding to and recovering from potential large-scale emergencies using all appropriate facilities and personnel in the City. The SEMS EOP assigns tasks and procedures for the coordination of emergency staff and service elements per the Comprehensive Plan Guide 101 (CPG101). The SEMS EOP identifies emergency response actions associated with large-scale emergencies through standard operating procedures.

The plan states that hazard mitigation is a year-round effort and encourages all entities to prepare hazard mitigation plans. The following activities are identified by the plan as potential mitigation activities: improving structures and facilities at risk; identifying hazard-prone areas and developing standards for prohibited or restricted use; recovery and relief from loss; and providing hazard warning.

Santa Barbara Aircraft Rescue (ARFF) and Firefighting Services

The Fire Department has been providing ARFF services at the Airport since July 1, 1990, after the Airport Director transferred the service from Santa Barbara County Fire Department. The ARFF Station 8, which was constructed in the early 1990s, was jointly funded by Federal Aviation Administration (FAA) Airport Improvement Program grants and Airport Capital funds. The Airport provides the two ARFF apparatuses, which were purchased in 2002 with FAA Airport Improvement Program grant funds, as well as a smaller "Rescue Squad" unit. Station 8 also houses the City's Mass Casualty unit, which can provide EMS supplies and staging equipment for 100 patients. Additionally, the Airport pays for specialized equipment (silver suits), routine supplies, and services. The Fire Department provides nine permanent positions - three Captains and six Engineers - to staff the ARFF station on a 24/7 basis. This personnel is trained and certified for airport firefighting (live fire drills), rescue, and EMS operations under both the FAA and City Fire Department requirements.

To accept commercial air carrier service, an airport is required to obtain certification from the Federal Aviation Administration, per the Code of Federal Regulations (CFR) Title 14, Part 139. CFR Part 139 regulations include requirements for equipment, firefighting agents, and operational requirements such as personnel training and emergency response times. All active-duty Fire Department ARFF personnel are compliant with these mandatory FAA requirements.

4.2.7 Human Resources

Human Resources provides a centralized program of personnel administration for approximately 1,050 regular employees (FTE) and approximately 500 hourly employees in 12 departments. Human Resources oversees programs designed to meet the needs of the City and its employees throughout the employee lifecycle.

- **Classification and Compensation:** Establishes job classifications and compensation levels for over 400 classifications; manages the HR Payroll System (Munis) concerning job titles, positions, and compensation (COLAS, merit increases, status changes, etc.)
- **Recruitment and Retention:** Recruits, tests, and certifies qualified applicants for City positions; establishes programs that ensure the City is abreast of current trends to stay an employer of choice.
- **Employee Relations:** Coordinates and assists departments with disciplinary actions, performance issues, grievances, and complaints; provides guidance, interpretation of policies, processes, laws, and MOU and other personnel-related information to employees and departments.
- **Civil Service Commission:** Provides staff support to the Civil Service Commission.
- **Benefits and Wellness:** Administers employee benefit programs including medical insurance, life insurance, long and short-term disability, flexible spending accounts, deferred compensation and retirement, and leaves of absences.
- **Training and Development:** Manages employee training through the LEAP programs (Learning for Excellence and Achievement Program), including the City Leadership Academy, City Supervisory Excellence Academy, New Employee Orientation, and Educational Reimbursement.

4.2.8 Information Technology

Information Technology provides Infrastructure support, Enterprise Applications, Web Services, Computer Training, and Centralized GIS. Infrastructure Support provides technical leadership, maintenance, and user support for computing and networking services to City staff by operating and maintaining the City's 40+ Local Area Networks; providing maintenance and support to over 950 desktop and laptop computers; establishing and maintaining standards for hardware and software; and performing systems analysis, system integration and system implementation; provides consulting services to all departments in areas of business problems, implementing solutions. Enterprise Applications Support provides financial management systems (including Human Resources and Payroll systems) and related services; maintains enterprise-wide applications such as customer information system for City Utilities, maintenance management, land use permitting, electronic content and agenda management, SQL reporting services, and data exportation to support the

analysis and inquiry needs of City staff. Web Services establishes standards and provides oversight of the City's local Intranet and public Website and associated services. Computer Training coordinates the City's computer training program; provides consulting services to all departments in areas of business problems, implementing solutions. Centralized GIS provides standards and a rules-based central database of GIS data; provides tools to update and display GIS data; and provides detailed maps, drawings, and other GIS services.

4.2.9 Public Library System

The Santa Barbara Public Library is dedicated to supporting community education for all ages through classes and events, building a community of readers, empowering individuals with free access to information, and connecting people to community resources.

In addition to providing free access to physical and digital materials for information and entertainment, the Library provides computer and internet access as well as through technology available for checkout. Library programming offers educational and enrichment opportunities for people of all ages and includes early literacy classes, science, technology, and maker classes, career resources, college readiness classes for teens, one-on-one support for business owners, job-seekers, and those pursuing citizenship, tech classes for seniors, and more. The Library celebrates local Santa Barbara history, supports the local community of artists, writers, and creators, and facilitates opportunities for residents to connect with other community organizations. Santa Barbara library staff work to serve all community members, including Black, Indigenous, and people of color, immigrants, people with disabilities, and the most vulnerable in our communities, offering services and educational resources to help transform communities, open minds, and promote inclusion, diversity, equity, and justice.

The central and Eastside libraries serve the residents of Santa Barbara, while the Carpinteria, and Montecito branch libraries are owned and funded by the County of Santa Barbara and administered under an agreement with the City.

4.2.10 Parks and Recreation Department

The City of Santa Barbara Parks and Recreation Department maintains 60 parks totaling nearly 1810 acres. The Parks Division is responsible for all aspects of parks, open space, street tree care, and beach management, and during emergencies provides logistical support such as personnel and supply transportation. The Recreation Division provides numerous recreational and cultural opportunities as well as community services. During emergencies, the Department manages community buildings and recreation facilities as shelters and staging areas. The Department oversees the management of the City's municipal golf course, which is a second staging area for emergency operations. The mission of the Creeks Restoration and Water Quality Improvement Division is to improve creek and ocean water quality and restore natural creek systems with the implementation of storm water and urban runoff pollution reduction, creek restoration, and community education programs. The water quality program focuses on creek clean-up, street sweeping, and storm water projects. Creek restoration programs improve creek health and water quality. Objectives include reducing erosion by bank stabilization and providing access where feasible. The Creeks Division has prepared Watershed Action Plans for Santa Barbara's three major watersheds and has held community forums for public input into these plans.

4.2.11 Police Department

The mission of the Santa Barbara Police Department, through the philosophy of community-oriented policing, is to create a safe community where all people can live in peace without the fear of crime. This commitment will ensure a professional quality of service and accountability to the citizens of the City of Santa Barbara.

While the primary mission of the Santa Barbara Police Department is law enforcement, the Police Department plays a pivotal role in general public safety as it relates to disaster preparedness. In addition, the Police Department has created some mitigation strategies that are included in their Unusual Occurrence Manual (UOM). The UOM is a guide for how officers will respond during a major incident or disaster.

The City's dispatch center was relocated to the Granada Garage facility at 1219 Anacapa Street. The move was due to the substandard condition of the current Police Department. In many emergencies, police officers are among the first responders, assisting with traffic control, effecting evacuations, and monitoring potentially life-threatening situations.

4.2.12 Public Works Department

The City's largest department is Public Works. The department's total annual budget of nearly $150 million represents approximately 40% of the City's total budget and its 301 full-time employees are approximately 28% of the City's permanent workforce. The Department is responsible for operating the City's El Estero Water Resources Center and Charles E. Meyer Desalination Plant both on Yanonali Street, the Ortega Groundwater Treatment Plant on Ortega Street, the Cater Water Treatment Facility on San Roque Road, and Mission Tunnel and the Gibraltar Dam and Reservoir located off Paradise Road on the Santa Ynez River. The Department's mission is to provide for the public's needs relative to the City's water and wastewater systems, construction and maintenance of all City facilities, automotive equipment, communications equipment, City parking lots and structures, and repair and maintenance of all streets, sidewalks, storm drains, traffic signals, and streetlights throughout the City.

The Public Works Department is divided into seven divisions: Administration, Engineering, Facilities, Streets Operations, and Infrastructure, Transportation Planning and Parking, Fleet Management, and Water Resource. The Administration Division provides administrative, personnel, and financial support to the entire department. The Engineering Division is responsible for engineering oversight for design and construction projects; land development; and real property. The Facilities Management Division is responsible for building maintenance; capital building renewal; communications; custodial services; and environmental compliance. The Transportation Planning and Parking Division is responsible for alternative transportation; parking; and transportation planning. The Streets Operations and Infrastructure Division is responsible for streets maintenance; transportation operations; traffic engineering and streets infrastructure management. The Water Resources Division is responsible for water and wastewater administration; water supply management; water treatment; water distribution; wastewater collection; wastewater treatment; and laboratory services. The Fleet Management Division is responsible for the service, repair, and replacement of all city vehicles and heavy equipment.

The Department is responsible for the following emergency activities and areas:

- Recovery operations in all types of disasters.
- Coordinating with Public Utility companies in the repair of utilities essential to the life, health, and welfare of the community.
- Coordinating and furnishing transportation to all emergency agencies of the City and providing maintenance for disaster vehicles and equipment throughout the State of Emergency.
- Assuring an adequate supply of water for emergency requirements and an adequate supply of potable water for human consumption.
- Assuring that sanitary facilities are operational or that alternate emergency facilities are provided.
- Assuring the Laguna pump station is operating.
- Assisting in and providing for traffic controls (signs, barricades, and signalization) and warning signs.
- Providing personnel to assist in EOC operations (office and field). Setting up and operating the Public Works Department Operations Center.

The Public Works Engineering Division is very involved in hazard mitigation activities. It manages the City's Capital Improvement Program and provides professional engineering services for planning, designing, and constructing public works improvements. Long-range master planning to support the City's street, water, wastewater, transportation, and parking infrastructures is also provided. The Division also provides the Airport, Waterfront, and all General Fund departments with engineering services.

4.2.13 Sustainability and Resilience Department

The City of Santa Barbara Sustainability and Resilience Department leads and coordinates projects, policies, and services related to environmental sustainability and resilience across the City. The Department consists of two divisions: Environmental Services, Energy, and Climate.

The Environmental Services Division provides garbage, recycling, and organics collection, processing, and disposal services for the community. The Division oversees zero waste planning, waste reduction policies, education, and food resilience and security programs. The Division's CleanSB program provides a suite of neighborhood services including illegal dumping, code enforcement, public area trash collection, encampment cleanup, and disaster debris planning. In the event of a disaster, Environmental Services is responsible for ensuring regular services are reestablished as quickly as possible, coordination with trash collection companies to remove disaster debris safely and efficiently, ensuring adequate disaster debris staging areas and processing, and communication with other regional solid waste agencies and state regulators.

The Energy and Climate Division is responsible for developing and managing the City's renewable energy and energy efficiency projects, creating and overseeing the Community Choice Energy enterprise, coordinating climate action planning and adaptation efforts, and overseeing other sustainable planning initiatives such as the Green Building policy. The Division is a primary contact for coordination with energy utilities providing power to the community and for coordinating efforts relating to climate hazard mitigation, such as sea level rise.

4.2.14 Waterfront Department

The Waterfront Department is an Enterprise Fund, which oversees the operations, infrastructure, and public safety within the City of Santa Barbara's Waterfront area. The Waterfront provides services in support of recreation, commercial fishing, local business, and tourism. The responsibilities of the Waterfront Department include:

- Tidelands and ocean space fronting the City of Santa Barbara
- Harbor Business District buildings and infrastructure
- Stearns Wharf buildings and infrastructure
- 1100+ Slip Marina and associated facilities
- Breakwater and associated infrastructure
- East Beach mooring areas
- 10 Waterfront parking lots and associated infrastructure

The Waterfront Department consists of three Divisions: Harbor Operations, Facilities Management, and Business Services. These three divisions are outlined below.

Harbor Operations Division

Harbor Operations oversees the marina management-related activities within the harbor, which includes oversight of visiting vessels, slip holders, and liveaboards. Additionally, Harbor Operations oversees the Santa Barbara Harbor Patrol. The mission of the Santa Barbara Harbor Patrol is to enforce laws, educate the public and provide emergency fire, medical, and ocean response services to facilitate the safe and orderly use of the Waterfront area.

Facilities Division

The Facilities Division is responsible for the maintenance of all Waterfront facilities and infrastructure, which includes the Harbor Business District, Stearns Wharf, breakwater, marina, parking lots, and all Waterfront buildings. The Facilities Division is tasked with providing clean and safe commercial and recreational facilities for tenants and visitors. The Facilities Division also oversees the Waterfront's Capital Improvement Program, which includes planning, design, permitting, and construction of all associated projects.

Business Management Division

The Business Management Division oversees all financial and budgeting elements of the entire Waterfront Department. Additionally, the Business Management Division oversees the Department's parking and property management operations. The property management operations include oversight of 61 tenant leases and licenses and associated revenues. The parking operations include 10 Waterfront parking lots and associated revenues.

For Emergency Response, the Waterfront Department is available and ready to respond. The Waterfront Department has the ability to standup a Department Operating Center (DOC) located in the Waterfront Administration Building, which is established to effectively coordinate personnel and resources to effectively respond to specific emergency events. The DOC becomes a base of operations and collection center for information, inspection/damage reports, and response

strategies as they are developed. For larger, citywide emergency events, the Waterfront Department will coordinate with the City's Emergency Operations Center (EOC) and provide support as needed.

4.3 ADMINISTRATIVE AND TECHNICAL CAPACITY

The administrative and technical capabilities of the City, as shown in Table 4-1, include staff, personnel, and department resources available to implement the actions identified in Section 7.0, *Mitigation Strategy* of this LHMP. 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, floodplain managers, surveyors, personnel with GIS skills and scientists familiar with hazards in the community. Equipment and supplies are maintained by the Public Works Director.

Table 4-1. City of Santa Barbara Administrative and Technical Capacity

Personnel Resources	Yes/No	Department/Position
Planner/engineer with knowledge of land development/land management practices	Yes	Public Works/Senior Planner Community Development/Project Planner
Engineer/professional trained in construction practices related to buildings and/or infrastructure	Yes	Public Works/Facilities Manager
Planner/engineer/scientist with an understanding of natural hazards	Yes	Community Development/Project Planner
Personnel skilled in GIS	Yes	IT/GIS Coordinator Community Development/GIS Technician
Full-time building official	Yes	Community Development/Chief Building Official
Floodplain manager	Yes	Community Development/Floodplain Coordinator
Emergency manager	Yes	Fire Department/Emergency Services Manager
Grant writer	Yes	Departmental
Other personnel		
GIS Data Resources (Hazard areas, critical facilities, land use, building footprints, etc.)	Yes	Information Technology/ Community Development and Public Works
Warning Systems/Services (Reverse 9-11, cable override, outdoor warning signals)	Yes	The City uses the County's notification system
Other	N/A	

4.4 LEGAL AND REGULATORY CAPABILITIES

The legal and regulatory capabilities of the City are shown in Table 4-2, including existing ordinances and codes that affect the physical or built environment of Santa Barbara. Examples of legal and/or regulatory capabilities can include the City's 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. City of Santa Barbara Legal and Regulatory Capability

Regulatory Tool (ordinances, codes, plans)	Yes/No
General Plan	Yes
Zoning ordinance	Yes
Subdivision ordinance	Yes
Growth management ordinance	Yes
Floodplain ordinance	Yes
Other special-purpose ordinances (stormwater, steep slope, wildfire)	Yes
Building code	Yes
Fire code	Yes
Fire department ISO rating	2
Erosion or sediment control program	Yes
Stormwater management program	Yes
Site plan review requirements	Yes
Capital improvements plan	Yes
Economic development plan	Yes
Local emergency operations plan	Yes
Other special plans	Tsunami Response Guide and Watershed Response Guide – both to be updated in the fall of 2021
Flood insurance study or other engineering studies for streams	Yes
Elevation certificates (for floodplain development)	Yes

4.5 GIS, COMPUTER AND COMMUNICATION TECHNOLOGY

The City has a basic GIS system used by the Public Works and Community Development Departments. Currently, parcels, zoning, and flood hazards have been mapped, including water, sewer, storm drain, and citywide striping. Hazard layers created for this plan can be incorporated into that system for future planning and updates. In the event it is needed, the GIS system is fully

functional and can be used to provide the State of California Office of Emergency Services with preliminary damage assessments.

Using the County's notification system, Santa Barbara has a fully functional 911 emergency telephone system, dispatch capabilities, and a reverse 911 system to issue warnings in advance of disasters.

The City has a website, which will be used to assist with communication necessary for the implementation and future updates of this plan.

4.6 FINANCIAL RESOURCES

The fiscal year 2022 adopted budget includes a total operating budget of $305.4 million and a citywide capital program of $460 million. The General Fund, which includes traditional local government services, is composed of a $143.8 million operating budget and a $24.5 million capital program.

In addition to the General Fund, the City has other funds used to account for various activities. Special revenue funds, totaling $32.2 million are used to account for revenues legally restricted for a specific purpose. Enterprise funds, totaling $151.7 million are used to account for the activities of the City operating like the private sector, including water, wastewater, airport, golf, downtown parking, and waterfront operations. Finally, internal service funds, totaling $29.8 million are used to account for services provided internally to City departments and programs, such as Information Systems and Risk Management Services.

In 1996, the City Council established minimum reserve levels for all operating funds, including the General Fund. Under the adopted resolution, the General Fund currently maintains two separate reserves:

- Emergency Reserve – Set at 15% of the adopted operating budget, established to respond to natural disasters, such as floods, earthquakes, etc.
- Contingency Reserve – Set at 10% of the adopted operating budget, established to respond to provide for unique one-time costs and maintenance of City services, and to permit orderly adjustments during periods of reductions.

Table 4-3 shows specific financial and budgetary tools available to the City such as community development block grants; capital improvements project funding; authority to levy taxes for specific purposes; fees for water, sewer, gas, or electric services; ability to incur debt through general obligations bonds; and withholding spending in hazard-prone areas.

Table 4-3. City of Santa Barbara Fiscal Capability

Financial Resources	Accessible or Eligible to Use (Yes/No)	Has This Been Used for Mitigation in the Past?	Comments
Community Development Block Grants (CDBG)	Yes	N/A	
Capital improvements project funding	Yes	Yes	City budgets capital expenditures across all funds.
Authority to levy taxes for specific purposes	Yes	No	Subject to Voter Approval. The voters approved a 1% district sales tax increase (Measure C) that took effect in 2018 that is being used to maintain critical infrastructure across the City.
Fees for water and sewer service	Yes	Yes	Fees charged for City Water, Wastewater, Solid Waste and soon Community Choice Energy
Incur debt through general obligation bonds	Yes	Yes	Several Enterprise Funds have current bonds. No current General Fund debt at this time. Initial planning is underway to issue debt for the new police facility.
Incur debt through special tax bonds	Yes	N/A	The City adopted a Debt Management Plan in 2018
Incur debt through private activity bonds	Yes	Yes	The City issued a private debt in 2014 for Waterfront capital projects.
Federal Grant Programs (Hazard Mitigation Grant Program)	Yes	Yes	The City has been successful in receiving and building projects from Hazard Mitigation Funds.

4.7 EDUCATION AND OUTREACH CAPABILITIES

The City of Santa Barbara Office of Emergency Services public outreach and education programs offer comprehensive emergency and disaster education to the community to reduce the loss of life and property. It includes activities that are designed to provide a variety of safety programs appropriate for all ages. The programs offered are bilingual in English and Spanish and are listed below:

- **Community Disaster Education**
  - This program is designed to bring disaster education into all venues, including but not limited to, businesses, homeowner associations, community centers, etc. This program is tailored for meetings that have limited time for a presentation. This CDE Presentation will assist in better preparing your staff, residences and/or community for any type of disaster or emergency.
- **CERT**
  - The Community Emergency Response Team (CERT) program educates participants about disaster preparedness for hazards that can impact their area and trains them in basic disaster response skills, such as fire safety, light search and rescue, team organization, and disaster medical operations. CERT offers a consistent, nationwide approach to disaster training and organization to assist your family and neighbors.
- **LISTOS**
  - This program was developed to provide individuals and families with basic emergency and disaster preparedness education. LISTOS is a basic curriculum offered to all populations that desire to learn in an informal conversational setting about risks and vulnerabilities in their local community.
- **Presentations, Drills and Special Events**
  - The City of Santa Barbara Office of Emergency Services offers specific presentations on all hazards, assists with all hazard evacuation drills upon request and actively participates in community events to provide the public with general safety education.
- **Social Media**
  - The City of Santa Barbara Office of Emergency Services conducts regular messaging through a content calendar that aligns with both local and national efforts such as, Tsunami Awareness Month, Earthquake Awareness Month, The Great California Shake Out, National Preparedness Month, Firewise and Firesafe, Storm Ready etc.
  - The city provides messaging for the public, via social media platforms, such as Facebook, Instagram, Nextdoor, Twitter, the City News in Brief, utility inserts among other local committees and social groups.

- Included in the city public messaging is partnerships with local media such as local radio, newspaper, and television stations to distribute preparedness and incident specific messaging.

Contacts: Liliana Encinas, Public Outreach Coordinator at 805-564-5778 or liencinas@SantaBarbaraCA.gov

4.8 RELEVANT PLANS, POLICIES, AND ORDINANCES

The City of Santa Barbara has a range of guidance documents and plans for each of its departments. These include a general plan, public works, and public utilities plans, capital improvement plans, emergency management plans, Local Coastal Program (LCP), Master Environmental Assessment (MEA), Circulation Element, Safety Element, Mission Creek Project, Conejo Slide Area Program, Airport plans, flood response guidelines, Tsunami Response Plan, Community Wildfire Protection Plan, Sea Level Rise Adaption Plan and Vulnerability Assessment, and slough programs. The City uses building codes, fire codes, zoning ordinances, subdivision ordinances, and various planning strategies to address how and where development occurs. One of the essential ways the City guides its future is through policies laid out in the 2011 Plan Santa Barbara General Plan. The LHMP directly informs these plans and is used to evaluate the need for adjustments or updates to existing plans and programs. The City considers the LHMP's assessment of capabilities, hazards, and vulnerabilities to inform planning, capital improvements, programs, decision-makers, and the public. The City also implements mitigation actions through the City's general plan, capital improvement program, maintenance programs, grant programming, community outreach, and budget process.

4.8.1 The General Plan

The City of Santa Barbara General Plan was first adopted in the 1960s and was last updated in 2011. The 2011 General Plan is comprised of a comprehensively updated Land Use Element and seven reorganized elements, including the seven state-mandated elements, as well as optional elements of Economy and Fiscal Health and Historic Resources. The Safety Element was updated in 2013 and the Housing Element is updated every eight years per state law. In 2022, the City initiated an update to the Housing Element and the Safety Element. The LHMP is incorporated by reference in the Safety Element.

Santa Barbara is a mature city, and not much vacant land remains for residential or nonresidential development. The remaining vacant land is generally found in areas of steep topography where development potential is constrained. Over 60 percent of the land is in residential use, excluding the residential portion of mixed-use development in the Downtown or other commercial areas. To encourage residential infill development and due to concern over resources limitations, the General Plan has a Growth Management program to limit nonresidential growth. Conversely, one of the top priorities of the General Plan is to encourage workforce and affordable housing in the City's multi-unit and commercial zones. Institutional and public facilities are mainly found all over the City while most of the City's government facilities are found in the historical center of the community. There are approximately 1,086 acres of land dedicated open space and parks (not including beaches).

Since the last update of the City's LHMP in 2017, land use and population in the City have not substantially changed. Modest development has occurred consistent with the adopted Land Use Element and has primarily comprised infill development and redevelopment within the City limits. There has been no expansion of the City boundary or its Sphere of Influence (SOI) and no comprehensive changes to the Land Use Element that would result in substantial densification. Further, City population has not substantially changed. As a result, the City's level of vulnerability to hazards analyzed in Section 6.0, *Vulnerability Assessment*, has not substantially changed due to land use, development, or population growth since the last update of the LHMP.

4.8.2 Zoning Ordinance

Local land use controls include the Zoning Ordinance, which shapes the form and intensity of land use and residential development. Consistent with the General Plan, the City's Zoning Ordinance allows a range of zones and dwelling unit densities from one unit per acre (single-unit) to 27 units per acre (studio units with variable density). Higher density residential of 28-36 units per acre and 37 – 63 units per acre (Priority Housing Overlay) is allowed in certain areas under the Average Unit-Size Density Incentive Program. These zones also allow mobile home and emergency shelter units.

Zoning ordinance regulations related to hazard mitigation relate to the risk assessment for hazards within the City, including flooding, faults, unstable soils, and wildfire hazards. Examples of zoning regulations for hazard mitigation include Development Along Mission Creek, which provides controls on development adjacent to Mission Creek to prevent undue damage or destruction of development from flood water; and a slope density regulation that increases the minimum lot area where the average slope from 10 to over 30 percent.

The Environmental Policy and Construction section of the Municipal Code includes regulations and general requirements for hazardous waste generators, seismic safety, flood plain management, erosion and sedimentation control for construction, and construction prohibited in the vicinity of the Conejo Road landslide due to special geologic hazard conditions.

4.8.3 Floodplain Management

The City of Santa Barbara has participated in the National Flood Insurance Program (NFIP) since 1978. Flood Insurance Rate Maps (FIRMs) were developed most recently in 2015 through the NFIP and have been made available in GIS format as Digital Flood Insurance Rate Maps. These are on file with the Santa Barbara County Office of Emergency Management, County Flood Control, and the Santa Barbara City Public Library to identify floodplains, along with evacuation routes and locations of public shelters. The 2018 Floodplain Management Ordinance minimizes public and private losses due to flood conditions in flood prone, mudflow or flood related erosion areas by restricting land use, controlling alteration of natural floodplains, and protecting uses that are vulnerable to floods.

Repetitive Loss (RL) Properties

Repetitive loss properties are defined as property that is insured under the NFIP that has filed two or more claims above $1,000 each within any consecutive 10-year period since 1978. FEMA repetitive loss data shows that there have been 30 properties in Santa Barbara with multiple claims

against the NFIP. These RL properties have resulted in 65 total losses amounting to approximately $1.5 million in loss payments.

4.8.4 Safety Element

The Safety Element is a required component of the City's General Plan and is the element most relevant to hazard mitigation and emergency response. The Safety Element was updated in 2013 and includes specific items as prescribed by the California Government Code as well as other relevant safety issues that are considered important. Hazard maps provided in the Safety Element depict the general locations and possible severity of various hazards and are important tools in identifying and reducing the potential effects of hazards and for hazard response planning. The Safety Element provides information to guide the evaluation of hazard-related effects, provides policies to protect the community from hazard-related risk, and supports the implementation of programs intended to enable and expedite the recovery of a community after a disaster occurs. The Safety Element incorporates this LHMP by reference.

4.8.5 Sea Level Rise Adaptation Plan and Vulnerability Assessment

The purpose of the City's Sea Level Rise Adaptation Plan is to identify vulnerabilities to coastal hazards expected from sea-level rise in the City of Santa Barbara and possible actions to prepare for and adapt to sea-level rise. Preparation of a sea-level rise adaptation plan was a 2017 LHMP mitigation action and is identified as a priority in the Coastal Land Use Plan, Safety Element, and LHMP. Additionally, the State requires the City, as a trustee of state tidelands, to proactively plan for sea-level rise at the Harbor and Stearns Wharf and to consider sea-level rise as part of coastal development permitting. A vulnerability assessment was prepared for the Adaptation Plan to identify the areas of the city that, in the absence of intervention, are projected to be exposed to sea-level rise and related coastal hazards. The Adaptation Plan provides the framework for the City to monitor sea-level rise impacts and reduce vulnerabilities in phases as specific thresholds for action are reached. A wide range of adaptation options are presented, providing the City flexibility to consider different adaptation strategies over time.

4.8.6 Community Wildfire Protection Plan

The City of Santa Barbara Fire Department (SBFD)'s Community Wildfire Protection Plan (CWPP) is maintained to protect lives, property, and natural resources threatened by wildland fire. The CWPP updated the City's 2004 Wildland Fire Plan, accounting for changes in the City's fire environment and work completed under that Plan. Development of the CWPP included an assessment of wildfire hazard, which involved modeling potential fire behavior in the City under extreme wind and weather conditions, consistent with conditions experienced during a sundowner wind event. Other wildfire hazard variables were evaluated (terrain, weather, fuels, development patterns, fire department response, structure density, etc.) to identify the High Fire Hazard Area of the City. The hazard assessment was used to evaluate the extent of the City's four High Fire Hazard Area Zones (Extreme Foothill, Foothill, Coastal Interior, and Coastal) and the locations of the City's Vegetation Management Units (VMUs) and Community Fuels Treatment Network (CFTN). CWPP development also included development of a Public Outreach and Engagement Plan to guide community engagement and coordination with other key stakeholders throughout the development

of the CWPP. The City's central engagement goal was to develop a CWPP that builds on input from key stakeholders, including community members, City departments, neighboring jurisdictions (e.g., Santa Barbara County Fire Department, the U.S. Forest Service), and the California Department of Forestry and Fire Protection. This CWPP outlines a series of policies and action items which are intended to guide implementation of the CWPP. The policies and actions focus on codes and standards, funding, fire rehabilitation, evacuation, fire protection, vegetation/fuels management, and public education. Action items identify tasks to be implemented by the SBFD, and other responsible City departments, to achieve the stated goal of protecting lives, property, and natural resources threatened by wildland fire.

4.9 OPPORTUNITIES FOR MITIGATION CAPABILITY IMPROVEMENTS

The City 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 City 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 City to expand or improve on these policies and programs to further protect the community:

- **Regulatory Opportunities**: As part of this update, the City will comply with AB 2140 by amending its Safety Element to incorporate the LHMP by reference. The City will consider the LHMP in policy, land use plans, and programs, including coastal hazard and sea level rise planning. For example, the City's CWPP recommends expanding the geographic extent of the City's High Fire Hazard Area and increasing the quantity and extent of VMUs based on wildfire hazard. Further, the City's Sea Level Rise Adaption Plan and Vulnerability Assessment recommends continued effort to improve the quality and accuracy of coastal hazard projections under sea level rise scenarios consistent with local and state guidelines.
- **Administrative/Technical Opportunities**: The City continues to improve its resilience to ensure emergency response operations are sustained during a hazardous event, including improvements to public safety facilities and planning. Enhancements to hazard training for staff in partnership with the County and other agencies or stakeholders would improve the City's ability to mitigate hazards with the latest knowledge and resources.
- **Outreach Opportunities**: Enhanced community outreach, emergency notifications, and trainings would further enhance the City's capabilities to respond to and recover from hazards. The City could expand outreach through digital tools such as social media, participate in the Great California ShakeOut, and increase FireWise outreach events and media coverage.
- **Fiscal Opportunities**: The City can update its CIP to include hazard mitigation actions from the LHMP and related documents such as the CWPP and the Sea Level Rise Adaptation Plan. The City will continue to seek grants (e.g., HMGP, BRIC) to fund these CIP projects and related projects in the City's mitigation strategy. The City can seek opportunities to partner with the County and/or other stakeholder agencies in grant applications to address regional hazards more effectively. The City could also consider expanding its fiscal capabilities through its annual budget process and other revenue measures (e.g., raising taxes, property assessments, bonds).

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 City of Santa Barbara LHMP. The intent is to confirm and update the description, location and extent, and history of hazards facing the City 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 City.

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 City LPT refined the list of hazards applicable to the City 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 City'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. Applicable hazard information from the City's 2017 LHMP was incorporated during the development of this section. A comprehensive treatment of hazards and their descriptions may be found in Chapter 5.0 of the Santa Barbara County 2022 MJHMP.

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

Table 5-1. City of Santa Barbara Local Priority Hazards

Hazard Type and Ranking	Score	Planning Consideration Based on Hazard Level
Wildfire	12	Significant
Earthquake	12	Significant

Hazard Type and Ranking	Score	Planning Consideration Based on Hazard Level
Flood	9	Moderate
Pandemic/Public Health Emergency	9	Moderate
Tsunami	9	Moderate
Drought and Water Shortage	8	Moderate
Energy Shortage and Resiliency	8	Moderate
Dam Failure	8	Moderate
Landslide	7	Moderate
Train Accident	7	Moderate
Aircraft Crash	7	Moderate
Coastal Hazards	6	Moderate
Extreme Heat	6	Moderate
Hazardous Materials Release	6	Moderate
Oil Spill	5	Limited

To continue compliance with the DMA of 2000, the City 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 City in subsections below. The City's LPT acknowledged the following hazards are either not a threat, are highly unlikely within the City limits, or are adequately addressed by the 2022 MJHMP and do not require additional information to be relevant to the City's hazard setting; therefore, these hazards are not addressed further in the City's LHMP: severe weather/storm, windstorm, hurricane, tornado, utility failure, natural gas pipeline rupture and storage facilities, hydraulic fracturing and well stimulation, radiological and nuclear accidents, levee failure, cyber threats, agricultural pests and invasive species, terrorism, and civil unrest. These additional hazards are being addressed in the more comprehensive 2022 MJHMP.

5.3 HAZARD PROFILES

5.3.1 Wildfire

Description of Hazard

Wildfires can be classified as either a wildland fire or a wildland-urban interface (WUI) fire. The former involves situations where wildfire occurs in an area that is relatively undeveloped except for the possible existence of basic infrastructure such as roads and power lines. A WUI fire includes situations in which a wildfire enters an area that is developed with structures and other human developments. In WUI fires, the fire is fueled by both naturally occurring vegetation and the urban structural elements themselves. According to the National Fire Plan issued by the U.S. Departments of Agriculture and Interior, the wildland-urban interface is defined as "*…the line, area, or zone where structures and other human development meet or intermingle with undeveloped wildland or vegetative fuels.*"

The WUI fire can be subdivided into three categories (NWUIFPP, 1998): The *classic wildland-urban interface* exists where well-defined urban and suburban development presses up against open

expanses of wildland areas. The *mixed wildland-urban interface* is characterized by isolated homes, subdivisions, and small communities situated predominantly in wildland settings. The *occluded wildland-urban interface* exists where islands of wildland vegetation occur inside a largely urbanized area. Generally, many of the areas at risk within Santa Barbara County fall into the classic wildland-urban interface category.

Certain conditions must be present for a wildfire hazard to occur; a large source of fuel must be present, the weather must be conducive (generally hot, dry, and windy), and fire suppression sources must not be able to easily suppress and control the fire. The cause of a majority of wildfires is human-induced 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. Weather as manifested in temperature, humidity, and wind (both short and long term) affect the probability, severity, and duration of wildfires.

Location and Extent of Hazard in Santa Barbara

The climate, topography, and vegetation in Santa Barbara County are conducive to wildfires. California Department of Forestry and Fire Protection, Fire and Resource Assessment Program (CDF-FRAP) was mandated to map areas of significant fire hazards based on fuels (vegetation), terrain, weather, and other relevant factors. These zones, referred to as Fire Hazard Severity Zones, define the application of various mitigation strategies to reduce the risk associated with wildland fires. The most current mapping efforts by CDF-FRAP were conducted in 2007. Figure 5-1 below shows the Fire Hazard Severity Zones located in Santa Barbara County.

CDF-FRAP developed data that displays the relative risk to areas of significant population density from wildfire. This data is created by intersecting residential housing unit density with proximate fire threat, to give a relative measure of potential loss of structures and threats to public safety from wildfire. Figure 5-2 of the 2022 MJHMP was generated using this data to show the WUI in Santa Barbara County. The WUI map depicts areas where potential fuels treatments will be prioritized to reduce wildland fire threats.

The WUI data shown in Figure 5-2 of the MJHMP was developed on a statewide basis and does not consider the placement of local neighborhoods within the geography. Santa Barbara City Fire has created data at a more local level to convey communities at risk. Due to the threat, the City developed a 'Ready, Set, Go' guide for residents within the high fire area. A list containing the federally regulated (communities that adjoin federal lands) communities at risk, which includes the City of Santa Barbara, is provided in Section 5.3.1 of the MJHMP (see also Figure 5-3 of the MJHMP).

The 2017 Thomas Fire burned approximately 281,893 acres in Ventura and Santa Barbara counties. The fire was started by power lines coming in contact during high winds and remained active for 40 days. Emergency personnel from all across the western U.S. responded to the fire The fire resulted in the destruction of 1,063 structures, the loss of one civilian, and one firefighter fatality.
Source: CALFIRE 2021; Ventura County Fire Department 2019. Photo: SB Bucket Brigade

History of Hazard in Santa Barbara

Santa Barbara County and the City are prone to wildfires. There are many areas in which the County and City intersect; there is a long history of wildfires in the County that have affected the City (refer to Figure 5-4 of the MJHMP). Table 5-4 of the MJHMP lists the major wildfires in Santa Barbara County since 1932.

The CDF-FRAP compiles fire perimeters of wildfires and has established an ongoing fire perimeter data capture process. Figure 5-4 of the MJHMP shows historic, significant wildfire perimeters in Santa Barbara County. Fire perimeters provide a reasonable view of the spatial distribution of past large fires.

Over the last ten years, Santa Barbara County has experienced 9 major fires. Two of these fires directly threatened the heavily populated Santa Barbara Front Country and areas of the City of Santa Barbara:

- Before even larger fires in recent years, the **Thomas Fire** in 2017 was the largest California wildfire in modern California history, engulfing more than 280,000 acres, destroying or damaging more than 1,000 structures, primarily within Ventura County, and resulting in two fatalities. The fire was ignited north of Santa Paula in Ventura County and burned into Santa Barbara County through the Santa Ynez Mountains and parts of the upper Santa Ynez River watershed. It was one of the first wildfires to burn from inland Ventura County into the Santa Barbara front country of the Santa Ynez Mountains. The fire was active for 40 days and at one time involved more than 8,500 firefighters, 800 fire engines, and dozens of aircraft (National Interagency Fire Center 2021; Santa Maria Times 2021). The fire burned in the City from December 5 to December 7. Within the City, evacuations were limited to the Riviera and

Eucalyptus Hill area. No deaths, injuries, property damage, or infrastructure damage occurred within the City boundaries. However, the City experienced economic impacts due to air quality and ash during the height of the holiday shopping season.

- The **Cave Fire** in 2019 burned over 3,000 acres near Painted Cave in the Los Padres National Forest for 21 days (National Interagency Fire Center 2021). Approximately 2,400 homes were placed under mandatory evacuation orders for areas north of Cathedral Oaks Road between Patterson Avenue and Highway 154 and areas of Foothill Road between Highway 154 and North Ontare Road. A unified command consisting of multiple County agencies was assembled to assist with the fire (County Fire Department 2021). No homes were damaged (Santa Maria Times 2021). The fire threatened a small area in the northwestern portion of the City.

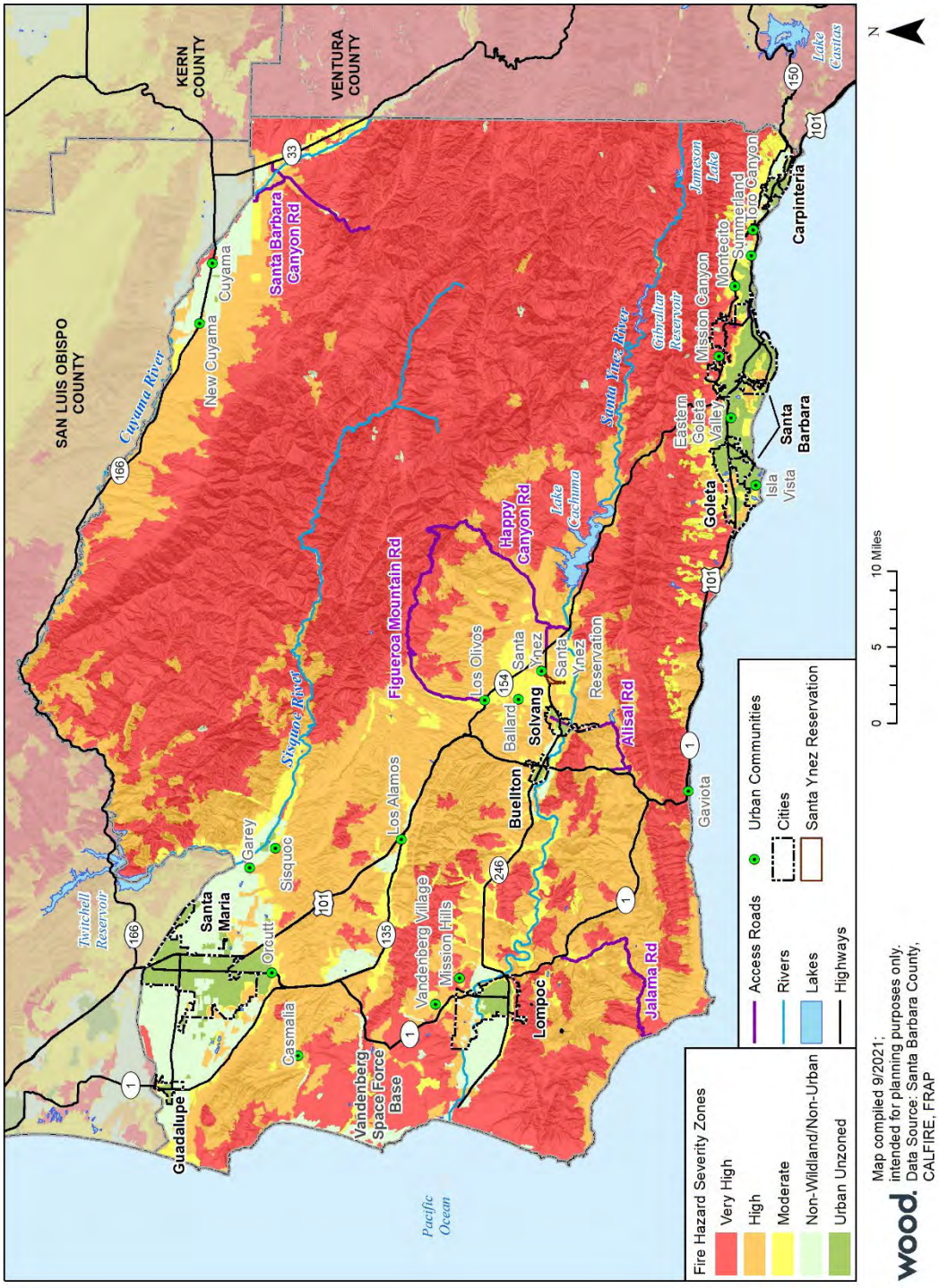
Probability of Occurrence

Vegetation and topography were significant elements in the identification of the fire threat zones. A substantial amount of the vegetation in Santa Barbara is commonly called chaparral, it is a dense and scrubby bush that has evolved to persist in a fire-prone habitat. Chaparral plants will eventually age and die; however, they will not be replaced by new growth until a fire rejuvenates the area. Chamise, manzanita, and ceanothus are all examples of chaparral which are quite common in Santa Barbara County and the foothills above the City. Santa Barbara County was subject to 42 major wildfires over 88 years, resulting in a 48 percent chance of occurrence in any given year.

Climate Change Considerations

Climate change plays a significant role in wildfire hazards. The changing conditions from wet to dry can create more fuel; the increased possibility of high winds increase risk and present a challenge, and drought conditions could hinder the ability to contain fires. Large wildfires also have several indirect effects beyond those of a smaller, local fire. These may include air quality and health issues, road closures, business closures, and other forms of losses. Furthermore, large wildfires increase the threat of other disasters such as landslide/debris flows and flooding (see Section 5.3.3, *Flood* and Section 5.3.9, *Landslide*).

Figure 5-1. Santa Barbara County Fire Hazard Severity Zones



5.3.2 Earthquake & Liquefaction

Description of Hazard

An earthquake is caused by a release of strain within or along the edge of the Earth's tectonic plates producing ground motion and shaking, surface fault rupture, and secondary hazards, such as ground failure. The severity of the motion increases with the amount of energy released decreases with distance from the causative fault or epicenter and is amplified by soft soils. After just a few seconds, earthquakes can cause massive damage and extensive casualties.

Most people are familiar with the Richter scale, a method of rating earthquakes based on strength using an indirect measure of released energy. The Richter scale is logarithmic. Each one-point increase corresponds to a 10-fold increase in the amplitude of the seismic shock waves and a 32-fold increase in energy released. For example, an earthquake registering 7.0 on the Richter scale releases over 1,000 times more energy than an earthquake registering 5.0.

Table 5-2. Richter Scale

Richter Magnitudes	Earthquake Effects
Less than 3.5	Generally not felt but recorded.
3.5-5.4	Often felt, but rarely causes damage.
Under 6.0	Slight damage to well-designed buildings. Can cause major damage to poorly constructed buildings over small regions.
6.1-6.9	Can be destructive in areas up to about 100 kilometers across residential areas.
7.0-7.9	Can cause serious damage to larger areas.
8 or greater	Can cause serious damage in areas several hundred kilometers across.

Peak ground acceleration (PGA) is a measure of the strength of ground shaking. Larger peak ground accelerations result in greater damage to structures. PGA is used to depict the risk of damage from future earthquakes by showing earthquake ground motions that have a specified probability (10%,5%, or 2%) of being exceeded in 50 years return period. These values are often used for reference in construction design, and in assessing relative hazards when making economic and safety decisions.

Liquefaction is the phenomenon that occurs when ground shaking causes loose, saturated soils to lose strength and act as a viscous fluid. Liquefaction causes two types of ground failure: lateral spread and loss of bearing strength. Lateral spreads develop on gentle slopes and entail the sidelong movement of large masses of soil as an underlying layer liquefies. Loss of bearing strength occurs when the soil supporting structures liquefy, causing the structures to settle; resulting in potential damage.

Location and Extent of Hazard in the City of Santa Barbara

As previously mentioned, Santa Barbara County, including the City of Santa Barbara, is located in a high seismic activity zone. The county is located in the Transverse Range geologic province.

The movement of continental plates manifests primarily along the San Andreas Fault system. The San Andreas fault is situated 7 miles northeast of Santa Barbara County; active faults in the San Andreas Fault system that fall within Santa Barbara County include the Nacimiento, Ozena, Suey, and Little Pine faults. Other active faults in the region include the Big Pine, Mesa, Santa Ynez, Graveyard- Turkey Trap, More Ranch, Pacifico, Santa Ynez, and Santa Rose Island faults. The Santa Barbara County Comprehensive Plan Seismic Safety and Safety Element provides descriptions of all faults in Santa Barbara County, including historically active, active, potentially active, and inactive, as well as their location and fault length. A map of faults in the Santa Barbara County region is located below (Figure 5-2).

The City has areas of liquefaction that would cause severe damage in the downtown and lower eastside areas (Figure 5-3). After earthquakes, some regions may be prone to liquefaction. On level ground, liquefaction results in water rising to the ground surface. On sloping ground, liquefaction will usually result in slope failure such as the event at the Sheffield Dam in the aftermath of the 1925 Santa Barbara earthquake. Liquefaction risk is considered high if there are soft soils (Types D or E) present. The National Earthquake Hazards Reduction Program (NEHRP) rates soils from hard to soft and gives the soils ratings from Type A through Type E. The hardest soils are rated Type A, and the softest soils are rated Type E. The majority of the soils in Santa Barbara County are types A-C, with some areas having type D. There have been no Type E soils identified. Liquefaction risk is also determined by the depth to groundwater. Most of the low coastal plain and valley bottoms in the City are underlain by alluvium and given a moderate rating with respect to liquefaction potential.

History of Hazard in the City of Santa Barbara

The City of Santa Barbara is located in a high seismic activity zone and as such has a long history of earthquakes. Although most seismic activity in California occurs along the San Andreas Fault system, most historic seismic events in the City of Santa Barbara region have been centered offshore on an east-west trending fault between Santa Barbara and the Channel Islands. While more extensive discussion of previous earthquakes in Santa Barbara County is available in the 2022 MJHMP, the following information provides an overview of the more recent, significant events. Table 5-9 of the MJHMP provides an overview of significant events within the last 50 years. Figure 5-10 of the MJHMP displays historical epicenters of earthquakes located in Santa Barbara County since 1700

- In June of 1925, the City experienced this destructive earthquake that caused property damage estimated at $8 million and killed 13 people. Most of the damage occurred at Santa Barbara and nearby towns along the coast, but the earthquake caused moderate damage at many points north of the Santa Ynez mountains, in the Santa Ynez and Santa Maria River valleys. North of Santa Barbara, the earth dam of the Sheffield Reservoir was destroyed, but the water released caused little damage. In Santa Barbara, few buildings on State Street escaped damage. Because parts of the main business district and the area near the seashore were built

on land fill, many of the structures there were demolished, and others were so shattered that they had to be razed. In general, however, buildings of reinforced concrete were damaged little, except where workmanship was poor; frame buildings covered with stucco, sheathing, or lath also withstood the shock well. Loss to the sewage system was heavy only in areas of land fill, but the disposal plant was destroyed above the surface of the ground.

- In March of 1978, and continuing sporadically through July of 1978, a swarm of small earthquakes, called micro-earthquakes occurred underneath the northeastern end of the Santa Barbara Channel. Toward the end of the micro-earthquake swarm, in July and early August of 1978, an unusually large amount of oil and tar was reported on local beaches in Santa Barbara. A common occurrence for the Santa Barbara area, the oil from these natural seeps was considered only a minor nuisance. On August 13, 1978, an earthquake occurred just to the southwest of the City of Santa Barbara, about 5 miles beneath the Santa Barbara Channel. There was minimal damage in the City. Sixty-five people were treated for injuries at local hospitals. No deaths were reported.
- On December 22, 2003, at 11:15 a.m. a magnitude 6.5 earthquake struck the central California coast. The event, known as the San Simeon Earthquake, was located 11 kilometers northeast of San Simeon, and 39 kilometers west/northwest of Paso Robles. Although the San Simeon Earthquake was felt in parts of the City, there was no damage.

Probability of Occurrence

The United States Geological Survey (USGS) and their partners, as part of the latest Uniform California Earthquake Rupture Forecast Version 3 (USGS 2015), have estimated the chances of having large earthquakes throughout California over the next 30 years. Statewide, the rate of earthquakes around magnitude 6.7 (the size of the 1994 Northridge earthquake) has been estimated to be one per 6.3 years (more than 99 percent likelihood in the next 30 years); in southern California, the rate is one per 12 years (93 percent likelihood in the next 30 years). Southern California's rates are given in Table 5-3.

Table 5-3. Southern California Region Earthquake Likelihoods

Magnitude (greater than or equal to)	Average Repeat Time (years)	30-year likelihood of one or more events
5	0.24	100%
6	2.3	100%
6.7	12	93%
7	25	75%
7.5	87	36%
8	522	7%

Source: USGS 2015.

Climate Change Considerations

To date, no credible evidence has been provided that links climate to earthquakes; however, climate and weather do play a significant role in the response and recovery from earthquakes. Effects from climate change could create cascading complications and impacts.

Figure 5-2. Santa Barbara County Probability of Shaking 2% in 50 Years

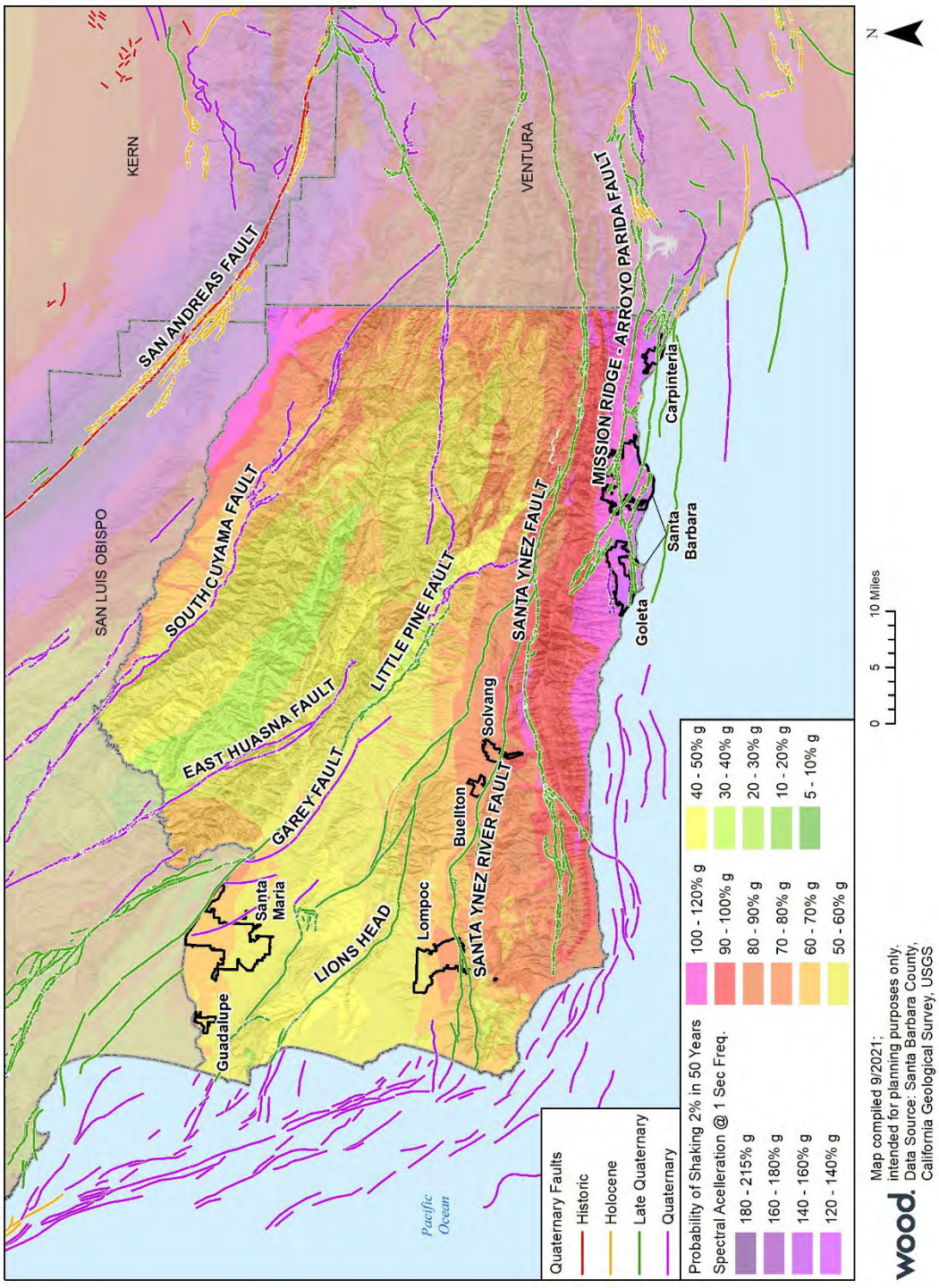
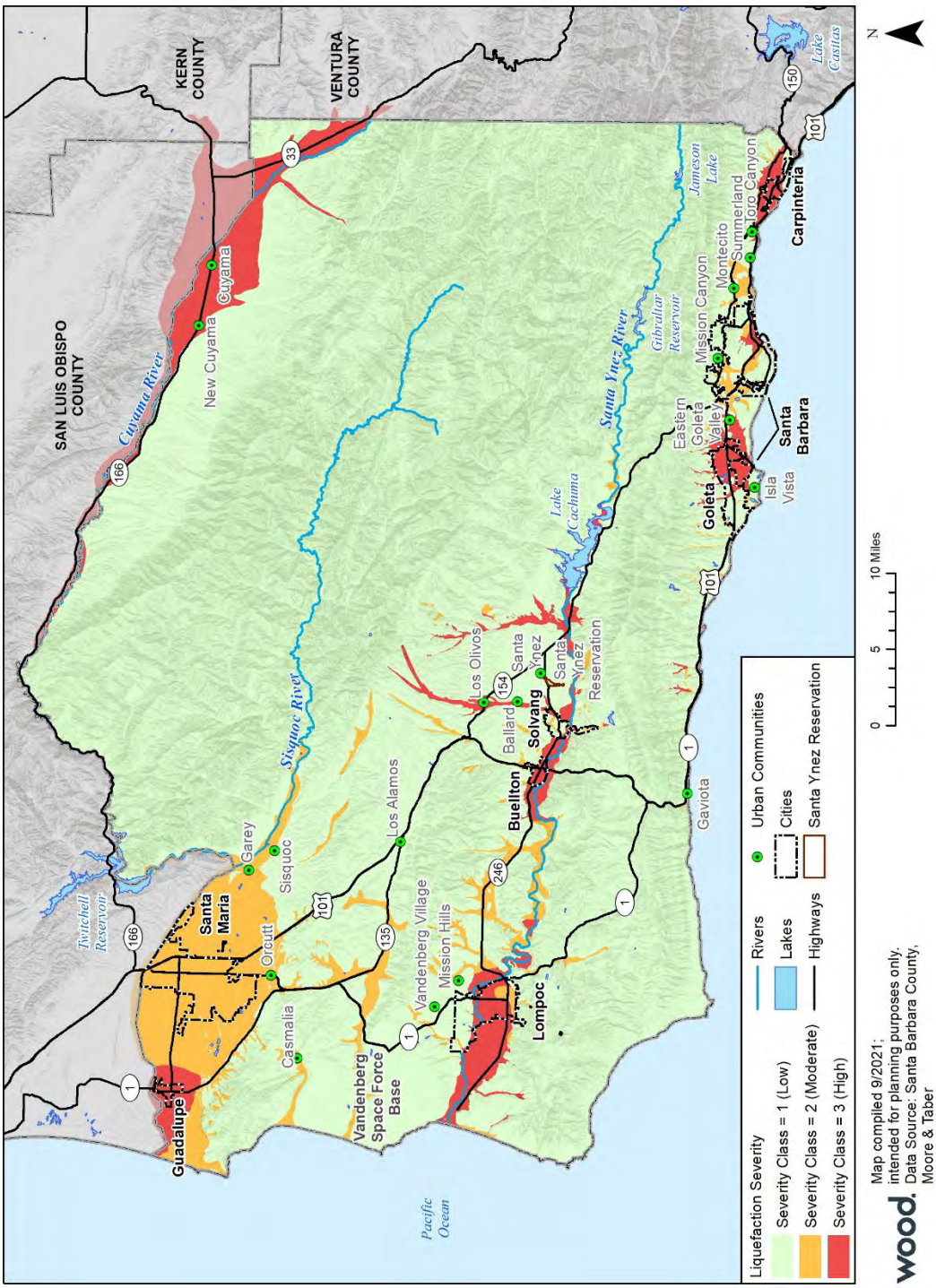


Figure 5-3. Santa Barbara County Liquefaction Severity



5.3.3 Flood

Description of Hazard

A flood is a general and temporary condition of partial or complete inundation on land that is normally dry. Several factors determine the severity of floods, including rainfall intensity and duration, antecedent moisture conditions, surface permeability, and geographic characteristics of the watershed such as shape and slope. Other causes can include a ruptured dam or levee, rapid ice or snow melting in the mountains, under-engineered infrastructure, or even a poorly placed beaver dam that can overwhelm a river or channel and send water spreading over adjacent land or floodplains.

A large amount of rainfall in a short time can result in flash flood conditions, as can a dam failure or other sudden spill. The National Weather Service's definition of a flash flood is a flood occurring in a watershed where the time of travel of the peak of flow from one end of the watershed to the other is less than six hours.

Another form of flooding occurs when coastal storms produce large ocean waves that sweep across coastlines making landfall. Storm surges inundate coastal areas, destroy dunes, and cause flooding. If a storm surge occurs at the same time as high tide, the water height will be even greater. The County historically has been vulnerable to storm surge inundation associated with tropical storms and El Niño.

Location and Extent of Hazard in the City of Santa Barbara

The geographical location, climate, and topography of Santa Barbara City and County make it prone to flooding (Figure 5-4). In regions such as Santa Barbara, without extended periods of below-freezing temperatures, floods usually occur during the season of highest precipitations or during heavy rainfalls after long dry spells. Additionally, due to the Mediterranean climate and the variability of rainfall, stream flow throughout the County is highly variable and directly impacted by rainfall with little snowmelt or base flow from headwaters. Watercourses can experience a high amount of sedimentation during wet years and high amounts of vegetative growth during dry and moderate years.

The drainages in the southern part of the County are characterized by high intensity, short duration runoff events, due to the relatively short distance from the top of the Santa Ynez Mountains to the Pacific Ocean. Runoff from high intensity, short-duration storm events can cause inundation of over bank areas, debris including sediment, rock, downed trees in the water that can plug culverts and bridges, erosion and sloughing of banks, and loss of channel capacity due to sedimentation.

The City is traversed by the floodplains of creeks that drain the Santa Ynez Mountains, with the degree of flood hazard varying substantially by community and creek. Mission Creek has been channelized reducing but not eliminating flood hazards. Flood control debris basins have been constructed on many of these creeks to intercept sediment and debris, reducing the potential for plugging of downstream creek channels and associated flood hazards.

Another contributing factor to flooding is the City's location along the Pacific Ocean. With its six miles of coastline, the City is susceptible to storm surge events following storms off the coast. In particular, low-lying areas, including much of the City's waterfront, are subject to wave attacks,

coastal flooding, and storm surges. Additionally, portions of the City's are subject to flooding due to flash flooding, urban flooding, watershed channel overflow, and downstream flooding (see Section 5.3.12, *Coastal Hazards*).

History of Hazard in the City of Santa Barbara

Flooding has been a major problem in the City of Santa Barbara. The City has several watershed areas that have different types of flooding problems, including over bank riverine flooding, flash floods, tidal flooding/tsunamis, and dam failure. The most common flooding in the City is due to watershed channel flooding and flash flood events.

Between 1906 and 2018, Santa Barbara County experienced 22 significant inland flood events. Eight of these floods received Presidential Disaster Declarations. Section 5.3.4 of the MJHMP describes the floods, including information concerning the nature of the flooding and the extent of the damages.

While there is a detailed account of historical flood events in Santa Barbara County provided in Section 5.0 of the 2022 MJHMP, the following section provides a summary of the more recent significant flood events that affected the City:

- **1998 –** The flooding events of 1998 arrived on a strong El Niño and brought several record-breaking rainfalls with 50-year storm event intensities throughout February. The City of Santa Barbara recorded its wettest month in history, 21.36-inches of rainfall. By the end of the month, many areas in the county had received 600 percent of normal February rainfall. Flood-related damages within Santa Barbara occurred during three major storm periods: February 1-4, February 6-9, and February 22-24. The cost to repair extensive flood damage to public and private property was estimated at $15 million. Just like in 1995, transportation throughout the county was disrupted through closures of roads, the Santa Barbara Airport, and train service. Flood damage was spread throughout the county and the county was declared a Federal Disaster Area on February 9. The floods received a Presidential Disaster Declaration (County Flood Control 1998).
- **February 2, 1998 –** During the first storm on February 2, winds with gusts as high as 63 miles per hour (mph) knocked over hundreds of trees and caused loss of power to thousands of homes across Goleta and Santa Barbara. The next day, 15-foot-high waves damaged pilings under Stearns Wharf and a broken sewer line near Arroyo Burro Beach, closing several nearby beaches due to high levels of bacteria buildup. Gaviota Creek overtopped and flooded the State Beach at the mouth of the creek. At the Gaviota Chevron plant, storm related damage caused a release of hazardous materials. The airport also closed down due to flood, and Highway 101 was shut down in Ventura, cutting off the City to the south (County Flood Control 1998).
- **February 6, 1998 –** With little time to recuperate, the South Coast was hit by a second major storm on February 6. Disruptions of transportation were widespread throughout the South Coast – a downed tree resulted in an accident that closed Highway 101. Along the coast, berms were hastily constructed to protect beachfront property (County Flood Control 1998).

- **2018** – Following the October 2017 Thomas Fire, heavy rains unleashed destructive rivers of water, mud, and debris in Santa Barbara County, particularly Montecito, leaving at least 23 people dead, destroying over 100 homes, and damaging over 300 homes. Rain from the storm fell on hillsides and mountains stripped of trees and vegetation by the Thomas Fire. The National Weather Service, Los Angeles reported that 0.54 inches of rain had fallen in 5 minutes at Montecito. Other figures include 0.73 inches in 10 minutes at KTYD Radio Towers, 0.86 inches in 15 minutes at Carpinteria, 1.11 inches in 30 minutes at Carpinteria, and 1.45 inches in 1 hour at Matilija Canyon (FloodList 2021) (see also, Section 5.3.9, *Landslide*).

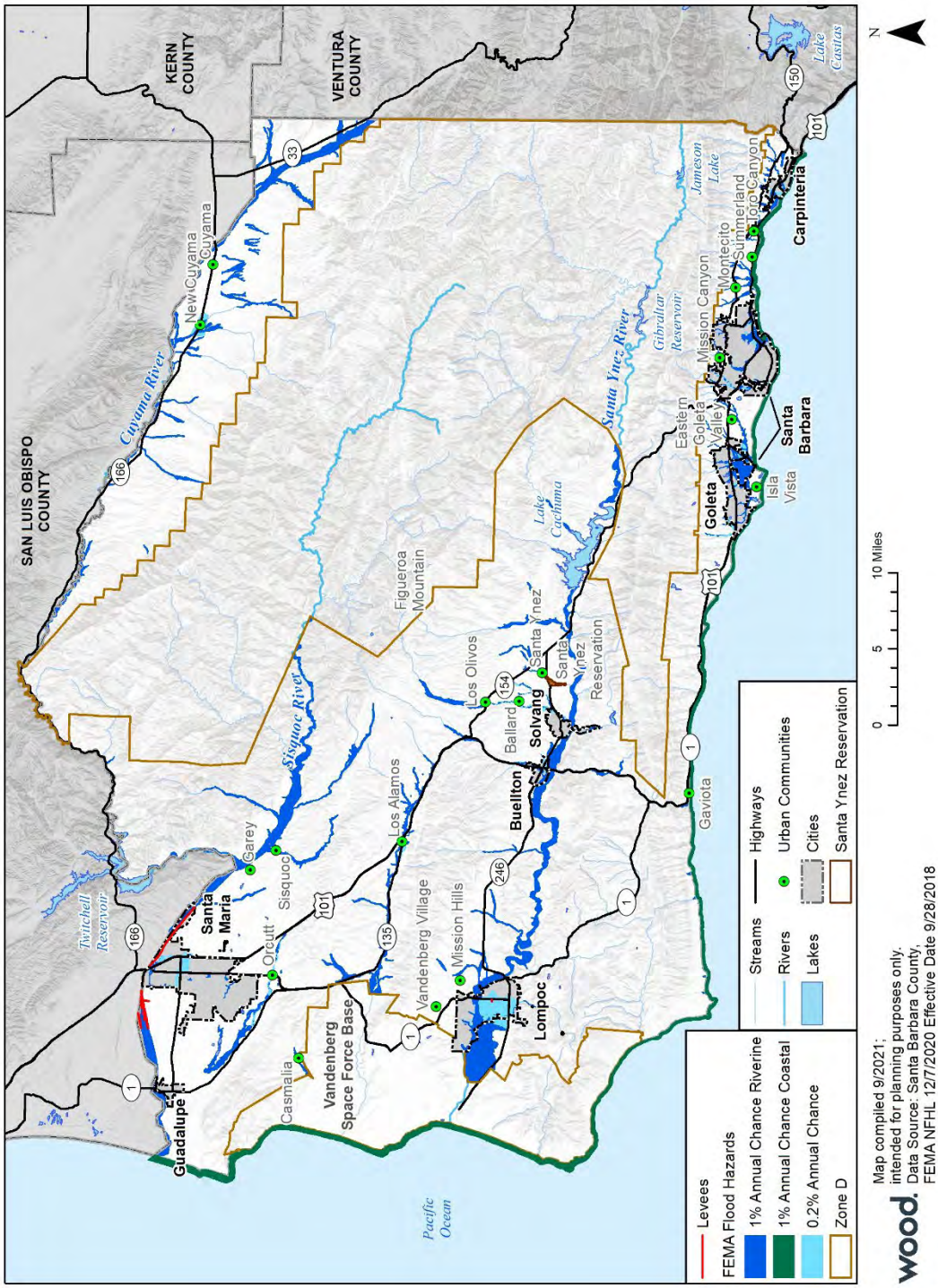
Probability of Occurrence

The 100-year flood is a flood that has a one percent chance in any given year of being equaled or exceeded. The 500-year flood is the flood that has a 0.2 percent chance of being equaled or exceeded in any given year.

Climate Change Consideration

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. For example, what is currently a 200-year storm, or one that has a 1 in 200 chance of occurring in a given year, by 2100 would increase in frequency by 40 to 50 years (to a 1 in 150/160 chance in a given year). This means that the 100-year and 500-year floodplains may expand, and the current floodplains may become 40- to 50-year floodplains (Santa County Barbara Planning and Development Department 2021). The frequency and intensity of heavy rainstorms are projected to increase, causing fluvial flooding along the City's creeks, although overall annual precipitation levels are expected to increase only slightly. For discussion regarding the impacts of climate change on coastal flooding and sea level rise, see Section 5.3.12, *Coastal Hazards*.

Figure 5-4. Santa Barbara County FEMA Flood Hazards



5.3.4 Pandemic/Public Health Emergency

Description of Hazard

Infectious disease emergencies are circumstances caused by biological agents, including organisms such as bacteria, viruses, or toxins, with the potential for significant illness or death in the population.

Infectious disease emergencies may be caused by:

- Naturally occurring diseases spread from person to person (e.g., measles, mumps, meningococcal disease, tuberculosis)
- Foodborne (e.g.: salmonella, E. coli, botulinum toxin, etc.)
- Vectors such as mosquitos can spread diseases (e.g.: West Nile virus, dengue, Zika, malaria).
- Newly emerging infectious diseases (e.g.: Ebola, Zika, SARS, MERS, avian influenza).
- Intentionally caused the spread of disease or toxins known as bioterrorism. Past bioterrorism events include the contamination of restaurant food with E. coli in Oregon (1984) and the release of Sarin gas in the Tokyo subway (1995).

The impact of infectious disease emergencies on the local community and its critical infrastructure will depend on:

- The type of biological agent and availability of treatment for victims
- The availability of prophylaxis for responders and the public
- The scale of exposure and ongoing exposure
- The mode of transmission and whether transmission can be interrupted
- Whether the event is affecting staffing for critical infrastructure within and outside of the county such as transportation, law enforcement, health care, and the medical and food supply chains.

An **outbreak** is when there are more cases than would be normally expected, often suddenly, of an infectious disease in a community or facility.

An **epidemic** is when there are more cases than would be normally expected of infectious disease, often suddenly, in a population of a large geographic area.

A **pandemic** refers to an epidemic that has spread over several countries or continents, usually affecting a large number of people. Examples include pandemic influenza and Severe Acute Respiratory Syndrome or "SARS" and the Coronavirus (COVID-19).

Outbreaks, epidemics, or pandemics can occur when a new virus emerges to which the population has little immunity. The 20th century saw three such pandemics, the most notable of which was the 1918 Spanish influenza pandemic that was responsible for 20 million deaths throughout the world. Secondary impacts include significant economic disruption to a community's infrastructure due to loss of employee work time, essential services and products, and costs of treating or preventing the spread of the disease.

Public health measures are used to control outbreaks, epidemics, or pandemics of infectious diseases, and are especially important for diseases with high morbidity or mortality and limited medical prophylaxis and/or rapid treatment.

Measures to control disease include:

- Legal measures such as isolation and quarantine of persons or products, and legal closure of food establishments.
- Control of contaminated food or water through recall of product or, for water, "Do Not Use", "Do Not Drink" or "Boil Water" orders issued by state or local health departments.

Vector control to eliminate vectors such as mosquitos that carry the disease from person to person. The Vector-Borne Disease Section of the California Department of Public Health identifies the following types of diseases:

- Africanized Honeybees
- Bed Bugs
- Body Lice
- Cat Scratch Disease
- Conenose Bugs
- Hantavirus Cardiopulmonary Syndrome
- Head lice
- Lyme Disease
- Mosquitoes
- Murine Typhus
- Plague
- Ticks
- West Nile Virus
- Red Imported Fire Ants
- Scabies
- Swimmer's Itch
- Tularemia
- Zika Virus

Location and Extent of Hazard in the City of Santa Barbara

Public health emergencies, such as infectious disease hazards or epidemics, occur not only on a local or state level but on a national and global scale. It is likely that most communities in the county, including the City, would be affected, either directly or by secondary impacts. Some indirect consequences may be the diversion of resources that may be otherwise available given the limited regional transportation opportunities and flow of goods and materials to the City.

History of Hazard in the City of Santa Barbara

Outbreaks, epidemics, or pandemics can occur when a new virus emerges to which the population has little immunity.

The 20th century saw several outbreaks, pandemics, and epidemics, the most notable of which was the 1918 Spanish influenza pandemic that was responsible for 40 to 50 million deaths throughout the world. The most notable pandemic of the 21st century is the current COVID-19 pandemic. The COVID-19 pandemic has severely impacted the economic, political, social, and environmental conditions of the City, county, California, the U.S., and the world. Older adults and people who have severe underlying medical conditions like heart or lung disease or diabetes seem to be at higher risk for developing more serious complications from COVID-19 illness; however, numerous stories were reported of young and healthy people who developed the disease and had serious complications. People with COVID-19 have had a wide range of symptoms reported – ranging from mild symptoms to severe illness. Symptoms of COVID-19 include but are not limited to fever or chills, cough, shortness of breath or difficulty breathing, fatigue, muscle or body aches, headache, new loss of taste or smell, sore throat, congestion or runny nose, nausea, or vomiting, and diarrhea. Symptoms may appear 2-14 days after exposure to the virus. Anyone can have mild to severe

symptoms (Centers for Disease Control and Prevention [CDC] 2021). On January 26, 2020, the CDC confirmed the first COVID-19 case in California, the third case in the U.S. As of June 2, 2021, there have been 34,507 confirmed COVID-19 cases within the county and 451 deaths (Santa Barbara County Public Health Department 2021a). In the City of Santa Barbara, there have been 15,065 reported cases and 112 reported deaths related to COVID-19. As of October 2021, 58 percent of Santa Barbara County was fully vaccinated (Santa Barbara County Public Health Department 2021). In the City of Santa Barbara, the County Public Health Department distributes COVID-19 vaccines at the Franklin Health Care Center and numerous participating pharmacies distribute vaccinations as well.

Probability of Occurrence

Disease outbreaks and flu epidemics occur on an ongoing basis. Occasionally these outbreaks require the initiation of the Santa Barbara County Public Health Department Infectious Disease Response Plan but have required little to no support from the City Emergency Operations Center (EOC). There is a continued threat from a novel influenza virus or other emerging epidemic or pandemic disease that would require a disaster response at the EOC level. The disease could affect the City infrastructure, and the ability of the EOC and other city departments to respond due to disease-related loss of staff.

Climate Change Consideration

It is widely accepted that the effects of climate change will facilitate increases in the frequency of infectious diseases. According to the National Institute of Environmental Health Services, many vector-borne and zoonotic diseases are climate-sensitive and ecological shifts associated with climate change are expected to impact the distribution and incidences of these diseases (National Institute of Environmental Health Services 2018). While many vector-borne and zoonotic diseases, such as malaria, yellow fever, dengue, and murine typhus, are rarely seen in the U.S., the City is directly susceptible to vector-borne and zoonotic diseases that are found in warmer climates and vulnerable due to global trade and travel. Changes in temperature and precipitation directly affect vector-borne disease transmission through pathogen-host interaction, and indirectly through ecosystem changes and species composition. As temperatures increases, vectors can spread into new areas that were previously too cold. During warm weather, animal species that carry diseases typically become more active and insects and other pests reproduce more rapidly. As climate change causes warmer temperatures earlier in the spring and later in the autumn, these animals may be active for longer periods, increasing the time that diseases can be transmitted (National Institute of Environmental Health Services 2018).

Further, climate-related natural disasters (e.g., wildfire, drought and water shortage, flood, coastal hazards) also increase the risk of infectious disease by disrupting health services and infrastructures and damaging water and sanitation networks (World Health Organization 2018).

5.3.5 Tsunami

Description of Hazard

A tsunami is a series of long waves generated in the ocean by a sudden displacement of a large volume of water. Underwater earthquakes, landslides, volcanic eruptions, meteoric impacts, or

onshore slope failures cause this displacement. Tsunami waves travel at speeds averaging 450 to 600 miles per hour. As a tsunami nears the coastline, its speed diminishes, its wavelength decreases, and its height increases. Depending on the type of event that creates the tsunami, as well the remoteness of the event, the tsunami could reach land within a few minutes or after several hours. Low-lying areas could experience severe inland inundation of water and deposition of debris more than 3,000 feet inland.

Location and Extent of Hazard in the City of Santa Barbara

As described in Section 5.3.9 of the MJHMP, areas prone to tsunami hazards in the county are limited to coastal areas and offshore areas. The cities of Santa Barbara and Carpinteria are most susceptible to tsunami hazards, given that they are located on or near several offshore geological faults, the more prominent faults being the Mesa Fault, the Santa Ynez Fault in the mountains, and the Santa Rosa Fault (refer to Section 5.3.3 of the MJHMP). Other unnamed faults in the offshore area of the Channel Islands may present tsunami hazards. These faults have been active in the past and can subject the entire county coastal area to seismic action at any time.

History of Hazard in the City of Santa Barbara

The relative threat for local tsunamis in Santa Barbara can be considered low due to low recurrence frequencies. Thirteen possible tsunamis have been observed or recorded in the county from local earthquakes between 1812 and 1988; however, there have been no recorded locally generated tsunamis since 1988. Additionally, these tsunami events were poorly documented, and the precise extent of environmental and public impacts is uncertain (refer to Section 5.3.9 of the MJHMP). The size of these tsunamis may never be known with certainty, but there are unconfirmed estimates of 30-35 feet waves in Santa Barbara City. The estimates are found in various literature and based on anecdotal history only.

- On February 27, 2010, a magnitude 8.8 earthquake occurred along the central coast of Chile and produced a tsunami. For the coast of Southern California, it was one of the largest tsunami episodes since 1964. In general, tsunami waves between 2 and 4 feet were reported. Tsunami waves of around 3 feet were reported by tide gauges across the Santa Barbara Channel. At Santa Barbara Pier, significant beach erosion was reported along with displacement of buoys. The tsunami surge lasted more than 20 hours. The most significant damage occurred along the coasts of Ventura and southern Santa Barbara counties. Numerous reports of dock damage were reported along with beach erosion.
- On March 11, 2011, a magnitude 9.0 earthquake occurred off the Pacific coast of Tohoku, Japan. This earthquake devastated many communities in Japan and caused tsunami effects across the ocean in Santa Barbara City. The only significant impact to Santa Barbara City was to the dredging contractor for the City of Santa Barbara harbor. The City harbor operations documented approximately $1,500 of damages (Public Assistance).

Probability of Occurrence

The University of Southern California (USC) Tsunami Research Group has modeled areas in the county that could potentially be inundated in the event of a tsunami. In 2001, the Tsunami Research Group concluded the walls of the basin that form the Santa Barbara Channel are susceptible to

submarine slope failures in at least two mapped locations (USC 2001). This model is based on potential earthquake sources and hypothetical extreme undersea, near-shore landslide sources. The data was mapped by the California Geological Survey and Cal OES for Tsunami Evacuation Planning. The maps and data are compiled with the best currently available scientific information and represent areas that could be exposed to tsunami hazards during a tsunami event. The tsunami inundation map helps to assist cities and counties in identifying their tsunami hazard areas. Figure 5-5 shows tsunami hazard areas in the City.

Based on the tsunami inundation map (Figure 5-5), several areas along the City's coast have the potential to be inundated by a tsunami. Given, there is a medium probability of an earthquake, which would result in high impacts including potential tsunami events in the City, the City is at minor risk of future tsunami events.

Climate Change Consideration

As previously described, tsunamis are created by earthquakes or other earth movements. To date, no direct relationship has been made between climate change and the occurrences of earthquakes or other earth movements.

5.3.6 Drought and Water Shortage

Description of Hazard

Drought and water shortages are a gradual phenomenon and generally are not signified by one or two dry years. California's and Santa Barbara's extensive system of water supply infrastructure (reservoirs, groundwater basins, and interregional conveyance facilities) generally mitigates the effects of short-term dry periods for most water users. However, drought conditions are present when a region receives below-average precipitation, resulting in prolonged shortages in its water supply, whether atmospheric, surface, or ground water. A drought can last for months or years or may be declared after as few as 15 days.

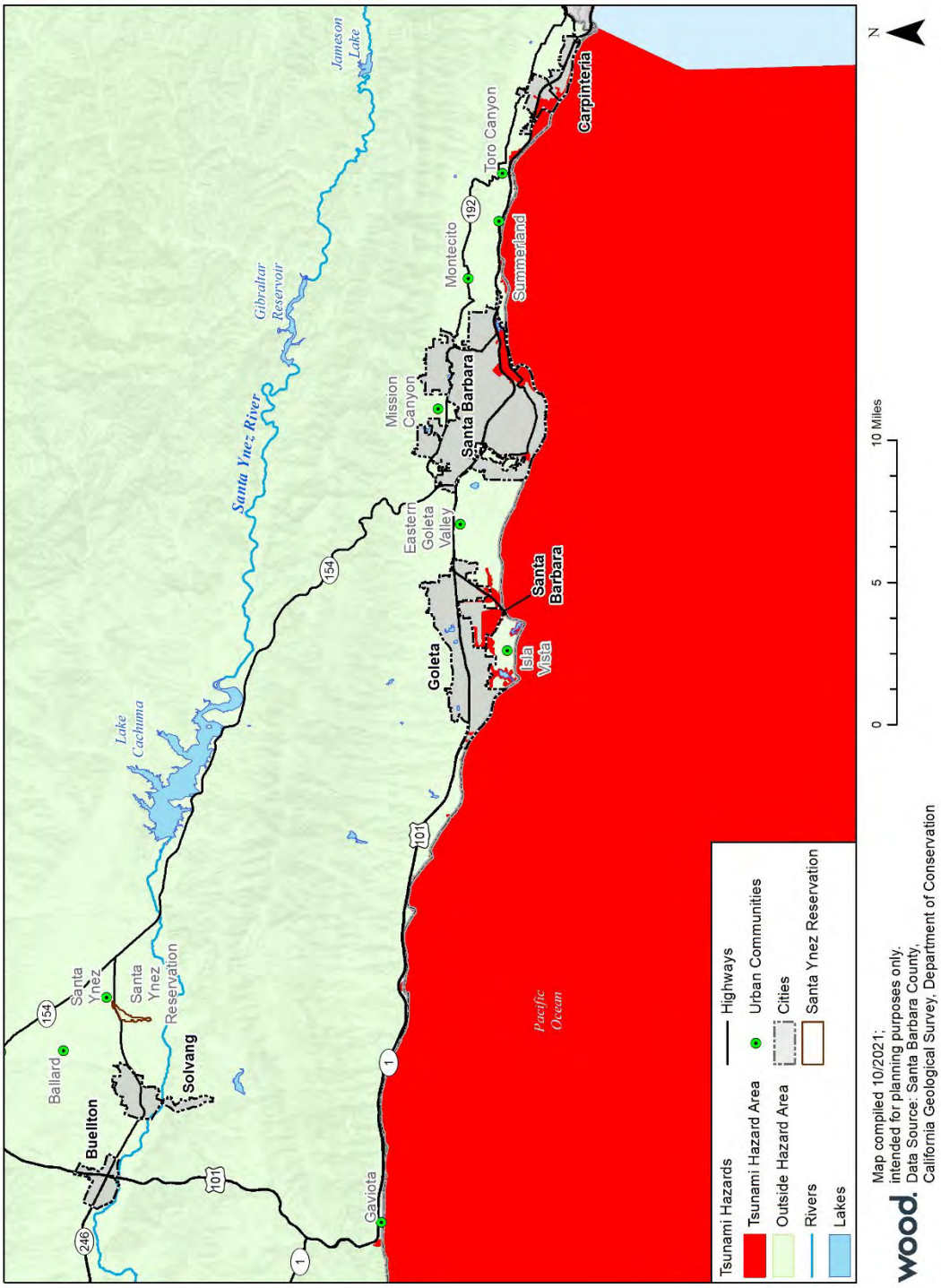
Location and Extent of Hazard in the City of Santa Barbara

The entire county is subject to drought conditions and water shortages.

History of Hazard in the City of Santa Barbara

Three 20th century droughts were of particular importance from a water supply standpoint—the droughts of 1929–1934, 1976–1977, and 1987–1992. More recent multiyear droughts occurred in 2007–2009 and 2012–2017 (DWR 2021). California's most recent multi-year drought occurred from 2012-2017. In January 2014, Santa Barbara County joined the State of California in declaring a local drought emergency, which was the first local emergency declaration of drought in the county's history (County of Santa Barbara 2014). This was the first time the state-imposed mandatory urban water use reduction requirements on water suppliers, and all of California's 58 counties declared local emergencies. Refer to Section 5.3.2 of the MJHMP for a detailed discussion of multi-year droughts that were identified as having significant impacts on the county.

Figure 5-5. South Coast Tsunami Hazard Area



Since August 2020, the period between 2012 and 2016 was one of the documented driest consecutive water years in the county with 50.83 inches in cumulative rainfall (County of Santa Barbara 2021a). Effects of the drought have lowered water storage at Lake Cachuma, one of the county's largest surface water reservoirs, with water storage at 48.4 percent of capacity in late 2021 (County Flood Control District 2021). Although the statewide drought of 2012–2016 was ended by a wet Water Year in 2017, localized drought conditions persisted in the Central Coast region and were not ended until a wet Water Year in 2019 (DWR 2021).

Probability of Occurrence

Droughts are a regularly recurring feature of Santa Barbara County weather that can be affected by overall regional or worldwide climactic patterns. El Niño and La Niña events are natural climate patterns over the Pacific Ocean often with global effects, with influence over the weather of the U.S. southwest that on average occur every two to seven years. The state recently experienced the 5-year significant drought event of 2012-2017; other notable historical droughts included 2007-09, 1987-92, 1976-77, and off-and-on dry conditions spanning more than a decade in the 1920s and 1930s. In any given year, the City can be subject to drought conditions and water shortages. However, out of the last 10 years, the county has been under a locally declared drought emergency for five years; therefore, it is likely drought and associated water shortages will continue and may increase due to climate change considerations, as described further below.

Climate Change Considerations

Climate change has the potential to make drought events more common in the county and City. Extreme heat creates conditions more conducive for the evaporation of moisture from the ground, thereby increasing the possibility of drought. A warming planet could lead to earlier melting of winter snowpacks, leaving lower stream flows and drier conditions in the late spring and summer. Snowpacks are important in terms of providing water storage and ensuring adequate supply in the summer when water is most needed. Changing precipitation distribution and intensity have the potential to cause more of the precipitation that does fall to run-off rather than be stored. The result of these processes is an increased potential for more frequent and more severe periods of drought.

5.3.7 Energy Shortage and Resiliency

Description of Hazard

Energy shortages (or disruptions) are considered a form of lifeline system failure. Disruptions can be the consequence of another hazard or can be a primary hazard, absent of an outside trigger. A failure could involve one, or a combination of the potable water system, power system, natural gas system, wastewater system, communication system, or transportation system. Most power blackouts are not human-caused. They are the result of situations involving unintended events, such as an overwhelming need for power due to weather conditions, equipment failure, or accidents. They may also fail due to natural hazards such as earthquakes, floods, and landslides. These outages can last anywhere from a few minutes to several weeks.

Santa Barbara County has two service providers. Pacific Gas and Electric (PG&E) provides electricity in the northern part of the county, with the termination of services north of the Gaviota area. Southern California Edison (SCE) provides power to the Southern parts of the county, with the

termination of services in Gaviota. The two systems are not connected. Thus, if there is a major interruption of service in the Santa Barbara area, then all services could be denied in either direction. The City of Santa Barbara is served by SCE.

Due to recent massive wildfires throughout California and their ignition originating from utility infrastructure and high winds, the electric utilities have initiated a program to conduct Public Safety Power Shutdowns to prevent wildfire ignitions. The utilities are currently working with the County to minimize power delivery interruption while managing wildfire hazards.

Location and Extent of Hazard in the City of Santa Barbara

The entire county, which includes the City of Santa Barbara, is subject to energy shortages. Electricity service is also highly vulnerable because it is highly dependent on electrical transmission lines and substations functioning properly.

History of Hazard in the City of Santa Barbara

Energy disruptions on a small scale have occurred regularly in Santa Barbara City; especially during strong wind and storm events. One of the largest events affecting electric and natural gas services in the City in recent years was the 2017 Thomas Fire, during which the transmission system running from Ventura County to the City of Goleta was shut down, leaving more than 85,000 customers without power for an extended period during the emergency (SCE 2017). Similar service disruptions, though not quite as extensive, occur in areas affected by wildfires and other disasters or emergencies. Small-scale energy disruptions have occurred regularly in the City.

Probability of Occurrence

In any given year, the City can be subject to energy shortages. A large disruption due to a power failure or rotating brown out is highly likely during strong storm events or during times of extreme heat.

Climate Change Considerations

With increased changes in weather and climate, the energy demands will shift too. The increased prevalence of extreme heat can drive energy demand and increase the need for intentional, unscheduled power shutoffs. Further, the resiliency of power systems can be threatened during a wildfire. As wildfire occurrences associated with climate change increase so does the risk for utility failure. Energy demand and management are critical during disaster response.

5.3.8 Dam Failure

Description of Hazard

Dams fail due to old age, poor design, structural damage, improper siting, landslides flowing into a reservoir, or terrorist actions. Structural damage is often a result of a flood, erosion, or earthquake. A catastrophic dam failure could inundate the area downstream. The force of the water is large enough to carry boulders, trees, automobiles, and even houses along a destructive path downstream. The potential for casualties, environmental damage, and economic loss is great. Damage to electric generating facilities and transmission lines could impact life support systems in communities outside the immediate hazard area.

Location and Extent of Hazard in the City of Santa Barbara

There are two dams in the county (i.e., Gibraltar Dam and Lauro Dam), which, if resulted in dam failure, would impact the City. These dams range in purpose from water supply to flood control.

Gibraltar Dam is owned and operated by the City of Santa Barbara. Gibraltar Dam and reservoir are located on the Santa Ynez River in Santa Barbara County, about 9 miles north of the City and upstream from Lake Cachuma. The City owns and operates the dam and reservoir under a Notice of Appropriation posted on October 11, 1904. Stored water is diverted through Mission Tunnel to the Cater Water Treatment Plant. The dam is a constant radius, concrete arch dam constructed in 1920 with an original capacity of 14,500 acre-feet; it was raised to its current elevation in 1949 and strengthened in 1991. Gibraltar Reservoir is the source of about one-third of the City of Santa Barbara's water supply. Loss of storage capacity due to siltation has been an issue since the dam was constructed. To monitor changes in capacity, and under the requirements of the Upper Santa Ynez River Operations Agreement, the City commissions a bathymetric survey of Gibraltar Reservoir at approximately three-year intervals.

Lauro Dam, which is owned and operated by the U.S. Bureau of Reclamation, is an earthen fill structure located on Diablo Creek at the northern edge of the City. The dam has a crest length of 540 feet and a height of 137 feet. The reservoir has a capacity of 640 acre-feet.

History of Hazard in the City of Santa Barbara

As described in Section 5.6.3 of the 2022 MJHMP, the county has experienced one incident of catastrophic dam failure, which occurred in the community of Mission Canyon. No historical dam failures have occurred within or in the vicinity of the City.

The DWR Division of Safety of Dams (DSOD) provides oversight of the design, construction, and maintenance of jurisdictional-sized and non-Federal dams. With DWR DSOD oversight, many potential dam issues have been addressed and/or resolved in the county (DWR DSOD 2021). Additionally, the USBR, responsible for oversight of federal dams in the county, has improved systems to ensure that peak releases during heavy inflows do not result in excessive downstream flows, which reduces the possibility of inundation from overflows (Santa Barbara County Planning and Development Department 2015).

Probability of Occurrence

Dam failure events are infrequent and usually coincide with the events that cause them, such as earthquakes, landslides, excessive rainfall, and snowmelt. There is a "residual risk" associated with dams; residual risk is the risk that remains after safeguards have been implemented. For dams, the residual risk is associated with events beyond those that the facility was designed to withstand. However, the probability of occurrence of any type of dam failure event is considered to be low in today's regulatory and dam safety oversight environment.

Climate Change Considerations

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.

5.3.9 Landslide

Description of Hazard

Landslides can be defined as the movement of a mass of rock, debris, or earth down an incline. Types of landslides include rock falls, rockslides, deep slope failures, shallow debris flows, and mudflows.

- Slope failure occurs when there is erosion of slopes by surface-water runoff. The intensity of slope wash is dependent on the discharge and velocity of surface runoff and the resistance of surface materials to erosion.
- Mudflows are defined as flows or rivers of liquid mud down a hillside on the surface of normally dry land. They occur when water saturates the ground, usually following long and heavy rainfalls. Mud forms and flows downslope if there is no ground cover such as brush or trees to hold the soil in place.
- Debris flow occurs when water begins to wash material from a slope or when water sheets off of a newly burned stretch of land. Chaparral land is especially susceptible to debris flows after a fire. The flow will pick up speed and debris as it descends the slope. As the system gradually picks up speed it takes on the characteristics of a basic river system, carrying everything in its path along with it.

The most common cause of a landslide is an increase in the downslope gravitational stress applied to slope materials, also known as over-steepening. Over-steepening can be caused by natural processes or by man-made activities. Undercutting of a valley wall by stream erosion or a sea cliff by wave erosion are ways in which over-steeping may occur naturally.

Location and Extent of Hazard in the City of Santa Barbara

Landslides and landslide-prone sedimentary formations are present throughout the coastal plain of western Santa Barbara County. Figure 5-18 of the MJHMP shows the location of soil types throughout the county. Generally, areas with soft soils are more prone to movement. Landslides also occur in the granitic mountains of East Santa Barbara County, although they are less prevalent. Many of these landslides are thought to have occurred under much wetter climatic conditions than at present. Recent landslides are those with fresh or sharp geomorphic expressions suggestive of active (ongoing) movement or movement within the past several decades. Reactivations of existing landslides can be triggered by disturbances such as heavy rainfall, seismic shaking, and/or grading. Many recent landslides are thought to be reactivations of ancient landslides.

Section 5.3.7 of the MJHMP lists the areas in Santa Barbara County where there are geologic formations that can lead to fairly severe landslides as identified by the Santa Barbara County Comprehensive Plan Seismic Safety and Safety Element (Santa Barbara County Planning and Development Department 2015). Some areas of the City are prone to more frequent rain-induced landslides, resulting in disruption to transportation and damage to roadways.

Figure 5-13 of the MJHMP shows the debris flow hazard areas along the South Coast as of 2018, after the Thomas Fire. As shown therein, only a small area of the northeastern portion of the City is susceptible to mudflow and debris flow hazards. However, this hazard area may shift after a debris flow or landslide or other hazards have affected an area, such as wildfire, flooding, or drought (Santa Barbara County Department of Planning and Development 2021).

History of Hazard in the City of Santa Barbara

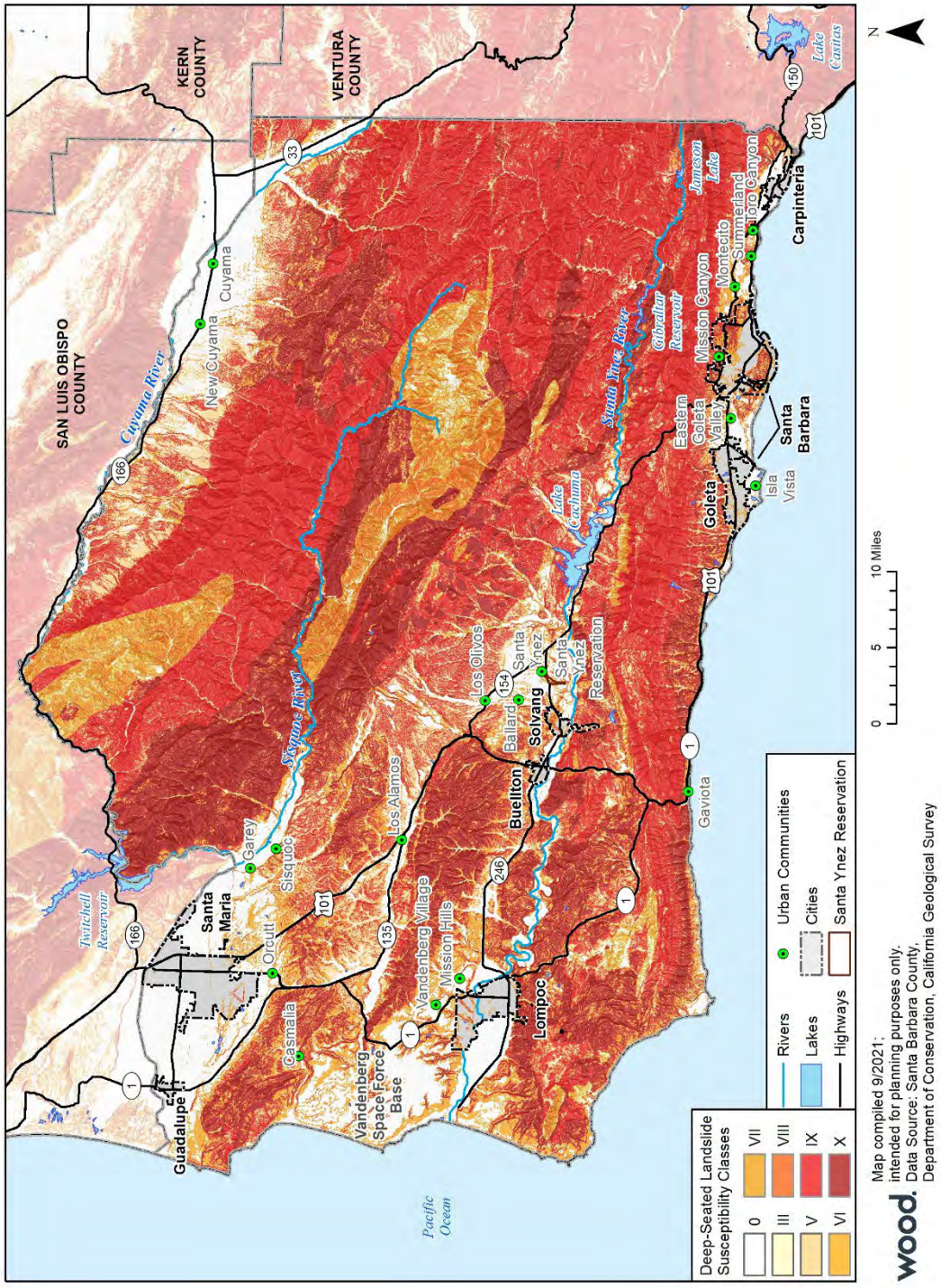
As previously mentioned, Santa Barbara County is prone to landslides; however, many previous landslide occurrences within the county were smaller and are not well documented. The Riviera area of the City has two area of landsliding referred to as the "Conejo Road Landslide" and the "Canon View Road/Sycamore Canyon Landslide". Movement of slopes in these areas were triggered in response to heavy rains in 1982-83 and again in 2005, destroying eight homes. Several large landslides have affected the coastal bluffs in the past, including the El Camino de la Luz landslide in 1978, which encompassed approximately three acres and destroyed two homes; and the bluff in Shoreline Park in 2008, which moved portions of the bluff edge landward 38 feet. Additionally, several historic storm and flood events in the county, particularly storms following intense wildfires, resulted in mudflows and debris flows. The most recent instance of debris flow affecting the City is the 2018 Montecito Debris Flows.

Following the 2017 Thomas Fire, which burned approximately 281,893 acres in Ventura and Santa Barbara Counties, a reported 0.59 inches of rain fell within 30 minutes in the burn scars from the Thomas Fire in the foothills of Montecito on Tuesday, January 9, 2018. Four inches of rain fell in two days, causing massive debris flows and flooding that damaged or destroyed 400 homes, killed 23 residents, and led to the closure of Highway 101 and the UPRR for more than 3 weeks, cutting off the county from communities to the south. California Geological Survey scientists estimated the Montecito debris flow as having speeds of 10-15 mph, being up to 25-30 feet deep, and capable of carrying boulders as large as a tow truck. (California Geological Survey 2019b).

Probability of Occurrence

Figure 5-6 below shows the locations of deep-seated landslide susceptibility in the county as mapped by the California Geological Survey. This map shows the relative likelihood of deep landslide based on the three site factors that most determine susceptibility: prior failure (from a landslide inventory), regional estimates of rock or soil strength, and steepness of slopes. On the most basic level, weak rocks and steep slopes are more likely to generate landslides. The map uses detailed information on the location of past landslides, the location and relative strength of rock units, and the steepness of the slope in a methodology developed by Wilson and Keefer (1985). The result shows the distribution of one very important component of landslide hazard. It is intended to provide infrastructure owners, emergency planners, and the public with a general overview of where landslides are more likely. The map does not include information on landslide triggering events, such as rainstorms or earthquake shaking, nor does it address susceptibility to shallow landslides such as debris flows. Therefore, this map is not appropriate for the evaluation of landslide potential at any specific site (California Geological Survey 2019). The areas shaded in darker red in Figure 5-6 are considered to have a higher probability of landslide occurrence than the low landslide risk areas in the City.

Figure 5-6. Landslide Susceptibility in Santa Barbara County



Based on historical data and given the likelihood of wildfires and intense rainfall events, as well as steep slopes upstream of the City, mudflow and debris flow hazards are likely to occur following wildfire and subsequent rain events. Mudflows and debris flows are usually a cascading effect of severe weather. The probability for more severe and damaging landslides increases during El Niño years or severe winter storms. The potential for debris flows dramatically increases following a wildfire (see also Section 5.3.1, *Wildfire*).

Climate Change Consideration

A 2021 study by the USGS finds that Southern California is likely to see increased post-wildfire landslides and debris flows caused by climate change-induced shifts in the state's wet and dry seasons. Wildfires make the landscape more susceptible to landslides when rainstorms pass through as the water liquefies unstable, dry soil and burned vegetation. Geologists routinely conduct landslide hazard assessments after wildfires occur, but there is often not enough time between a fire and a rainstorm to implement an effective emergency response plan (USGS 2021). Wildfire frequency, higher temperatures, and increased droughts projected to occur under climate change can reduce soil absorption capacity and kill vegetation that holds soil in place, making it unable to absorb as much water, further destabilizing slopes. The results also suggest more intense rainfall events could make landslides much more frequent. Slope failure is expected to become more frequent as more precipitation falls during fewer storm events (refer also to Section 5.3.3, *Flood*). Also, the increased heavy precipitation events may cause instability in areas where landslides were not as likely before. Therefore, resulting landslides may be larger or more widespread.

5.3.10 Train Accident

Description of Hazard

Train accidents are defined as any accidents involving public or private trains carrying passengers or cargo along the rail corridor. Train accidents, like other transportation accidents, are less likely to lead to a state or federal disaster declaration, than other hazards previously and aforementioned.

Location and Extent of Hazard in the City of Santa Barbara

The UPRR carries both freight and passengers through the coastal areas. The county is served by two Amtrak train routes for passenger-only services along the UPRR: the Pacific Surfliner and Coast Starlight (Santa Barbara 2021). The Pacific Surfliner runs adjacent to Highway 101 and the coastline with stops in San Diego, Orange, Los Angeles, and Ventura counties (Santa Barbara 2021). The Coast Starlight connections Seattle and Los Angeles travel south from Seattle with stops in Portland, the San Francisco Bay Area, Sacramento, Paso Robles, San Luis Obispo, and Santa Barbara.

In addition to passenger-only rail services, the Santa Barbara train station receives train movements from the shipment of commodities, such as hazardous materials, fuel (including oil), agriculture, meats, and non-consumables. Train accidents are generally localized and the incidents result in limited impacts at the community level. However, if there are volatile or flammable substances on the train and the train is in a highly populated, death, injuries, and damage to homes, infrastructure, and the environment, including forest fires, can occur. Additionally, a hazardous materials incident

on the rails or roadway has the potential to shut down both rail and highway transportation routes, such as Highway 101, where the two are within proximity to one another.

History of Hazard in the City of Santa Barbara

No major train accidents have occurred in the City of Santa Barbara or Santa Barbara County. However, in the last thirty years, numerous train accidents have occurred throughout the southern California region. For example, in 1991 the Seacliff Incident occurred in Ventura County when a train released 440 gallons of aqueous hydrazine (used to make agricultural, metal, and plastics processing chemicals) and naphthalene (industrial solvent) (Los Angeles Times 1991). The accident required the evacuation of the nearby Seacliff Community along with the shutting down of Highway 101 and took 5 days to clean up.

Probability of Occurrence

Given that no known train accidents have occurred in the City or county, the probability of occurrence is low. While neither of the train accidents described above occurred within the county, due to the scale and scope of train transportation for people and commodities, such events have the potential to occur.

Climate Change Consideration

There is no known linkage between climate change and train accidents; however, because of railroad track proximity along the Pacific Ocean, sea level rise could impact service. It is expected that conditions would be gradual and would not create unforeseen problems or complications.

5.3.11 Aircraft Crash

Description of Hazard

Airline crashes are defined as an accident of private, commercial, or military aircraft on land or oversea. Airline crashes, like other transportation accidents, are less likely to lead to a state or federal disaster declaration, than other hazards previously and aforementioned.

Location and Extent of Hazard in the City of Santa Barbara

In addition to being within the flight pattern of many airports providing regional flights (i.e., Los Angeles International, San Francisco International, Oakland, San Jose International, Burbank Airport, John Wayne Airport, Long Beach Airport, Ontario International Airport), Santa Barbara has one general aviation airport

The Santa Barbara Airport (SBA) is located near Goleta, west of Santa Barbara. SBA encompasses 952 acres and services five major airlines with 12 non-stop destinations. SBA served nearly 786,0000 passengers in 2018 and is the 13th largest airport in California (Santa Barbara Airport 2021). SBA has approximately 32 daily non-stop flights including to Chicago, Dallas, Denver, Las Vegas, Los Angeles, Oakland, Phoenix, Portland, Sacramento, Salt Lake City, San Francisco, and Seattle.

History of Hazard in the City of Santa Barbara

Currently, in the City of Santa Barbara, there has not been a record of a large aircraft incident.

Probability of Occurrence

Given that no known aircraft crashes have occurred in the county or the City, the probability of occurrence is low. However, with the number of general aviation operations, military flights, and its position between Los Angeles/San Diego and the Bay Area, there is a possibility of Santa Barbara County experiencing an airline crash.

Climate Change Consideration

There is no known linkage between climate change and airline crashes. Although bad weather does play a factor in some airline crashes, current aviation technology, and safety standards greatly reduce the risk of potential public and environmental safety concerns, including from weather.

5.3.12 Coastal Hazards

Description of Hazard

Erosion is a natural process that alters existing geomorphic features. Erosion can occur due to several factors, including winter storms, tidal action, wind-generated high surf, wave action, and rising sea levels.

Coastal storms produce large ocean waves that sweep across low-lying coastlines making landfall. Storm surges can inundate coastal areas, destroy dunes, and cause flooding. If a storm surge occurs at the same time as high tide, the water height will be even greater. Historically, the county has also been vulnerable to storm surge inundation associated with El Niño events and a related increase in storm severity.

Location and Extent of Hazard in the City of Santa Barbara

The impacts from sea level rise and erosion in the City will be felt along its six-mile-long coastline. Much of the westerly portion of the City's coastal zone is situated on bluffs overlooking the beach. Bluff areas in the City include the area from approximately Sea Ledge Lane at the west end of the City of Santa Barbara to approximately Santa Barbara Point, as well the far easterly portion of the City by the Bellosguardo Estate. Only a few small portions of the bluff area along the City's shoreline are currently protected by shoreline protection devices. Shoreline protection devices, such as seawalls and rock revetments, are structures along the coast that can provide flood and erosion protection for properties but can result in accelerated erosion of sandy beach areas in front of (seaward) and adjacent to the devices. These bluffs are currently eroding with exposure to waves and as a result of upland erosion and geologic hazards such as landslides (City of Santa Barbara 2020).

The low-lying areas of the City include the City's waterfront, lower downtown area, Airport, and Arroyo Burro County Beach Park. These low-lying areas have experienced coastal flooding due to storms surges and wave attacks, although the currently wide beaches fronting the City of Santa Barbara's waterfront tend to reduce such hazards. In these sandy beaches and low-lying areas in the City, impacts from erosion, tidal inundation, and storm waves are generally limited to the area south of Cabrillo Boulevard (City of Santa Barbara 2020).

Stearns Wharf is exposed to wave damage during large storms and a 100-year coastal event is expected to require temporary closure and significant structural repairs. The harbor includes the

marina, commercial uses, parking, industrial areas, and the City Pier (sometimes called the "harbor pier"), which supports the Coast Guard and houses a fuel dock. Under existing conditions, storm events and the highest high tides (e.g., "King Tides") can dislocate pile caps at the floating docks, and waves can overtop the harbor breakwater and reduce public access (City of Santa Barbara 2020).

Sea level rise coupled with increased frequency, severity, and duration of high tide and storm events related to climate change will result in more frequent and severe extreme events along the coast.

These events could expose the coast to severe flooding and erosion, damage to coastal structures and real estate, and salinity intrusion into delta areas and coastal aquifers (Projecting Future Sea Level, A Report from the California Climate Change Center 2006).

History of Hazard in the City of Santa Barbara

Typically, coastal hazards increase during periods of major storms that can coincide with high tides, causing coastal flooding, coastal bluff erosion, and landslides such as those that were experienced during the 1983, 1998, and 2015/2016 El Niño storms. Segments of the South Coast, in particular, have been subject to significant damage from coastal hazards. Homes along the City's coastline suffered substantial damage during the 1983 and 2015/2016 El Niño events. Subsequent El Niño seasons led to major beach erosion and further damage in some locations.

Historic coastal flooding has occurred along the county's South Coast since the mid-1800s. Between 1862 and 2010, the county had 15 significant floods, 8 of which were deemed a Presidential Disaster Declaration (County of Santa Barbara 2011). Coastal flooding has historically damaged residences, crops, and transportation infrastructure and is highly costly (each costing millions of dollars) (County of Santa Barbara 2017).

Coastal erosion is a recurring and ongoing hazard in south county and is particularly severe along Padaro Lane, Channel Drive, Del Playa Drive, More Mesa, Goleta Beach, Hope Ranch, and Shoreline Park. Coastal erosion hazards have resulted in the adoption of required city and County blufftop setbacks because development in coastal communities generally require a minimum of 75 years of structural life. Many residences along Del Playa Drive in Isla Vista are threatened by coastal erosion and setbacks have eroded to the point many homes now sit on the cliff edge.

Probability of Occurrence

Coastal flooding from tidal inundation and wave attack and associated erosion of coastal bluffs and beaches occurs during many winters but is most pronounced during past major El Niño events, which have return intervals of 2 to 7 years. Although many private coastal properties and public facilities have been protected by rock revetments or seawalls in the County, coastal flooding, and beach and bluff erosion continue in areas such as the City. While the existing probability of occurrence is typically confined to El Niño seasons or major storm events, as discussed below, climate change and sea level rise are projected to increase in frequency and severity of occurrence.

Climate Change Considerations

The County's 2017 Coastal Resiliency Project projects sea level in the county will rise by 10.2 inches in 2030, 27.2 inches by 2060, and 60.2 inches in 2100 (County of Santa Barbara 2017). The

County modeled coastal hazards for coastal armoring and no coastal armoring. Particularly susceptible areas of the county to sea level rise related impacts include Isla Vista, Goleta Beach County Park, and the Santa Barbara Airport, coastal bluff homes in Summerland, Toro Canyon and Padaro Lane, segments of the UPRR and Highway 101 from the City of Carpinteria to the Gaviota Coast, including the City of Santa Barbara (County of Santa Barbara 2017).

Additionally, more specific coastal hazard modeling was performed for the City by Environmental Science Associates as part of the city's 2021 *Sea Level Rise Adaptation and Vulnerability Plan*. This plan similarly concluded that the most susceptible areas of the City include Downtown Santa Barbara, East Beach, and Leadbetter Beach (City of Santa Barbara 2021). See Section 6.7, *Coastal Hazards* for more information about the Sea Level Rise Adaptation Plan's assessment of vulnerabilities in the City from coastal hazards.

Based on these studies, sea levels are projected to rise by as much as 6.6 feet by 2100, though more extreme scenarios project sea levels rising as much as 7.1 feet by 2100; however, these extreme scenarios are based on worst-case GHG emissions assumptions, are highly conservative, and considered to be very unlikely of occurring (refer to Table 5-11 of the MJHMP). While sea level rise projections will continue to change as scientific understanding increases and policy choices manifest, what is clear for the most current projections is that sea levels are bound to increase at a significant rate, further increasing both the probability and severity of coastal hazards throughout all of Santa Barbara County (Ocean Protection Council 2018).

5.3.13 Extreme Heat

Description of Hazard

Extreme heat is defined by FEMA as temperatures that hover 10 degrees Fahrenheit (°F) or more above the regional average high temperature or over 100 °F in California and last for at least three days or even as long as several weeks (FEMA 2021). Extreme heat is a function of heat and relative humidity. A heat index describes how hot the heat-humidity combination makes the air feel. As relative humidity increases, the air seems warmer than it is because the body is less capable of cooling itself or regulating heat via evaporation of perspiration. As the heat index rises, so do health risks such as heat exhaustion, sunstroke, and heatstroke.

While the effects of extreme heat on human health can be severe, so too can its effects be on natural ecosystems, services, infrastructure, and various economic sectors (e.g., agricultural sector). During periods of extreme heat, transportation, gas, power, and other services may be disrupted, and critical infrastructure may be destroyed or damaged (FEMA 2021). The National Institute for Occupational Safety and Health (NIOSH), alongside OSHA, provides a Heat Safety Tool App that offers occupational safety and health recommendations based on the heat index (OSHA 2021). Each extreme heat day or heat wave can present additional risk of other hazards present within the County but is primarily a direct contributor to wildfire hazards and risks (refer to Section 5.3.1, *Wildfire*). As heat increases, the need for additional cooling systems to avoid mechanical failure increases as well. This can increase costs to consumers and may contribute to climate change if fossil fuels are used to generate the electricity needed to operate cooling systems.

Location and Extent of Hazard in the City of Santa Barbara

All of Santa Barbara County can experience extreme heat. Coastal communities such as the City on average have lower temperatures compared to communities in the inland areas of the county and could be less at risk to extreme temperatures although potentially less acclimatized to high temperatures if they occur.

History of Hazard in the City of Santa Barbara

Santa Barbara County and the City have experienced several extreme heat events in the past; however, they are not well documented. One documented event reported as "simoon", occurred on June 17, 1859, where a record temperature of 133 °F was taken during an extreme heat and wind event that struck Santa Barbara in the early afternoon (Noozhawk 2020). More recently, according to the NOAA Storm Events Database, a combination of high pressure and high humidity caused temperatures to spike to between 100 °F and 119 °F on July 22, 2006, throughout southern California, including the county (NOAA 2021). In 2020, heatwaves in the Santa Ynez Valley with temperatures reaching 118 °F caused early grape harvests at wineries (Jervis 2020).

Probability of Occurrence

In any given year, the City can be subject to extreme heat conditions.

Climate Change Considerations

Historically, Santa Barbara County has experienced an average of four extreme heat days a year, however, this is expected to increase to 12 extreme heat events per year by 2030, 19 extreme heat events per year by 2060, and 34 extreme heat events per year by 2100 (Santa Barbara County Planning and Development Department 2021). Due to the rising temperatures, heat waves are likely to become more frequent, which will have direct impacts on human health in terms of heat-related illness. Outdoor laborers will be most vulnerable to the rising temperatures and most at risk for heat-related illnesses. Residents will also be vulnerable to rising temperatures, as many of the homes on the coast do not have air conditioning units, as there was less of a need in the past, and therefore may be less prepared compared to the inland region of the county to adapt to extreme heat events.

Cascading impacts include increased stress on water quantity and quality, degraded air quality, and increased potential for more severe or catastrophic natural events such as heavy rain, droughts, and wildfire. Another cascading impact includes increased duration and intensity of wildfires with warmer temperatures.

Extreme heat has also been shown to accelerate wear and tear on the natural gas system and electrical infrastructure. Projected increases in summer demand associated with rising temperatures may increase risks to energy infrastructure and may exceed the capacity of existing substations and distribution line infrastructure and systems.

5.3.14 Hazardous Materials Release

Description of Hazard

Hazardous Waste/Materials are widely used or created at facilities such as hospitals, wastewater treatments plants, universities, and industrial/manufacturing warehouses. Several household products such as cleaning supplies and paint are also considered hazardous materials. Hazardous materials include:

- Explosives;
- Flammable, non-flammable, and poisonous gases;
- Flammable liquids;
- Flammable, spontaneously combustible, and dangerous when wet solids;
- Oxidizers and organic peroxides;
- Poisons and infectious substances;
- Radioactive materials; and
- Corrosive materials.

Both mobile and external hazardous materials releases can spread and affect a wide area, through the release of plumes of chemical, biological, or radiological elements or leaks or spills. Conversely, internal releases are more likely to be confined to the structure the material is stored in.

Chemicals may be corrosive or otherwise damaging over time. A hazardous materials release could also result in fire or explosion. Contamination may be carried out of the immediate area of the incident by people, vehicles, wind, and water. Weather conditions can increase the size and intensity of the Hazardous Materials Release. Typography, such as hills and canyons, can increase the size of the release or make it more difficult to contain.

Location and Extent of Hazard in the City of Santa Barbara

The locations and identity of facilities that store hazardous materials are reported to local and federal governments. Many facilities have their own hazardous materials guides and response plans, including transportation companies that transport hazardous materials.

The release of hazardous materials into the environment can cause a multitude of problems. Although these incidents can happen almost anywhere, certain areas of the City are at higher risk, such as near roadways that are frequently used to transport hazardous materials and locations with industrial facilities that use, store, and/or dispose of such materials. Areas crossed by railways, waterways, airways, and pipelines also have increased potential for mishaps.

History of Hazard in the City of Santa Barbara

Several significant hazardous material incidents have occurred in the County in the past century, and include the oil spills which occurred in 1969, 1997, 2007, 2008, 2015, and 2020 (see Section 5.3.15, *Oil Spill* for a detailed discussion of these incidents and risks associated with oil spill-related hazards). Approximately 550 hazardous materials incidents in the City were reported to the Cal OES Warning Center from 2006 through 2021, which is the largest number of incidents by far when compared to any other city within the county. These incidents include both transportation and

fixed-facility incidents. This list does not capture all hazardous material spills within the City, only those that were significant enough to be reported to Cal OES (refer to Table 5-18 of the MJHMP for a summary of hazardous materials incidents reported to Cal OES in Santa Barbara County by location and type). The data indicates that hazardous materials incidents can occur across the county with a greater frequency in the more developed areas.

Probability of Occurrence

Given that 550 significant hazardous materials incidents occurred within the City over 15 years (i.e., between 2006 and 2021), these incidents occur approximately 37 times per year or twice per month. Incidences can occur during the production, storage, transportation, use, or disposal of hazardous materials. Communities can be at risk if a chemical is used unsafely or released in harmful amounts into the environment. Hazardous materials can cause death, serious injury, long-lasting health effects, and damage to buildings, the environment, homes, and other property.

Climate Change Consideration

There are no known effects of climate change on human-caused hazards including hazardous material and waste incidents. However, the weather may play a factor in hazardous material releases. While there is little evidence to link climate change increase occurrences of hazardous material releases, it could impact the response and recovery efforts.

5.3.15 Oil Spill

Description of Hazard

An oil spill is a release of liquid petroleum hydrocarbon into the environment due to human activity or technological error that results in pollution of land, water, and air. Oil releases also occur naturally through oil seeps either on land or underwater. Marine oil spills, whether accidental or intentional, can result from the release of crude oil from offshore oil platforms, drilling rigs, wells, pipelines, tank trucks, and marine tank vessels (tankers). Refined petroleum products such as gasoline, diesel, and heavier fuels such as bunker fuel used by cargo ships are also sources of potential oil spill releases. Depending on the origin, size, and duration of the release, an oil spill can have serious impacts on air and water quality, public health, plant and animal habitat, and biological resources.

Clean up and recovery is time and cost consuming, and dependent on weather conditions such as wind and rain. Tidal and Current conditions may also make the spill more dynamic.

Location and Extent of Hazard in the City of Santa Barbara

This hazard can occur in any part of Santa Barbara County where existing oil and gas operations are located, either onshore through supply pipelines and well facilities or offshore where there are several platforms and undersea pipelines. Currently, there are 19 offshore oil platforms off the coast of Santa Barbara County as well as two onshore refineries and six oil separation and treatment plants (refer to Figure 5-32 of the MJHMP; County Department of Planning and Development 2017).

History of Hazard in the City of Santa Barbara

The City has experienced several large oil spills. In 1969, an estimated total of 100,000 barrels (4.2 million gallons) of crude oil was spilled from Platform A of a Union Oil drilling rig platform into the ocean and onto nearby shores over several months. In 2015, a 24-inch subterranean pipeline owned and operated by Plains All America Pipeline ruptured on the Gaviota Coast, west of Refugio State Park. Much of the crude oil spilled ran down a storm drain and into a ravine under the freeway and entered the ocean. The size of the spill ranged from 100,000 to 140,000 gallons, covering the Santa Barbara County coastline and extending nearly 9 miles out into the ocean. Refer to Section 5.6.7 of the MJHMP for a detailed description of these incidents and other oil spills in the county.

Probability of Occurrence

In any given year, Santa Barbara City could be subject to oil spills onshore or offshore.

Climate Change Considerations

With increased changes in weather, climate, and economics, the demands for oil and gas production may shift. This shift in demand could increase production, distribution, and transportation of oil products; thus, increasing the potential oil spill occurrences.

6.0 VULNERABILITY ASSESSMENT

The vulnerability assessment builds on the hazard assessment provided in Section 5.0 of the LHMP and Chapter 5.0 of the 2022 MJHMP to estimate losses where data is available and consider a specific list of critical facilities identified within the City of Santa Barbara. The City identified 233 critical facilities to be included in the Vulnerability Assessment portion of the LHMP. These facilities primarily included utilities, government, and educational structures as well as bridges. Of the available data, it was shown that these buildings are worth approximately $117,303,136 in total building value (i.e., structural and content value) (Table 6-1). No values were able to be obtained for many major facilities, so the actual value may be much more than this amount.

Table 6-1. Critical Facilities in the City of Santa Barbara

Type	Name	Address	Total Building Value
Communications	Vic Trace Ac		-
Paging Tower	Dial Page, Inc	923 Laguna Street	-
Paging Tower	Dial Page, Inc	320 West Pueblo Street	-
Community Center	Recreation	1232 De La Vina Street	-
Community Center	Recreation	100 E. Carrillo Street	-
Community Center	Lower Westside Community Center	629 Coronel Place	-
Community Center	Franklin Community Center	1136 E. Montecito Street	-
Hydrology Field	Hydrology Field Installations	735 Anacapa Street	$463,890

Type	Name	Address	Total Building Value
Reservoir	Escondido Pump Station and Reservoir	2300 Skyline Way	-
Reservoir	La Cornilla Pump Station and Vic Trace Reservoir	1631 La Coronilla Drive	-
Utilities	Sheffield Pump Station	2375 Foothill Road	-
Utilities	Skofield Pump Station	2117 Mount Calvary	-
Utilities	Laguna Pump Station	236 E. Cabrillo Blvd	-
Water District	Goleta West Water District	J Road	-
Water Treatment Plant	Cater Water Treatment Plant	1150 San Roque Road	-
Water Treatment Plant	Ortega Well Treatment Plant	220 E. Ortega Street	-
Water Treatment Plant	Ortega Well Treatment Plant	631 Garden St	-
Water Treatment Plant	Sheffield Treatment Plant	530 Mountain Drive	-
Water Treatment Plant	Charles E. Meyer Main Desalination Plant	525 E. Yananoli St.	-
Water Treatment Plant	SCADA / MCC Building	525 E. Yananoli St.	-
Water Treatment Plant	El Estero Water Resources Center	520 E. Yananoli St.	-
Clinic	McDonald Building Human Resources	1226 Anacapa Street	$1,036,791
Clinic	Sansum Clinic-Pesetas	215 Pesetas Ln	-
Clinic	Santa Barbara Community Dialysis Center	222 Pesetas Lane	-
Clinic	Valle Verde Health Facility- SNF	900 Calle De Los Amigos	-
Clinic	La Cumbre Senior Living Concepts	3880 Via Lucero	-
Clinic	Vista Del Monte Sunridge SNF	3775 Modoc Road	-
Clinic	Sansum Clinic-Hitchcock	51 Hitchcock	-
Clinic	Samarkand- Smith Center- SNF	2566 Treasure Drive	-
Clinic	Mission Terrace Convalescent Hospital	623 West Junipero Street	-
Clinic	Sansum Clinic- Ob/ Gyn	515 W. Pueblo St	-
Clinic	Cottage Rehabilitation Hospital	2415 De La Vina Street	-
Clinic	Sansum Clinic- Pueblo	317 Pueblo St	-
Clinic	Santa Barbara Cottage Hospital	Bath At Pueblo	-
Clinic	Santa Barbara Convalescent Hospital	2225 De La Vina Street	-
Clinic	Santa Barbara Neighborhood Clinic- Westside	628 W. Micheltorena Street	-
Clinic	Santa Barbara Artificial Kidney Center	1704 State Street, #2	-

Type	Name	Address	Total Building Value
Clinic	Santa Barbara Neighborhood Clinic- Eastside	915 N Milpas St	-
Clinic	PhD Franklin Clinic	1136 Montecito St	-
Clinic	PhD Children's Medical Services	1111 Chapala Street	$375,583
EMS Station	American Medical Response Station 3	415 West Figueroa Street	-
EMS Station	American Medical Response Station 4	1025 Castillo Street	-
Nursing Home	Cliff View Terrace	1020 Cliff Drive	-
Nursing Home	Alto Lucero Transitional Care	3880 Via Lucero	-
Nursing Home	The Californian	2225 De La Vina St	-
Nursing Home	Alexander Court	325 W Islay St	-
Nursing Home	Samarkand Skilled Nursing Facility	2566 Treasure Dr	-
Nursing Home	Samarkand of Santa Barbara	2550 Treasure Drive	-
Nursing Home	Wood Glen Hall, Inc.	3010 Foothill Road	-
Nursing Home	Mission Villa	321 West Mission Street	-
Nursing Home	Vista Del Monte	3775 Modoc Road	-
Nursing Home	Valle Verde Health Facility	900 Calle De Los Amigos	-
Nursing Home	Alexander Gardens	2120 Santa Barbara Street	-
Nursing Home	Mission Terrace Convalescent Hospital	623 W Junipero St	-
Nursing Home	Oak Cottage of Santa Barbara Memory Care	1820 Delavina Street	-
Nursing Home	Garden Court at Villa Santa Barbara	227 E. Anapamu Street	-
Nursing Home	Villa Alamar	45 East Alamar	-
Nursing Home	Villa Riviera	1621 Grand Avenue	-
Nursing Home	Mountain House	37 Mountain Drive	-
Nursing Home	At Home in Santa Barbara	1801 Bath Street	-
Veteran Services	Sb Veterans Memorial Bldg.	112 W. Cabrillo Blvd.	$2,034,893
Airport Patrol	Santa Barbara Airport Patrol	601 Firestone Road	-
Colleges / Universities	Fielding Graduate University	2020 De La Vina St	-
Colleges / Universities	The Santa Barbara and Ventura Colleges of Law At Santa Barbara	20 E Victoria St	-
Colleges / Universities	Antioch University-Santa Barbara	602 Anacapa Street	-
Colleges / Universities	Santa Barbara City College	721 Cliff Drive	-
Court	County Courthouse	1100 Anacapa Street	$40,553,793
Court	Sb Superior Court Building	118 E. Figueroa Street	$9,343,534
Court	County Courthouse Annex	1100 Anacapa St	$6,023,849
Court	Court Services Bldg.	118 E. Figueroa Street	$357,608

Type	Name	Address	Total Building Value
Education	Saint Vincent Orphanage and School Building	925 De La Vina Street	-
Education	Santa Barbara Unified Early Childhood	1030 E. Yanonali St.	-
Education	Adelante Charter	1102 E. Yanonali St.	-
Education	Franklin Elementary	1111 E. Mason St.	-
Education	Harding University Partnership	1625 Robbins St.	-
Education	Monte Vista Elementary	730 N. Hope Ave.	-
Education	Alta Vista Alternative High	215 E. Ortega St.	-
Education	McKinley Elementary	350 Loma Alta Dr.	-
Education	Roosevelt Elementary	1990 Laguna St.	-
Education	Open Alternative	4025 Foothill Rd.	-
Education	Monroe Elementary	431 Flora Vista Dr.	-
Education	Alta Vista Alternative Junior High	215 E. Ortega St.	-
Education	La Cumbre Junior High	2255 Modoc Rd.	-
Education	Santa Barbara Community Academy	850 Portesuello Ave.	-
Education	Adams Elementary	2701 Las Positas Rd.	-
Education	Santa Barbara Junior High	721 E. Cota St.	-
Education	Santa Barbara Senior High	700 E. Anapamu St.	-
Education	La Cuesta Continuation High	710 Santa Barbara St.	-
Education	Washington Elementary	290 Lighthouse Rd.	-
Education	Hope Elementary	3970-A La Colina Rd.	-
Education	La Colina Junior High	4025 Foothill Rd.	-
Education	Cleveland Elementary	123 Alameda Padre Serra	-
Education	Peabody Charter	3018 Calle Noguera	-
Education	Providence-SBCS	3723 Modoc Rd	-
Education	El Montecito School San Roque	3225 Calle Pinon	-
Education	Notre Dame School	33 E Micheltorena St	-
Education	Bishop Garcia Diego High School	4000 La Colina Rd	-
Education	Sunrise Montessori School	1201 E Yanonali St	-
Education	Providence	630 E Canon Perdido St	-
Education	Santa Barbara Middle School	1321 Alameda Padre Serra	-
Education	The Knox School of Santa Barbara	1525 Santa Barbara St	-
Education	Eureka School of Santa Barbara	3324 State St Ste M	-
Education	St Therese Classical Academy	33 E Micheltorena St	-
Fire Station	Fire Station 4	19 N. Ontare Road	-
Fire Station	Fire Station 5	2505 Modoc Road	-
Fire Station	Fire Station 6	1802 Cliff Drive	-
Fire Station	Fire Station 1	121 W. Carrillo St	-

Type	Name	Address	Total Building Value
Fire Station	Fire Station 3	415 E. Sola Street	-
Fire Station	Fire Station 7	605 Mission Ridge Road	-
Fire Station	Fire Training	30 S. Olive Street (2 S. Cesar Chavez)	-
Fire Station	Fire Station 2	819 Cacique	-
Fire Station	Airport Fire Station 8	40 Hartley Place	-
Government	Administration Building	105 E. Anapamu Street	$27,266,352
Government	Engineering Building	123 E. Anapamu Street	$11,145,938
Government	Sbch East Wing	1105 Santa Barbara Street	$7,308,080
Government	Probation Building	117 E. Carrillo Street	$4,216,037
Government	Hall Of Records	1100 Anacapa Street	$4,179,732
Government	Schwartz Building	130 E Victoria St	$2,652,501
Government	City Hall	735 Anacapa Street	-
Government	Public Works	220 E. Ortega Street	-
Government	Public Works	630 Garden Street	-
Government	Community Development	630 Garden Street	-
Government	Public Works	630 Garden Street	-
Government	Public Works Yard	635 Laguna Street	-
Government	Admin Well Corp. at Parks Department	402 East Ortega Street	-
Government	Parks And Recreation	620 Laguna St.	-
Government	ADMHS Offices	2034 De La Vina Street	$145,154
Government	Sb Child Support Office	4 East Carrillo Street	$199,401
Harbor Patrol	Santa Barbara Waterfront Harbor Patrol	132 Harbor Way A, Po Box 1990	-
Historic Site	Virginia Hotel	17 And 23 West Haley Street	-
Historic Site	Mission Santa Barbara	2201 Laguna Street	-
Historic Site	Janssens-Orella-Birk-Building	1029 - 1031 State Street	-
Historic Site	Hill-Carrillo Adobe	11 East Carrillo Street	-
Historic Site	Old Lobero Theatre	33 E. Canon Perdido	-
Historic Site	Casa De La Guerra	808-818 State Street, 813 - 819 Anacapa Street, 9 - 25 E. De La Guerra Street	-
Historic Site	Santa Barbara Presidio	123 East Canon Perdido Street	-
Historic Site	Hastings Adobe	414 W. Montecito Street	-
Historic Site	Covarrubias Adobe	715 Santa Barbara Street	-
Historic Site	Rafael Gonzalez House	835 Laguna Street	-
Historic Site	Faith Mission	409 State Street	-
Historic Site	Los Banos Del Mar	401 Shoreline Drive	-
Historic Site	Andalucía Building	316 - 324 State Street	-
Historic Site	Burton Mound	129 W. Mason At Burton Circle	-
Police	Police Department	215 E. Figueroa St.	-

Type	Name	Address	Total Building Value
Post Office	US Post Office Main	836 Anacapa Street	-
Airport	Santa Barbara Airport	500 James Fowler Road	-
Bridge	Bridge	'Olive Mill Road' / 'U.S. Highway 101'	-
Bridge	Bridge	'State Route 192' / 'Mission Creek'	-
Bridge	Bridge	HWY 101 Sb' / 'Castillo Street'	-
Bridge	Bridge	HWY 101 Sb' / 'Carrillo Street'	-
Bridge	Bridge	HWY 101 Sb' / 'Mission Street'	-
Bridge	Bridge	HWY 101 Nb' / 'Mission Street'	-
Bridge	Bridge	'State Route 225' / UPRR	-
Bridge	Bridge	HWY 101 Sb' / 'Garden Street'	-
Bridge	Bridge	HWY 101 Nb' / 'Garden Street'	-
Bridge	Bridge	HWY 101 Sb' / 'State Street'	-
Bridge	Bridge	HWY 101 Nb' / 'State Street'	-
Bridge	Bridge	HWY 101' / 'Sycamore Creek'	-
Bridge	Bridge	HWY 101' / 'Cacique Street'	-
Bridge	Bridge	'Mission Canyon Rd' / 'Mission Creek'	-
Bridge	Bridge	'Las Canoas Rd' / 'Rattlesnake Canyon'	-
Bridge	Bridge	'Ontare Road' / 'San Roque Creek'	-
Bridge	Bridge	'Hollister Ave' / 'Carneros Creek'	-
Bridge	Bridge	'Gutierrez St' / 'Mission Creek'	-
Bridge	Bridge	'State St' / 'Mission Creek'	-
Bridge	Bridge	'Castillo Street' / 'Mission Creek'	-
Bridge	Bridge	'Carrillo St' / 'Mission Creek'	-
Bridge	Bridge	'State Street' / 'San Roque Creek'	-
Bridge	Bridge	'Pueblo St' / 'Mission Creek'	-
Bridge	Bridge	'Montecito St' / 'Mission Creek'	-
Bridge	Bridge	'James Fowler Road' / 'San Pedro Creek'	-
Bridge	Bridge	'Quinientos St' / 'Sycamore Creek'	-
Bridge	Bridge	'Torino Drive' / 'Arroyo Burro Creek'	-
Bridge	Bridge	'Por Lamar Dr' / 'Sycamore Creek'	-
Bridge	Bridge	'Ninos Dr' / 'Sycamore Creek'	-
Bridge	Bridge	'Zoological Garden' / 'Sycamore Creek'	-
Bridge	Bridge	'Carpinteria St' / 'Sycamore Creek'	-
Bridge	Bridge	'De La Guerra St' / 'Mission Creek'	-
Bridge	Bridge	'Firestone' / 'Carneros Creek'	-
Bridge	Bridge	'Pedregosa Street' / 'Mission Creek'	-
Bridge	Bridge	'Calle De Los Amigo' / 'Arroyo Burro Creek'	-
Bridge	Bridge	'Fairview Ave' / 'Up Rr & Amtrak'	-
Bridge	Bridge	'East Cabrillo Blvd' / 'Laguna Channel'	-

Type	Name	Address	Total Building Value
Bridge	Bridge	'E Mason Street' / 'Sycamore Canyon Creek'	-
Bridge	Bridge	'De La Vina St' / 'Mission Creek'	-
Bridge	Bridge	'Ortega Street' / 'Mission Creek'	-
Bridge	Bridge	'Primavera Road' / 'Cieneguitas Creek'	-
Bridge	Bridge	'Hope Avenue' / 'Arroyo Burro Creek'	-
Bridge	Bridge	HWY 101 Sb' / 'Cabrillo Blvd'	-
Bridge	Bridge	HWY 101 Nb' / 'Cabrillo Blvd'	-
Bridge	Bridge	'State Route 192' / 'San Roque Canyon'	-
Bridge	Bridge	'State Route 192' / 'Sycamore Canyon Creek'	-
Bridge	Bridge	'State St (Wb)' / 'Us Highway 101'	-
Bridge	Bridge	'State St (Eb)' / 'Us Highway 101'	-
Bridge	Bridge	'State Route 225' / HWY 101'	-
Bridge	Bridge	HWY 101 Nb' / 'Carrillo Street'	-
Bridge	Bridge	HWY 101 Nb Rt Lane' / 'Mission Creek'	-
Bridge	Bridge	HWY 101' / 'Quarantina Street'	-
Bridge	Bridge	HWY 101' / 'Salsipuedes Street'	-
Bridge	Bridge	HWY 101 Sb' / 'Mission Creek'	-
Bridge	Bridge	HWY 101 Nb' / 'Mission Creek'	-
Bridge	Bridge	HWY 101 Sb' / 'Mission Creek'	-
Bridge	Bridge	HWY 101 Nb' / 'Mission Creek'	-
Bridge	Bridge	HWY 101' / 'Chapala St Equalizer'	-
Bridge	Bridge	'La Cumbre Road' / HWY 101'	-
Bridge	Bridge	'Micheltorena St' / HWY UPRR Mission'	-
Bridge	Bridge	HWY 101' / 'Milpas Street'	-
Bridge	Bridge	HWY 101' / 'Cacique Street'	-
Bridge	Bridge	'Cliff Drive' / 'Arroyo Burro Creek'	-
Bridge	Bridge	'Hollister Avenue' / 'San Pedro Creek'	-
Bridge	Bridge	'Mission St' / 'Mission Creek'	-
Bridge	Bridge	'Alamar Ave' / 'Mission Creek'	-
Bridge	Bridge	'State Street' / 'Mission Creek'	-
Bridge	Bridge	'Valerio St' / 'Mission Creek'	-
Bridge	Bridge	'Junipero Street' / 'Mission Creek'	-
Bridge	Bridge	'Tallant Road' / 'Mission Creek'	-
Bridge	Bridge	'Yanonali Street' / 'Laguna Drainage Channel'	-
Bridge	Bridge	'East Cabrillo Blvd' / 'Sycamore Creek'	-
Bridge	Bridge	'Chapala Street' / 'Mission Creek'	-
Bridge	Bridge	'Punta Gorda Road' / 'Punta Gorda Creek'	-

Type	Name	Address	Total Building Value
Bridge	Bridge	'Cliff Drive' / 'Hillside'	-
Bridge	Bridge	'Anapamu Street' / 'Old Mission Creek'	-
Bridge	Bridge	HWY 101 Nb' / 'Castillo Street'	-
Bridge	Bridge	'State Route 154' / 'La Colina Rd'	-
Bridge	Bridge	'State Route 154' / 'Primavera Rd'	-
Bridge	Bridge	'Hollister Avenue' / 'Tecolotito Creek'	-
Bridge	Bridge	'Arrellaga Street' / 'Mission Creek'	-
Bridge	Bridge	'De La Vina St' / 'Mission Creek'	-
Bridge	Bridge	'Islay St' / 'Mission Creek'	-
Bridge	Bridge	'Bath St' / 'Mission Creek'	-
Bridge	Bridge	'Matthews Street' / 'San Pedro Creek'	-
Government	Buses/Vehicles		-
Train Depot	Southern Pacific Train Depot	209 State Street	-

Using a GIS and the mapped extents of the hazards affecting the City, it was determined which critical facilities are exposed to which hazards depending on whether they fall within the mapped hazard area. The results of the exposure analysis are included in this section. A further description of the threats and methodologies used in this analysis is provided in Chapter 6.0, *Vulnerability Assessment* of the 2022 MJHMP. As the City continues to assess its vulnerability, the collection of better and more complete data will help to improve the risk assessment process to direct planning and mitigation decisions.

Table 6-2. Summary of Potential Impacts on Critical Facilities

Hazard Type	Specific Risk	Count	% of Critical Facilities Impacted	Exposure ($)
Wildfire	Moderate Wildfire Threat	6	3%	-
	Very High Wildfire Threat	1	0.5%	-
Earthquake	High Liquefaction Potential	75	32%	$2,034,893
	Moderate Liquefaction Potential	61	26%	-
Flood	1% Chance FEMA Flood Zone	73	31%	$2,034,893
	0.2% Chance FEMA Flood Zone	6	3%	-
Tsunami		23	10%	$2,034,893
Dam Failure	Lauro and Glen Annie Dam Failure	21	9%	-
Landslide	Class 7 and 9	40	17%	-
Coastal Hazards	Sea Level Rise (2030)	14	6%	-
	Sea Level Rise (2060)	19	8%	-

6.1 WILDFIRE

The City and surrounding landscape exhibit a complex wildfire environment that presents a significant wildfire risk due to steep and varied terrain, a mosaic of different vegetation types, and a Wildland-Urban Interface (WUI) development pattern. The southern side of the Santa Ynez Mountains, including portions of the City, has a significant history of devastating wildland fires, including 2 of the state's 20 most destructive wildfires—the 1990 Paint Fire and the 2017 Thomas Fire. The Santa Barbara Fire Department recognizes the catastrophic impact of wildfire in the community and is committed to reducing hazards and risk through fire protection, fuel hazard reduction, public education, preparedness, and community involvement.

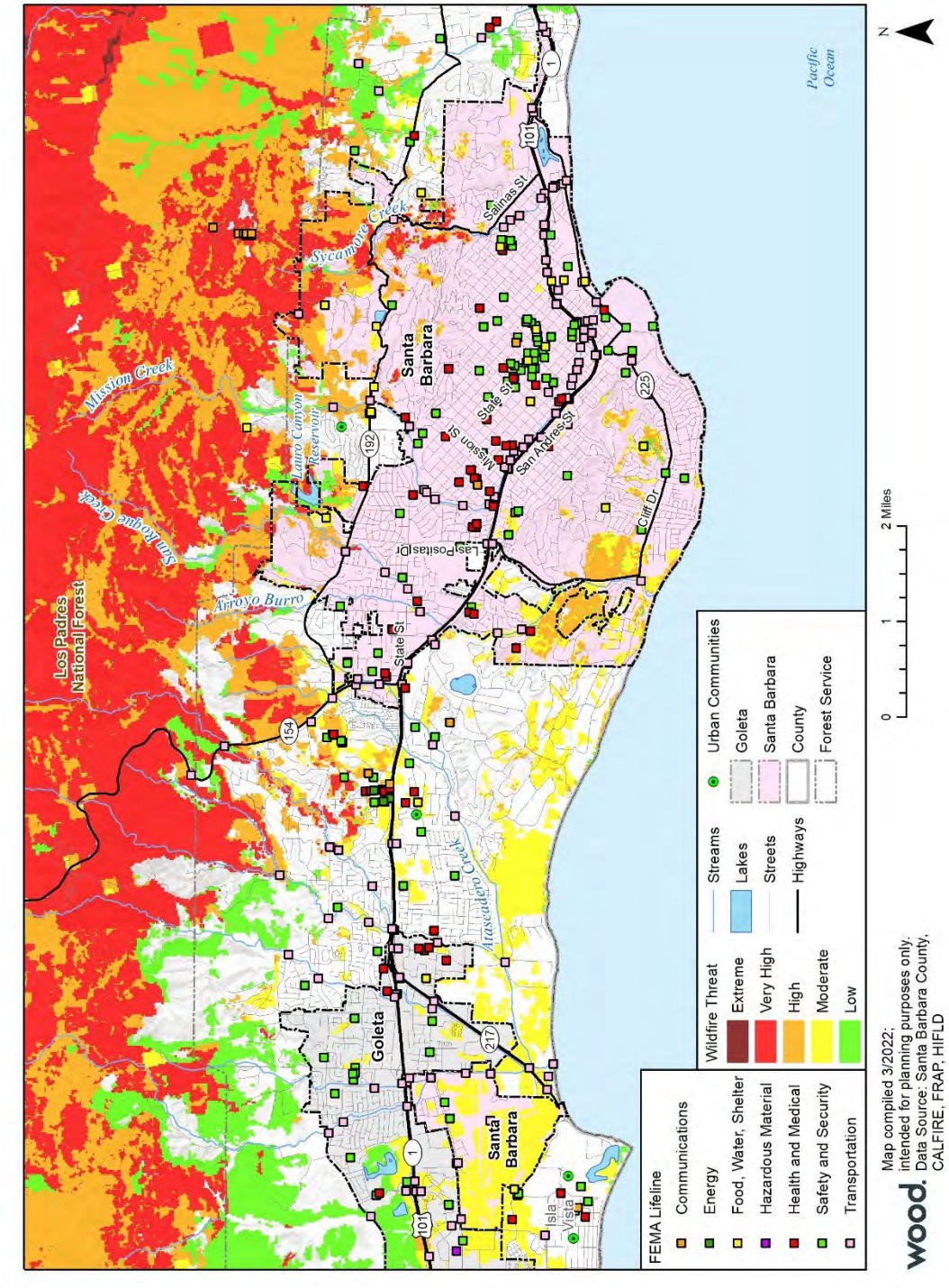
Santa Barbara County has extensive areas within mapped Fire Hazard Severity Zones and Wildland-Urban Interface (WUI) areas. These hazard areas generate vulnerability for life and structures, including critical facilities, throughout the county, but most severely within rural foothills areas where dry vegetation, steep slopes, and difficult access combine to create a high probability of wildfire. The City is surrounded by wildland vegetation and the western and southern slopes of the Santa Ynez Mountains. The City contains WUI area and has therefore been designated as a WUI community at risk. Based on these maps, the City has 321 acres (2.55 percent) within Very High Wildfire Threat areas, 746 acres (5.91 percent) within High Wildfire Threat areas, 942 acres (7.47 percent) within Moderate Wildfire Threat areas, and 94 acres (0.74 percent) within Low Wildfire Threat areas. Most of these areas are residential with limited vulnerabilities in commercial, agricultural, and industrial areas.

Based on the GIS analysis conducted for the 2022 MJHMP, in Santa Barbara, 561 improved properties with a total value of over $687 million are vulnerable to wildfire. In Santa Barbara, approximately 1,333 residents live in very high, high, moderate, or low wildfire threat areas. This information is summarized in Table 6-3 below (see also, Section 6.3.1, *Wildfire* of the 2022 MJHMP). Figure 6-1 shows the fire threat in the City. Fire threat is a combination of two factors: 1) fire frequency or the likelihood of a given area burning, and 2) potential fire behavior. These two factors are combined to create four threat classes ranging from Moderate to Extreme. While the probability for the City is likely lower due to the urban environment and the Pacific Ocean to the south, the threat remains Moderate. However, northern portions of the City are adjacent to High and Very High threat areas.

Table 6-3. City of Santa Barbara at Risk to Wildfire Threat

Property Type	Improved Parcel Count by Wildfire Threat Level						Total Value	Population
	Extreme	Very High	High	Moderate	Low	Total		
Agricultural	0	1	0	0	0	1	$90,528	
Commercial	0	0	1	6	0	7	$48,704,948	
Exempt	0	0	1	3	0	4	$4,194,834	
Industrial	0	0	0	1	0	1	$69,301,580	
Mixed Use	0	0	0	0	0	0	$0	0
Residential	0	60	198	253	33	544	$562,254,207	1,333
Improved Vacant	0	0	3	1	0	4	$2,935,184	
Total	**0**	**61**	**203**	**264**	**33**	**561**	**$687,481,281**	**1,333**

Figure 6-1. City of Santa Barbara Critical Facilities within Wildfire Threat Zones

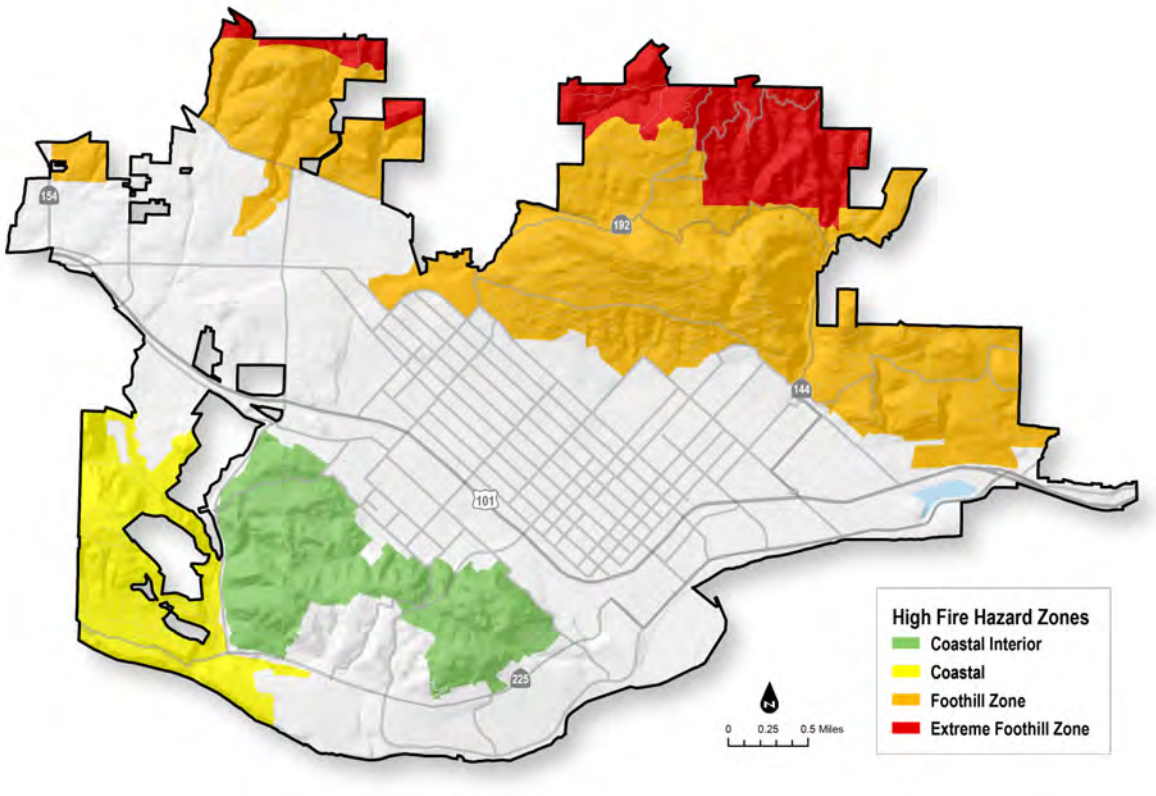


Seven of the City's critical facilities fall within Very High or Moderate wildfire threat areas, as listed in Table 6-4 (see also, Section 6.3.1, *Wildfire* of the 2022 MJHMP).

Table 6-4. City of Santa Barbara Critical Facilities Vulnerable to Wildfire

Type	Critical Facility	Hazard Source/Type	Total Building Value
Water Treatment Plant	Cater Water Treatment Plant	Moderate Wildfire Threat	-
Clinic	Sansum Clinic	Moderate Wildfire Threat	-
Airport	Santa Barbara Airport	Moderate Wildfire Threat	-
Bridge	Bridge	Very High Wildfire Threat	-
Bridge	Bridge	Moderate Wildfire Threat	-
Bridge	Bridge	Moderate Wildfire Threat	-
Bridge	Bridge	Moderate Wildfire Threat	-

The City has also delineated local High Fire Hazard Zones, linking to local wildfire management and response strategies in the CWPP. The CWPP is maintained to protect lives, property, and natural resources threatened by wildland fire. Development of the CWPP included an assessment of wildfire hazard to identify the High Fire Hazard Area of the City. The hazard assessment was used to evaluate the extent of the City's four High Fire Hazard Area Zones (Extreme Foothill, Foothill, Coastal Interior, and Coastal).



The CWPP includes an assessment of wildfire hazard, which involved modeling potential fire behavior in the City under extreme wind and weather conditions, consistent with conditions experienced during a Sundowner wind event. Other wildfire hazard variables were evaluated (terrain, weather, fuels, development patterns, fire department response, structure density, etc.) to identify the High Fire Hazard

6.2 EARTHQUAKE & LIQUEFACTION

Chapter 6.0, *Vulnerabilities Assessment* of the 2022 MJHMP addresses regional seismicity under two scenarios that include the City of Santa Barbara. The 2,500-year scenario considers general seismicity from multiple faults in the region and a 7.0 magnitude event. The methodology utilizes probabilistic seismic hazard contour maps developed by the U.S. Geological Survey (USGS) for the 2018 update of the National Seismic Hazard Maps that are included with Hazus-MH. A deterministic scenario was also prepared to predict the outcome of a specific earthquake event. The deterministic scenarios used USGS provided ShakeMap datasets to model a Magnitude 7.4 earthquake of the Red Mountain Fault. This scenario assesses the effect that an earthquake sourced from this fault would generate in terms of damages and losses for the chosen area of interest (i.e., southern Santa Barbara County, including the City). Figure 6-2 is the ShakeMap produced for this scenario.

As described in the MJHMP, regional losses to people and property would include the City. As shown in the Red Mountain Fault ShakeMap scenario, the south and central parts of the county would perceive much stronger shaking and would likely receive the most severe damage when compared to the rest of the county. The entire City would perceive severe to extreme shaking and would likely receive moderate/heavy to very heavy damage. Direct effects of ground shaking could damage buildings and create dangerous debris and unstable structures. Displaced residents would likely seek shelter in the City, including residents from outside the City. Further, fires often occur after an earthquake. Because of the number of fires and the lack of water to fight the fires, they can often burn out of control.

Unreinforced masonry building type structures consist of buildings made of unreinforced concrete and brick, hollow concrete blocks, clay tiles, and adobe. Buildings constructed of these materials are heavy and brittle and typically provide little earthquake resistance. In small earthquakes, unreinforced buildings can crack, and in strong earthquakes, they tend to collapse. The City does not have any known unreinforced masonry buildings.

The City lies in an area with high, moderate, and low liquefaction severity classes. Regional earthquakes could cause liquefaction in the City, which could damage buildings and utilities when soils become unstable. Based on the GIS analysis conducted for the 2022 MJHMP, the City has 123,784 improved parcels valued at over $21 billion in liquefaction severity zones. Based on this analysis, which accounts for residents only and not workers, 52,849 residents are living in this hazard zone within the City. While liquefaction would not likely affect all areas uniformly during an earthquake, this analysis indicates the extent and scale of vulnerabilities to liquefaction during a large earthquake.

Table 6-5. City of Santa Barbara at Risk to Liquefaction Hazard by Property Type

Property Type	Improved Parcel Count	Total Value	Population
High Liquefaction Hazard			
Agricultural	0	$0	
Commercial	441	$770,747,018	
Exempt	26	$40,500,456	

Property Type	Improved Parcel Count	Total Value	Population
Industrial	193	$386,752,938	
Mixed Use	43	$171,822,528	105
Residential	2,212	$2,036,799,933	5,419
Improved Vacant	9	$3,921,284	
Total High Liquefaction	**2,924**	**$3,410,544,157**	**5,525**
Moderate Liquefaction Hazard			
Agricultural	0	$0	
Commercial	432	$933,498,844	
Exempt	48	$179,684,078	
Industrial	113	$109,571,348	
Mixed Use	29	$153,807,638	71
Residential	5,868	$2,849,407,328	14,377
Improved Vacant	7	$4,990,218	
Total Moderate Liquefaction	**6,497**	**$4,230,959,453**	**14,448**
Low Liquefaction Hazard			
Agricultural	3	$1,476,116	
Commercial	755	$2,296,776,766	
Exempt	113	$2,098,371,104	
Industrial	7	$5,104,908	
Mixed Use	40	$131,219,472	98
Residential	13,379	$9,195,180,227	32,779
Improved Vacant	66	$60,205,324	
Total Low Liquefaction	**14,363**	**$13,788,333,916**	**32,877**
Total Liquefaction Hazard	**23,784**	**$21,429,837,526**	**52,849**

As listed in Table 6-6, all critical facilities in the City would be vulnerable to damage or destruction from ground shaking and liquefaction during a significant regional earthquake (Figure 6-3; see also, Section 6.2.1, *Earthquake (Groundshaking)* and Section 6.3.3, *Liquefaction (Earthquake)* of the 2022 MJHMP).

Table 6-6. City of Santa Barbara Critical Facilities Vulnerable to Groundshaking & Liquefaction

Type	Name	Address	Total Building Value
Communications	Vic Trace Ac		-
Paging Tower	Dial Page, Inc	923 Laguna Street	-
Paging Tower	Dial Page, Inc	320 West Pueblo Street	-
Community Center	Recreation	1232 De La Vina Street	-
Community Center	Recreation	100 E. Carrillo Street	-
Community Center	Lower Westside Community Center	629 Coronel Place	-

Type	Name	Address	Total Building Value
Community Center	Franklin Community Center	1136 E. Montecito Street	-
Hydrology Field	Hydrology Field Installations	735 Anacapa Street	$463,890
Reservoir	Escondido Pump Station and Reservoir	2300 Skyline Way	-
Reservoir	La Cornilla Pump Station and Vic Trace Reservoir	1631 La Coronilla Drive	-
Utilities	Sheffield Pump Station	2375 Foothill Road	-
Utilities	Skofield Pump Station	2117 Mount Calvary	-
Utilities	Laguna Pump Station	236 E. Cabrillo Blvd	-
Water District	Goleta West Water District	J Road	-
Water Treatment Plant	Cater Water Treatment Plant	1150 San Roque Road	-
Water Treatment Plant	Ortega Well Treatment Plant	220 E. Ortega Street	-
Water Treatment Plant	Ortega Well Treatment Plant	631 Garden St	-
Water Treatment Plant	Sheffield Treatment Plant	530 Mountain Drive	-
Water Treatment Plant	Charles E. Meyer Main Desalination Plant	525 E. Yananoli St.	-
Water Treatment Plant	SCADA / MCC Building	525 E. Yananoli St.	-
Water Treatment Plant	El Estero Water Resources Center	520 E. Yananoli St.	-
Clinic	McDonald Building Human Resources	1226 Anacapa Street	$1,036,791
Clinic	Sansum Clinic-Pesetas	215 Pesetas Ln	-
Clinic	Santa Barbara Community Dialysis Center	222 Pesetas Lane	-
Clinic	Valle Verde Health Facility- SNF	900 Calle De Los Amigos	-
Clinic	La Cumbre Senior Living Concepts	3880 Via Lucero	-
Clinic	Vista Del Monte Sunridge SNF	3775 Modoc Road	-
Clinic	Sansum Clinic-Hitchcock	51 Hitchcock	-
Clinic	Samarkand- Smith Center- SNF	2566 Treasure Drive	-
Clinic	Mission Terrace Convalescent Hospital	623 West Junipero Street	-
Clinic	Sansum Clinic- Ob/ Gyn	515 W. Pueblo St	-
Clinic	Cottage Rehabilitation Hospital	2415 De La Vina Street	-
Clinic	Sansum Clinic- Pueblo	317 Pueblo St	-
Clinic	Santa Barbara Cottage Hospital	Bath At Pueblo	-
Clinic	Santa Barbara Convalescent Hospital	2225 De La Vina Street	-

Type	Name	Address	Total Building Value
Clinic	Santa Barbara Neighborhood Clinic- Westside	628 W. Micheltorena Street	-
Clinic	Santa Barbara Artificial Kidney Center	1704 State Street, #2	-
Clinic	Santa Barbara Neighborhood Clinic- Eastside	915 N Milpas St	-
Clinic	PhD Franklin Clinic	1136 Montecito St	-
Clinic	PhD Children's Medical Services	1111 Chapala Street	$375,583
EMS Station	American Medical Response Station 3	415 West Figueroa Street	-
EMS Station	American Medical Response Station 4	1025 Castillo Street	-
Nursing Home	Cliff View Terrace	1020 Cliff Drive	-
Nursing Home	Alto Lucero Transitional Care	3880 Via Lucero	-
Nursing Home	The Californian	2225 De La Vina St	-
Nursing Home	Alexander Court	325 W Islay St	-
Nursing Home	Samarkand Skilled Nursing Facility	2566 Treasure Dr	-
Nursing Home	Samarkand of Santa Barbara	2550 Treasure Drive	-
Nursing Home	Wood Glen Hall, Inc.	3010 Foothill Road	-
Nursing Home	Mission Villa	321 West Mission Street	-
Nursing Home	Vista Del Monte	3775 Modoc Road	-
Nursing Home	Valle Verde Health Facility	900 Calle De Los Amigos	-
Nursing Home	Alexander Gardens	2120 Santa Barbara Street	-
Nursing Home	Mission Terrace Convalescent Hospital	623 W Junipero St	-
Nursing Home	Oak Cottage of Santa Barbara Memory Care	1820 Delavina Street	-
Nursing Home	Garden Court at Villa Santa Barbara	227 E. Anapamu Street	-
Nursing Home	Villa Alamar	45 East Alamar	-
Nursing Home	Villa Riviera	1621 Grand Avenue	-
Nursing Home	Mountain House	37 Mountain Drive	-
Nursing Home	At Home in Santa Barbara	1801 Bath Street	-
Veteran Services	Sb Veterans Memorial Bldg.	112 W. Cabrillo Blvd.	$2,034,893
Aiport Patrol	Santa Barbara Airport Patrol	601 Firestone Road	-
Colleges / Universities	Fielding Graduate University	2020 De La Vina St	-
Colleges / Universities	The Santa Barbara and Ventura Colleges of Law At Santa Barbara	20 E Victoria St	-
Colleges / Universities	Antioch University-Santa Barbara	602 Anacapa Street	-
Colleges / Universities	Santa Barbara City College	721 Cliff Drive	-

Type	Name	Address	Total Building Value
Court	County Courthouse	1100 Anacapa Street	$40,553,793
Court	Sb Superior Court Building	118 E. Figueroa Street	$9,343,534
Court	County Courthouse Annex	1100 Anacapa St	$6,023,849
Court	Court Services Bldg	118 E. Figueroa Street	$357,608
Education	Saint Vincent Orphanage and School Building	925 De La Vina Street	-
Education	Santa Barbara Unified Early Childhood	1030 E. Yanonali St.	-
Education	Adelante Charter	1102 E. Yanonali St.	-
Education	Franklin Elementary	1111 E. Mason St.	-
Education	Harding University Partnership	1625 Robbins St.	-
Education	Monte Vista Elementary	730 N. Hope Ave.	-
Education	Alta Vista Alternative High	215 E. Ortega St.	-
Education	McKinley Elementary	350 Loma Alta Dr.	-
Education	Roosevelt Elementary	1990 Laguna St.	-
Education	Open Alternative	4025 Foothill Rd.	-
Education	Monroe Elementary	431 Flora Vista Dr.	-
Education	Alta Vista Alternative Junior High	215 E. Ortega St.	-
Education	La Cumbre Junior High	2255 Modoc Rd.	-
Education	Santa Barbara Community Academy	850 Portesuello Ave.	-
Education	Adams Elementary	2701 Las Positas Rd.	-
Education	Santa Barbara Junior High	721 E. Cota St.	-
Education	Santa Barbara Senior High	700 E. Anapamu St.	-
Education	La Cuesta Continuation High	710 Santa Barbara St.	-
Education	Washington Elementary	290 Lighthouse Rd.	-
Education	Hope Elementary	3970-A La Colina Rd.	-
Education	La Colina Junior High	4025 Foothill Rd.	-
Education	Cleveland Elementary	123 Alameda Padre Serra	-
Education	Peabody Charter	3018 Calle Noguera	-
Education	Providence-SBCS	3723 Modoc Rd	-
Education	El Montecito School San Roque	3225 Calle Pinon	-
Education	Notre Dame School	33 E Micheltorena St	-
Education	Bishop Garcia Diego High School	4000 La Colina Rd	-
Education	Sunrise Montessori School	1201 E Yanonali St	-
Education	Providence	630 E Canon Perdido St	-
Education	Santa Barbara Middle School	1321 Alameda Padre Serra	-
Education	The Knox School of Santa Barbara	1525 Santa Barbara St	-
Education	Eureka School of Santa Barbara	3324 State St Ste M	-
Education	St Therese Classical Academy	33 E Micheltorena St	-

Type	Name	Address	Total Building Value
Fire Station	Fire Station 4	19 N. Ontare Road	-
Fire Station	Fire Station 5	2505 Modoc Road	-
Fire Station	Fire Station 6	1802 Cliff Drive	-
Fire Station	Fire Station 1	121 W. Carrillo St	-
Fire Station	Fire Station 3	415 E. Sola Street	-
Fire Station	Fire Station 7	605 Mission Ridge Road	-
Fire Station	Fire Training	30 S. Olive Street (2 S. Cesar Chavez)	-
Fire Station	Fire Station 2	819 Cacique	-
Fire Station	Airport Fire Station 8	40 Hartley Place	-
Government	Administration Building	105 E. Anapamu Street	$27,266,352
Government	Engineering Building	123 E. Anapamu Street	$11,145,938
Government	Sbch East Wing	1105 Santa Barbara Street	$7,308,080
Government	Probation Building	117 E. Carrillo Street	$4,216,037
Government	Hall Of Records	1100 Anacapa Street	$4,179,732
Government	Schwartz Building	130 E Victoria St	$2,652,501
Government	City Hall	735 Anacapa Street	-
Government	Public Works	220 E. Ortega Street	-
Government	Public Works	630 Garden Street	-
Government	Community Development	630 Garden Street	-
Government	Public Works	630 Garden Street	-
Government	Public Works Yard	635 Laguna Street	-
Government	Admin Well Corp. at Parks Department	402 East Ortega Street	-
Government	Parks And Recreation	620 Laguna St.	-
Government	ADMHS Offices	2034 De La Vina Street	$145,154
Government	Sb Child Support Office	4 East Carrillo Street	$199,401
Harbor Patrol	Santa Barbara Waterfront Harbor Patrol	132 Harbor Way A, Po Box 1990	-
Historic Site	Virginia Hotel	17 And 23 West Haley Street	-
Historic Site	Mission Santa Barbara	2201 Laguna Street	-
Historic Site	Janssens-Orella-Birk-Building	1029 - 1031 State Street	-
Historic Site	Hill-Carrillo Adobe	11 East Carrillo Street	-
Historic Site	Old Lobero Theatre	33 E. Canon Perdido	-
Historic Site	Casa De La Guerra	808-818 State Street, 813 - 819 Anacapa Street, 9 - 25 E. De La Guerra Street	-
Historic Site	Santa Barbara Presidio	123 East Canon Perdido Street	-
Historic Site	Hastings Adobe	414 W. Montecito Street	-
Historic Site	Covarrubias Adobe	715 Santa Barbara Street	-
Historic Site	Rafael Gonzalez House	835 Laguna Street	-
Historic Site	Faith Mission	409 State Street	-

Type	Name	Address	Total Building Value
Historic Site	Los Banos Del Mar	401 Shoreline Drive	-
Historic Site	Andalucía Building	316 - 324 State Street	-
Historic Site	Burton Mound	129 W. Mason At Burton Circle	-
Police	Police Department	215 E. Figueroa St.	-
Post Office	US Post Office Main	836 Anacapa Street	-
Airport	Santa Barbara Airport	500 James Fowler Road	-
Bridge	Bridge	'Olive Mill Road' / 'U.S. Highway 101'	-
Bridge	Bridge	'State Route 192' / 'Mission Creek'	-
Bridge	Bridge	HWY 101 Sb' / 'Castillo Street'	-
Bridge	Bridge	HWY 101 Sb' / 'Carrillo Street'	-
Bridge	Bridge	HWY 101 Sb' / 'Mission Street'	-
Bridge	Bridge	HWY 101 Nb' / 'Mission Street'	-
Bridge	Bridge	'State Route 225' / UPRR	-
Bridge	Bridge	HWY 101 Sb' / 'Garden Street'	-
Bridge	Bridge	HWY 101 Nb' / 'Garden Street'	-
Bridge	Bridge	HWY 101 Sb' / 'State Street'	-
Bridge	Bridge	HWY 101 Nb' / 'State Street'	-
Bridge	Bridge	HWY 101' / 'Sycamore Creek'	-
Bridge	Bridge	HWY 101' / 'Cacique Street'	-
Bridge	Bridge	'Mission Canyon Rd' / 'Mission Creek'	-
Bridge	Bridge	'Las Canoas Rd' / 'Rattlesnake Canyon'	-
Bridge	Bridge	'Ontare Road' / 'San Roque Creek'	-
Bridge	Bridge	'Hollister Ave' / 'Carneros Creek'	-
Bridge	Bridge	'Gutierrez St' / 'Mission Creek'	-
Bridge	Bridge	'State St' / 'Mission Creek'	-
Bridge	Bridge	'Castillo Street' / 'Mission Creek'	-
Bridge	Bridge	'Carrillo St' / 'Mission Creek'	-
Bridge	Bridge	'State Street' / 'San Roque Creek'	-
Bridge	Bridge	'Pueblo St' / 'Mission Creek'	-
Bridge	Bridge	'Montecito St' / 'Mission Creek'	-
Bridge	Bridge	'James Fowler Road' / 'San Pedro Creek'	-
Bridge	Bridge	'Quinientos St' / 'Sycamore Creek'	-
Bridge	Bridge	'Torino Drive' / 'Arroyo Burro Creek'	-
Bridge	Bridge	'Por Lamar Dr' / 'Sycamore Creek'	-
Bridge	Bridge	'Ninos Dr' / 'Sycamore Creek'	-
Bridge	Bridge	'Zoological Garden' / 'Sycamore Creek'	-
Bridge	Bridge	'Carpinteria St' / 'Sycamore Creek'	-
Bridge	Bridge	'De La Guerra St' / 'Mission Creek'	-
Bridge	Bridge	'Firestone' / 'Carneros Creek'	-
Bridge	Bridge	'Pedregosa Street' / 'Mission Creek'	-

Type	Name	Address	Total Building Value
Bridge	Bridge	'Calle De Los Amigo' / 'Arroyo Burro Creek'	-
Bridge	Bridge	'Fairview Ave' / 'Up Rr & Amtrak'	-
Bridge	Bridge	'East Cabrillo Blvd' / 'Laguna Channel'	-
Bridge	Bridge	'E Mason Street' / 'Sycamore Canyon Creek'	-
Bridge	Bridge	'De La Vina St' / 'Mission Creek'	-
Bridge	Bridge	'Ortega Street' / 'Mission Creek'	-
Bridge	Bridge	'Primavera Road' / 'Cieneguitas Creek'	-
Bridge	Bridge	'Hope Avenue' / 'Arroyo Burro Creek'	-
Bridge	Bridge	HWY 101 Sb' / 'Cabrillo Blvd'	-
Bridge	Bridge	HWY 101 Nb' / 'Cabrillo Blvd'	-
Bridge	Bridge	'State Route 192' / 'San Roque Canyon'	-
Bridge	Bridge	'State Route 192' / 'Sycamore Canyon Creek'	-
Bridge	Bridge	'State St (Wb)' / 'Us Highway 101'	-
Bridge	Bridge	'State St (Eb)' / 'Us Highway 101'	-
Bridge	Bridge	'State Route 225' / HWY 101'	-
Bridge	Bridge	HWY 101 Nb' / 'Carrillo Street'	-
Bridge	Bridge	HWY 101 Nb Rt Lane' / 'Mission Creek'	-
Bridge	Bridge	HWY 101' / 'Quarantina Street'	-
Bridge	Bridge	HWY 101' / 'Salsipuedes Street'	-
Bridge	Bridge	HWY 101 Sb' / 'Mission Creek'	-
Bridge	Bridge	HWY 101 Nb' / 'Mission Creek'	-
Bridge	Bridge	HWY 101 Sb' / 'Mission Creek'	-
Bridge	Bridge	HWY 101 Nb' / 'Mission Creek'	-
Bridge	Bridge	HWY 101' / 'Chapala St Equalizer'	-
Bridge	Bridge	'La Cumbre Road' / HWY 101'	-
Bridge	Bridge	'Micheltorena St' / HWY UPRR Mission'	-
Bridge	Bridge	HWY 101' / 'Milpas Street'	-
Bridge	Bridge	HWY 101' / 'Cacique Street'	-
Bridge	Bridge	'Cliff Drive' / 'Arroyo Burro Creek'	-
Bridge	Bridge	'Hollister Avenue' / 'San Pedro Creek'	-
Bridge	Bridge	'Mission St' / 'Mission Creek'	-
Bridge	Bridge	'Alamar Ave' / 'Mission Creek'	-
Bridge	Bridge	'State Street' / 'Mission Creek'	-
Bridge	Bridge	'Valerio St' / 'Mission Creek'	-
Bridge	Bridge	'Junipero Street' / 'Mission Creek'	-
Bridge	Bridge	'Tallant Road' / 'Mission Creek'	-
Bridge	Bridge	'Yanonali Street' / 'Laguna Drainage Channel'	-

Type	Name	Address	Total Building Value
Bridge	Bridge	'East Cabrillo Blvd' / 'Sycamore Creek'	-
Bridge	Bridge	'Chapala Street' / 'Mission Creek'	-
Bridge	Bridge	'Punta Gorda Road' / 'Punta Gorda Creek'	-
Bridge	Bridge	'Cliff Drive' / 'Hillside'	-
Bridge	Bridge	'Anapamu Street' / 'Old Mission Creek'	-
Bridge	Bridge	HWY 101 Nb' / 'Castillo Street'	-
Bridge	Bridge	'State Route 154' / 'La Colina Rd'	-
Bridge	Bridge	'State Route 154' / 'Primavera Rd'	-
Bridge	Bridge	'Hollister Avenue' / 'Tecolotito Creek'	-
Bridge	Bridge	'Arrellaga Street' / 'Mission Creek'	-
Bridge	Bridge	'De La Vina St' / 'Mission Creek'	-
Bridge	Bridge	'Islay St' / 'Mission Creek'	-
Bridge	Bridge	'Bath St' / 'Mission Creek'	-
Bridge	Bridge	'Matthews Street' / 'San Pedro Creek'	-
Government	Buses/Vehicles		-
Train Depot	Southern Pacific Train Depot	209 State Street	-

Figure 6-2. City of Santa Barbara Critical Facilities and Earthquake Groundshaking Potential (Red Mountain Fault 7.4 Magnitude ShakeMap)

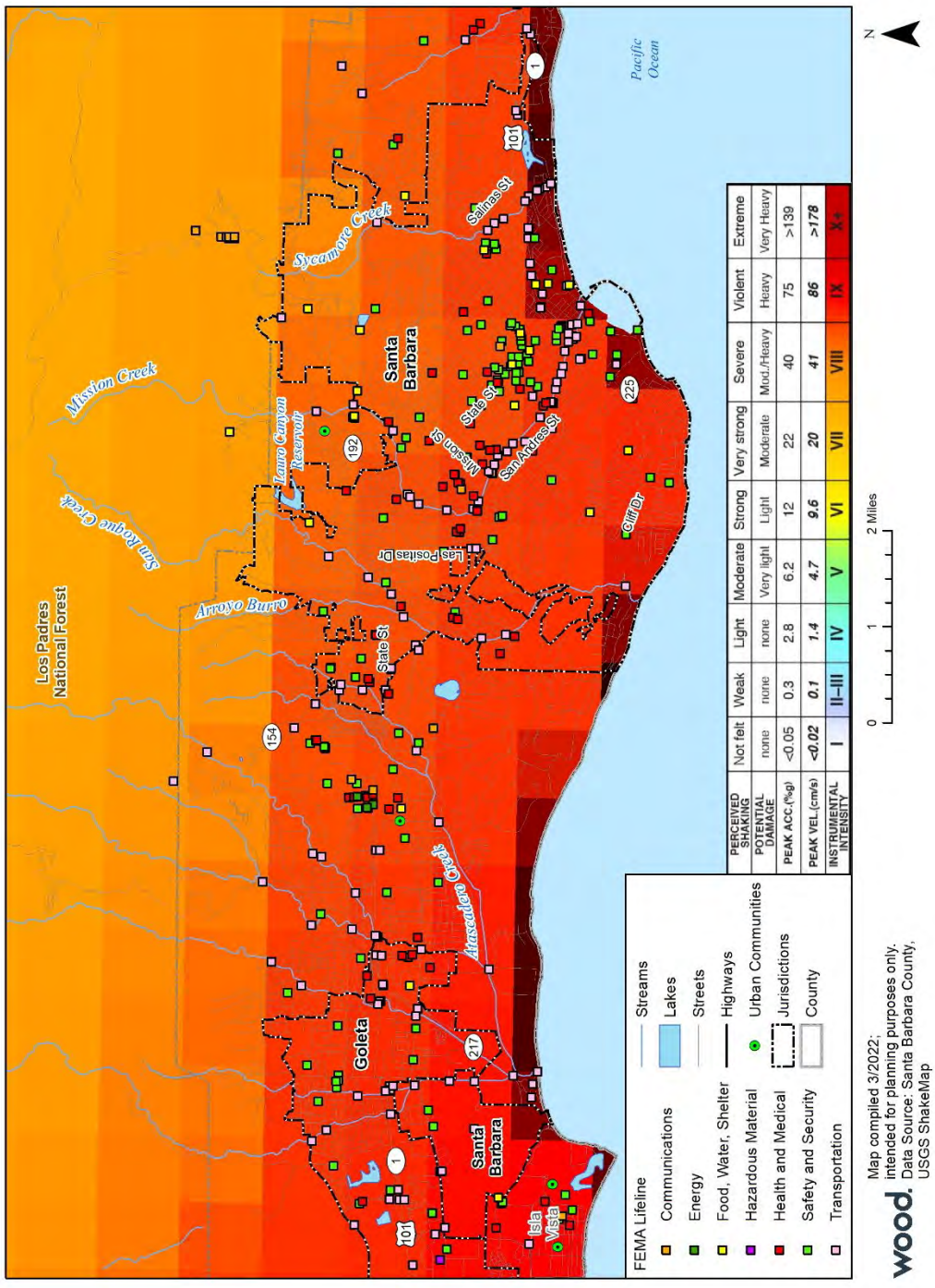
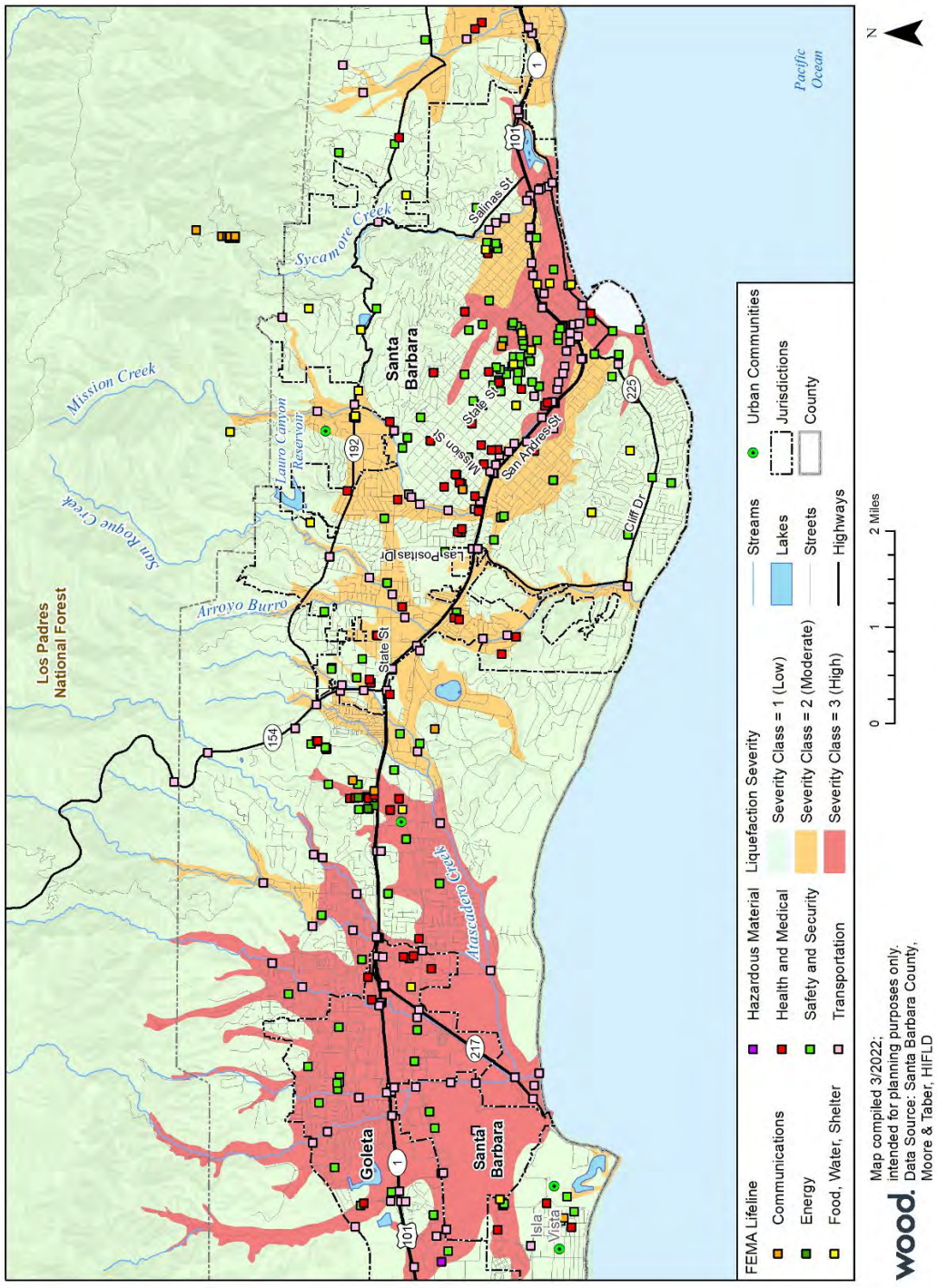


Figure 6-3. City of Santa Barbara Critical Facilities and Liquefaction Potential



6.3 FLOOD

The geographical location, climate, and topography of the South Coast make some areas of the City prone to flooding, particularly near the coastline and low-lying creek corridors. Flooding presents a hazard to development in floodplains. In addition to the damage to properties, flooding can also cut off access to utilities, emergency services, transportation, and may impact the overall economic well-being of an area. Emergency response can be interrupted by damaged roads and infrastructure. Fire can break out as a result of dysfunctional electrical equipment. Hazardous materials can also get into floodways, causing health concerns and polluted water supplies. During a flood, the drinking water supply can be contaminated. Climate change is expected to increase the frequency and intensity of heavy rainstorms that cause riverine flooding.

Based on the GIS analysis conducted for the 2022 MJHMP, the City has 1,792 improved parcels valued at over $1.9 billion in the 1-percent annual chance floodplain. Based on this analysis, which accounts for residents only and not workers, 3,339 residents are living in the 1-percent annual chance floodplain throughout the City. An additional 515 improved parcels and over $564 million in value fall within the 0.2-percent annual chance floodplain. Areas of the City vulnerable to the 0.2-percent annual chance riverine flood are home to 1,063 residents. Development in the 0.2-percent annual chance floodplain is typically not regulated, thus a large flood event could be extremely damaging in the City. This information is summarized in Table 6-7 below.

Table 6-7. City of Santa Barbara FEMA Floodplain Exposure and Loss

Property Type	Improved Parcel Count	Total Value	Estimated Loss	Population
Riverine 1% Annual Chance Floodplain Exposure and Loss				
Commercial	238	$503,338,458	$125,834,615	
Exempt	20	$60,896,806	$15,224,202	
Industrial	166	$242,179,170	$60,544,793	
Mixed Use	23	$81,217,906	$20,304,477	
Residential	1,340	$1,031,372,627	$257,843,157	
Improved Vacant	5	$2,968,766	$742,192	
Total 1% Chance	**1,792**	**$1,921,973,733**	**$480,493,433**	3,339
Riverine 0.2% Annual Chance Floodplain Exposure and Loss				
Commercial	73	$147,840,838	$36,960,210	
Exempt	5	$27,790,650	$6,947,663	
Industrial	3	$80,753,765	$20,188,441	
Mixed Use	5	$30,479,344	$7,619,836	
Residential	429	$277,449,645	$69,362,411	
Total 0.2% Chance	**515**	**$564,314,242**	**$141,078,561**	1,063
Total Flood Hazard	**2,307**	**$2,486,287,975**	**$624,571,994**	**4,403**

As listed in Table 6-8, 79 critical facilities in the City with a total value of $2,034,893 would be vulnerable to damage or destruction from 1-percent or 0.2-percent annual chance flood (Figure 6-4; see also, Section 6.3.3, *Flood* of the 2022 MJHMP).

Table 6-8. City of Santa Barbara Critical Facilities at Risk to Flood Hazard

Type	Critical Facility	FEMA Flood Chance	Total Building Value
Utilities	Sheffield Pump Station	1% Chance	-
Utilities	Laguna Pump Station	1% Chance	-
Water District	Goleta West Water District	1% Chance	-
Water Treatment Plant	Charles E. Meyer Main Desalination Plant	1% Chance	-
Water Treatment Plant	SCADA / MCC Building	1% Chance	-
Clinic	Vista Del Monte Sunridge SNF	1% Chance	-
Clinic	Mission Terrace Convalescent Hospital	0.2% Chance	-
Clinic	Sansum Clinic- Ob/ Gyn	1% Chance	-
Nursing Home	Vista Del Monte	1% Chance	-
Nursing Home	Mission Terrace Convalescent Hospital	0.2% Chance	-
Veteran Services	Sb Veterans Memorial Bldg.	1% Chance	$2,034,893
Airport Patrol	Santa Barbara Airport Patrol	1% Chance	-
Education	Santa Barbara Junior High	1% Chance	-
Education	Providence-SBCS	1% Chance	-
Education	El Montecito School San Roque	1% Chance	-
Fire Station	Fire Training	1% Chance	-
Fire Station	Airport Fire Station 8	1% Chance	-
Government	Public Works Yard	1% Chance	-
Government	Admin Well Corp. at Parks Department	1% Chance	-
Government	Parks And Recreation	1% Chance	-
Historic Site	Hastings Adobe	1% Chance	-
Historic Site	Los Banos Del Mar	1% Chance	-
Historic Site	Burton Mound	1% Chance	-
Airport	Santa Barbara Airport	1% Chance	-
Bridge	Bridge	1% Chance	-
Bridge	Bridge	1% Chance	-
Bridge	Bridge	1% Chance	-
Bridge	Bridge	1% Chance	-
Bridge	Bridge	1% Chance	-
Bridge	Bridge	1% Chance	-
Bridge	Bridge	1% Chance	-
Bridge	Bridge	1% Chance	-
Bridge	Bridge	1% Chance	-
Bridge	Bridge	0.2% Chance	-
Bridge	Bridge	1% Chance	-
Bridge	Bridge	1% Chance	-
Bridge	Bridge	0.2% Chance	-
Bridge	Bridge	1% Chance	-
Bridge	Bridge	1% Chance	-
Bridge	Bridge	1% Chance	-

Type	Critical Facility	FEMA Flood Chance	Total Building Value
Bridge	Bridge	1% Chance	-
Bridge	Bridge	0.2% Chance	-
Bridge	Bridge	1% Chance	-
Bridge	Bridge	1% Chance	-
Bridge	Bridge	1% Chance	-
Bridge	Bridge	1% Chance	-
Bridge	Bridge	1% Chance	-
Bridge	Bridge	1% Chance	-
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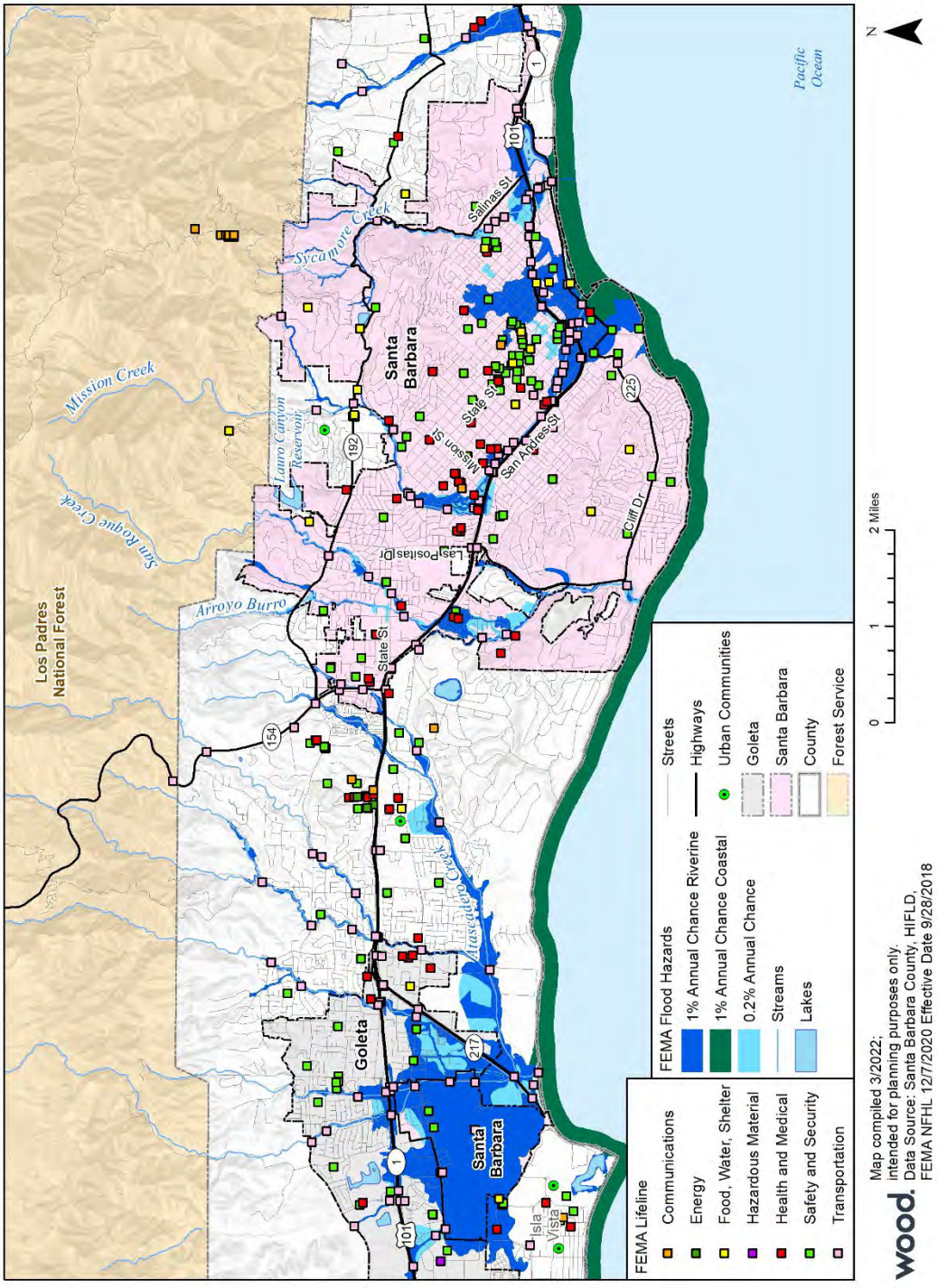
Bridge	Bridge	1% Chance	-
Bridge	Bridge	1% Chance	-
Bridge	Bridge	1% Chance	-
Bridge	Bridge	1% Chance	-
Bridge	Bridge	1% Chance	-
Bridge	Bridge	0.2% Chance	-
Bridge	Bridge	1% Chance	-
Bridge	Bridge	1% Chance	-
Airport	Bridge	1% Chance	-
Bridge	Bridge	1% Chance	-
Bridge	Bridge	1% Chance	-
Bridge	Bridge	1% Chance	-
Bridge	Bridge	1% Chance	-
Bridge	Bridge	1% Chance	-
Bridge	Bridge	1% Chance	-
Bridge	Bridge	1% Chance	-
Bridge	Bridge	1% Chance	-
Bridge	Bridge	1% Chance	-
Bridge	Bridge	1% Chance	-
Bridge	Bridge	1% Chance	-
Bridge	Bridge	1% Chance	-
Bridge	Bridge	1% Chance	-
Bridge	Bridge	1% Chance	-
Train Depot	Southern Pacific Train Depot	1% Chance	-

Figure 6-4. City of Santa Barbara Critical Facilities in FEMA Flood Hazard Zones



6.4 TSUNAMI

Based on the GIS analysis conducted for the 2022 MJHMP, the City has 890 improved parcels valued at over $1.3 billion in the tsunami hazard zone. Based on this analysis, which accounts for residents only and not workers, 1,580 residents are living in the tsunami hazard zone throughout the City. This information is summarized in Table 6-9 below and depicted in Figure 6-5.

Table 6-9. City of Santa Barbara at Risk to Tsunami Hazard

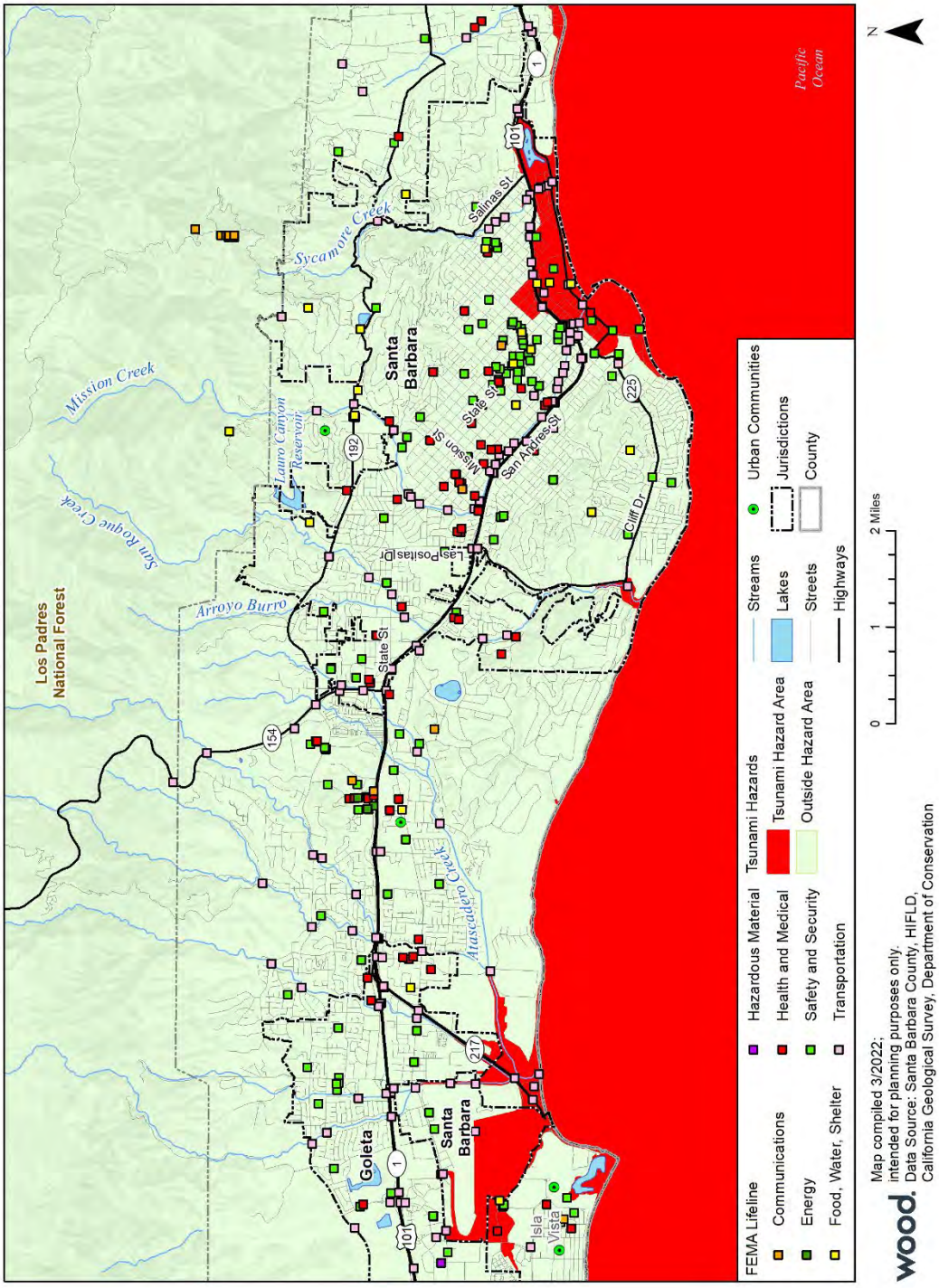
Property Type	Improved Parcel Count	Total Value	Population
Commercial	113	$225,256,702	
Exempt	4	$12,479,014	
Industrial	128	$186,632,753	
Mixed Use	7	$12,260,718	17
Residential	638	$951,704,762	1,563
Improved Vacant	3	$1,794,022	
Total	**890**	**$1,388,333,948**	**1,580**

As listed in Table 6-10, 23 critical facilities in the City would be vulnerable to damage or destruction from tsunami inundation (See also, Section 6.3.9, *Tsunami* of the 2022 MJHMP).

Table 6-10. City of Santa Barbara Critical Facilities Vulnerable to Tsunami

Type	Name	Total Building Value
Utilities	Laguna Pump Station	-
Water Treatment Plant	Charles E. Meyer Main Desalination Plant	-
Water Treatment Plant	Scada / Mcc Building	-
Water Treatment Plant	El Estero Water Resources Center	-
Veteran Services	Sb Veterans Memorial Bldg.	$2,034,893
Fire Station	Fire Training	-
Fire Station	Fire Station 2	-
Harbor Patrol	Santa Barbara Waterfront Harbor Patrol	-
Historic Site	Los Banos Del Mar	-
Historic Site	Burton Mound	-
Airport	Santa Barbara Airport	-
Bridge	Bridge	-
Bridge	Bridge	-
Bridge	Bridge	-
Bridge	Bridge	-
Bridge	Bridge	-
Bridge	Bridge	-
Bridge	Bridge	-
Bridge	Bridge	-
Bridge	Bridge	-
Bridge	Bridge	-
Bridge	Bridge	-
Bridge	Bridge	-

Figure 6-5. City of Santa Barbara Critical Facilities in Tsunami Hazard Zone



6.5 DAM FAILURE

Lauro Dam is of the largest concern to the City of Santa Barbara. Failure of Lauro Dam would inundate portions of the City with relatively little evacuation time. Based on the GIS analysis conducted for the 2022 MJHMP, in Santa Barbara, 1,224 properties with a total value of $808 million are vulnerable to the catastrophic flooding that would occur if Lauro Dam failed. Approximately 2,754 residents within the inundation zone may need to be evacuated, cared for, and possibly permanently relocated. This information is summarized in Table 6-11 below.

Table 6-11. City of Santa Barbara at Risk to Dam Inundation Hazard

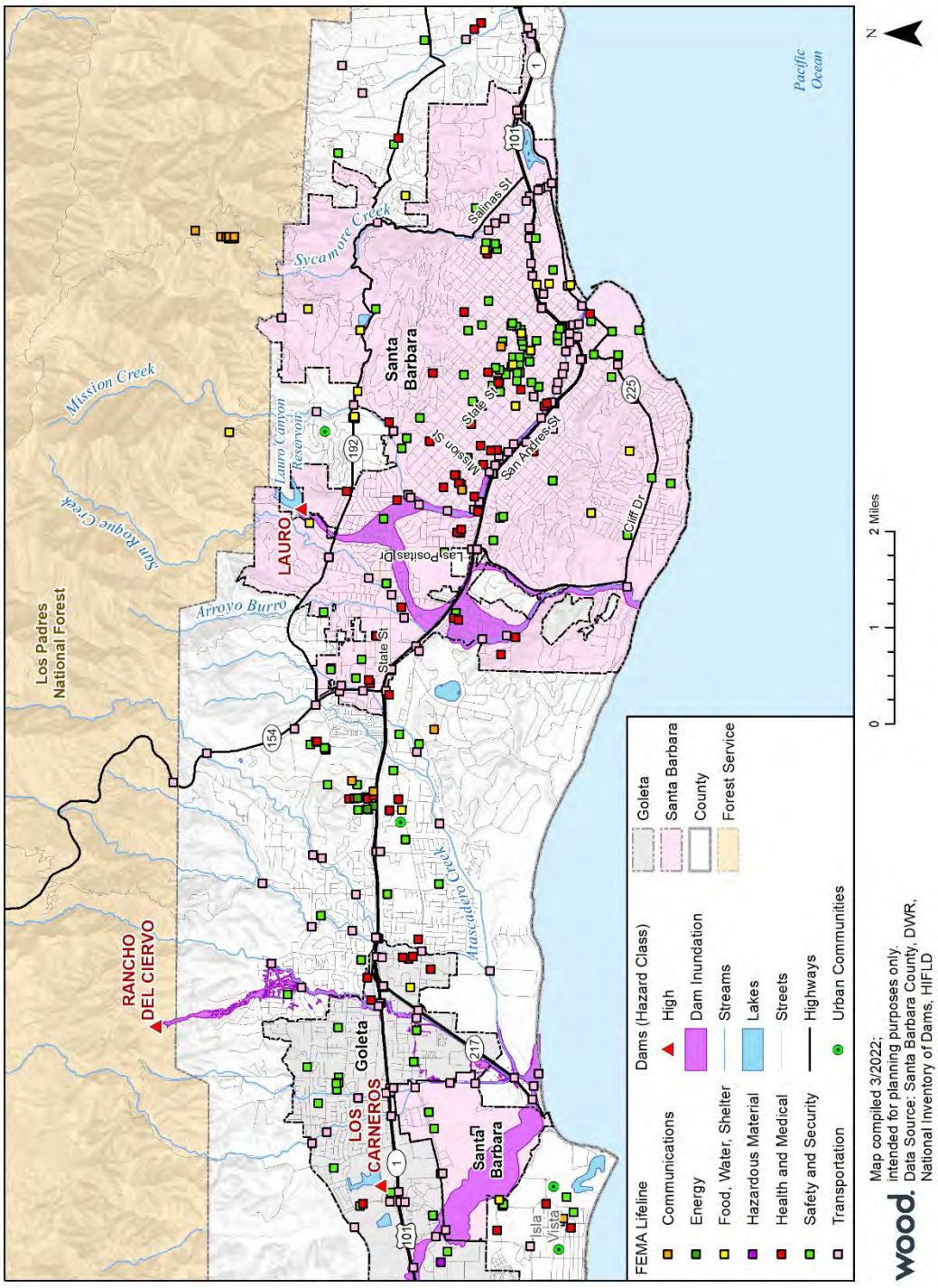
Property Type	Improved Parcel Count	Total Value	Population
Commercial	88	$133,647,498	
Exempt	11	$57,291,886	
Industrial	1	$163,005	
Mixed Use	1	$919,448	2
Residential	1,123	$616,614,786	2,751
Total	**1,224**	**$808,636,623**	**2,754**

As listed in Table 6-12, 21 critical facilities in the City would be vulnerable to damage or destruction from dam inundation (Figure 6-6; see also, Section 6.6.3, *Dam Failure* of the 2022 MJHMP). All but one of these facilities would be affected by the failure of the Lauro Dam. One bridge would be affected by the failure of the Glen Annie Dam.

Table 6-12. City of Santa Barbara Critical Facilities Vulnerable to Inundation from Dam Failure

Type	Name	Dam Name	Total Building Value
Clinic	Vista Del Monte Sunridge SNF	Lauro	-
Nursing Home	VISTA DEL MONTE	Lauro	-
Education	PEABODY CHARTER	Lauro	-
Education	PROVIDENCE-SBCS	Lauro	-
Bridge	Bridge	Lauro	-
Bridge	Bridge	Lauro	-
Bridge	Bridge	Lauro	-
Bridge	Bridge	Lauro	-
Bridge	Bridge	Lauro	-
Bridge	Bridge	Lauro	-
Bridge	Bridge	Lauro	-
Bridge	Bridge	Lauro	-
Bridge	Bridge	Lauro	-
Bridge	Bridge	Lauro	-
Bridge	Bridge	Lauro	-
Bridge	Bridge	Lauro	-
Bridge	Bridge	Lauro	-
Bridge	Bridge	Lauro	-
Bridge	Bridge	Glen Annie	-
Bridge	Bridge	Lauro	-
Bridge	Bridge	Lauro	-
Bridge	Bridge	Lauro	-

Figure 6-6. City of Santa Barbara Critical Facilities in Dam Inundation Zone



6.6 LANDSLIDE

As described in Section 5.3.9, *Landslides*, landslides are most common on steep slopes made of loose soil and other material such as those found in the City, but they can also happen on shallower slopes. The City has 9,925 improved parcels that lie within Class 5, 7, 8, 9, or 10 landslide hazard zones, amounting to $7.6 billion and home to 23,758 residents.

Table 6-13. City of Santa Barbara Improved Properties at Risk to Landslide Summary

Class 5 Parcel County	Class 7 Parcel Count	Class 8 Parcel Count	Class 9 Parcel Count	Class 10 Parcel Count	Total Improved Parcel Count	Total Value	Population
10	6,961	16	1,551	1,387	9,925	$7,652,734,542	23,758

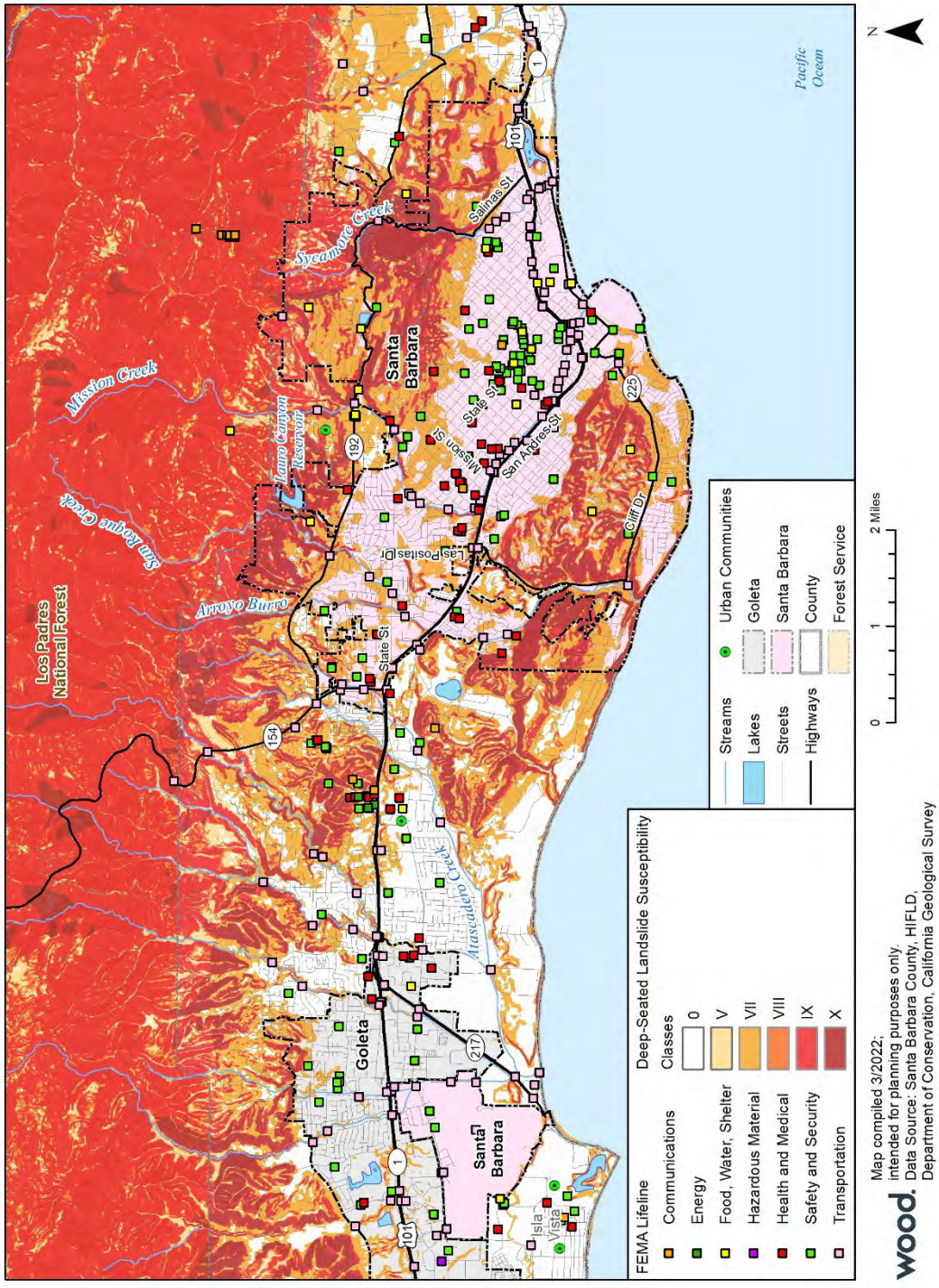
Further, as listed in Table 6-14, 40 critical facilities in the City would be vulnerable to damage or destruction from landslides (Figure 6-7; see also, Section 6.3.7, *Landslide* of the 2022 MJHMP).

Table 6-14. City of Santa Barbara Critical Facilities Vulnerable to Landslide

Type	Name	Landslide Severity Class	Total Building Value
Reservoir	Escondido Pump Station and Reservoir	7	-
Utilities	Sheffield Pump Station	7	-
Utilities	Skofield Pump Station	7	-
Water Treatment Plant	Cater Water Treatment Plant	7	-
Clinic	Valle Verde Health Facility- SNF	7	-
Clinic	La Cumbre Senior Living Concepts	7	-
Clinic	Sansum Clinic-Hitchcock	7	-
Clinic	Samarkand- Smith Center- SNF	7	-
Nursing Home	Alto Lucero Transitional Care	7	-
Nursing Home	Samarkand Of Santa Barbara	7	-
Nursing Home	Wood Glen Hall, Inc.	7	-
Nursing Home	Valle Verde Health Facility	7	-
Nursing Home	Alexander Gardens	9	-
Nursing Home	Mission Terrace Convalescent Hospital	7	-
Nursing Home	Villa Riviera	9	-
Nursing Home	Mountain House	7	-
Colleges / Universities	Santa Barbara City College	7	-
Education	Roosevelt Elementary	7	-
Education	Open Alternative	9	-
Education	Monroe Elementary	7	-

Type	Name	Landslide Severity Class	Total Building Value
Education	Adams Elementary	7	-
Education	La Colina Junior High	7	-
Education	Cleveland Elementary	9	-
Education	Eureka School of Santa Barbara	7	-
Fire Station	Fire Station 6	7	-
Fire Station	Fire Station 3	7	-
Fire Station	Fire Station 7	7	-
Historic Site	Los Banos Del Mar	7	-
Bridge	Bridge	7	-
Bridge	Bridge	7	-
Bridge	Bridge	7	-
Bridge	Bridge	7	-
Bridge	Bridge	7	-
Bridge	Bridge	7	-
Bridge	Bridge	7	-
Bridge	Bridge	7	-
Bridge	Bridge	9	-
Bridge	Bridge	7	-
Bridge	Bridge	9	-
Bridge	Bridge	7	-

Figure 6-7. City of Santa Barbara Critical Facilities within Landslide Susceptibility Zones



6.7 COASTAL HAZARDS

In 2021 the City approved a Sea Level Rise Adaption Plan and Vulnerability Assessment that quantifies the exposure of identified assets and resources to projected future coastal flood and erosion hazards. The purpose of the Sea Level Rise Adaption Plan and Vulnerability Assessment is to identify vulnerabilities to coastal hazards expected from sea-level rise in the City of Santa Barbara and possible actions to prepare for and adapt to sea-level rise. The plan can be found at www.SantaBarbaraca.gov/slr and is hereby incorporated by reference into this plan.

The City's 2021 Sea Level Rise Adaptation Plan and Vulnerability Assessment only included the main portion of the City and not the Airport and Goleta Slough. Sea level rise vulnerabilities at the Airport and Goleta Slough area were analyzed as part of the 2015 Goleta Slough Area Sea Level Rise And Management Plan. An updated vulnerability assessment and sea level rise adaptation plan is currently being developed for the City's Airport area.

The following analysis is based on the Santa Barbara County Climate Vulnerability Assessment to be consistent with the methodology contained for the greater Santa Barbara County Multi-Jurisdictional Hazard Mitigation Plan. Based on the MJHMP's analysis, approximately 100 acres of the City are susceptible to coastal hazards and sea level rise by 2030 (10.2 inches) and 145 acres by 2060 (27.2 inches). Based on the GIS analysis conducted for the 2022 MJHMP, the City has 1,014 improved parcels valued at over $1,6 billion in sea level rise coastal hazard zones. Based on this analysis, which accounts for residents only and not workers, 1,436 residents are living in this hazard zone within the City.

Table 6-15. City of Santa Barbara at Risk to Sea Level Rise Coastal Hazards by Property Type

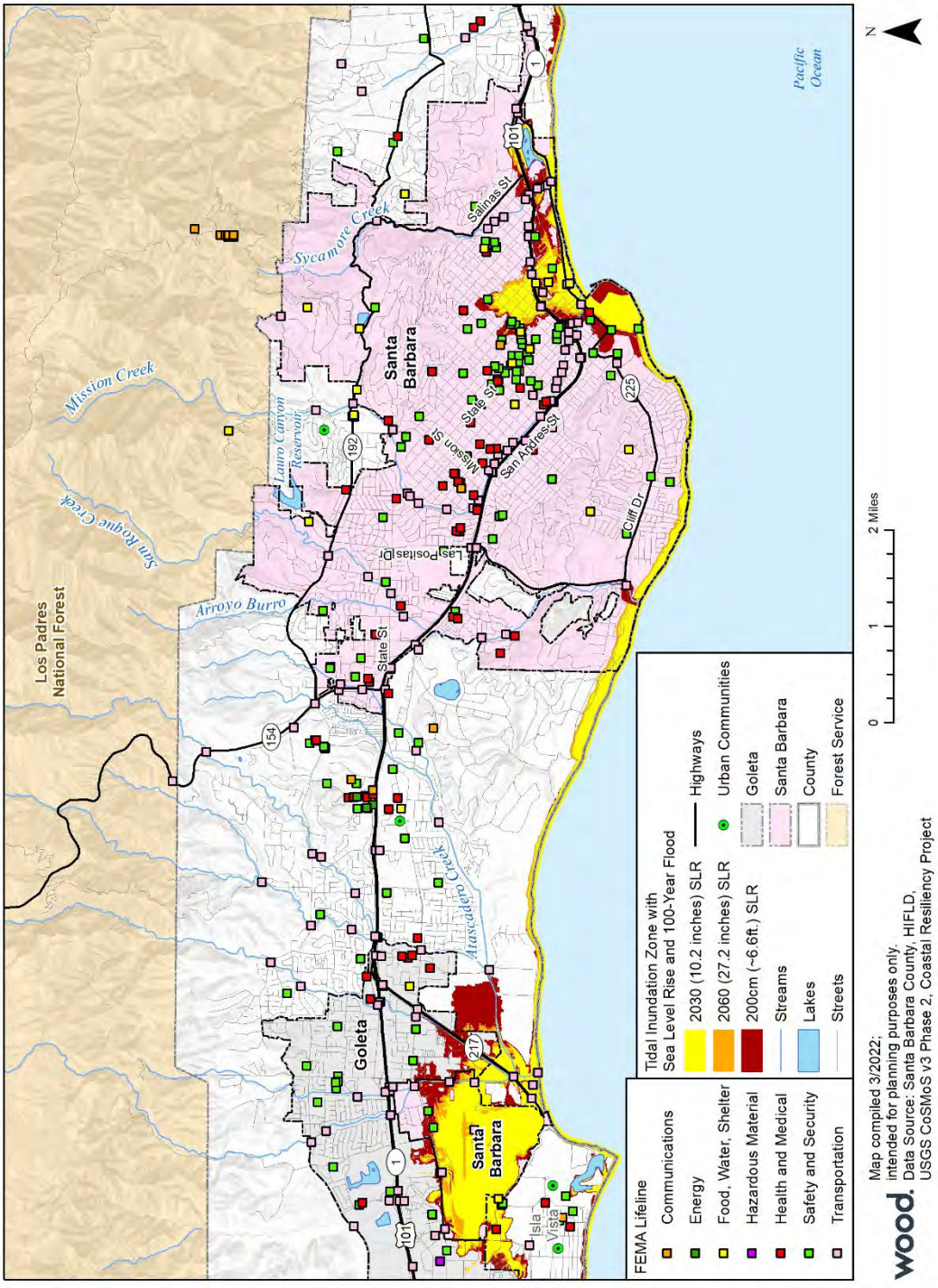
Property Type	Improved Parcel Count	Total Value	Population
2030 Sea Level Rise			
Commercial	84	$187,609,824	
Exempt	3	$618,954	
Industrial	98	$143,146,390	
Mixed Use	5	$21,117,388	12
Residential	231	$340,247,270	566
Improved Vacant	1	$68,994	
Total	**422**	**$692,808,820**	**578**
2060 Sea Level Rise			
Commercial	109	$236,143,706	
Exempt	5	$926,740	
Industrial	126	$213,313,565	
Mixed Use	13	$48,788,222	32
Residential	337	$464,798,276	826
Improved Vacant	2	$657,114	
Total	**592**	**$964,627,623**	**858**
Total Sea Level Rise Hazard	**1,014**	**$1,657,436,442**	**1,436**

Additionally, 14 critical facilities area vulnerable to damage or destruction from coastal hazards and sea level rise by 2030, and 19 critical facilities are vulnerable by 2060 (Table 6-16) (Figure 6-8; see also, Section 6.3.6, *Coastal Hazards* of the 2022 MJHMP).

Table 6-16. City of Santa Barbara Critical Facilities Vulnerable to Coastal Hazards

Type	Name	2030	2060	Total Building Value
Utilities	Laguna Pump Station	Yes	Yes	-
Water District	Goleta West Water District	No	Yes	-
Water Treatment Plant	Charles E. Meyer Main Desalination Plant	No	Yes	-
Water Treatment Plant	Scada / Mcc Building	No	Yes	-
Government	Public Works Yard	Yes	Yes	-
Government	Admin Well Corp. at Parks Department	Yes	Yes	-
Government	Parks And Recreation	Yes	Yes	-
Harbor Patrol	Santa Barbara Waterfront Harbor Patrol	Yes	Yes	-
Airport	Santa Barbara Airport	Yes	Yes	-
Bridge	Bridge	Yes	Yes	-
Bridge	Bridge	Yes	Yes	-
Bridge	Bridge	Yes	Yes	-
Bridge	Bridge	No	Yes	-
Bridge	Bridge	Yes	Yes	-
Bridge	Bridge	Yes	Yes	-
Bridge	Bridge	Yes	Yes	-
Bridge	Bridge	No	Yes	-
Bridge	Bridge	Yes	Yes	-
Bridge	Bridge	Yes	Yes	-

Figure 6-8. City of Santa Barbara Critical Facilities in Sea Level Rise Coastal Hazard Zones



7.0 MITIGATION STRATEGY

In preparation for the 2022 LHMP update, the City's LPT made no revisions to the countywide goals and objectives because they continue to reflect the needs of the City; see also, Chapter 7.0, *Mitigation Plan* of the 2022 MJHMP. This section contains the City's updated and most current mitigation strategy as of 2022.

7.1 MITIGATION GOALS AND OBJECTIVES

The City's LPT developed 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. These preliminary goals, objectives, and actions were developed to represent a vision of long-term hazard reduction or enhancement of capabilities. To help further the development of these goals and objectives, the LPT compiled and reviewed current jurisdictional sources, including the City's planning documents, codes, and ordinances, and specifically discussed hazard-related goals, objectives, and actions as they related to the overall LHMP.

The updated goals and objectives of this plan are:

Goal 1: Promote disaster-resistant development and strive to minimize the risks of hazards

Objective 1A: Minimize development in known hazard areas. When development must be sited in hazardous areas, minimize the impacts of hazards through hazard-resistant designs or phasing of development based on degree of hazard.

Objective 1B: Minimize hazard frequency, severity, and risks through mitigation projects and programs.

Objective 1C: Continue to assess hazards in the City based on best available science and information.

Goal 2: Prioritize hazard mitigation for critical facilities and community assets

Objective 2A: Plan for redundancy of critical services and infrastructure (energy, transportation, water supply) in the event of a hazard.

Objective 2B: Implement hazard mitigation projects for critical facilities, public transportation systems, and public services that are essential for basic city functions. Upgrade and replace aging critical facilities and infrastructure.

Objective 2C: Promote mitigation projects that have co-benefits and that minimize impacts to existing development, the local economy, natural resources, community and historical assets, and the public shoreline, parks, open spaces, and recreation areas.

Objective 2D: Promote mitigation projects that benefit or minimize impacts to vulnerable populations that may have a higher sensitivity and lower adaptive capacity to hazards.

Objective 2E: Promote mitigation projects and programs that respond to climate change and build resiliency partnerships and coordination locally, regionally, and statewide.

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 City's capability and efficiency at administering pre- and post-disaster mitigation programs.

Objective 3.F: Monitor and publicize the effectiveness of mitigation actions implemented in the City.

Objective 3.G: Position the City to apply for and receive grant funding from FEMA and other sources.

Goal 4: Promote community resilience to hazard events

Objective 4A: Integrate hazard mitigation with public policy and standard business practices.

Objective 4B: Create community resilience plans and resource hubs

Objective 4C: Incentivize resilience actions in the community.

Goal 5: Minimize the risks to life and property associated with urban and human-caused hazards

Objective 5A: Minimize risks from biological hazards, including disease, invasive species, and agricultural pests.

Objective 5B: Be prepared and respond to urban hazards, including terrorism, cyber threats, and civil disturbance.

Objective 5C: Minimize risks from energy production, including hazardous oil and gas activities.

Goal 6: Update and improve emergency response planning and programs

Objective 6A: Provide effective life safety measures and reduce property loss.

Objective 6B: Ensure rapid resumption of basic City services after an emergency.

Objective 6C: Accurately document and record response efforts to ensure cost recovery.

Goal 7: Prepare to adapt and recover from the impacts of climate change and ensure regional resiliency.

Objective 7A: Promote projects and programs that reduce greenhouse gas emissions, utilize carbon free energy, and reduce the potential of further impacts from climate change

Objective 7B: Identify, assess, and prepare for the impacts of climate change.

Objective 7C: Use the latest climate science to implement hazard mitigation strategies in response to climate change.

7.2 MITIGATION PROGRESS

Since 2017, the City has incorporated the LHMP goals, objectives, and mitigation actions into its local plans and processes, including the General Plan Safety Element by reference, specific hazard planning efforts (e.g., Sea Level Rise Adaptation Plan), the City's grant pursuits, and capital improvement planning. Ongoing monitoring and evaluation of the LHMP by the City ensured mitigations are implemented and tracked. Key mitigation actions completed since 2017 include improving the resilience of coastal structures, including Stearns Wharf and Mesa Lane and 1,000 Steps Coastal Access, beginning upgrades to the Laguna Pump Station and the Santa Barbara Police Station, and completing the Sea Level Rise Adaptation Plan and Vulnerability Assessment. The City's LPT reviewed the mitigation actions listed in the 2017 LHMP to determine the status of each action. Once reviewed, deferred projects from 2017 were renumbered to reflect 2022 updates (see Table 7-1).

Table 7-1. Status of City of Santa Barbara Previous Mitigation Actions

Mitigation Action No.	Mitigation Action Description	Status	Comments	In 2022 Update?
2016-1	Pedregosa Storm Drain	Deferred	Construction will significantly reduce flooding in the Mission Creek area around Pedregosa	X
2016-2	Replacement Storm Drain Outfall (Airport)	Canceled	Previously from 2011 – This project is planned but not budgeted. Will significantly reduce flooding on Hollister Avenue.	
2016-3	Flood Wall Construction (Airport)	Deferred	Flood Wall Construction - Around buildings 223, 304, 314, and 315 to protect these structures from flooding. Eliminate frequent water intrusion into buildings and subsequent clean-up costs due to storm events, many of which are less than 10-year events.	X
2016-4	Honda Valley Hillside Stabilization in a location of High-Pressure Gas Line Serving City	Deferred	A high-pressure gas line serving the City is located in an area of Honda Valley where stabilization of soil is needed.	X
2016-5	Hidden Valley Park Slope Stability	Deferred	To reduce risk to life and property from slides and flooding.	X
2016-6	Stevens Park Eastern Access Erosion Remediation	Deferred	A benefit to secure life and property and the preservation of an effective and ecologically sound creek system.	X
2016-7	Francheschi Park/Mission Ridge	Deferred	Deferred due to lack of funding – a retaining wall is crucial to evacuation and emergency response.	X

Mitigation Action No.	Mitigation Action Description	Status	Comments	In 2022 Update?
	Hillside geotechnical stabilization of retaining wall			
2016-8	Bluff Retreat Management at Shoreline Park	Deferred	Deferred due to lack of funding – This project is ongoing due to continuous bluff erosion.	X
2016-9	Rehabilitate Coastal Access Stairs at 1000 Steps	In Progress	In DART Process. Rehabilitation of damaged steps and drainage improvements anticipated in 2022.	X
2016-10	New Police Department	In Progress	PD Station funding through Measure C and potential bond	X
2016-11	High Fire Area Roadways	Deferred	Previously from 2011 - Erosions and landslides due to steep slopes and unreinforced retaining walls will hamper evacuation and emergency response. Renamed to Unreinforced Retaining Walls and Unstable Slopes project	X
2016-12	Laguna Pump Station	In Progress	The project is currently being funding by FEMA Mitigation Grant Funding – 2023	X
2016-13	Replace deluge system on Stearns Wharf	Completed	Continues to be an ongoing maintenance Project to promote firefighting on Stearns Wharf, which is a historical site in the Waterfront area.	
2016-14	Backup generator for Waterfront Department Operating Center.	Completed	Upgraded power needed for Harbor Patrol and Waterfront DOC.	
2016-15	Current Harbor facilities are old early 60s type construction – seismic renovation needed for safety	Deferred	Current Harbor facilities are early 60s type construction that would not withstand a large earthquake. Seismic evaluation is needed.	X
2016-16	Mesa Lane Coastal Access	Completed	The lowest portion of the Mesa Lane steps was replaced in 2012. Replacement of the upper portion is deferred.	
2016-17	Salsipuedes Street Storm Drain Improvement	Deferred	Potential improvements include the connection of storm drain inlets on Micheltorena Street to the existing storm drain on Salsipuedes Street and the construction of a new storm drain pipe along Salsipuedes and Victoria Streets. Pipes continue to be identified; funding for the project is from Measure C	X
2016 -18	Corrugated Metal Pipe Repairs	Deferred	Repair through slip lining or completely replace the highest priority corrugated metal pipe drain lines annually. Pipes are being identified; funding for the project is from Measure C.	X
2016-19	Gutierrez Storm Drain Improvements	Canceled	Construct additional storm drains to reduce the duration and severity of flooding when the upstream storm drain system is overwhelmed. The project is intended to improve the ability to remove runoff from the area by providing increased inlet	

Mitigation Action No.	Mitigation Action Description	Status	Comments	In 2022 Update?
			capacity and by providing larger conduits between the street inlets and the box culverts under Hwy 101. Current funding for the project with Hazard Mitigation Grant	
2016-20	Goleta Slough Mouth Management	Deferred	The project will control the water level in the Goleta Slough to minimize flood hazards, mosquito population blooms, and waterfowl attractants that pose a greater bird-strike risk. The project will be designed to minimize adverse effects to the Federally endangered tidewater goby and steelhead trout, while avoiding significant flood and bird-strike hazards such as those experienced in November 2012, May 2013, and February 2014. Currently waiting on Federal environmental regulators	X
2016-21	Hollister Drainage Improvement	Deferred	The project includes establishing new swales to connect to an existing culvert emptying to Carneros Creek. To preserve the wetland habitat within the project site, the swales will be "eco-channels" which are constructed to allow a certain depth of water to still fill the wetlands but now allow the water to overflow into Hollister Avenue. There will be a significant component of wetland enhancement/planting to offset any detrimental impacts of the project to the wetland habitat. Continued wetland disruption.	X
2016-22	Sea Level Rise Adaptation Plan	Completed	Comprehensive Sea Level Rise Adaptation Plan completed in 2021.	
2016-23	Review/Revise the City's Critical Facilities List	In Progress	Develop a more comprehensive list of Critical Facilities that would include hospitals, skilled nursing facilities, and private companies; as applicable.	X

7.3 MITIGATION APPROACH

A simplified Benefit-Cost Review was applied to both deferred and new 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 Planning Team. 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. Pedregosa Storm Drain

Priority: High	
Mitigation Strategy Description	This storm drain was recorded as part of the Storm Drain System Data Collection and Inspection Services, Phase 2. The City retrieved a Pipeline Assessment Certification Program ranking on portions of this storm drain. The City is determining the priority and scope of repair for this known drainage issue. Additional video of the pipe will be necessary following a storm drain clearing effort as the first camera was unable to traverse debris in certain areas.
Relevant Objective	Reducing significant flooding
Applicable Hazards	Flood
Estimated Timeline for Completion	2030
Estimated Cost/Funding Source	Measure C/Streets Capital Fund – estimated cost of project $700,000
Responsible Agency/Department	Public Works – Streets Division
Other Comments	Adapted from 2016-1 in the 2016 LHMP

2022-2. Honda Valley Hillside Stabilization

Priority: High	
Mitigation Strategy Description	Honda Valley Hillside Stabilization in a location of High-Pressure Gas line Serving the City. An area near a roadway and private property where high-pressure gas lines are buried erodes frequently due to runoff and the steepness of the slope. This necessitates stabilization of the continually eroding hillside containing the gas line. An engineering consultant would prepare plans for slope stabilization and native revegetation, and infrastructure relocation if necessary. Identify Funding Prepare scope of work Hire consultation firm to design job

	Acquire all necessary permits. Write Specifications Bid construction Construct project
Relevant Objective	The benefits of public safety and a secure utility delivery would outweigh the likely financial costs of planning and implementation of a slope stabilization project.
Applicable Hazards	Flooding, Landslide/Coastal Erosion
Estimated Timeline for Completion	2026
Estimated Cost/Funding Source	The benefits of public safety and a secure utility delivery would outweigh the likely financial costs of planning and implementation of a slope stabilization project.
Responsible Agency/Department	Parks & Recreation – Parks Division
Other Comments	City of Santa Barbara Parks and Recreation Department working with City of Santa Barbara Public Works and the Gas Company Adapted from 2016-4 in the 2016 LHMP

2022-3. Hidden Valley Park Slope Stability

Priority: High	
Mitigation Strategy Description	At numerous locations throughout the park, slope stability problems are reoccurring along steep creek banks causing public safety hazards from slides and flooding, as well as stability issues on private and public property that lines the park. Potential hazards to park users and public and private economic losses would be reduced if the slopes were stabilized. Identify Funding Hire consultation firm to design job Acquire all necessary permits. Write Specifications Bid construction Construct project
Relevant Objective	Reduced risk to life and property from slides and flooding would outweigh likely fiscal costs.
Applicable Hazards	Flooding
Estimated Timeline for Completion	2026
Estimated Cost/Funding Source	Funding has not been specified
Responsible Agency/Department	Parks & Recreation – Parks Division
Other Comments	City of Santa Barbara Parks and Recreation working with County of Santa Barbara Flood Control and City of Santa Barbara Creeks Division. Adapted from 2016-5 in the 2016 LHMP

2022-4. Stevens Park Eastern Access Erosion Remediation

Priority: High	
Mitigation Strategy Description	The sole emergency access point to the majority of Stevens Park is subject to severe erosion, undercutting, potential slope failure, and substantial sedimentation into San Rogue Creek from storm damage and poor drainage. To reduce the hazard to life and property from slides and flooding and to maintain a functional flood control system the area must be repaired employing bank stabilization, revegetation, and appropriate drainage control. Identify Funding Prepare scope of work Hire consultation firm to design job Acquire all necessary permits. Write Specifications Bid construction Construct project
Relevant Objective	The benefit of secure life and property and the preservation of an effective and ecologically sound creek system would outweigh the likely fiscal costs.
Applicable Hazards	Flooding, Landslide/Coastal Erosion
Estimated Timeline for Completion	2024
Estimated Cost/Funding Source	Funding has not been specified
Responsible Agency/Department	Parks & Recreation – Parks Division
Other Comments	The benefit of secure life and property and the preservation of an effective and ecologically sound creek system would outweigh the likely fiscal costs. Adapted from 2016-6 in the 2016 LHMP

2022-5. Francheschi Park/Mission Ridge Hillside Geotechnical

Priority: High	
Mitigation Strategy Description	Francheschi Park/Mission Ridge Hillside geotechnical stabilization of retaining wall Improve storm drain infrastructure improvements
Relevant Objective	Retaining wall is crucial to ingress and egress in the area; especially for evacuation and emergency response
Applicable Hazards	Flooding, Landslide/Coastal Erosion
Estimated Timeline for Completion	2025
Estimated Cost/Funding Source	Funding has not been specified
Responsible Agency/Department	Parks & Recreation – Parks Division
Other Comments	Adapted from 2016-7 in the 2016 LHMP

2022-6. Bluff Retreat Management at Shoreline Park

Priority: High	
Mitigation Strategy Description	Since the late '90s, the Park's bluff has been subject to numerous slides. Management of sidewalks and parkway needs to be continually addressed.
Relevant Objective	Currently, the erosion of the park continues and will continue. Keeping the management of sidewalks and vegetation in the area is an ongoing issue.
Applicable Hazards	Sea Level Rise, Landslide Coastal Erosion, Tsunami
Estimated Timeline for Completion	2028
Estimated Cost/Funding Source	Currently an unfunded project
Responsible Agency/Department	Parks & Recreation – Parks Division Public Works - Engineering
Other Comments	Adapted from 2016-8 in the 2016 LHMP

2022-7. Rehabilitate Coastal Stairs at 1000 Steps

Priority: High	
Mitigation Strategy Description	Coastal erosion to the access on the beach has been ongoing. The lower portion of the stairway needs to be rebuilt to maintain coastal access for first responders at this location.
Relevant Objective	Civil engineering plans are completed and permitting is in the process as of summer 2019. Construction is anticipated to be completed in summer 2022.
Applicable Hazards	Sea Level Rise, Landslide/Coastal Erosion, Tsunami
Estimated Timeline for Completion	2023
Estimated Cost/Funding Source	$800,000
Responsible Agency/Department	Parks & Recreation – Parks Division Public Works - Engineering
Other Comments	Adapted from 2016-9 in the 2016 LHMP

2022-8. New Police Department

Priority: High	
Mitigation Strategy Description	The police building has been assessed by an outside architectural firm and has been determined that the building needs seismic renovation.
Relevant Objective	Critical facility seismic renovation
Applicable Hazards	Earthquake
Estimated Timeline for Completion	2026
Estimated Cost/Funding Source	Measure C Funding and potential bond will assist in funding the new Police Department - $96,000,000
Responsible Agency/Department	Police Department Community Development – Planning Division
Other Comments	Adapted from 2016-10 in the 2016 LHMP

2022-9. Unreinforced Retaining Walls and Unstable Slopes

Priority: High	
Mitigation Strategy Description	Many steep-sloped areas are subject to erosion and have already partially failed in areas due to past flooding events. Gravity and unreinforced retaining walls subject to landslides, earthquakes, and fires are at a higher risk of failing in an emergency event. Reinforcement and replacement of the walls would protect infrastructure, access, and the residents of the Riviera. The City is determining whether an unreinforced wall on Marilyn Way is a good fit for LHP.
Relevant Objective	Erosions and landslides will hamper emergency responders from accessing these high fire areas and will drastically slow down calls times if these roads are hampered.
Applicable Hazards	Flooding, Wildfire, Landslide/Coastal Erosion
Estimated Timeline for Completion	2036
Estimated Cost/Funding Source	$30,000,000
Responsible Agency/Department	Public Works, Engineering Fire Dept., Fire Prevention Bureau, Wildland Specialist
Other Comments	Adapted from 2016-11 in the 2016 LHMP

2022-10. Seismic Upgrades to City Facility in the Harbor

Priority: High	
Mitigation Strategy Description	Current Harbor facilities are old early 60s type construction – seismic renovation needed for safety
Relevant Objective	Critical Facility needing seismic upgrades for safety
Applicable Hazards	Earthquake
Estimated Timeline for Completion	2032
Estimated Cost/Funding Source	$5 Million
Responsible Agency/Department	Waterfront – Operations Division Public Works – Engineering Division
Other Comments	Adapted from 2016-15 in the 2016 LHMP

2022-11. Salsipuedes Street Storm Drain Improvements

Priority: High	
Mitigation Strategy Description	The project first involves the study of existing public and private storm drain facilities beginning on Salsipuedes Street at Micheltorena Street and continuing south to Victoria Street. Potential improvements include the connection of storm drain inlets on Micheltorena Street to an existing storm drain on Salsipuedes Street and the construction of a new storm drain pipe along Salsipuedes and Victoria Streets.
Relevant Objective	Public Works will pursue the completion of an initial study and design for this project if grant funding or a cost-sharing agreement with County Flood Control can be secured to cover 50% of the cost for construction.
Applicable Hazards	Flooding

Priority: High	
Estimated Timeline for Completion	2035
Estimated Cost/Funding Source	$1,500,000
Responsible Agency/Department	Public Works – Engineering Division
Other Comments	Adapted from 2016-17 in the 2016 LHMP

2022-12. Corrugated Metal Pipe Repairs

Priority: High	
Mitigation Strategy Description	Studies done in several areas within the City noted many corrugated metal pipes would need to be replaced. This project would seek to repair through slip lining, spiral wound lining, or replacement of the highest priority corrugated metal pipe drain lines.
Relevant Objective	Many of the City-owned corrugated metal pipes were installed over 50 years ago and may require replacement. Due to the lack of funding for this project, repairs are typically only completed as emergency maintenance projects in response to failures evident at the street level (typically as sinkholes following rain events). 2019 – Currently pipes are being identified. The City will review findings from an ongoing Pipeline Assessment Certification Program and create a replacement plan
Applicable Hazards	Flooding
Estimated Timeline for Completion	2028
Estimated Cost/Funding Source	Measure C Funding - $20,000,000
Responsible Agency/Department	Public Works – Engineering Division
Other Comments	Adapted from 2016-18 in the 2016 LHMP

2022-13. Goleta Slough Mouth Management

Priority: Medium	
Mitigation Strategy Description	This project will control the water level in the Goleta Slough to minimize flood hazards, mosquito population blooms, and waterfowl attractants that pose a greater bird-strike risk. This project will be designed to minimize adverse effects to the Federally endangered tidewater goby and steelhead trout, while avoiding significant flood and bird-strike hazards such as those experienced in November 2012, May 2013, and February 2014.
Relevant Objective	The Federal Aviation Administration (FAA) requires that wildlife strike risk be avoided to the maximum extent feasible within environmental constraints. The Santa Barbara County Flood Control District completed an Environmental Impact Report for their maintenance activities, including slough mouth management in 2011. 2019 – Continue to work with environmental regulators.
Applicable Hazards	Flooding, Sea Level Rise, Agricultural Pests/Disease, Commercial Aircraft
Estimated Timeline for Completion	2030
Estimated Cost/Funding Source	Discussion with the County regarding potential mitigations. Funding sources include funding from FAA and the Airport. - $300,000

Priority: Medium	
Responsible Agency/Department	Airport – Operations Division Public Works – Engineering Division
Other Comments	Adapted from 2016-20 in the 2016 LHMP

2022-14. Hollister Drainage Improvement

Priority: Medium	
Mitigation Strategy Description	The project includes establishing new swales to connect to an existing culvert emptying to Carneros Creek. To preserve the wetland habitat within the project site, the swales will be "eco-channels" which are constructed to allow a certain depth of water to still fill the wetlands but now allow the water to overflow into Hollister Avenue. There will be a significant component of wetland enhancement/planting to offset any detrimental impacts of the project to the wetland habitat.
Relevant Objective	Hollister Avenue is an important access route to the Airport and needs to remain a safe and dependable route to the Airport in moderate and heavy rains. The project is consistent with Public Works Engineering standards that require roads to be adequately drained during a 10-year storm. 2019 – Not planned due to mitigating wetland disruptions.
Applicable Hazards	Flooding
Estimated Timeline for Completion	2030
Estimated Cost/Funding Source	Airport Project funding - $500,000
Responsible Agency/Department	Airport – Operations Division
Other Comments	The area south of Hollister Avenue and east and west of Los Carneros Way is twelve-acre moisture of upland and wetland habitats. The area is drained by several poorly defined swales, which have not been maintained for many years. In moderate storm events (3–5-year storms), the swales, which are severely choked by bulrush, back up with storm runoff and flood over Hollister Avenue. The depth of water on Hollister Avenue is as much as 12 inches and the road has to be closed for safety reasons. Adapted from 2016-21 in the 2016 LHMP

2022-15. Review/Revise City's Critical Facilities List

Priority: Medium	
Mitigation Strategy Description	Develop a more comprehensive list of Critical Facilities that would include hospitals, skilled nursing facilities, and private companies; as applicable.
Relevant Objective	To have a comprehensive Hazard Mitigation Plan, the City will need to develop a critical infrastructure list that includes outside agencies and businesses, such as hospitals, skilled nursing facilities, dialysis clinics, etc.
Applicable Hazards	All
Estimated Timeline for Completion	2023
Estimated Cost/Funding Source	In-Kind staff cost
Responsible Agency/Department	Finance – Risk Management

Priority: Medium	
	Community Development – Long Range Planning Division Fire – Office of Emergency Services
Other Comments	Adapted from 2016-23 in the 2016 LHMP

2022-16. Sycamore Creek Flood Control and Restoration Project

Priority: High	
Mitigation Strategy Description	The proposed project is an effort to prevent flooding in the Lower Eastside, relieve major flow constriction points, and improve overall flow capacity and system reliability. Work consists of several bridge replacements and channel widening, along with additional improvements to the entire lower reach of Sycamore Creek.
Relevant Objective	The list of undersized bridges includes Indio Muerto Street Bridge, Zoo Bridge, El Escorial Bridge, Railroad Bridge, and the Por La Mar Bridge. The reaches between the bridges are also significantly undersized.
Applicable Hazards	Flooding
Estimated Timeline for Completion	2032
Estimated Cost/Funding Source	$50,000,000
Responsible Agency/Department	Public Works - Streets Division
Other Comments	

2022-17. Parma Park Debris Basin

Priority: High	
Mitigation Strategy Description	The proposed project is an effort to prevent flooding and erosion along Sycamore Creek, its tributary areas, and downstream properties. Work consists of clearing debris and vegetation to restore the basin's capacity to its original conditions.
Relevant Objective	Parma Park basin was impacted by the Thomas Fire and subsequent debris flows.
Applicable Hazards	Flooding
Estimated Timeline for Completion	2030
Estimated Cost/Funding Source	$5,000,000
Responsible Agency/Department	Parks & Recreation – Parks Division Public Works – Streets Division
Other Comments	

2022-18. Creeks Development Standards

Priority: Medium	
Mitigation Strategy Description	Establish creek development standards for new development and redevelopment along the City's creeks inland of the Coastal Zone and prepare or update guidelines for restoration, an increase of pervious surfaces, and appropriate land uses within designated creek buffers.

Priority: Medium	
Relevant Objective	Protection and restoration of creeks and their riparian corridors is a priority for flood control in conjunction with adaptation planning for climate change.
Applicable Hazards	Flooding
Estimated Timeline for Completion	2030
Estimated Cost/Funding Source	$100,000/Grant or General Fund
Responsible Agency/Department	Community Development – Long Range Planning Division
Other Comments	Creek development standards, specifically numeric development setbacks, protect from flood, erosion, and geologic hazards and provide an area for habitat support. Numeric creek setbacks and buffer standards have been developed in the Coastal Land Use Plan for the Coastal Zone. This project would provide appropriate standards for the inland areas of the City. The policy direction for this project is found in the 2011 Environmental Resources Element and 2012 Climate Action Plan.

2022-19. Automatic Reservoir Isolations Valves

Priority: High	
Mitigation Strategy Description	The City's 14 potable water reservoirs should be retrofitted with automatic isolation valves, which would shut in the event of a water main break caused by an earthquake or other force.
Relevant Objective	The reservoirs all range in capacity from 1 to 10 million gallons. Retrofitting each reservoir with automatic isolation valves is important for protecting the City's water supply from an earthquake event and also protecting surrounding structures from a flood event resulting from a free-flowing pipe from the reservoir.
Applicable Hazards	Earthquake, Flooding
Estimated Timeline for Completion	2025
Estimated Cost/Funding Source	$1,400,000
Responsible Agency/Department	Public Works – Water Resources Division
Other Comments	

2022-20. Automated Metering Infrastructure (AMI) Program

Priority: High	
Mitigation Strategy Description	The City currently manually reads its 27,000 meters monthly. In the event of a private property leak, a month might pass before the meter is read and the leak is noticed because of the high use registered by the meter.
Relevant Objective	AMI would provide the infrastructure to enable leak notification 24 hours within the leak incident, thus eliminating high amounts of water loss. AMI would be a significant tool for helping conserve water Citywide.
Applicable Hazards	Earthquake, Wildfire, Drought
Estimated Timeline for Completion	2023

Priority: High	
Estimated Cost/Funding Source	This project is partially funded through the City's Capital Program. In addition, the City has received a grant for $1,500,000 from the Federal Bureau of Reclamation for Phase II implementation.- $6,802,000
Responsible Agency/Department	Public Works – Water Resources Division
Other Comments	The City is nearing the completion of the installation of compatible meters. Pilot testing of a limited number of meters is complete. The City is starting Phase II which is the AMI Implementation Phase in which smart meter communication equipment will be installed, data storage created and, a customer interface set up. Once Phase II is complete, the project will be complete

2022-21. El Estero WRC – Chlorine Contact Chamber Bypass

Priority: High	
Mitigation Strategy Description	Many of the structural components are past their useful life, such as baffle walls, flow control gates, and monitoring devices. Upgrading the structure and equipment will reduce the risk of failure due to natural disasters, such as floods, earthquakes, fires, and associated power disruptions.
Relevant Objective	
Applicable Hazards	Earthquake, Flooding, Wildfire, Sea Level Rise
Estimated Timeline for Completion	2023
Estimated Cost/Funding Source	Wastewater Capital Funds - $1,500,000
Responsible Agency/Department	Public Works – Water Resources Division
Other Comments	

2022-22. El Estero WRC – New DAFT and GT

Priority: High	
Mitigation Strategy Description	Many of the structural components and equipment are past their useful life, such as weirs, rotating equipment, walkways, and stairs. Upgrading the structure and equipment will reduce the risk of failure due to natural disasters, such as floods, earthquakes, fires, and associated power disruptions.
Relevant Objective	Maintain human health and safety and preserve the environment
Applicable Hazards	Earthquake, Flooding, Wildfire, Sea Level Rise
Estimated Timeline for Completion	2026
Estimated Cost/Funding Source	Wastewater Capital Funds - $6,400,000
Responsible Agency/Department	Public Works – Water Resources Division
Other Comments	

2022-23. El Estero WRC – Digester Upgrades

Priority: High	
Mitigation Strategy Description	This project will result in a third digester being constructed. This third digester will reduce the risk of failure due to natural disasters that may subject the older digesters to failure.
Relevant Objective	A new digester will allow this critical wastewater treatment process to continue to operate during floods, earthquakes, and power failures due to wildfires. This new digester will also allow for El Estero to operate independently from Southern California Edison and the power grid during a natural disaster.
Applicable Hazards	Earthquake, Flooding, Wildfire, Sea Level Rise
Estimated Timeline for Completion	2042
Estimated Cost/Funding Source	Wastewater Capital Funds - $14,600,000
Responsible Agency/Department	Public Works – Water Resources Division
Other Comments	

2022-24. El Estero WRC – Electrical Distribution Upgrade Project

Priority: High	
Mitigation Strategy Description	The Electrical Distribution System Upgrade project will replace the substations and electrical equipment that is outdated and past useful life.
Relevant Objective	The new electrical substations and equipment will be designed with redundancy and features that will allow the important wastewater treatment facilities to run independently on internally generated power. This redundancy and power independence will allow the wastewater treatment process to be maintained during earthquakes, floods, and wildfires. The project is in the final design stage.
Applicable Hazards	Earthquake, Flooding, Wildfire, Sea Level Rise
Estimated Timeline for Completion	2026
Estimated Cost/Funding Source	SRF – $30,200,000
Responsible Agency/Department	Public Works – Water Resources Division
Other Comments	

2022-25. Community Resilience Plans and Hubs

Priority: High	
Mitigation Strategy Description	Develop community resilience plans including a comprehensive database of relief resources in the event of a disaster and neighborhood-level Community Resilience Hubs to improve initial emergency response, subsequent recovery, and ongoing self-sufficiency. Resilience hubs are community-serving facilities augmented to support residents, coordinate communication, distribute resources, and reduce carbon pollution while enhancing the quality of life. The plans will define, identify, and analyze the logistical and economic feasibility of Community Resilience Hubs and develop a comprehensive implementation and operations plan for several Community Resilience Hubs in the City. Execute elements needed for the resilience hubs,

Priority: High	
	including but not limited to installing energy generation and storage, building upgrades, and improvements necessary for services.
Relevant Objective	
Applicable Hazards	Earthquake, Flooding, Wildfire, Sea Level Rise, Drought, Agricultural Pests/Disease, Epidemic/Pandemic, HazMat Release, Oil Spills, Landslide/Coastal Erosion, Tsunami, Dam Failure, Commercial Aircraft, Terrorism, Cyber Threat
Estimated Timeline for Completion	2025
Estimated Cost/Funding Source	$250,000-$1,500,000 depending on scope and implementation
Responsible Agency/Department	Community Development and Sustainability and Resilience
Other Comments	

2022-26. Water System Reservoirs Seismic Evaluation and Other Upgrades

Priority: High	
Mitigation Strategy Description	The City's 13 potable water reservoirs would be evaluated for seismic code deficiencies and other needed upgrades as necessary. The reservoirs all range in capacity from 1 to 10 million gallons.
Relevant Objective	Seismically retrofitting and upgrading aging equipment in each reservoir is important for protecting the City's water supply from an earthquake event and also for protecting surrounding structures from a flood event resulting from a failed reservoir.
Applicable Hazards	Earthquake, Flooding
Estimated Timeline for Completion	2022
Estimated Cost/Funding Source	Capital Program funding - $173,000
Responsible Agency/Department	Public Works – Water Resources Division
Other Comments	

2022-27. Transfer of Development Rights (TDR) Program

Priority: Low	
Mitigation Strategy Description	Develop a TDR Program that allows the transfer of residential density from the City's High Fire Hazard Areas to High-Density residential land use designations.
Relevant Objective	Reduce residential density in High Fire Hazard Areas
Applicable Hazards	Wildfire
Estimated Timeline for Completion	2030
Estimated Cost/Funding Source	$100,000/Grant or General Fund
Responsible Agency/Department	Community Development Dept. – Long Range Planning Division
Other Comments	Residential growth within the City is encouraged in the existing urban areas, rather than the front-country areas most subject to wildfire risk. The City's General Plan Update of 2011 did not change land use designations or increase development potential within High Fire Hazard Areas; however, this project would implement a policy that proposes to limit new development in High Fire Hazard Areas by

Priority: Low	
	offering incentives and/or an option to transfer development rights to urban areas. The policy direction for this project is found in the 2011 Land Use Element and 2012 Climate Action Plan.

2022-28. El Estero WRC – Solids Handling

Priority: High	
Mitigation Strategy Description	The Solids Handling project includes Sludge Holding Tank replacement, Dewatering Building structural upgrades, conveyance/truck loading, and polymer system upgrades.
Relevant Objective	The construction of the new structures will bring these facilities up to earthquake standards reducing the risk of failure to structures and important wastewater processes within these structures during earthquakes. Also, the new facilities will allow the important wastewater process of dewatering to continue during floods or power failures due to wildfire
Applicable Hazards	Earthquake, Flooding, Wildfire, Sea Level Rise
Estimated Timeline for Completion	2030
Estimated Cost/Funding Source	SRF – $23,270,000
Responsible Agency/Department	Public Works – Water Resources Division
Other Comments	

2022-29. Desal Intake Pump Platforms Hardening Project

Priority: High	
Mitigation Strategy Description	With the recent start-up of the City's Desalination Facility, it was found that the Intake Pump Platforms are not fully supported by the ocean floor.
Relevant Objective	The platforms were originally pinned to the sandy, ocean bottom with vertical pilings in the 1990s. The pilings lack adequate scour protection. Currently, one of the platforms was found to be without any sand support to a depth of 18" below the bottom of the slab. Only the friction with the pilings is holding the slabs from dropping. Failure of the platforms would result in the interruption of raw water supplies to the Desalination Plant.
Applicable Hazards	Earthquake, Landslide/Coastal Erosion, Tsunami
Estimated Timeline for Completion	2023
Estimated Cost/Funding Source	Hazard Mitigation Grant Program and Water Capital funds as the grant match – $4,200,000
Responsible Agency/Department	Public Works – Water Resources Division
Other Comments	

2022-30. Castillo Street Capacity Improvement Project

Priority: High	
Mitigation Strategy Description	This project would divert flow from the existing trunk sewer on the west side of Highway 101.

Priority: High	
Relevant Objective	The new pipeline would follow Castillo Street from Pedregosa Street to Haley Street, where it would reconnect to the existing system. The existing trunk sewer cannot convey wet weather peak flows.
Applicable Hazards	Earthquake, Flooding,
Estimated Timeline for Completion	2025
Estimated Cost/Funding Source	Wastewater Collection Capital Funds - $3,201,000
Responsible Agency/Department	Public Works – Water Resource Division
Other Comments	

2022-31. Milpas Street Capacity Improvement Project

Priority: High	
Mitigation Strategy Description	This project would provide relief for an undersized existing 6-inch pipe between Alphonse Street and Ortega Street.
Relevant Objective	Model results indicate the pipe currently has limited capacity during storm events and cannot convey the peak wet weather flow without surcharging the system.
Applicable Hazards	Earthquake, Flooding
Estimated Timeline for Completion	2025
Estimated Cost/Funding Source	Wastewater Collection Capital Funds - $82,000
Responsible Agency/Department	Public Works – Water Resources Division
Other Comments	

2022-32. Nopal Street Capacity Improvement Project

Priority: High	
Mitigation Strategy Description	At Nopal Street and De La Guerra Street, a short reach of 6-inch pipe is a hydraulic bottleneck, which has difficulties conveying wet weather peak flows.
Relevant Objective	This project would provide a parallel pipe to support the bottleneck and prevent a surcharge in the system.
Applicable Hazards	Earthquake, Flooding
Estimated Timeline for Completion	2025
Estimated Cost/Funding Source	Wastewater Collection Capital Funds - $35,000
Responsible Agency/Department	Public Works – Water Resources Division
Other Comments	

2022-33. Olive Street Capacity Improvement Project

Priority: High	
Mitigation Strategy Description	This project would provide relief for an existing 8-inch pipe in Olive Street from Cota Street to Haley Street.
Relevant Objective	The existing pipe is a hydraulic bottleneck that does not convey the peak wet weather flow for preventing a system surcharge.

Priority: High	
Applicable Hazards	Earthquake, Flooding
Estimated Timeline for Completion	2030
Estimated Cost/Funding Source	Wastewater Collection Capital Funds – $174,000
Responsible Agency/Department	Public Works – Water Resources Division
Other Comments	

2022-34. Ortega Street Capacity Improvement Project

Priority: High	
Mitigation Strategy Description	Between Laguna Street and Garden Street, an existing 6-inch pipe is a hydraulic bottleneck that does not convey wet weather flow capacity.
Relevant Objective	This project would provide a parallel pipe to support the bottleneck and prevent a surcharge in the system.
Applicable Hazards	Earthquake, Flooding
Estimated Timeline for Completion	2030
Estimated Cost/Funding Source	Wastewater Collection Capital Funds - $107,000
Responsible Agency/Department	Public Works – Water Resources Division
Other Comments	

2022-35. Quarantina Street Capacity Improvement Project

Priority: High	
Mitigation Strategy Description	This project would start near the intersection of Ortega Street and the extension of Nopal Street. It would provide wet weather capacity to carry flows southwest in Ortega Street and then southeast in Quarantina Street.
Relevant Objective	
Applicable Hazards	Earthquake, Flooding
Estimated Timeline for Completion	2025
Estimated Cost/Funding Source	Wastewater Collection Capital Funds - $650,000
Responsible Agency/Department	Public Works – Water Resources Division
Other Comments	

2022-36. State Street Capacity Improvement Project

Priority: High	
Mitigation Strategy Description	This project would provide additional wet weather capacity in State Street in front of La Cumbre Plaza and would address the restriction in the current siphon under Arroyo Burro.
Relevant Objective	Maintains human health and safety and preserves the environment
Applicable Hazards	Earthquake, Flooding
Estimated Timeline for Completion	2025

Priority: High	
Estimated Cost/Funding Source	Wastewater Collection Capital Funds - $541,000
Responsible Agency/Department	Public Works – Water Resources Division
Other Comments	

2022-37. Various Collection System Pipe Segments Capacity Improvement Project

Priority: High	
Mitigation Strategy Description	This project would address wet weather capacity constraints throughout the collection system. These pipes are currently unable to convey peak wet weather flows without surcharging the system.
Relevant Objective	Maintains human health and safety and preserves the environment
Applicable Hazards	Earthquake, Flooding
Estimated Timeline for Completion	2030
Estimated Cost/Funding Source	Wastewater Collection Capital Funds - $13,000,000
Responsible Agency/Department	Public Works – Water Resources Division
Other Comments	

2022-38. Rattlesnake Sewer Crossing Project

Priority: High	
Mitigation Strategy Description	A sewer main supported on a pipe bridge conveys sewage across Rattlesnake Creek where it joins the remainder of the sewage conveyance system to the wastewater treatment plant.
Relevant Objective	This project would replace the pipe bridge that carries the sewer main across the creek with a directionally drilled pipe under the creek and a lift station. The pipe bridge is exposed and vulnerable and its length makes it cost-prohibitive to strength. In addition, strengthening would require extensive environmental review and mobilization in a creek. Failure of the pipe would spill sewage into the creek.
Applicable Hazards	Earthquake, Flooding
Estimated Timeline for Completion	2028
Estimated Cost/Funding Source	Currently, there is funding for this project - $1,000,000
Responsible Agency/Department	Public Works – Water Resources Division
Other Comments	

2022-39. El Camino de la Luz Sewer Crossing Project

Priority: High	
Mitigation Strategy Description	A sewer main supported on a pipe bridge conveys sewage across a ravine where it joins the remainder of the sewage conveyance system to the wastewater treatment plant.
Relevant Objective	This project would replace the pipe bridge that carries the sewer main across the ravine by rerouting it through city streets. The pipe bridge is exposed and vulnerable and its length makes it cost-prohibitive to

Priority: High	
	strengthen. In addition, strengthening would require extensive environmental review and mobilization in a creek. Failure of the pipe would spill sewage into the ravine and potentially carry sewage to the ocean.
Applicable Hazards	Earthquake, Flooding, Landslide/Coastal Erosion
Estimated Timeline for Completion	2025
Estimated Cost/Funding Source	Currently, there is no funding for this project - $1,000,000
Responsible Agency/Department	Public Works – Water Resources Division
Other Comments	

2022-40. Wastewater Generator Containment Project

Priority: High	
Mitigation Strategy Description	This project would install containment around the generators throughout the wastewater treatment plant and collection system to prevent the spill of oil in the event of an earthquake.
Relevant Objective	Maintains human health and safety and preserves the environment
Applicable Hazards	Earthquake
Estimated Timeline for Completion	2025
Estimated Cost/Funding Source	Currently, there is no funding for the project - $700,000
Responsible Agency/Department	Public Works – Water Resources Division
Other Comments	

2022-41. Braemar Flood Wall Project

Priority: High	
Mitigation Strategy Description	This project would install a floodwall around the Braemar Lift Station to prevent inundation during flooding or dam failure and as prevention against sea level rise.
Relevant Objective	Braemar Lift Station is the largest lift station belonging to the City pumping approximately 1041 gal/min of sewage. The pump station sits next to the Arroyo Burro Creek and is vulnerable to flooding, dam failure, and sea level rise.
Applicable Hazards	Flooding, Sea Level Rise, Dam Failure
Estimated Timeline for Completion	2023
Estimated Cost/Funding Source	SRF – 100,000
Responsible Agency/Department	Public Works – Water Resources Division
Other Comments	Final design in progress. City preparing SRF funding application

2022-42. Creek Crossing Projection Project

Priority: High	
Mitigation Strategy Description	This project would move sewer pipelines that are exposed on the sides of bridges to a place underneath the bridge for better protection during a high flow event or in the event of a landslide.

Priority: High	
Relevant Objective	Maintains human health and safety and preserves the environment
Applicable Hazards	Flooding, Landslide/Coastal Erosion
Estimated Timeline for Completion	2029
Estimated Cost/Funding Source	Currently, there is no funding for this project - $7,000,000
Responsible Agency/Department	Public Works – Water Resources Division
Other Comments	

2022-43. Central Library Backup Power

Priority: High	
Mitigation Strategy Description	The Santa Barbara Public Library (SBPL) does not currently have any form of backup power. SBPL is a safe place during times of disaster and emergency, providing trusted information and serving as a place of refuge to the most vulnerable populations. Battery energy storage systems are the preferred source of backup power.
Relevant Objective	SBPL is also considered a cooling center during times of extreme heat. Additionally, with the advent of the Public Safety Power Shutdown, the Library must have an alternate source of power. On a typical day, SBPL welcomes over 1500 visitors and this number is often doubled during outages and/or emergencies. This project proposes the installation of a portable backup generator and associated infrastructure costs to serve the Library.
Applicable Hazards	Power Outages
Estimated Timeline for Completion	2023
Estimated Cost/Funding Source	Purchase the portable generator and trailer to include the necessary retrofitting of the Library. The estimated cost is $300,000; there is currently no funding for this project
Responsible Agency/Department	Resilience & Sustainability Public Works – Facilities Library - Administration
Other Comments	

2022-44. Collection System Freeway Crossing Project

Priority: High	
Mitigation Strategy Description	This project will assess collection system pipes that run under the 101 freeway and recommend repairs, realignment, and/or abandonment.
Relevant Objective	This project will harden the current infrastructure and make this part of the collection system easier to operate and maintain. It will provide reliability during earthquake events.
Applicable Hazards	Earthquake
Estimated Timeline for Completion	2023
Estimated Cost/Funding Source	Wastewater Capital Funds – $5,800,000
Responsible Agency/Department	Public Works, Water Resources Division - Wastewater Systems

Priority: High	
Other Comments	The alternative analysis phase is in progress. Once a preferred alternative for consolidation and repair is determined, the final design of the project will begin.

2022-45. Lower Elevation Sewer Collection System

Priority: High	
Mitigation Strategy Description	The sewer collection system located south of the 101 freeway sits at a lower elevation that is at risk of becoming inundated with any rain or flooding event, which may lead to failure of the system.
Relevant Objective	Reinforcement of the underground collection system and the sealing of the manhole covers will be required to protect the system from infiltration and potential damage
Applicable Hazards	Flooding, Sea Level Rise, Tsunami
Estimated Timeline for Completion	2035
Estimated Cost/Funding Source	Wastewater Collections Capital Improvement Program - $20,000,000
Responsible Agency/Department	Public Works – Water Resources Division – Wastewater Collections
Other Comments	

2022-46. Cater Clearwell Seismic Upgrade

Priority: High	
Mitigation Strategy Description	The clearwell is a 5-million gallon finished water reservoir at the Cater Water Treatment Plant that was constructed in 1965. It has not had significant structural improvements since that time. It is believed that the buried clearwell, which is topped with two feet of soil, is overloaded and does not meet current seismic standards. In addition, it is a single point of failure having no bypass for distribution of water produced by the Cater Water Treatment Plant.
Relevant Objective	Maintains safe drinking water for human health and safety
Applicable Hazards	Earthquake, Wildfire, Drought
Estimated Timeline for Completion	2025
Estimated Cost/Funding Source	Water Capital Fund, Joint Powers Agreement – $1,500,000
Responsible Agency/Department	Public Works, Water Resources Division – Water Systems
Other Comments	In the planning stages

2022-47. Water Conveyance Main

Priority: High	
Mitigation Strategy Description	This project would install a pipeline in the downtown area of the City to convey water from the desalination plant to the Cater Water Treatment Plant where it can be distributed to the entire City.
Relevant Objective	Currently, water from the desalination plant is used in the downtown area of the City only. In the case of a natural disaster where the flow

Priority: High	
	from Lake Cachuma or Gibraltar Reservoir is interrupted, the entire City would be able to receive water.
Applicable Hazards	Earthquake, Wildfire, Drought
Estimated Timeline for Completion	2023
Estimated Cost/Funding Source	Water Capital Funds, IRWM grant, Water Sales Agreement with Montecito Water District - $20,500,000
Responsible Agency/Department	Public Works, Water Resources Division - Water Systems
Other Comments	The final design is complete. The final execution of the Water Sales Agreement is needed to begin construction

2022-48. Desalination Project Water Pump Station

Priority: High	
Mitigation Strategy Description	This project would install a pump station at the desalination plant to convey water from the desalination plant to the Cater Water Treatment Plant where it can be distributed to the entire City. Currently, water from the desalination plant is used in the downtown area of the City only. In the case of a natural disaster where the flow from Lake Cachuma or Gibraltar Reservoir is interrupted, the entire City would be able to receive water.
Relevant Objective	Maintains safe drinking water for human health and safety
Applicable Hazards	Earthquake, Wildlife, Drought
Estimated Timeline for Completion	2023
Estimated Cost/Funding Source	Water Capital Funds, Water Sales Agreement with Montecito Water District - $4,000,000
Responsible Agency/Department	Public Works – Water Resources Division – Water Systems
Other Comments	Final Design is beginning

2022-49. Water Transmission Main Renewal

Priority: High	
Mitigation Strategy Description	This four-part project will perform maintenance on and add resilience to the main pipelines that convey water throughout the City. A portion of this project will harden piping along the route needed to convey water from the desalination plant to the Cater Water Treatment Plant where it can be distributed to the entire City. This project will be in two phases, also renew the main transmission pipeline from the Cater Water Treatment Plant to Vic Trace reservoir. The final phase will install a system to cathodically protect the metal pipeline thereby extending pipeline life.
Relevant Objective	Maintains safe drinking water for human health and safety
Applicable Hazards	Earthquake, Wildfire, Drought
Estimated Timeline for Completion	2025
Estimated Cost/Funding Source	Water Capital Funds, Water Sales Agreement with Montecito Water District (only Phase One) - $3,500,000
Responsible Agency/Department	Public Works – Water Resources Division – Water Systems

Priority: High	
Other Comments	Design is in progress

2022-50. Cater Yard Piping Project

Priority: High	
Mitigation Strategy Description	This project would install a pipeline at the Cater Water Treatment Plant to allow water from the desalination plant to be piped into the Cater Water Treatment Plant Clearwell where it can be distributed to the entire City. Currently, water from the desalination plant is used in the downtown area of the City only. In the case of a natural disaster where the flow from Lake Cachuma or Gibraltar Reservoir is interrupted, the entire City would be able to receive water.
Relevant Objective	Maintains safe drinking water and human safety
Applicable Hazards	Earthquake, Wildfire, Drought
Estimated Timeline for Completion	2023
Estimated Cost/Funding Source	Water Capital Funds, Water Sales Agreement with Montecito Water District - $1,200,000
Responsible Agency/Department	Public Works, Water Resources Division – Water Systems
Other Comments	In the planning stages

2022-51. Sheffield Pump Station Rehabilitation

Priority: High	
Mitigation Strategy Description	This pump station was constructed in 1982 and is nearing the end of its useful life. It is the City's largest pump station and is critical for supplying water to the upper reaches of the City's water distribution system by pumping water from the Cater Water Treatment Plant to Hoover and McLaughlin Reservoirs. Rehabilitation of this pump station will ensure the City's ability to supply water to several high fire danger areas in case of an emergency.
Relevant Objective	Maintain safe drinking water and human safety
Applicable Hazards	Earthquake, Wildfire
Estimated Timeline for Completion	2025
Estimated Cost/Funding Source	Water Capital Fund – $166,000
Responsible Agency/Department	Public Works – Water Resources Division – Water Systems
Other Comments	

2022-52. Vic Trace Reservoir Replacement

Priority: High	
Mitigation Strategy Description	This reservoir was constructed in 1956 and has a capacity of ten million gallons. It is one of the City's larger reservoirs and is critical for supplying water to the lower portion of the City's water distribution system. Work has been recommended to improve the operations and maintenance of this reservoir and to increase the flexibility of supplying the water distribution system.

Priority: High	
Relevant Objective	This reservoir is critical for supplying water in fire emergencies to the coastal and coastal interior high fire hazard areas.
Applicable Hazards	Earthquake, Wildfire
Estimated Timeline for Completion	2025
Estimated Cost/Funding Source	SRF – $40,000,000
Responsible Agency/Department	Public Works – Water Resources Division – Water Systems
Other Comments	

2022-53. Via Lucero Lift Station and Force Main

Priority: High	
Mitigation Strategy Description	The project will rehabilitate the Via Lucero Lift Station and reroute the force main to provide redundancy to the existing system that has limited capacity during storm events and cannot convey the peak wet weather flow.
Relevant Objective	Objective 2.A: Mitigate vulnerability structures and public infrastructure including facilities, roadways, and utilities
Applicable Hazards	Flooding
Estimated Timeline for Completion	2025
Estimated Cost/Funding Source	$1,000,000
Responsible Agency/Department	Water Resources/Public Works
Other Comments	

2022-54. Alameda Well Pipeline to Ortega Groundwater Treatment Plan

Priority: High	
Mitigation Strategy Description	The Alameda Well accesses one of the City's primary groundwater basins, Storage Unit 1 (in the general vicinity of downtown); however, water quality is relatively poor. The purpose of the proposed project is to install approximately 3,300 feet of new raw water main from the existing Alameda Well in Alameda Park to a tie-in point in the intersection of Olive Street and Anapamu Street, to the existing raw water main. Once tied in, the raw water main system will convey the raw water from Alameda Well to the Ortega Groundwater Treatment Plant to treat it for potable use, further adding to the City's available water supply and resiliency to drought.
Relevant Objective	Objective 2.A: Mitigate vulnerability structures and public infrastructure including facilities, roadways, and utilities
Applicable Hazards	Drought
Estimated Timeline for Completion	2023
Estimated Cost/Funding Source	$1,500,000
Responsible Agency/Department	City of Santa Barbara/Public Works/Water Resources
Other Comments	

2022-55. Bilingual Outreach and Education campaign for Energy Assurance, Hazard Adaptation, and Climate Measures

Priority: Medium	
Mitigation Strategy Description	Develop and implement bilingual outreach and education campaigns around energy and climate initiatives, including but not limited to energy resilience, climate adaptation, climate mitigation strategies.
Relevant Objective	Disaster planning, recovery, and relief. Energy resilience. Climate change. Sea-level rise. Public Outreach.
Applicable Hazards	Climate change; sea-level rise; energy outages; disaster relief.
Estimated Timeline for Completion	2023
Estimated Cost/Funding Source	$100,000
Responsible Agency/Department	Sustainability and Resilience
Other Comments	

2022-56. Community Energy Assurance

Priority: High	
Mitigation Strategy Description	Conduct site assessments, feasibility studies, and implementation plans for community-wide energy assurance projects. Projects may include community-scale energy generation and storage, microgrid deployment, vehicle to grid technologies, and demand response programs.
Relevant Objective	Disaster planning, recovery, and relief. Energy resilience. Climate change.
Applicable Hazards	Energy outages; disaster relief; climate change
Estimated Timeline for Completion	2023
Estimated Cost/Funding Source	$300,000-$700,000 depending on scope
Responsible Agency/Department	Sustainability and Resilience
Other Comments	

2022-57. Clean Energy Assurance for City Facilities, Emergency Operations, and City Fleet

Priority: High	
Mitigation Strategy Description	Scope and implement clean energy generation and storage for critical municipal facilities, City emergency operations, and the City's fleet. Ensure functionality during energy outages.
Relevant Objective	Disaster planning, recovery, and relief. Energy resilience. Climate change.
Applicable Hazards	Disaster planning, recovery, and relief. Energy resilience. Climate change.
Estimated Timeline for Completion	2023
Estimated Cost/Funding Source	$200,000-$2,000,000 depending on scope
Responsible Agency/Department	Sustainability and Resilience
Other Comments	

2022-58. Disaster Debris Management Plan Implementation

Priority: High	
Mitigation Strategy Description	Build upon the Santa Barbara County Debris Management Plan by assessing, securing, and permitting appropriate temporary debris storage, disposal, and discharge sites and developing processes for the City of Santa Barbara to support regional debris management during and following a disaster. Debris-generating events include windstorms, flooding, debris flows, mudslides, earthquake, wildland fires, and other incidents. Appropriate sediment sources could also potentially be used for beach nourishment and other erosion mitigation efforts.
Relevant Objective	Disaster planning and recovery.
Applicable Hazards	Windstorm, flooding, debris flows, mudslides, earthquake, wildland fire, and other incidents
Estimated Timeline for Completion	2024
Estimated Cost/Funding Source	$250,000
Responsible Agency/Department	Sustainability and Resilience and Public Works
Other Comments	

2022-59. Airport Sea-Level Rise Adaptation Plan

Priority: High	
Mitigation Strategy Description	Building upon the previously completed Goleta Slough Sea-Level Rise Assessment, study adaptation actions for the Airport, including adaptations options for the impacted stormwater system.
Relevant Objective	Would prepare airport for sea level rise.
Applicable Hazards	Sea-level rise; flooding
Estimated Timeline for Completion	2023
Estimated Cost/Funding Source	$250,000
Responsible Agency/Department	Airport; Sustainability and Resilience
Other Comments	

2022-60. Changes to Development Floodplain Regulations and Creek Setbacks

Priority: High	
Mitigation Strategy Description	Modify the City's floodplain regulations and creek setbacks south of Highway 101 for new and substantially redeveloped structures to address increased flood risks associated with sea level rise and extreme rainfall events. Develop incentives for floodproofing and raising existing structures (permit streamlining or relief from design, zoning, or height requirements) south of Highway 101 and other areas of the City with projected increases in flooding from sea-level rise and extreme rainfall events.
Relevant Objective	Would prevent damages to structures during flooding
Applicable Hazards	Sea level rise; flooding; climate change
Estimated Timeline for Completion	2025
Estimated Cost/Funding Source	$100,000

Priority: High	
Responsible Agency/Department	Sustainability and Resilience
Other Comments	

2022-61. Sea-Level Rise Groundwater Impacts and Adaptation Options Study

Priority: High	
Mitigation Strategy Description	Study existing groundwater elevations, freeboard from typical levels up to flood threshold, and potential impacts of sea-level rise. Study the potential of raised groundwater levels to spread contamination. Study feasibility of groundwater pumping to lower the water table.
Relevant Objective	Would prevent damage to infrastructure and buildings from corrosion and other groundwater impacts
Applicable Hazards	Sea-level rise; flooding
Estimated Timeline for Completion	2025
Estimated Cost/Funding Source	$150,000
Responsible Agency/Department	Sustainability and Resilience;
Other Comments	

2022-62. Harbor Breakwater and Groins

Priority: High	
Mitigation Strategy Description	The City's recently completed Sea-Level Rise Adaptation Plan identified critical facilities that are vulnerable to sea level rise and prioritized actions to adapt. Conduct a feasibility study and concept design for raising or modifying Harbor breakwater, rock groin, sand spit, and walkway and wall spanning from the breakwater to the Harbor commercial area to reduce impacts from existing storm surges and address the impacts of sea-level rise. This will protect not just the Harbor, but also continue to protect the West Beach neighborhood.
Relevant Objective	Objective 2.A: Mitigate vulnerability structures and public infrastructure including facilities, roadways, and utilities
Applicable Hazards	Sea-level rise; flooding; storm surge and waves; tsunami
Estimated Timeline for Completion	2024
Estimated Cost/Funding Source	$200,000
Responsible Agency/Department	Waterfront and Sustainability and Resilience
Other Comments	Upon completion of the feasibility and alternatives analysis, a capital project will be programmed in future years.

2022-63. Laguna Creek, Tide Gate, and Pump Station Redesign

Priority: High	
Mitigation Strategy Description	The City's recently completed Sea-Level Rise Adaptation Plan identified critical facilities that are vulnerable to sea level rise and prioritized actions to adapt. Redesign the Laguna Creek tide gate, pump station, and channel to accommodate sea level rise and increased creek discharge flooding from changes in rainfall runoff. The

Priority: High	
	project includes the creation of a Laguna Creek conceptual plan, infrastructure relocation alternatives analysis, beach berm analysis, and updated hydrologic and biological studies. The tide gate already overtops during some high tide events and storm surges.
Relevant Objective	Objective 2.A: Mitigate vulnerability structures and public infrastructure including facilities, roadways, and utilities
Applicable Hazards	Sea-level rise; flooding; tsunami
Estimated Timeline for Completion	2025
Estimated Cost/Funding Source	$350,000
Responsible Agency/Department	Sustainability and Resilience and Public Works
Other Comments	Upon completion of the feasibility and alternatives analysis, a capital project will be programmed in future years.

2022-64. Prepare Marina Facilities and City Pier for Sea-Level Rise

Priority: High	
Mitigation Strategy Description	Renovate marina facilities and the City Pier to accommodate increased tide heights and storm surges related to sea-level rise. City Pier supports the marinas fuel dock, icehouse, and coast guard facilities.
Relevant Objective	Would prevent damage to marinas and pier during storms and high tide events
Applicable Hazards	Sea-level rise; storm surge
Estimated Timeline for Completion	2030
Estimated Cost/Funding Source	$500,000
Responsible Agency/Department	Waterfront; Sustainability and Resilience
Other Comments	

2022-65. Master Drainage Plan and Increased Rainfall Intensities

Priority: High	
Mitigation Strategy Description	This project consists of new hydrologic and flood modeling factoring in sea-level rise and changes in rainfall intensities from climate change. Results from this study are necessary for other projects including changes to floodplain regulations, creek setbacks, design of the Laguna Creek tide gate, and adaptation options for the stormwater system.
Relevant Objective	Would facilitate planning for increased flooding and impacts to stormwater system
Applicable Hazards	Sea-level rise; flooding
Estimated Timeline for Completion	2025
Estimated Cost/Funding Source	$150,000
Responsible Agency/Department	Sustainability and Resilience
Other Comments	

2022-66. Regional Shoreline Monitoring Program

Priority: High	
Mitigation Strategy Description	Develop and implement a Shoreline Monitoring Program in coordination with other regional, state, and federal agencies to monitor sea-level rise-related hazards; identify action thresholds, and regularly reassess the need for hazard mitigation actions. Use program to assess the success of implemented mitigation actions.
Relevant Objective	Key element in decisionmaking for adaption
Applicable Hazards	Sea-level rise; flooding; shoreline erosion
Estimated Timeline for Completion	2025
Estimated Cost/Funding Source	$300,000
Responsible Agency/Department	Sustainability and Resilience; BEACON
Other Comments	

2022-67. Stormwater System Vulnerability Assessment and Adaptation Plan

Priority: High	
Mitigation Strategy Description	Assess vulnerabilities and adaptation options for those portions of the stormwater system potentially affected by sea-level rise and extreme rainfall-related hazards.
Relevant Objective	Would ensure continued operation of stormwater system during flooding and erosion events
Applicable Hazards	Sea-level rise; flooding; climate change; erosion
Estimated Timeline for Completion	2025
Estimated Cost/Funding Source	$300,000
Responsible Agency/Department	Sustainability and Resilience; Public Works
Other Comments	

2022-68. Wastewater and Water System Vulnerabilities and Adaptation Options

Priority: High	
Mitigation Strategy Description	The City's recently completed Sea-Level Rise Adaptation Plan identified critical facilities that are vulnerable to sea level rise and prioritized actions to adapt. One of the highest priority actions identified for the next few years is a comprehensive study of adaptation options for threatened portions of the wastewater and water systems, including the redesign of portions of the system, adaptation options for El Estero Water Resource Center, and possible service point improvements. Portions of the wastewater system, in particular, are already at risk from flooding during major storms. One of the most vulnerable facilities identified is the existing sewer trunk line on Cabrillo Boulevard that carries sewage to the El Estero Water Resources Center to be treated. The existing pipeline and manholes are vulnerable to flooding from storm surges during major storms and will be at risk from storm surge and erosion due to sea-level rise, which would result in sanitary sewer overflows. The analysis

Priority: High	
	should study the feasibility and alternatives for relocating the existing trunk line.
Relevant Objective	Objective 2.A: Mitigate vulnerability structures and public infrastructure including facilities, roadways, and utilities
Applicable Hazards	Sea-level rise; flooding; shoreline erosion; tsunami
Estimated Timeline for Completion	2023
Estimated Cost/Funding Source	$500,000
Responsible Agency/Department	Sustainability and Resilience and Public Works
Other Comments	Upon completion of the feasibility and alternatives analysis, a capital project will be programmed in future years.

2022-69. Waterfront and Harbor 30-Year Plan

Priority: High	
Mitigation Strategy Description	This is a detailed study of the assets along the Waterfront and Harbor to: Analyze adaptation options and establish 30-year design storm and sea level rise amounts for Harbor Commercial area, parking areas, and other assets along the Waterfront. Identify options to relocate to the extent feasible and where not feasible protect in place sewer main and collocated gas pipelines, water lines, and major utilities south of Cabrillo Boulevard; Assess the feasibility of additional beach berm construction, dune creation, and sediment management to address 30-year vulnerabilities along Waterfront; Assess options for increased Harbor dredging and other sand supplies.
Relevant Objective	Objective 2.A: Mitigate vulnerability structures and public infrastructure including facilities, roadways, and utilities
Applicable Hazards	Sea-level rise; flooding; shoreline erosion; tsunami
Estimated Timeline for Completion	2025
Estimated Cost/Funding Source	$250,000
Responsible Agency/Department	Sustainability and Resilience; Waterfront; Parks and Recreation
Other Comments	

2022-70. Airport Sewer Master Plan – Phase III

Priority: High	
Mitigation Strategy Description	The 2004 Sewer Master Plan was prepared to provide a modern solution to the airport sewer system originally constructed in the 1940s. This project would implement a second phase of the Sewer Master Plan. The second phase consists of the removal of lift station 3 and the re-routing of the northwest quadrant of the airfield to flow to the new Goleta Sanitary District lift station on Norman Firestone Road. This will avoid the need to pump sewage in an 80-year-old force main under the main air carrier runway and through the Goleta Slough State Ecological Reserve.

Priority: High	
Relevant Objective	Maintain Infrastructure, Modernize City Facilities, Support the City's Plans
Applicable Hazards	Earthquake, flood, infrastructure failure
Estimated Timeline for Completion	This is an unscheduled project in the City's CIP. Completion would take nine months.
Estimated Cost/Funding Source	$2.3 million – Airport Capital Fund
Responsible Agency/Department	Airport Department
Other Comments	The first phase of the Sewer Master Plan, the removal of lift stations 1 and 2 and their replacement with a new Goleta Sanitary District lift station, was completed in 2009.

2022-71. Central Library ADA Elevator

Priority: High	
Mitigation Strategy Description	Installation of an ADA compliant elevator would ease mobility challenges and allow for greater access to all areas of the Library. The Santa Barbara Library (SBPL) serves as a cooling center during extreme weather conditions and serves as a place of refuge for all ages during times of disaster such as local fire. While the Library does have a small elevator, its size presents challenges for mobility devices, which in turn limits ease of access to spaces in the facility.
Relevant Objective	Installation of an ADA compliant elevator to allow for full access to all spaces in the Library, particularly while serving as a cooling shelter or refuge during disaster and emergency.
Applicable Hazards	Lack of compliance with current ADA standards and challenges for mobility devices.
Estimated Timeline for Completion	Tentatively Fall/Winter 2022
Estimated Cost/Funding Source	$2,267,535/ Partially Measure C
Responsible Agency/Department	City of Santa Barbara Library Department
Other Comments	This project is in progress. The design and plan review is complete. The permit has been issued and bidding should take place in January 2022 with construction to tentatively begin March 2022.

2022-72. Las Positas Landfill Capping Project

Priority: High	
Mitigation Strategy Description	The Closed Las Positas Landfill is located within the boundaries of Eling's Park includes a methane recovery system that burns off methane produced. The methane recovery system requires an onsite propane tank that poses an explosives hazard and produces hazardous and non-hazardous waste products that are stored onsite pending disposal. There is also a section of soil that has tested above the action limits for lead contamination. The land is currently held in a longer-term lease agreement with a private operator that operates sports fields and recreational amenities onsite.

Priority: High	
Relevant Objective	This project includes the installation of a clay liner over the closed landfill footprint at the baseball and soccer fields. The cap would decrease the potential for infiltration of water into the buried waste which may decrease the generation of methane and decrease the potential for leaching of contaminants to groundwater.
Applicable Hazards	Hazardous Materials release
Estimated Timeline for Completion	2025? (prefer to occur when field turf replacement occurs in 2-3 years)
Estimated Cost/Funding Source	$720,000 for clay layer to cap sports fields (does not include design, permitting, etc.), the cost would be more do line the entire landfill area.
Responsible Agency/Department	City of Santa Barbara, Sustainability and Resilience Department
Other Comments	The project could be expanded to install the cap across the entire closed landfill footprint, but that would cost more. The above cost does not include design, technical studies, permitting, maintenance, and monitoring. Before moving forward with designing the cap the metrics for ending the monitoring and reporting program and methane mitigation should be defined with the Central Coast Regional Water Quality Control Board and the Santa Barbara County Public Health Department.

2022-73. Las Positas Creek Restoration Project

Priority: Medium	
Mitigation Strategy Description	This creek restoration/water quality improvement project includes the removal of concrete, invasive plants, and other debris from Las Positas Creek, which will facilitate flood flow conveyance through the creek channel. The project scope also includes biotechnical bank and toe stabilization, which will reduce erosion and bank failure near adjacent homes and Las Positas Road.
Relevant Objective	Reduce flooding, erosion, and creek bank failure along Las Positas Road and nearby private properties.
Applicable Hazards	Flooding, creek bank erosion.
Estimated Timeline for Completion	Estimated completion in 2027.
Estimated Cost/Funding Source	The estimated cost is $950,000. The funding source is Measure B (Creeks Fund) and unidentified grant funding.
Responsible Agency/Department	Parks and Recreation/Creeks Division
Other Comments	

2022-74. Arroyo Burro Restoration at Palermo Drive

Priority: High	
Mitigation Strategy Description	This creek restoration/water quality improvement project includes the removal of concrete, invasive plants, and other debris from Arroyo Burro, which will facilitate flood flow conveyance through the creek channel. The project scope also includes biotechnical bank and toe stabilization, which will reduce erosion and bank failure near the adjacent park, homes, and commercial properties.
Relevant Objective	Reduce flooding, erosion, and creek bank failure along City park and nearby private properties.

Priority: High	
Applicable Hazards	Flooding, creek bank erosion
Estimated Timeline for Completion	Estimated completion in 2026.
Estimated Cost/Funding Source	Estimated cost is $2,000,000. The funding source is Measure B (Creeks Fund) and unidentified grant funding.
Responsible Agency/Department	Parks and Recreation/Creeks Division
Other Comments	

2022-75. San Roque Creek Restoration Project

Priority: Medium	
Mitigation Strategy Description	This creek restoration/water quality improvement project includes the removal of concrete, invasive plants, and other debris from San Roque Creek, which will facilitate flood flow conveyance through the creek channel. The project scope also includes biotechnical bank and toe stabilization, which will reduce erosion and bank failure near adjacent roads, homes, and commercial areas of the City.
Relevant Objective	Reduce flooding, erosion, and creek bank failure along San Roque Creek.
Applicable Hazards	Flooding, creek bank erosion
Estimated Timeline for Completion	Estimated completion in 2027.
Estimated Cost/Funding Source	Estimated cost is $1,300,000. The funding source is Measure B (Creeks Fund) and unidentified grant funding.
Responsible Agency/Department	Parks and Recreation/Creeks Division
Other Comments	

2022-76. Mid-Arroyo Burro Restoration Project

Priority: Medium	
Mitigation Strategy Description	This creek restoration/water quality improvement project includes the removal of concrete, invasive plants, and other debris from Arroyo Burro, which will facilitate flood flow conveyance through the creek channel. The project scope also includes biotechnical bank and toe stabilization, which will reduce erosion and bank failure along Arroyo Burro in the upper State Street area of the City.
Relevant Objective	Reduce flooding, erosion, and creek bank failure along Arroyo Burro, upper State Street, and the surrounding neighborhood and business district.
Applicable Hazards	Flooding, creek bank erosion
Estimated Timeline for Completion	Estimated completion in 2027.
Estimated Cost/Funding Source	Estimated cost is $1,350,000. The funding source is Measure B (Creeks Fund) and unidentified grant funding.
Responsible Agency/Department	Parks and Recreation/Creeks Division
Other Comments	

2022-77. Upper Mission Creek Restoration Project

Priority: Medium	
Mitigation Strategy Description	This creek restoration/water quality improvement project includes the removal of concrete, invasive plants, and other debris from upper Mission Creek, which will facilitate flood flow conveyance through the creek channel. The project scope also includes biotechnical bank and toe stabilization, which will reduce erosion and bank failure near adjacent parks, homes, and Mission Canyon Road.
Relevant Objective	Reduce flooding, erosion, and creek bank failure along Mission Canyon Road and nearby private properties.
Applicable Hazards	Flooding, creek bank erosion
Estimated Timeline for Completion	Estimated completion in 2028.
Estimated Cost/Funding Source	Estimated cost is $1,600,000. The funding source is Measure B (Creeks Fund) and unidentified grant funding.
Responsible Agency/Department	Parks and Recreation/Creeks Division
Other Comments	

2022-78. Mission Creek Restoration at Oak Park

Priority: High	
Mitigation Strategy Description	This creek restoration/water quality improvement project includes the removal of concrete, invasive plants, and other debris from Mission Creek, which will facilitate flood flow conveyance through the creek channel. The project scope also includes biotechnical bank and toe stabilization, which will reduce erosion and bank failure near adjacent homes and Oak Park.
Relevant Objective	Reduce flooding, erosion, and creek bank failure along Mission Creek at Oak Park and nearby private properties.
Applicable Hazards	Flooding, creek bank erosion
Estimated Timeline for Completion	Estimated completion in 2024.
Estimated Cost/Funding Source	Estimated cost is $1,250,000. The funding source is Measure B (Creeks Fund) and unidentified grant funding.
Responsible Agency/Department	Parks and Recreation/Creeks Division
Other Comments	

2022-79. Lower Mission Creek Restoration Project

Priority: High	
Mitigation Strategy Description	This creek restoration/water quality improvement project includes the removal of concrete, invasive plants, and other debris from lower Mission Creek, which will facilitate flood flow conveyance through the creek channel. The project scope also includes biotechnical bank and toe stabilization, which will reduce erosion and bank failure near adjacent homes, businesses, and downtown Santa Barbara streets.
Relevant Objective	Reduce flooding, erosion, and creek bank failure along lower Mission Creek, downtown roads, and nearby private properties.
Applicable Hazards	Flooding, creek bank erosion
Estimated Timeline for Completion	Estimated completion in 2025.

Priority: High	
Estimated Cost/Funding Source	Estimated cost is $2,300,000. The funding source is Measure B (Creeks Fund) and unidentified grant funding.
Responsible Agency/Department	Parks and Recreation/Creeks Division
Other Comments	

2022-80. Old Mission Creek Restoration at Figueroa Street

Priority: Medium	
Mitigation Strategy Description	This creek restoration/water quality improvement project includes the removal of concrete, invasive plants, and other debris from Old Mission Creek, which will facilitate flood flow conveyance and improve floodplain access through the creek channel. The project scope also includes biotechnical bank and toe stabilization, which will reduce erosion and bank failure near adjacent homes and Figueroa Street.
Relevant Objective	Reduce flooding, erosion, and creek bank failure along Old Mission Creek, Figueroa Street, and nearby private properties.
Applicable Hazards	Flooding, creek bank erosion
Estimated Timeline for Completion	Estimated completion in 2028.
Estimated Cost/Funding Source	Estimated cost is $1,000,000. The funding source is Measure B (Creeks Fund) and unidentified grant funding.
Responsible Agency/Department	Parks and Recreation/Creeks Division
Other Comments	

2022-81. Rattlesnake Creek Restoration Project

Priority: Medium	
Mitigation Strategy Description	This creek restoration/water quality improvement project includes the removal of concrete, invasive plants, and other debris from Rattlesnake Creek, which will facilitate flood flow conveyance through the creek channel. The project scope also includes biotechnical bank and toe stabilization, which will reduce erosion and bank failure near adjacent homes and Las Canoas Road.
Relevant Objective	Reduce flooding, erosion, and creek bank failure along Rattlesnake Creek, Las Canoas Road, and nearby private properties.
Applicable Hazards	Flooding, creek bank erosion
Estimated Timeline for Completion	Estimated completion in 2027.
Estimated Cost/Funding Source	Estimated cost is $1,250,000. The funding source is Measure B (Creeks Fund) and unidentified grant funding.
Responsible Agency/Department	Parks and Recreation/Creeks Division
Other Comments	

2022-82. Sycamore Creek Restoration Project

Priority: High	
Mitigation Strategy Description	This creek restoration/water quality improvement project includes the removal of concrete, invasive plants, and other debris from Sycamore

Priority: High	
	Creek, which will facilitate flood flow conveyance through the creek channel. The project scope also includes biotechnical bank and toe stabilization, which will reduce erosion and bank failure near adjacent streets, parks, homes, and businesses.
Relevant Objective	Reduce flooding, erosion, and creek bank failure along Sycamore Creek and nearby private properties.
Applicable Hazards	Flooding, creek bank erosion
Estimated Timeline for Completion	Estimated completion in 2028.
Estimated Cost/Funding Source	Estimated cost is $80,000,000. The funding source is Measure B (Creeks Fund) and unidentified grant funding.
Responsible Agency/Department	Parks and Recreation/Creeks Division
Other Comments	

2022-83. Andree Clark Bird Refuge Restoration Project

Priority: High	
Mitigation Strategy Description	This wetland restoration/water quality improvement project includes removal and replacement of a failing weir and weir gates at the Andree Clark Bird Refuge, which will facilitate flood flow conveyance out of the Bird Refuge and under Cabrillo Boulevard. The project scope also includes managing the sand berm between the Bird Refuge and the Pacific Ocean during storms to allow water to flow through the culverts and prevent flooding of Cabrillo Boulevard.
Relevant Objective	Reduce flooding on Cabrillo Boulevard.
Applicable Hazards	Flooding.
Estimated Timeline for Completion	Estimated completion in 2023.
Estimated Cost/Funding Source	Estimated cost is $2,500,000. The funding source is Measure B (Creeks Fund) and unidentified grant funding.
Responsible Agency/Department	Parks and Recreation/Creeks Division
Other Comments	

2022-84. Defensible Space/Home Hardening Survey

Priority: High	
Mitigation Strategy Description	Assess vulnerabilities and needs regarding home hardening and defensible space within the City's designated High Fire Hazard Areas. Encourage home hardening retrofits Complete Defensible Space Survey Increase grant funding opportunities Develop programs to incentivize improved defensible space around homes
Relevant Objective	Improve Defensible Space regarding home hardening within communities vulnerable to wildfire.
Applicable Hazards	Wildfire
Estimated Timeline for Completion	FY 2023-24
Estimated Cost/Funding Source	$20,000 from grants and/or Wildland General Fund

Priority: High	
Responsible Agency/Department	Fire Department/Prevention - Wildfire
Other Comments	This task is based on recommendations made in the 2021 Community Wildfire Protection Plan (CWPP)

2022-85. Expand Wildland Fire Suppression Assessment District

Priority: High	
Mitigation Strategy Description	The Community Wildfire Protection Plan (CWPP) expanded all four of the City's designated High Fire Hazard Areas. As part of the CWPP implementation, a study and survey should be completed to determine areas to potentially be included in the Wildland Fire Suppression Assessment District. This would be determined by ballot measure to residents in the newly proposed area.
Relevant Objective	Create a new Assessment District in the Coastal and Coastal Interior High Fire Hazard areas and expand the existing Wildfire Suppression Assessment District within the Foothill High Fire Hazard area to include parcels added in the CWPP.
Applicable Hazards	Wildfire
Estimated Timeline for Completion	FY2024-25
Estimated Cost/Funding Source	$40,000 Wildland General Fund
Responsible Agency/Department	Fire Department/Prevention - Wildfire
Other Comments	This project is expected to take 2+ years and implementation will be determined by ballot measures issued to all residents within the proposed areas.

2022-86. Increase Evacuation Safety

Priority: High	
Mitigation Strategy Description	Combine CWPP and 2014 Evacuations Procedure Analysis. Publicly identify evacuation routes in High Fire Hazard Areas with signage Identify Roads that do not meet SBFD Access Standards Conduct detailed evacuation study
Relevant Objective	Improve evacuation safety in communities vulnerable to wildfire.
Applicable Hazards	Wildfire, Flooding, Debris Flow
Estimated Timeline for Completion	FY2023-24
Estimated Cost/Funding Source	$20,000 from grants and/or Wildland General Fund
Responsible Agency/Department	Fire Department/Prevention - Wildfire
Other Comments	A consultant may be needed for portions of the Evacuation Procedure Analysis.

2022-87. Fuels Reduction Within Identified Vegetation Management Units

Priority: High	
Mitigation Strategy Description	Complete fuels reduction projects within all 50 of the identified Vegetation Management Units within the City. This also includes areas within the Community Fuels Treatment Network.
Relevant Objective	Reduce wildfire danger within our communities by expanding defensible space in targeted locations beyond the homeowner's required clearance.
Applicable Hazards	Wildfire
Estimated Timeline for Completion	FY2035
Estimated Cost/Funding Source	$500,000-$1,000,000 from Grants/Wildland General Fund/Wildland Fire Suppression Assessment District Fund
Responsible Agency/Department	Fire Department/Prevention - Wildfire
Other Comments	Reduce wildfire danger within our communities by expanding defensible space in targeted locations beyond the homeowner's required clearance.

2022-88. Community Wildfire Protection Plan Implementations

Priority: High	
Mitigation Strategy Description	Continue to evaluate and implement actions recommended within the Community Wildfire Protection Plan (CWPP).
Relevant Objective	Complete all recommended actions, projects, and goals as outlined and identified within the Community Wildfire Protection Plan.
Applicable Hazards	Wildfire
Estimated Timeline for Completion	FY2030
Estimated Cost/Funding Source	$300,000 from Grants/Wildland General Fund/Wildland Fire Suppression Assessment District Fund
Responsible Agency/Department	Fire Department/Prevention - Wildland
Other Comments	Multiple projects and recommendations identified within the Community Wildfire Protection Plan are critical in improving the Fire Department's ability to mitigate wildfire danger within vulnerable communities. This includes educational outreach, improved enforcement, updating mapping, and increased training opportunities for both agency personnel and the public.

2022-89. Upgrade City Emergency Operations Center (EOC)

Priority: High	
Mitigation Strategy Description	Upgrade the City EOC's electronic technology for better communications and interoperability. The upgrading of the EOC would replace projectors and screens with smart TVs, including teleconferencing capabilities, wireless network, and cameras to feed information to the Policy Room, Bullpen, and Administrative Conference Room.
Relevant Objective	The City's EOC is a critical facility during times of disaster. The facility has not been upgraded since 2009 and there are challenges with interoperability.

Priority: High	
Applicable Hazards	All Hazards
Estimated Timeline for Completion	2026
Estimated Cost/Funding Source	$75,000
Responsible Agency/Department	Fire Department/Office of Emergency Services
Other Comments	

2022-90. Relocation of Fire Station 7 Building

Priority: High	
Mitigation Strategy Description	Fire Station 7, located at 2411 Stanwood Drive, was built in 1951 and the station is essentially the same as when it was built. The station was built to accommodate an all-male crew with one dorm room, one locker room, and one shower/restroom. The shower/restroom was divided in the early 1980s. During the remodeling review process, it was noted that Station 7 was built above an earthquake fault. With that discovery, it was determined that Station 7 needs to be relocated for the safety of the staff housed in that station.
Relevant Objective	For the relocation and construction of the Station, the project will include hiring a design professional to evaluate the long-term needs (Needs Assessment) of the Fire Department at Fire Station 7 that contains separate dorm rooms with lockers, separate restrooms, a separate captain's office, and more apparatus floor space to accommodate today's larger fire engines.
Applicable Hazards	Earthquake, Wildfire
Estimated Timeline for Completion	2030
Estimated Cost/Funding Source	$6,000,000
Responsible Agency/Department	Fire Department/Public Works
Other Comments	

8.0 PLAN MAINTENANCE

8.1 MONITORING, EVALUATING, AND UPDATING THE PLAN

Since the last LHMP in 2017, the LPT has monitored, evaluated, and updated the plan on a continuing and as-needed basis. The City was very successful in implementing the 2017 mitigation actions as noted in Table 7-1. The remaining mitigation actions outlined in the 2017 LHMP are ongoing at the time of this 2022 update.

The City of Santa Barbara Office of Emergency Services (OES) will be responsible for ensuring that this plan is monitored on an ongoing basis. City OES will call the Local Hazard Mitigation Planning (LHMP) team together on an annual basis to review the mitigation actions outlined in this plan and discuss progress. During this meeting, the LHMP team will develop a list of items to be updated, added, or removed in future revisions of this plan.

City OES will report the outcomes of the annual meeting to the County Office of Emergency Management (OEM) and the City's Disaster Council.

The Plan will be a discussion/work item on the City's Emergency Managers Task Team (EMTT) agenda each year. Department heads and other emergency preparedness staff who serve in the City's Emergency Operations Center (EOC) will focus on evaluating the Plan in light of technological, budgetary, political changes, or other significant events that may occur during the year.

The Plan's existence will be addressed in the City's Emergency Management Plan, as well as discussed at Community Disaster Education presentations in both English and Spanish.

The City will continue to participate in the countywide MAC and attend the annual meeting organized by the County Office of Emergency Management 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 City's LHMP will be forwarded to the County Office of Emergency Management for inclusion in further updates to the MJHMP.

Major disasters affecting the City, legal changes, and/or other events may trigger a meeting of the LHMP team. This group will be responsible for determining if the plan needs to be updated before the five-year mark.

The City of Santa Barbara is committed to reviewing and updating this plan at least once every five years, as required by the Disaster Mitigation Act of 2000.

8.2 IMPLEMENTATION THROUGH EXISTING PLANS AND PROGRAMS

The City 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., General Plan, building codes, floodplain management ordinance). The General Plan and the LHMP annex are complementary documents that work together to achieve the goal of reducing risk exposure to the City's citizens. An update to a general plan 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 City incorporates the LHMP by reference into its General Plan Safety Element. Under AB 2140, the City may adopt its current, FEMA-approved LHMP into the Safety Element of the General Plan. This adoption makes the City eligible to be considered for part or all of its local-share costs on

eligible Public Assistance funding to be provided by the state through the California Disaster Assistance Act (CDAA) (see Section 2.0, *Plan Purpose and Authority* for the adopting resolutions). The LHMP has also been prepared to support the City's CWPP to reduce wildfire risks and Sea Level Rise Adaption Plan to address changing coastal hazards over time. The Floodplain Management Ordinance applies in concert with the City's zoning ordinance and building codes to reduce flooding hazards from land use. The LHMP includes several mitigations addressing flood control infrastructure to support the City's efforts to reduce flooding hazards.

The information contained within this LHMP, including results from the Vulnerability Assessment and the Mitigation Strategy, is used by the City to help inform updates and the development of local plans, programs, and policies. The City may utilize the hazard information when developing and implementing the City's capital improvement programs and the Planning and Building Divisions may utilize the hazard information when reviewing a site plan or other type of development applications. The City's budget process and CIP are updated to include hazard mitigation actions.

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 City will provide multiple opportunities for the public to comment on the revisions. A public notice will be published before the meetings to announce the comment period and meeting locations. Moreover, the City 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 the City using the following information:

Liliana Encinas, Fire Public Outreach Coordinator
City of Santa Barbara
Fire Department
Office of Emergency Services
925 Chapala Street
Santa Barbara, CA 93101

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City of Santa Maria
Local Hazard Mitigation Plan

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

February 2023

City of Santa Maria

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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 City of Santa Maria (City) 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 City. The LHMP was last comprehensively updated in 2017 as an annex to the 2017 MJHMP. Since 2017, the City has:

- Incorporated the LHMP goals, objectives, and mitigation actions into its local plans and processes, including the General Plan Safety Element by reference and specific hazard planning efforts (e.g., Stormwater Plan).
- Used the LHMP's assessment of capabilities, hazards, and vulnerabilities to inform planning, capital improvements, programs, decision-makers, and the public.
- Implemented mitigation actions through the City's general plan, capital improvement program, maintenance programs, grant programming, community outreach, and budget process.
- Reviewed and evaluated mitigation actions before and after emergencies, including the COVID-19 pandemic.

This update to the LHMP builds on and refines the MJHMP's assessment of hazards and vulnerabilities countywide to develop a mitigation plan for the City. The City participated in the 2022 MJHMP Mitigation Advisory Committee (MAC) and Local Planning Team (LPT), reviewed all portions of the MJHMP pertaining to the City, 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 City is a participating agency in the County's MJHMP update.

The City'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 City. Vulnerability assessments summarize the identified hazards' impact on the City. 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 City's 2022 LHMP.

[INSERT CITY RESOLUTION(S) ADOPTING PLAN UPDATE]

[INSERT CITY 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 City'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 Mitigation Advisory Committee (MAC) and the second is the Local Planning Team (LPT).

All eight incorporated cities and the six special districts joined the County as participating agencies in the preparation of the MJHMP update, including the 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 Santa Maria Valley Water Conservation District (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 City participated as a MAC member to prepare this LHMP as an annex to the 2022 MJHMP. The City was represented by Roy Dugger, Emergency Services Specialist, and Jason Stilwell, City Manager, 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	**MAC Meeting #1 (virtual)** 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	**MAC Meeting #2 (virtual)** 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	**MAC Meeting #3 (virtual)** 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	**MAC Meeting #4 (virtual)**

Date	Purpose
	Collected feedback on 2017 mitigation strategies Conducted interactive exercise on mitigation strategies for key hazards unaddressed in previous MJHMP Discussed annex updates
January 2022	**MAC Meeting #5 (virtual)** Presented draft plan Discussed key MAC/LPT review needs and key issues Discussed annex updates to dovetail with plan update
March 2022	**MAC Meeting #6 (virtual)** Review and discuss public comments received on the draft plan Recommend a revised draft plan to decision-makers Review annex updates for review and approval

3.3 LOCAL PLANNING TEAM (LPT)

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

Table 3-2. City of Santa Maria Local Planning Team 2022

Department	Name	Title
Public Works	Kevin McCune	Director of Public Works/City Engineer
Community Development	Chuen Ng	Director of Community Development
Emergency Preparedness Program	Roy Dugger	Emergency Services Specialist
Fire/Fire Prevention/Fire Marshall	Todd Tuggle	Fire Chief
Fire/Fire Prevention/Fire Marshall	James Austin	Fire Marshall
Planning Division	Dana Eady	Planning Division Manager
Management	Jason Stilwell	City Manager
Management	Mark van de Kamp	Public Information Officer
Law Enforcement	Marc Schneider	Chief of Police
Utilities	Shad S. Springer	Director of Utilities
Utilities	Alexandra Griffith	Regulatory Compliance Manager

The Santa Maria LPT members worked directly with the Santa Barbara 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 City 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 (12/9/21) to discuss LHMP priorities and mitigation approaches. LPT members coordinated information, goals and objectives of the LHMP.
January and March 2022	Reviewed new maps and local vulnerabilities. Provided input on the status of 2017 LHMP mitigation strategies. Reviewed draft mitigation strategies and provide feedback. Reviewed and finalized 2022 LHMP

3.4 PUBLIC OUTREACH AND ENGAGEMENT

As a participating agency in the 2022 MJHMP update, the City 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 City'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.

While the MJHMP update process occurred during 2021/22, the City regularly addresses hazards and its mitigations through regulatory and permit processes. The City regularly participates in Santa Barbara County Operational Area meetings and training, as well as San Luis Obispo County partner agencies to coordinate City programs and processes with neighboring areas. City departments such as Utilities, Community Development, Public Works, Police, Fire, City Manager's Office, Recreation and Parks, and the Library meet regularly with regional partners and engage in programs and policies that enhance the resiliency of our local communities. Interdepartmental and interagency meetings are convened yearly and as needed to address emergent issues such as flood and drought and to develop and implement mitigation programs and activities. Regional development trends are analyzed by City departments with regional partners regularly. The City

Manager's Office assists the Departments in regional planning programs and opportunities. The Emergency Services Specialist, who participated on the MAC, had individual conversations with City department representatives to understand the current processes and status of mitigation programs in the City. The City also participates in regional coordination meetings with Community, Local, County, State, and Federal partners that address planning, training, operational coordination, and hazard mitigation continually. It is part of the "fabric" of civil governance and planning.

The City has not had a separate process for engaging the community in the MJHMP and LHMP annex update process and relied on the countywide outreach provided by County OEM for the 2022 MJHMP update. Rather, the City regularly engages with the public in a variety of preparedness activities, which include mitigation. The City is committed to a whole community approach, and to that end, meets with community partners to assist in preparedness planning, training, and potential hazard mitigations. Examples of whole community engagement include ongoing preparedness with Independent Living Resource Center, Good Samaritan Services, the Salvation Army, and a wide variety of faith-based organizations. Mitigation discussions are an active component of our outreach efforts, both in formal classroom settings and in community engagement opportunities such as fairs and festivals.

Drought preparedness outreach has been a continuing process with the City's Utilities Department, using a variety of outreach and engagement opportunities, including ongoing water conservation and anti-pollution programs, media stories, flyers, public forums, web resources/social media, and personal dialogue. The City promotes environmental education by participating with a public education booth at fairs and festivals.

With the onset of the Novel Corona Virus in the Spring of 2019, the City engaged its Pandemic Response Plan outline in coordination with the Operational Area and Santa Barbara County Public Health Department. While the City does not have a Public Health Department, it does have a duty to protect its employees and residents in accordance to local ordinance, State and Federal laws and regulations. To that end a major component of the City's response is to use a Whole Community approach to educate the public on disease transmission prevention and work collaboratively with leaders across the community to develop strategies and policies that minimize the impact of the disease and its consequences on individuals and businesses as well as maintaining necessary services. The City produced and distributed multilingual press releases, posters, video and radio spots early in the process before the County, State, or Federal agencies built their capacity to do the same. When those agencies produced material and adopted strategies that were accessible to the City's communities, we adopted those materials and amplified their reach within the City. City leadership continued to engage with community partners to develop comprehensive strategies to provide consistent messaging and activities to help reduce the impacts of the Pandemic. The City also engaged with various Authorities Having Jurisdiction to advocate for the needs of underserved and at risk populations within the City beyond the authority and expertise of the City to act. The City activated its leadership team following ICS principles via a virtual EOC process to maintain situational awareness and coordinate response activities as needed.

The City hosts annual exercises to provide awareness to various risks and hazards and explore appropriate responses to these events. Annually we participate in the California ShakeOut exercise, and review EOC operations in the context of disaster scenarios. Such scenarios have included flooding (occasionally in coordination with the United States Bureau of Reclamation), and Cyber-attack/network infrastructure disruption. The City also covers subsets of disaster functions (ICS functions) to enhance skills and provide awareness of Whole Community response including department level workshops (Finance for example) and City wide exercises (ICS-213 practicum). Departments also participate in drills and full scale exercises to support skill development and interoperability capabilities including joint exercises with the Santa Maria Airport, Santa Barbara County Fire Department, Santa Barbara County Sheriff's Office, and regional task forces and include scenarios such as Mass Casualty Incidents, Active Shooter, Earthquake and Hazardous Materials events.

There is an active disaster public education program, teaching CERT (Community Emergency Response Training), Listos, and various topic-specific workshops in English and Spanish, as well as public education tables at fairs and events. CERT is a FEMA standard course while Listos Statewide program originated in Santa Barbara County, that is offered in Santa Maria in Spanish and English. More information on these programs can be found at the following websites:

- CERT: https://www.fema.gov/community-emergency-response-teams
- Listos: http://listos.org/ and http://www.cafsti.org/programs/alertar-y-preparar-and-listos/

Hazard information from previous hazard mitigation plans, plus emergent hazards (drought, pandemic, active shooter, etc.) are incorporated into the classes and outreach, as well as addressing concerns of the public.

The City's Emergency Services Specialist is available to the public to answer questions about preparedness and coordinates with Santa Barbara County Operational Area, San Luis Obispo Operational Area, California Office of Emergency Services, U.S. Fire Administration (USFA), National Fire Protection Association (NFPA), Federal Emergency Management Agency, and other private sector and government safety education partners.

During the preparation of the City's 2017 LHMP annex, the City identified a need to operationalize disaster planning (for example Mitigation, Operations, Continuity, and Recovery) by creating an interdepartmental working group to facilitate coordination with existing planning and operations within the City. With the concurrence of the Interim Fire Chief and the City Manager, a Disaster Planning Group was authorized and established starting in the 2016-2017 fiscal year. Due to staffing changes and emergent events such as the Novel Corona Virus Pandemic, the City pivoted to an operational mode. The City intends to reconstitute the Disaster Planning Group to meet quarterly or as needed to operationalize the various planning processes to maintain the LHMP, Emergency Operations Plan, and other plans and to ensure that these plans are integrated into and reflect City plans, processes and procedures. The LHMP will be updated as emerging hazards or relevant mitigation strategies are identified.

The City Emergency Services Program has established a goal to host a Community Organizations Active in Disaster (COAD) specific to the Santa Maria Valley as a subset of the existing Santa Barbara County Operational Area Voluntary Organizations Active in Disaster (VOAD). The goals of the COAD are to enhance and operationalize the whole community planning process continuingly that meet the needs of the local community. Hazard mitigation will be a component of this program. Needs and mitigation strategies identified in the COAD or from other public engagement will be incorporated in the planning and community resiliency process. Towards this end, Santa Barbara County VOAD has established co-chairs from North and South County and has increased engagement with Santa Maria based organizations.

In May 2022, the LHMP was completed and made available for public review, concurrent with review by FEMA and CalOES. In addition, the opportunity for the community to be heard was permitted during the City Council meeting before the adoption of this plan.

4.0 CAPABILITY ASSESSMENT

The City identified current capabilities and mechanisms available for implementing hazard mitigation activities. This section presents a discussion of the roles of key departments, administrative and technical capacity, fiscal resources, and summaries of relevant planning mechanisms, codes, and ordinances.

4.1 DEVELOPMENT TRENDS AND DEMOGRAPHICS

The City of Santa Maria encompasses 22.76 square miles, located approximately 250 miles south of San Francisco and 170 miles north of Los Angeles in Santa Barbara County. It lies within the Santa Maria River Valley, surrounded by rolling hills on three sides and the Pacific Ocean 13 miles to the west.

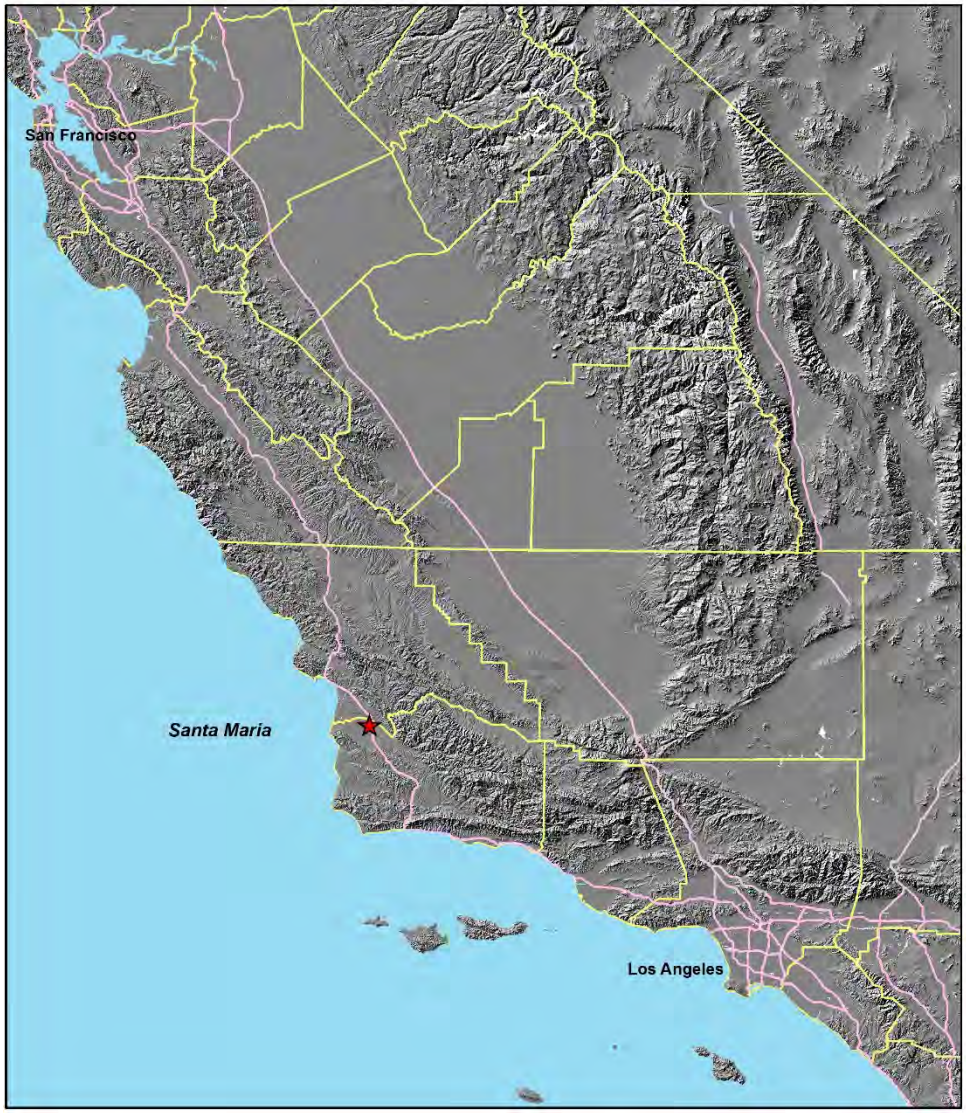


Figure 4-1. Location of the City of Santa Maria

According to 2019 U.S. Census Bureau data, the City is home to 107,859 residents. This population is projected to grow to 125,288 residents by 2050 (SBCAG 2018). The average household size in the City is 3.73 and the median household income is $56,581. The majority of the City of Santa Maria's residents identify as Hispanic (75.5 percent); approximately 17.4 percent of residents identify as White, 4.7 percent identify as Asian, and 2.4 percent identify as Black, Mixed, or Other. (US Census Bureau 2019)

Agriculture has always played an important role in the City's economy, however, other important sectors of the local economy are retail, education, medical, the aerospace industry; communications; high-technology research and development; petroleum production; military operations; and various manufacturing industries.

Santa Maria aggressively works toward increasing the supply of housing to meet local demands. Because the City sits within commuting distances between Santa Barbara and San Luis Obispo, two

areas with higher housing costs, the City became positioned as an affordable location for first-time homebuyers and others looking for good housing values.

Large housing developments are continuously being incorporated within the City's jurisdiction as agricultural property is converted into housing in an "infill" process, as agriculture and other industrial facilities find themselves surrounded by housing development requiring re-zoning to accommodate compatible land uses within the City. Environmental Impact Reports and City building codes require mitigation of hazard impacts such as increased runoff, earthquake resiliency, fire safety, drought resistance/water conservation, and weather resistance/energy efficiency.

Residential care facilities have also found Santa Maria to be an attractive location to accommodate the needs of our aging population. In addition, recent (since 2017) California laws require the City to approve high density housing and residential lot remodels to accommodate more people with minimal mitigations. This increased density of the population is resulting in increased emergency services call load. With increased growth and several proposed large developments, the City Fire Department produced a Standards of Cover report and Strategic Plan in 2021 and 2022 which identify the need to continue to grow the capacity and capabilities of the Fire Department to meet standards and to identify revenue sources to maintain those capabilities. Other departments will also need to grow their capacities to meet public safety, building code, water, sewer, trash, and other essential City Services needs. As the City population grows, additional challenges and opportunities will arise that are part of an economically and culturally diverse urban center. The ability to create and maintain a safe and equitable environment will require significant resources and effort.

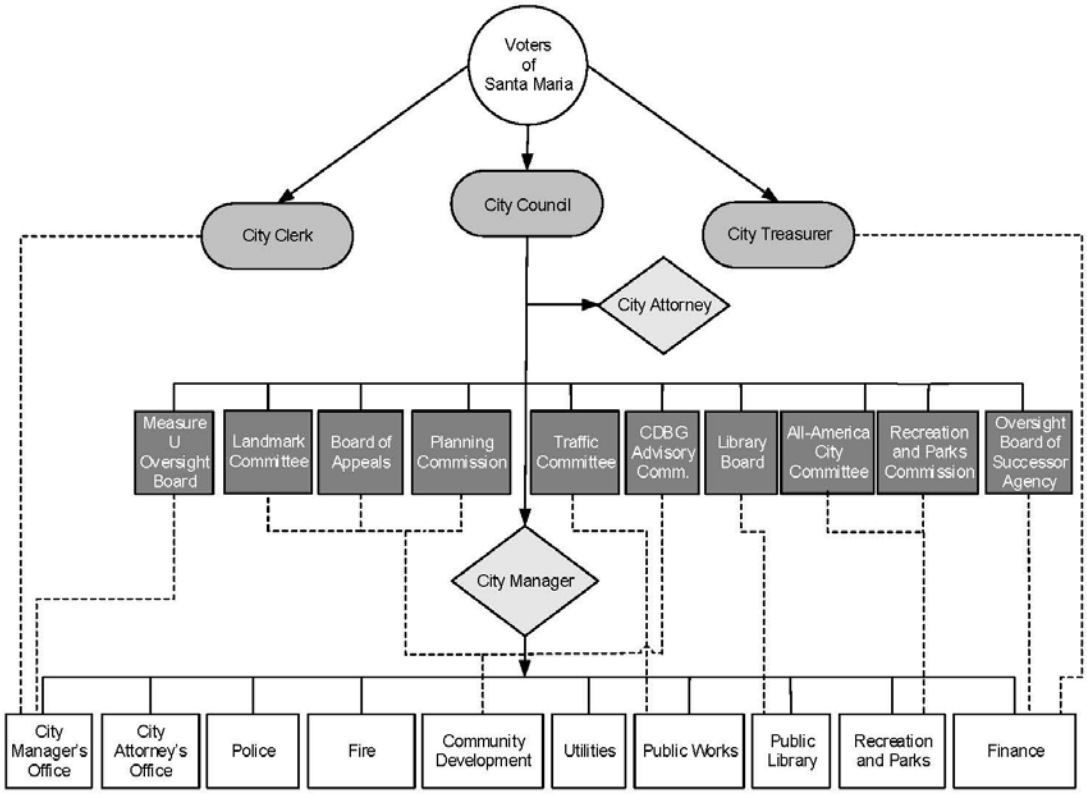
Since the City's LHMP in 2017, there have been significant development projects brought to the City. Currently (February 2023), there are over 4,000 new units in development or approved plans for development within the City, and that does not include ADU's (accessory dwelling units, required to be approved by State Law) and includes multistory high density housing. The City is also currently aware of at least an additional 2,000 units proposed that have begun the planning process and a proposal to annex additional areas adjacent to the City that would include a currently undetermined number of additional housing units in at least the hundreds (records on file in Planning and Development).

While the U.S. Census population estimates for the City appear static, the reality is that the last census likely dramatically undercounted the City's population. Calls volumes to the City's Fire Department and Police Department have increased since 2017 and continue to increase monthly, indicating that either the population has increased or that the demographics of the City changed. If Fire and Law call volume can be used as a barometer of vulnerability, we can say that the level of vulnerability in the community is increasing (Per Standards of Cover documentation referenced above).

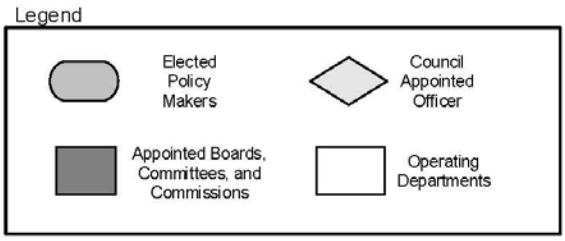
4.2 KEY DEPARTMENTS

The City utilizes the council-manager form of local governance, which includes both elected officials and an appointed City Manager. Santa Maria has four council members and a Mayor elected at large, which means that members represent the entire City, rather than specific districts.

ORGANIZATIONAL CHART



City Manager's Office:	Administration, Human Resources, Records/City Clerk, Information Technology, Public Information
City Attorney:	Administration, Code Enforcement, Legal
Police:	Administration, Operations, Support
Fire:	Administration, Fire Operations & Training, Fire & Life Safety Prevention
Community Development:	Administration, Building, Planning, Special Projects
Utilities:	Administration, Finance, Solid Waste, Water Resources
Public Works:	Administration, Engineering, Operations, Transit
Library:	Administration, Main Library, Branch Libraries
Recreation and Parks:	Administration, Recreation, Parks
Finance:	Administration, Finance, Revenue, Business License, Utility Billing



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The City Council is Santa Maria's legislative body, setting policy, approving budgets, and setting tax rates. Members also hire the City Manager, who is responsible for the day-to-day administration of the City and serves as the Council's chief advisor. The City Manager prepares a recommended budget and carries out the council's policies. While the City Manager may recommend policy decisions, he or she is ultimately bound by the actions of the Council. The Council appoints one additional staff member — the City Attorney. City Departments involved in activities related to Hazard Mitigation include:

4.2.1 City Manager's Office

- Provide overall direction and coordination of City operations to ensure that the City Council's adopted service objectives are met or exceeded and that costs do not exceed budget restrictions.
- Continually evaluate the organizational structure of the City to provide the most effective, efficient, and economical public service possible.
- Improve the operational capabilities of the City through the development of high-quality human resources.
- Direct employee relations, including negotiating and administering contracts with represented groups.
- Continually monitor and evaluate services, programs, and activities of the City to ensure they continue to be relevant to community needs and are administered equitably.
- Through the Records/City Clerk Division, maintain accurate records of City Council activities and other official City files and ensure municipal elections are conducted in compliance with applicable laws and guidelines.
- Serves as the City's Emergency Services Director.

4.2.2 Information Technology Division

- Provide comprehensive computer services that include defining informational needs and translating them into technology standards and computer policies.
- Ensure the security and integrity of data stored on the City's computer equipment.
- Provide appropriate services to internal customers to keep computers and associated equipment and software operating as designed.
- Administer and manage contracts for all computer hardware/software, telephone, and radio equipment.
- Ensure that technologies related to emergency services are maintained operational 24/7.
- Participates as part of the City's Emergency Management Team and the City's EOC Team.

4.2.3 Finance Department

Finance Division

- Analyze the City's financial position and develop short and long-range plans to ensure financial viability.
- Provide high-quality financial reporting and budget presentations
- Advise City management on business factors affecting the City's fiscal environment.
- Ensure the security and proper disbursement of funds through effective appropriation management.
- Administer the business license and occupancy tax ordinances including annual renewals, new licenses, complaints, and coordination with State agencies.
- Develop and update effective administrative policies to maintain internal controls.
- Ensure City departments obtain materials and services needed, within budget, and in compliance with procurement policies.
- Maximize investment earnings while safeguarding public funds as established by the City Investment Policy and State law.
- Participates as part of the City's Emergency Management Team and the City's EOC Team.

Utility Billing Division

- Administer the utility billing system to ensure that residents and businesses are paying the appropriate amount for water, sewer, and refuse collection services through the production of accurate bills, collection of all revenues, monitoring, and collecting delinquent accounts.
- Respond to utility customers' service needs in an effective, efficient, and economical manner.
- Participates as part of the City's Emergency Management Team and the City's EOC Team.

4.2.4 Fire Department

Administration

- Develop, implement and monitor policies, procedures, budgets, fees, automatic aid agreements, mutual aid agreements, and liaison with other City departments and outside agencies.
- Manage department contracts and agreements.
- Emergency Services program lead.

Life and Fire Safety

- Coordinate adoption of codes and ordinances, review site and building plans for fire code compliance, inspect occupancies for compliance with fire and life safety laws and regulations, investigate fire cause and origin, and present community education programs.
- Provide public information to the community on the department's emergency and non-emergency activities.

- Coordinate the City's Disaster Preparedness Program, liaison with all City departments and divisions, as well as other public and private organizations, develop, coordinate and implement hazard-specific response plans, and maintain the operational readiness of the City's Emergency Management Team, the EOC, and other key elements.
- Manage the development of new department facilities and existing facility renovation.
- Ready Santa Barbara County Program coordination and administration.

Operations Division

- Maintain the department's personnel, apparatus, equipment, and fire stations in a state of readiness to respond to the community's needs for emergency and non-emergency calls for service, develop and implement standard operating procedures for various types of emergency responses, and train and interact with neighboring jurisdictions and regional agencies.
- Long-range planning.

4.2.5 Community Development Department

Building Division

- Coordinate adoption of building, plumbing, electrical, and mechanical codes. Develop building ordinances.
- Review site and building plans for compliance with building codes and ordinances.
- Damage assessment of structures from multiple causes to facilitate their repair and future occupancy.
- Serves as Floodplain Administrator.
- Reviews architectural and engineering plans to assure compliance with Federal, State, and local ordinances on seismic and structural stability.
- Participates as part of the City's Emergency Management Team and the City's EOC Team.

4.2.6 Planning Division

- Develop and maintain the City's General Plan, zoning ordinances, and development standards. Oversight of the City development process assuring compliance with zoning and general plan, including environmental impact reports, design review, historic preservation, landscape review, habitat conservation, floodway prohibitions, and floodplain development standards consistent with State and Federal laws and regulations.
- Participates as part of the City's Emergency Management Team and the City's EOC Team.

4.2.7 Public Works Department

Streets & Facilities Division

- Maintains City infrastructure (streets and buildings).

- Responds to City emergencies, including emergency repair of roads and facilities, assisting police and fire departments with hazardous materials clean up, traffic and perimeter control efforts, and evacuation routing.
- Maintains and operates City emergency generator assets.
- Participates as part of the City's Emergency Management Team and the City's EOC Team.

Fleet Services Division

- Maintains the City fleet of vehicles and equipment, including all emergency response vehicles and equipment.
- Maintains City fuel supply and dispensary.
- Contracts with local heavy equipment maintenance vendors for essential mechanical maintenance needs.

Engineering Division

- Reviews engineering on private and public grading, floodways, retention basins, transportation infrastructure, and structures to assure compliance with Federal, State, and local ordinances regarding stormwater management and flood control.
- Develops engineering ordinances and policies that help protect and preserve City infrastructure.
- Evaluates all circulation elements for projected traffic impacts.
- Maintains and operates the City's public transit system, including buses and vans.
- Determines needed infrastructure improvements, including roadways, storm drains, utilities, water systems, and wastewater/sewer collection and treatment capabilities.
- Provides response personnel for evaluation of damaged infrastructure and rescue situations.
- Coordinates other response agencies assisting with damage assessment.
- Participates as part of the City's Emergency Management Team and the City's EOC Team.

Utilities Department

- Provides water, wastewater, and stormwater services for the City of Santa Maria. These services include water production and distribution, wastewater collection and treatment, and storm drain system maintenance.
- Solid waste services, including the collection of recycling, green waste, and solid waste. Operation of the Santa Maria Regional Landfill with recycling services and a Household Hazardous Waste collection facility. This includes street sweeping services.
- The Regulatory Compliance Division assists all department divisions on regulatory issues.
- During and after a disaster, produces and manages the Debris Management Plan.
- Participates as part of the City's Emergency Management Team and the City's EOC Team.

4.3 POLICE DEPARTMENT

Administration

- Develop, implement and monitor policies, procedures, budgets, accounting, purchasing, grants administration, litigation, claims, personnel, automatic aid agreements, mutual aid agreements, and liaison with other City departments and outside allied agencies.

Operations Division

- Responds to safety concerns involving threats and/or damage to life or property. Acts as the enforcement entity for violations of State and local laws and ordinances.
- Primary emergency responders to acts of civil disobedience and public disorders and terrorism. Support personnel for emergency rescue and management.
- Develops and implements emergency response plans and policies, focusing on evacuation procedures and traffic control.
- Primary responders to acts of terrorism, focusing on suspect intervention, facility, and staff protection.
- Participates as part of the City's Emergency Management Team and the City's EOC Team.

Support Division

- Investigative services for criminal acts that result in personal injury, death, and the destruction of property.
- Manage law enforcement services contract with the Santa Maria Public Airport District.
- Manage the department's Homeland Security and Law Enforcement Terrorism Prevention Programs.
- Manage the City's Public Safety Answering Point (PSAP) (aka 9-1-1 Service or Dispatch), receive 9-1-1 calls, dispatch police units, fire apparatus, and emergency medical services.

4.3.1 Recreation and Parks Department

Administration

- Writes and manages grants, provides human resource and fiscal management of the Recreation and Parks Department.
- Produces strategic plans to meet the Recreation and Parks needs of the community.
- Coordinates with other City departments and community partners.
- Ensures regulatory compliance of programs and services.
- Participates as part of the City's Emergency Management Team and the City's EOC Team.

Recreation Division

- The Recreation Division provides a variety of programs and services available to all members of the community. Some of the programs offered include; Youth and Adult Sports, Senior Services, Special Olympics, Community Classes, Community Events, and Youth Programs.
- Manages Recreation and Parks facilities.
- Manages and provides logistical support for events.
- Participates as part of the City's Emergency Management Team and the City's EOC Team.

Parks Division

- The Parks Division is responsible for ongoing maintenance of the City's 294 acres of landscape and open spaces. The division is also responsible for the maintenance of the City's athletic facilities, sports fields, tennis courts, and outdoor basketball courts. The division is also responsible for the City's Graffiti Removal Program, Shopping Cart Abatement Program, and provides support for hundreds of community events. This division is also responsible for Aquatic Programming, Aquatic Maintenance, and provides Maintenance and Lifeguarding Services to the High School District at their Aquatic Facilities.
- Urban Forest (street and parks) maintenance, with use of a contractor, of 45,000 (+ / -) trees that include; tree trimming, insect and disease control, tree planting. Responds to storm or related issues specific to the urban forest.
- Park Services Officers (i.e. City Rangers) provide public safety, security, and law enforcement at City parks and facilities properties.
- Participates as part of the City's Emergency Management Team and the City's EOC Team.

4.4 CITY ATTORNEY

Legal Services

- Provide legal services to the City Council and all departments of the City as needed.
- Participates as part of the City's Emergency Management Team and the City's EOC Team.

Code Compliance Division

- Investigate violations of the Santa Maria Municipal Code within the City limits.
- Initiate administrative, civil, and criminal actions to correct violations of the Santa Maria Municipal Code.
- Participates as part of the City's Emergency Management Team and the City's EOC Team.

Public Library

- Acquires, catalogs, and circulates books, print, and audio-visual materials to approximately 120,000 customers through the main library in Santa Maria, and branch libraries in Orcutt, Guadalupe, Los Alamos, and Cuyama.

- Acquires and provides access to electronic services such as Internet access, digital and downloadable products, online databases, and personal computers with Microsoft Word, PowerPoint, and Excel software.
- Participates as part of the City's Emergency Management Team and the City's EOC Team.

4.5 ADMINISTRATIVE AND TECHNICAL CAPACITY

The administrative and technical capabilities of the City, as shown in Table 4-1, include staff, personnel, and department resources available to implement the actions identified in Section 7.0, Mitigation Plan of this LHMP. 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. The City's department heads multitask in many areas because of budgetary constraints. The City of Santa Maria has an Emergency Services Specialist position to oversee all factors of Emergency Management within the City.

Table 4-1. City of Santa Maria Administrative and Technical Capacity

Personnel Resources	Yes/No	Department/Position
Planner/engineer with knowledge of land development/land management practices	Yes	Community Development Department
Engineer/professional trained in construction practices related to buildings and/or infrastructure	Yes	Community Development Department/ Building Division
Planner/engineer/scientist with an understanding of natural hazards	Yes	Fire/Emergency Services Specialist
Personnel skilled in GIS	Yes	City Manager's Office/IT/GIS
Full-time building official	Yes	Community Development Department
Floodplain manager	Yes	Community Development Director
Emergency manager	Yes	Fire Chief
Grant writer	Yes	Community Development/Special Projects Division
Other personnel	N/A	
GIS Data Resources (Hazard areas, critical facilities, land use, building footprints, etc.)	Yes	City GIS
Warning Systems/Services (Reverse 9-11, cable override, outdoor warning signals)	Yes	Police Dept./PSAP/Everbridge
Other	N/A	

4.6 LEGAL AND REGULATORY CAPABILITIES

The legal and regulatory capabilities of the City are shown in Table 4-2, including existing ordinances and codes that affect the physical or built environment of Santa Maria. Examples of legal and/or regulatory capabilities can include the City's 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.

The Santa Maria City Council on January 19, 2016, adopted Part I of the 2016 Multi-Hazard Emergency Response Plan, which also includes language that addresses Continuity of Government. The plan delineates the City's procedures and policies when responding to a significant disaster.

Table 4-2. City of Santa Maria: Legal and Regulatory Capability

Regulatory Tool (ordinances, codes, plans)	Yes/No
General Plan	Yes
Zoning ordinance	Yes
Subdivision ordinance	Yes
Growth management ordinance	Yes
Floodplain ordinance	Yes
Other special-purpose ordinances (stormwater, steep slope, wildfire)	Yes
Building code	Yes
Fire code	Yes
Fire department ISO rating	3
Erosion or sediment control program	Yes
Stormwater management program	Yes
Site plan review requirements	Yes
Capital improvements plan	Yes
Economic development plan	Yes
Local emergency operations plan	Yes
Other special plans	Yes
Flood insurance study or other engineering studies for streams	No
Elevation certificates (for floodplain development)	No

4.7 FINANCIAL RESOURCES

Table 4-3 shows specific financial and budgetary tools available to the City such as community development block grants; capital improvements project funding; authority to levy taxes for specific

purposes; fees for water, sewer, gas, or electric services; ability to incur debt through general obligations bonds; and withholding spending in hazard-prone areas.

Table 4-3. City of Santa Maria Fiscal Capability

Financial Resources	Accessible or Eligible to Use (Yes/No)	Has This Been Used for Mitigation in the Past?	Comments
Community Development Block Grants (CDBG)	Yes	No	
Capital improvements	Yes	No	
Authority to levy taxes for specific purposes	Yes	No	
Fees for water and sewer service	Yes	No	
Incur debt through general obligation bonds	Yes	No	
Incur debt through special tax bonds	Yes	No	
Incur debt through private	Yes	N/A	
Federal Grant Programs (Hazard Mitigation Grant Program)	Yes	No	

4.8 EDUCATION AND OUTREACH CAPABILITIES

The City of Santa Maria regularly engages with the community using a variety of social media, special event, education and outreach programs.

The City is also a partner in the Santa Barbara County Operational Area and participates and supports a variety of community outreach and educational programs, usually in coordination with national campaigns.

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 City.

The City has a Public Information Officer (PIO) who supports the department level PIO's in messaging and production. Such tools include 3 public access channels and a video production studio, a public website https://www.cityofsantamaria.org, utilization of the Simplicity app to push information to the public, as well as Twitter and Facebook. Our GIS department also has the ability

to push ad hoc map based data such as evacuation routes, shelter sites, etc. as needed over social media links.

The City regularly participates in the Downtown Friday events (https://www.dtfsantamaria.com/) with public education and outreach information including fire prevention, drought, water conservation, public safety, emergency preparedness, planning, utilities etc.

Santa Maria PD hosts National Night Out events yearly that a variety of community partners and City Departments participate in to provide safety and resiliency information to the public.

The Recreation Department and Library departments regularly support public education events in alignment with national campaigns such as California Shakeout, Emergency Preparedness Month, Fire Prevention (holiday season), etc. through exhibits, and social media outreach.

The Utilities Department regularly engages with the public on conservation and recycling programs, water conservation and drought resilience.

The Fire Department including the Prevention and Emergency Services divisions provides public education.

Programs include:

- Fire prevention for youth, residential, and at risk populations
- Smoke alarm use, placement and maintenance
- Fire extinguisher training with evacuation planning
- Disaster planning including awareness, planning, disaster kit, communication, power resiliency, pre-event mitigation strategies, life safety actions during events, and recovery best practices.
- Formal programs such as the Junior Fire Fighter program and Active Ageing Senior preparedness programs in conjunction with our Recreation and Parks Dept, and the CERT program and Listos program in conjunction with whole community partners and volunteers.
- The City also recognizes and uses national educational opportunities such as the Great California Shakeout, National Preparedness Month, Fire Safety Week, Earthquake Awareness Month, Drought Awareness and Water Conservation.
- Emergency outreach opportunities such as school programs, emergent events, fairs and festivals.
- Utilization of volunteers representative of different populations in the City to promote safety and programs in their communities and participate in the formal and informal programs listed above.
- Participates in exercises and drills including the annual California Public Health disaster exercise, triennial Airport Exercise, annual Urban Search and Rescue exercise (California USAR Team 12), Bureau of Reclamation Exercises (Twitchell Dam), active shooter exercises and trainings at local schools, California Shakeout, apartment buildings, mobile home parks, corporations as requested and appropriate.

4.9 RELEVANT PLANS, POLICIES, AND ORDINANCES

The City has a range of guidance documents and plans for each of its departments. These include a general plan, Specific Plans, public works, and public utility plans, capital improvement plans, and emergency management plans. The City uses building codes, zoning ordinances, subdivision ordinances, and various planning strategies to address how and where development occurs. The City is in the process of adopting the 2016 State of California Building Standards Code (Title 24) and the 2016 California Fire Code (Title 24, Part 9.) These codes will be adopted within the first quarter of 2017.

City Plans, Municipal Code, specific plans, and ordinances can be found here:

http://www.cityofsantamaria.org/city-government/departments/community-development/planning-division/planning-policies-and-regulations

City policies are also articulated in City Administrative Memos (CAMS) which are updated and maintained by the City Manager's Office. This list is constantly being reviewed and updated. The Hazard Mitigation Plan is used to determine if existing codes and plans require expansion and improvement. If so, standard regulatory processes are used to recommend or make changes as necessary. For specific questions, the reader is referred to the City Manager's Office.

It is important to note that during the LHMP update planning process these plans, programs, codes, and policies were evaluated to determine their effectiveness in risk education and reduction efforts, as well as their usefulness to implement mitigation measures. Any shortfalls or areas where the plans, programs, codes, and policies could be improved or expanded were identified and captured under annual review, the annual planning process, and Section 7.0, *Mitigation Strategy* of this plan. If no mitigation actions were identified, then it can be assumed that the planning team determined that no shortfalls or areas for improvement are currently needed or were not feasible.

4.9.1 The General Plan

One of the essential ways the City guides its future is through policies laid out in the General Plan. The General Plan for the City consists of seven general areas of information.

- Circulation Element
- Housing Element
- Land Use Element
- Noise Element
- Resources Management Element-Conservation Element-Open Space Element-Public Infrastructure, Recreation and Parks Element
- Safety Element
- Economic Development Element

The various elements listed above have been reviewed and updated between 1991 and 2022. The City's General Plan is available for review on the City's website at http://www.cityofsantamaria.org/city-government/departments/community-development/planning-division/planning-policies-and-regulations/general-plan

The General Plan - Safety Element

The Safety Element is a long-range planning document that sets forth goals, policies, objectives, and implementation programs to protect Santa Maria from risks associated with the following hazards: seismically and geologically induced hazards, flooding, wildland and urban fires, electromagnetic fields, oil wells/sumps, landfill gas migration, safe drinking water, aircraft safety, and hazardous materials. This portion of the General Plan also describes the emergency response capabilities of the various disaster service agencies within Santa Maria. The LHMP is incorporated by reference in the Safety Element.

Geologic and Seismic Hazards

Santa Maria City Council adopted an unreinforced masonry (URM) implementation ordinance in 1989. The ordinance adopted a standard and a schedule for reinforcing URM buildings based on the type of building and its occupancy load. The City has identified 28 URM buildings within the City. Approximately 20 property owners complied with the January 1, 1993 date to submit rehabilitation plans for their URM building.

To mitigate this hazard, the City has already:

- Adopted an Unreinforced Masonry Ordinance that contains a compliance schedule.
- Adopted the most recent editions of the Uniform Building Code, the Uniform Fire Code, the Uniform Housing Code, the Uniform Plumbing Code, the National Electrical Code, and the Hazardous Building Code.
- Implemented public education programs in English and Spanish through the Ready Santa Barbara County Program, CERT (Community Emergency Response Training) program, participation in California ShakeOut program, and National Emergency Preparedness Month.

Flooding

The Santa Maria River Levee, built by the U.S. Army Corps of Engineers, is designed to protect the City from a "100-year" flood event. The Santa Barbara County Flood Control District patrols the levee any time there are more than a few hundred cubic feet per second flowing in the river. Levee erosion has been experienced and if the levee ruptured, it could cause flooding south of the Levee.

To mitigate this hazard, the City has already:

- Successfully lobbied for Federally-funded rehabilitation of 7 miles of the levee; rehabilitation work began in January 2009 and was substantially complete as of April 2014.
- Participation in the National Flood Insurance Program.
- Developments adjacent to the Santa Maria River have dedicated 60-foot-wide buffer zones next to the levee.
- New developments in the 100-year floodplain have complied with the requirement that finish floor elevations be at least 2 feet above the 100-year flood plain elevation.

Fire

Aging structures, non-permitted renovations or changes in occupancy, weeds, and abandoned structures are some of the many hazards that can increase fire risk in a community. To reduce the risk of urban fires, fire codes, building codes, various City codes, and building setback restrictions are enforced.

To mitigate this hazard, the City has already:

- Developed an ongoing weed abatement program.
- Adopted the most recent edition of the California Fire Code.
- A proactive code enforcement program with uniformed officers.
- Fire Prevention staff and programs.

Electromagnetic Fields (EMF)

The California Public Utilities Commission (CPUC) encourages utilities to take no-cost and low-cost measures to reduce exposure from new or upgraded utility facilities. It directs that no-cost mitigation measures be undertaken and that low-cost options be implemented through a CPUC project certification process. Four percent of total budgeted costs is the benchmark in developing EMF mitigation guidelines, and mitigation measures should achieve some noticeable reductions. Some mitigation measures include siting new facilities in alternative locations, increasing right-of-way widths, altering line or tower geometry, using higher voltages to reduce current levels, and underground utilities.

The proliferation of electronic devices, including digital devices, electrical systems in vehicles and increased power use within the City is also creating additional Radio Frequency Interference (RFI). Recent FCC changes to enforcement (47 CFR § 15.103) have also resulted in increased RFI with minimal capability to require mitigation at the local level (Federal Preemption by FCC). This is resulting in increased interference and reduced effective range of public safety communication channels. This will necessitate undetermined mitigations to ensure effective public safety communications.

To mitigate this hazard, the City has: :

- Collected a compilation of data regarding the recent studies associated with EMFs.
- Participated in regional planning with Pacific Gas and Electric on routing and upgrading of the power distribution system.
- Will collect additional data on RFI and test public safety communication systems effective geography.

Oil Wells and Oil Sumps

The source for local oil regulations is the Santa Barbara County Petroleum Ordinance. The City's Municipal Code adopts the County ordinance as the petroleum ordinance of Santa Maria. New facilities (wells, tanks, etc.) must follow applicable regulations, including the Uniform Fire Code, and require permits from the County Petroleum Department and/or the California Division of Oil, Gas, and Geothermal Resources. In addition, new facilities cannot be located within certain distances

from roadways and existing buildings. The County Petroleum Department and the State Supervisor of Oil, Gas, and Geothermal Resources both have the power to determine that a well, an oil field, or other operations covered by the ordinances are safety hazards and, therefore, have the right to compel the operator to make modifications to correct unsafe conditions. Abandoned wells must have a 10-foot-wide radius “no build” easement measured from the well if the well resides in a residentially zoned area. For non-residential property, the property owner has the choice of recording the 10-foot-wide “no build” easement around the well or installing an approved venting system over the well, in which case a structure may be built over the well.

To mitigate this hazard, the City has already:

- Adopted a Petroleum Ordinance and the designation of the County Petroleum Engineer to act on the City's behalf.
- Remediated oil sump/contaminated soil areas within the City Limits.
- Recent projects have recorded 10-foot radius "no-build" easements over abandoned oil wells.

Landfill Gas Migration

The City owns and operates a regional landfill located in the northeast portion of the City. In addition, abandoned landfill areas are located underneath Preisker Park and around the Santa Maria Public Airport. A hazard associated with existing and abandoned landfills is underground methane gas migration. California Code of Regulations (CCR) under Title 14, Chapter 3, Article 7 applies to LFG production, containment, control, and utilization at Class III sanitary landfill sites. The CCR "Minimum Standards" are enforced by Cal Recycle, formerly known as the California Integrated Waste Management Board (CIWMB), and the Local Enforcement Agency (LEA). For the City, the LEA is the Santa Barbara County Environmental Health Division.

To mitigate this hazard, the City has already:

- Installed 38 City-owned LFG monitoring wells around the Santa Maria Regional Landfill.

Safe Drinking Water

In 1974, the Federal Safe Drinking Water Act was passed to establish standards for public drinking water. In 1986, the Act was amended to further safeguard the sources and treatment of water. The Environmental Protection Agency (EPA) and the State Water Resources Control Board, Division of Drinking Water (DDW), set quality standards that require water suppliers to monitor and treat public drinking water for potentially harmful contaminants. Any water supplier needs to make sure that its water supply meets State and Federal drinking water standards. The City of Santa Maria needs to be particularly aware of the presence of nitrate and total dissolved solids in its supply.

To mitigate this hazard, the City has already:

- Procured high-quality imported State Water supply to blend with local drinking water supply.
- Addressed water supply reliability and quality in its Urban Water Management Plan, which is posted on the City’s website.
- And is within the adjudicated area of the Santa Maria Groundwater Basin.

Aircraft Safety

The City of Santa Maria is within the Santa Maria Public Airport District Area of Influence. This area is divided into three areas of major concern: height restrictions, safety, and noise. Policies regarding these three issues have been established.

To mitigate this hazard, the City has already:

- Adopted the Clear Zone and Airport Approach Overlay zoning designations in coordination with the Santa Maria Airport District and Santa Barbara County.

Hazardous Materials

Hazardous materials are found throughout the Planning Area. The use and storage of hazardous materials are primarily regulated by the California Fire Code. Transport of hazardous materials and waste on public streets is primarily regulated by the California Vehicle Code and the City's Municipal Code. Storage and disposal of hazardous wastes are primarily regulated by the Santa Barbara County Environmental Health Services Division through its Hazardous Waste Generator Program as authorized by the State Health and Safety Code. Santa Barbara County's Site Mitigation Program administered by the EHS is responsible for the supervision of cleanup at contaminated sites throughout the County, including sites within the City Limits.

Although incidents may occur anywhere at any time, certain portions of the Planning Area are more likely to be the site of an accident involving hazardous materials including Highway 101, Highway 166, Betteravia Road, fixed facilities along Blosser Road, railroads, and airport industrial zones.

To mitigate this hazard, the City has already:

- Adopted the countywide Household Hazardous Waste Element in 1995.
- Per Article 80 of the Uniform Fire Code, industrial and commercial hazardous material users are required to provide the County of Santa Barbara Fire Department with either a hazardous material inventory statement or a hazardous materials management plan that lists the hazardous materials used on the site, a description of where and how each is stored, and how each reacts in a fire.
- Industrial and commercial hazardous material users are required to provide a Business Plan to the County Environmental Health Services Department.
- The California Highway Patrol and the City's Municipal Code have designated appropriate hazardous material transport routes.

Emergency Services

The City's emergency preparedness capabilities include Chapter 17 of Title 2 of the Municipal Code, the Multi-Hazard Functional Plan, and the California Master Mutual Aid Agreement. Santa Maria has a functional Emergency Operations Center (EOC) to be activated in the event of an emergency.

4.9.2 Zoning and Subdivision Ordinances

The State of California has empowered all cities, and counties to adopt zoning ordinances. The City's Zoning Ordinance is detailed in Title 12 of the Santa Maria Municipal Code. The City's Subdivision Ordinance is detailed in Title 11 of the Santa Maria Municipal Code. The full text of the Santa Maria Municipal Code is available for review in the City Clerk's office, the Public Library, or at the City's website, http://www.qcode.us/codes/santamaria/. Local land use controls include the Zoning Ordinance, which shapes the form and intensity of land use and residential development. Consistent with the General Plan, the City's Zoning Ordinance allows a range of zones and dwelling unit densities. Zoning ordinance regulations related to hazard mitigation relate to the risk assessment for hazards within the City, including flooding.

4.9.3 Building Codes

The State of California is responsible for enacting the California Building Code, which the City is responsible for enforcing locally. The current California Building Code (Title 24) is the 2016 adopted triennial Uniform Building Code (with amendments).

The Building Division is principally responsible for enforcing State and City codes for building residential and commercial structures with support from the Fire Prevention Unit of the Fire Department for Fire Code enforcement. The enforcement of environmental codes and guidelines for maintaining existing structures is a shared responsibility of the Building Division, Fire Department, and City Attorney's Office/Code Compliance Division.

4.9.4 Floodplain Management Ordinance (NFIP)

The Director of the Community Development Department is the designated Floodplain Administrator per City Municipal Code section 9-10.202. The Community Development Department is the lead agency in the City to coordinate National Flood Insurance Program (NFIP) compliance and enforces the City's Flood Plain Management Ordinance.

All potential development projects located within floodplains must follow an established development review process. Developments involving drainage ditches or watercourses in floodplains must receive Federal, State, and Local review and permits as required by the Floodplain Administrator and the Santa Maria Municipal Code. The ordinance contains provisions for public utilities and facilities, such as sewer, gas, electric, and water systems, manufactured homes, recreational vehicles, and existing structures.

The City of Santa Maria has an enforced floodplain ordinance requiring that all habitable floors must be built above the 100-year floodplain and the special flood hazard areas. It is important to note, however, that there are areas of the City that may flood due to the inadequate capacities of their stormwater infrastructure – not because of their proximity to 100-year floodplains. A complete discussion of flood hazards is included in Section 5.4.4 of the Santa Barbara County 2016 Multi-Jurisdictional Hazard Mitigation Plan.

The Community Development Department provides the floodplain maps while the interpretations of floodplain district locations are made by the Federal Emergency Management Agency (FEMA). The Flood Insurance Rate Maps (FIRMs) were developed through the NFIP and were last updated in

September 2008 and made available in GIS format as Digital Flood Insurance Rate Maps (DFIRM) and have been incorporated into the City GIS. Flood maps are also available from the FEMA Flood Map Service Center on the internet at http://msc/fema/gov/portal/. The FIRMs are used by both the public and private sector to determine flood insurance requirements and rates and to administer the City's Flood Zone Management Ordinance (Chapter 9-10 of the Santa Maria Municipal Code). These maps, last updated in 2008, do not reflect the recent (2009-2014) rehabilitation of the Santa Maria River Levee. Future maps will reflect updated calculations.

Floodplain districts identified in the FIRMs include the following flood hazard zones and definitions:

- **Zone A** is the flood insurance rate zone that corresponds to the 100-year floodplains that are determined in the Flood Insurance Study (FIS) by approximate methods. Because detailed hydraulic analysis is not performed for such areas, no Base Flood Elevations or depths are shown within this zone.
- **Zone AE** is the flood insurance rate zone that corresponds to the 100-year floodplains that are determined in the FIS by detailed methods. In most instances, whole-foot Base Flood Elevations derived from the detailed hydraulic analyses are shown at selected intervals within this zone.
- **Zone AH** is the flood insurance rate zone that corresponds to the 100-year floodplains that are flood depths of 1 to 3 feet (usual areas of ponding); base flood elevations determined.
- **Zone X** is the flood insurance rate zone that corresponds to areas outside the 500-year floodplain, areas within the 500-year floodplain, and to areas of 100-year flooding where average depths are less than 1 foot, areas of 100-year flooding where the contributing drainage area is less than 1 square mile, and areas protected from the 100-year flood by levees. No Base Flood Elevations or depths are shown within this zone.

4.9.5 Repetitive Loss (RL) Properties

Repetitive Loss Properties are defined as property that is insured under the NFIP that has filed two or more claims above $1,000 each within any consecutive 10-year period since 1978. There are no Repetitive Loss Properties within the City of Santa Maria, according to a Federal Emergency Management Agency (FEMA) regional representative who was asked that question by City staff on July 26, 2011. There have been no flooding events since that date. Therefore, that relieves the City of the need to identify funding or education/engineering plans to reduce the risk of flooding to those properties.

4.9.6 City of Santa Maria Stormwater Plan

In October 1990, the National Pollutant Discharge Elimination System (NPDES) became the Federal law for regulating stormwater runoff to reduce pollution.

The City's Utilities Department continually maintains over 330 miles of water mains, 230 miles of sewer lines, and other storm drainage-related structures throughout the City's drainage system. The division has a Storm Water Management Plan, which outlines design criteria and policies, City standards, and technical specifications for infrastructure development.

The City's approved Storm Water Management Plan is on the City's website at http://www.cityofsantamaria.org/city-government/departments/utilities-sewer-water-trash/stormwater.

During its first year of enrollment under the General Permit, the City made great strides in implementing its Storm Water Management Program. Some program highlights of Permit Year 1 include:

- Development of a robust Public Education and Outreach program resulting in greater community awareness and volunteering for Project Clean Waterways workdays.
- A Water Quality Monitoring Program focused on local water quality impairments and challenges (Appendix A) to reduce and improve discharges to receiving water bodies.
- Creation of a targeted Business and Industry Inspection Program including enforcement actions resulting in observable operational changes for some local businesses.
- GIS mapping of Mutt Mitt stations, stormwater basins, channels, and other drainage facilities.
- Adoption of a practical and City-specific Storm Water Runoff Pollution Prevention Ordinance to the City Municipal Code.
- An overall greater understanding of the City's drainage sub-watersheds, its MS4, urban pollutant sources, and challenges arising from stormwater comingled with agricultural runoff.

4.9.7 SEMS Multi-Functional Emergency Management Plan

In January 2016, the City completed an update of the Multi-Hazard Functional Plan (MHFP), which details the City's disaster operations activities. The MHFP is based on "Whole Community Planning" which engages different segments of the community to ensure that the plan addresses the potential needs of all residents in the community. The City is actively engaged with the Operational Area continually to ensure training, education, risk and hazard assessments, and planning are continually being addressed. The City has adopted the use of SEMS/NIMS in the management of disasters in the City. The plan discusses disaster response, mitigation, and recovery activities through a "whole community" approach. The City has an active bilingual (English and Spanish) CERT (Community Emergency Response Team) program, Listos program (Hispanic preparedness outreach), *Ready!* preparedness program, and continual community education and outreach on preparedness, response, and recovery planning. The City continually offers State- and FEMA-authorized courses to help meet Incident Command System (ICS) education requirements for employee and volunteer staff.

A copy of the City's MHFP is available for review in the Fire Department administration office during regular business hours.

4.9.8 City of Santa Maria Economic Development Element

Core Policies

1. Effectively target the recruitment of commercial, industrial, and retail enterprises that best fit Santa Maria's market and infrastructure. Continue to identify target industries.

2. Utilize a sophisticated and effective Strategic Workforce Action Team (SWAT) that best responds to commercial/industrial (job producing) prospect contacts, resulting in ultimate job creation.
3. Provide a cost-effective, operational Geographic Information System (GIS) with the ability to have integrated layered information, and easily updated.
4. Provide sufficient commercial/industrial sites that meet the size and location needs of prospects. To that end, unless the subject property clearly cannot be used for industrial purposes, suppress the rezoning of any sites from existing industrial zoning unless an equal or greater amount of land is zoned to an industrial classification before or during the zoning process.

   The above policy shall be applied on a case-by-case basis and shall consider some or all of the following factors:

   a. The amount of industrially-zoned land (in acres) currently available at the time of the rezoning request that is readily available for construction.
   b. The land feasibility of the site for industrial development (due to such factors as the size and configuration of the parcel or remaining site area).
   c. Any County property approved by LAFCO for annexation which is pre-zoned to industrial and feasible for development.
   d. A Santa Maria Multiplier Impact rating at or above 2.11 and/or within a one-half point of the average of all industries within the California RIMS II jobs multiplier.
   e. Additional factors may be considered as appropriate for the site being considered.
5. Create and utilize ordinance amendments to address problems that thwart business creativity.
6. Streamline development processes using proven methods, such as concurrent permit processing or Performance Evaluation Review Technology (PERT).
7. Turn the current State budget crisis and negative impact on businesses into a positive situation by contacting businesses threatening to leave the Tri-County regions by emphasizing the many assets common to Santa Maria including the relatively low cost of doing business.
8. Adopt and implement an industrial preservation zone to protect scarce industrially-zoned properties to facilitate long-term job growth.

Note: The City contracts with the Chamber for economic development services.

4.9.9 City of Santa Maria Capital Projects

The City of Santa Maria Capital Projects Report lists the improvement categories and funding for each project within a given category. The City continually evaluates its hazard and risk profile and identifies mitigation strategies, whether by code, policy or by investment in infrastructure improvements. Currently (April 2022) there are multiple projects within the Public Safety category or related categories that have an impact on Public Safety and/or disaster resiliency (including

climate change impacts). Capital projects are continuously evaluated. Current plan can be found on the City's website and search for Capital Projects: https://www.cityofsantamaria.org. Inclusion of a project in the Capital Project list does not imply that funding exists in the budget to accomplish the project.

- **National Integrated Ballistic Information Network**: The National Integrated Ballistic Information Network (NIBIN) is an automated technology that allows law enforcement agencies to compare ballistic evidence from crime scenes to the firearm of an offender. These links provide investigators with leads, increasing the probability of arrest.
- **Public Safety Scheduling Software**: Upgrade personnel scheduling software used by Police and Fire to ensure adequate staffing levels are maintained.
- **Body-Worn Cameras**: Implementation of the use of department-issued body worn cameras to aid in gathering evidence, demonstrate a sense of transparency ,and comply with Assembly Bill 748.
- **Fire Prevention Inspection Software**: Purchase of a software system to increase efficiency and effectiveness of fire prevention and mitigation.
- **Fire Department Parking Lot Resurfacing**: Resurface Fire Station 1 and Fire Station 4 parking lots.
- **Fire Department Training Tower**: To provide a reliable, consistent ,and safe training site for Fire Department personnel. To learn new skills and maintain competencies within industry and mandated standards.
- **Reservoir Site Improvements**: Improvements at reservoir sites 4 and 5 to maintain and prolong the life of the reservoirs; Repair and replacement of roof structure at reservoir 4.
- **Water Main Upgrade**: Replacement of water main lines identified in the City's 2012 Utilities Capacity Study.
- **Well Rehabilitation**: Well rehabilitation and placement of packers. Extend well header line from well 11 to well 6 to increase well capacity and meet potable water requirements.
- **Well Generators and Enclosures**: Purchase of generators and construction of generator enclosures for three well sites.
- **Water Line Conversion**: Convert water lines at Newlove and Battles to larger lines as recommended in the Utility Capacity Study.
- **Potable Water Line**: Construction of a potable water pipeline to the Wastewater Treatment Plant.
- **Reconnect Potable Water System**: Reconnect potable water system to former secondary system to eliminate cross connection and potential for water system contamination.
- **Blending Facility Improvements**: Rehabilitation of the chlorine system piping at the blending facility, through which all of the City's domestic water supply is routed. Installation of valve to isolate the facility from the rest of the distribution system.

- **Hydrant Replacement and Relocation and Valve Replacement and Relocation Projects**: Replace hydrants and valves at the end of their useful life and relocate hydrants and valves as needed by CalTrans projects on Highway 135 (Broadway).
- **Trickling Filter Valve Replacements:** Replacement of seven primary trickling filter valves to ensure efficient operation of the Wastewater Treatment Plant
- **Trash Capture Devices**: Purchase and installation of trash capture devices throughout the City's drainage system in accordance with State regulations. Full implementation to occur over the next 10 years.
- **Hazardous Materials Storage Building Replacement**: Replacement of the Hazardous Materials Storage Building at the Wastewater Treatment Plant
- **Motor Control Replacement**: Replacement of motor controls at the Wastewater Treatment Plant.
- **Telemetry System Rewiring**: Rewiring of telemetry system at the Wastewater Treatment Plant.
- **Cogeneration System**: Design and construct a cogeneration system at the Wastewater Treatment Plant.
- **Equipment Wash Station**: Design and construction of an onsite wash station for vehicles and heavy equipment.
- **Portable Generator**: Purchase of a portable generator to provide a backup power source to the sewer lift station and to the stormwater retention pump at Edwards Basin.
- **SCADA System Connection Design**: Design for a direct connection of instrumentation equipment located at various sites to the SCADA system to reduce communication failures.
- **Water and Wastewater System Upgrade**: Upgrade the Wonderware Software system to increase software security functionality, improve access controls for remote users, have more detailed information on plant operations for supervisors, and improve connectivity with a wider selection of control equipment.
- **DeJoy Sewer Line Upgrades**: Sewer line upgrades for Dejoy Phase II(A-1) as identified in the City's 2012 Utilities Capacity Study.
- **Knudsen Sewer Line Upgrades**: Sewer line upgrades on Knudsen Way (A-2) as identified in the City's 2012 Utilities Capacity Study.
- **Wastewater Treatment Plant Study**: Wastewater Treatment Plant operations study to meet potential upcoming regulatory requirements for nutrient discharge limits.
- **Sewage Sludge Beds**: Construction of additional sewage sludge beds on the north and south sides of the Wastewater Treatment Plant to create additional space for drying, or dewatering.
- **Commercial Organics Recycling Containers**: The organics recycling containers are necessary for the State mandated AB1826 organics recycling requirements.
- **Zero-Emission Electric Automated Side Loader Charging Station:** Construction of a charging station for a zero emission electric automated side loader.

- **Alternative Transportation Enhancements**: Design, construction, and repair of alternative transportation facilities, primarily bicycle or pedestrian infrastructure as required by the Measure A Transportation Plan.
- **Local Roadway Safety Plan Development**: Development of a Local Roadway Safety Plan to comply with requirements for grant funding applications.
- **SMAT Replacement and Expansion Busses**: Purchase of replacement and expansion buses. The replacement buses will provide reliable and dependable buses and allow more frequent service during peak periods.
- **Transit Vehicle Overhaul**: Overhaul up to four SMAT and Breeze buses to enable them to reach their useful life.
- **Transit Electrification Infrastructure**: Planning, design, and installation of infrastructure and charging facilities at Transit properties and facilities to allow for maintenance of electric buses.
- **Transit Intelligent Transportation System**: Integration services to provide intelligent transportation system which would provide real time schedules to passengers and provide vehicle health management tools.
- **Bridge Preventative Maintenance**: Implement Phase 2 of the Bridge Preventative Maintenance Program which includes design and construction of the top priority repairs identified through Phase 1.
- **City Building Security Improvement**s: Engage a security consultant to create a plan to add additional security access control to City-owned buildings.
- **City Wide Wi-Fi**: Perform a design study and begin the implementation of a city-wide Wi-Fi network. The City's Wi-Fi network will enable employees' mobility and will enhance public safety.
- **Expansion of City Wi-Fi**: Expand Wi-Fi to City facilities that currently do not have it to allow for greater efficiency for City staff members and patrons.
- **Connect City Buildings to Fiber Ring**: Connection of City buildings to the fiber ring providing better and more reliable network access
- **Police Department Fleet Expansion**: Additional vehicles to meet operational goals and objectives. **VHF Radio System**: Rehabilitation of the VHF Radio System to maintain interoperability with regional Fire Department mutual aid systems and cover areas of the City where the legacy system does not reach.
    - **Tree Trimming:** Maintain urban forest on City properties to maintain health of the resource and minimize hazards.
- **Emergency Medical Dispatching**: Enhance and expand Public Safety Access Point (aka Dispatch Center) to incorporate EMS dispatchers and required communication and IT infrastructure.
- **Fire Department Forklift:** Replace existing forklift that does not meet OSHA and State of California standards.

- **Fire Station Addition:** Expansion of Fire Station 1 to house existing fire department staff and on duty shift Battalion Chief.

4.10 OPPORTUNITIES FOR MITIGATION CAPABILITY IMPROVEMENTS

The City 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 City 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 City to expand or improve on these policies and programs to further protect the community:

- **Regulatory Opportunities:** As part of this update, the City will comply with AB 2140 by amending its Safety Element to incorporate the LHMP by reference. The City will consider the LHMP in policy, land use plans, and programs, including coastal hazard and sea level rise planning. The City is exploring the creation of a sustainability strategic goals and objectives policy group that would help create a long term, whole community approach to prioritizing infrastructure projects and coordinating available funding sources. Existing processes within the State and Federal regulatory frameworks set the boundaries for local communities to address planning, building, and zoning issues that are the fundamental basis for community resiliency and mitigation.
- **Administrative/Technical Opportunities:** The City aims to improve its resilience to ensure emergency response operations are sustained during a hazardous event, including seismic upgrades, critical facility assessments and upgrades, and improvements to public safety facilities, planning, and information technology. Enhancements to hazard training for staff in partnership with the County and other agencies or stakeholders would improve the City's ability to mitigate hazards with the latest knowledge and resources. The City aims to address hydrologic and water quality issues through continued improvements to its water infrastructure and reduce air quality and urban forestry hazards through monitoring and assessment programs.
- **Outreach Opportunities:** Enhanced community outreach, emergency notifications, and trainings would further enhance the City's capabilities to respond to and recover from hazards. The City could expand outreach through digital tools such as social media, participate in the Great California ShakeOut, and increase FireWise outreach events and media coverage.
- **Fiscal Opportunities:** The City can update its CIP to include hazard mitigation actions from the LHMP. The City can seek grants (e.g., HMGP, BRIC) to fund these CIP projects and related projects in the City's mitigation strategy. The City can seek opportunities to partner with the County and/or other stakeholder agencies in grant applications to address regional hazards more effectively. The City could also consider expanding its fiscal capabilities through its annual budget process and other revenue measures (e.g., raising taxes, property assessments, bonds).

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 City of Santa Maria LHMP. The intent is to confirm and update the description, location and extent, and history of hazards facing the City 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 City.

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 City refined the list of hazards applicable to the City and confirmed the hazard prioritization. The following sections provide the results of this effort.

5.1.1 History of Disaster and Emergency Events in Santa Maria

There is a multitude of events that have affected the populations of Northern Santa Barbara County in the past. The earliest recorded events are in the diaries and records of the various explorers, Spanish Missions, and Ranchos. Earthquakes, floods, wildfires, droughts, and El Niño events are not new phenomena and stretched the resources of the early Spanish colonists and Native American populations. Most recently, the COVID-19 pandemic caused a public health emergency requiring a local response in the City similar to communities throughout the world. The following table lists the currently known multi-family disasters that have occurred or adversely affected populations. It is not a comprehensive listing of all known events. Severe weather events are common. Winds over 40 knots are not uncommon. Rain events over 1" per hour are also common. Some historic events not listed include wildfires in Santa Maria valley before irrigated agriculture and multiple train derailments and collisions with automobiles. Per the Plan Update Guide completed for the 2022 MJHMP update, there have been no significant emergencies or disasters in the City since the last LHMP update in 2016 (Appendix A).

Table 5-1. Historic Emergencies and Disasters Affecting Santa Maria

Event	Date	Description
Earthquake	Dec. 21, 1812	Large-scale (estimated 7+ pts. on Richter scale) located offshore SB county. Heavy damage to missions & Presidio. Original Mission in Lompoc was destroyed. A mudflow during an aftershock was particularly devastating, potentially caused by the failure of the dam/aqueduct system.
Earthquake	Jan. 9, 1857	Fort Tejón Earthquake. Damage to northern Santa Barbara county (Missions Santa Ynez and La Purisima). Damage at Dana Adobe in Nipomo. No record of impacts to Native American settlements in Santa Maria Valley.

Event	Date	Description
Floods	Dec. 1861 – Jan 1862	The "Great Flood". Severe damage to area ports, railroads, and bridges. A significant number of landslides. All rivers overbanked causing widespread destruction.
Earthquake	Mar. 26,1872	Owens Valley Earthquake. Damage in Santa Ynez Valley.
Earthquake	July 27, 1902	Los Alamos area (7+ pt.) Damage to structures.
Earthquake	July 31, 1902	Los Alamos area (7+ pts.) Damage to structures in Los Alamos and Santa Maria.
Floods	Jan. 1907	Significant flooding in the region. Widespread damage to railroads, ports, and infrastructure. Overbanking of all rivers in the area.
Earthquake	Jan. 11, 1915	Los Alamos area. Damage to structures in Los Alamos and Lompoc.
Epidemic	Late – 1917	Influenza epidemic.
Earthquake	Jun. 29,1925	Santa Barbara earthquake, 6.3, estimated location offshore. 3,000 units damaged, 13 dead. Large feeding operation. No shelters (Tents issued) 373 ARC financial assistance cases for home repair / re-building. Felt in Santa Maria, but no reported significant damage or casualties.
Earthquake	Nov. 04, 1927	Lompoc Valley earthquake (7.3). Estimated location off Point Arguello. Damage in the Lompoc area to structures and rail lines. Liquefaction "sand volcanoes" documented.
Earthquake	Nov. 18, 1927	Lompoc Valley earthquake aftershock – Santa Maria damage.
Aviation Incident	Jan. 30, 1945	P-38 Crashes into Rusconi Café in Santa Maria. 3 killed. 2nd P-38 crashes into a nearby field the same day.
Earthquake	July 21, 1952	Kern County Earthquake (7.7). Damage to buildings in Santa Barbara, especially old and poorly repaired from prior 1925 and 1941 events. Damage in Santa Maria with water tower failures and wells reported as going dry.
Aviation Incident	Oct. 26, 1959	Santa Maria Airport, Pacific Airlines flight 308. Engine explosion and fire on takeoff. Clips high voltage power line and crashes. 1 fatality and 19 injured. Power to City of Santa Maria out.
Terrorism	April 25, 1965	Orcutt Hill Sniper. Closure of Highway 101. 4 dead including the shooter. 10 wounded.
Flood	Jan-Feb. 1969	Widespread damage. Evacuations in Santa Maria, Guadalupe, Buellton, and Lompoc. Highways, bridges, railroads, and ports were damaged or destroyed.
Fire	April 25, 1970	Bradley Hotel Fire. City block at the corner of Broadway and Main destroyed. Reserve Firefighter Newton killed.
Earthquake	Aug. 13, 1978	Goleta earthquake 5.7 (Richter Scale) DR 473, no shelters; 395 units affected, all trailers (350 with major damage); 30 ARC cases; $28,000 in ARC relief costs. Significant non-structural damage at UCSB and in Goleta. Train derailment. Felt in Santa Maria but no reported damage or casualties. Economic impact as commute workers' jobs in Goleta was impacted.

Event	Date	Description
HazMat	Dec. 28, 1983	Santa Ynez – Lompoc Valley Hazardous Materials Evacuation; (excessive odorant in natural gas system), 2 shelters in Lompoc and Santa Maria (Hancock College) 644 persons sheltered. Estimated 10,000 to 40,000 evacuated; 60,000, in affected areas; Solvang, Santa Ynez Buellton, Ballard, Lompoc, Los Olivos, Vandenberg Village. Total of $777 ARC relief costs.
HazMat	Apr-86	Vandenberg SFB missile explosion near Casmalia, short term precautionary shelter opened at Hancock College, Santa Maria – no population.
HazMat/, Explosion	Nov. 7, 1990	Welding shop explosion in Guadalupe. 2 dead. 1 building was destroyed, second unreinforced masonry building across the street was condemned due to damage from the shock waves.
HazMat	Jul. 28, 1991	Hazardous Material spill (Mutual Aid and local operation) Sea Cliff Train Derailment – Ventura County incident at SB county line – Hwy 101 closed at Sea Cliff. Sea Cliff community evacuated due to hazardous materials spill, 45 travelers and evacuees sheltered; housed at Santa Barbara Chapter H.Q. and Carpinteria Community Church. Traffic and hotel impact in Santa Maria.
Wind	Dec. 11, 1993	High winds (over 60 MPH) through the area. Downed trees, power lines, fences, and roof damage.
Earthquake	Jan. 17, 1994	Northridge Earthquake; Minor damage (some glassware) in Santa Maria. No significant damage or casualties.
Flood	Jan. 1995	Tri-Counties Flood, DR # 562. Flooding, principally in southern SB County. 349 cases assisted; 14 shelters; 893 shelter residents; 16,000 meals served. Initial isolation of Southern SB County by road, rail, commercial airlines. ARC relief over $100K (Level IV operation). Figures include San Luis Obispo and Ventura county chapters. Homes in Guadalupe and Orcutt were affected.
Landslide	Feb. 1995	La Conchita Mudslide (Mutual Aid – Ventura County Chapter.)
		DR 589. Destruction of several homes due to landslides. The entire community evacuated and temporary closure of Hwy 101. Shelter at Carpinteria Community Church, and the SB Chapter, for evacuees and travelers. (Ongoing hazard area). Closure of 101 created traffic and lodging impacts in Santa Maria.
Flood	Mar. 1995	Central Coast Floods, DR 597, Flooding principally in southern Santa Barbara County. 609 cases assisted; 21 shelters; 344 shelter residents; over 27,000 meals served. Initial isolation of southern Santa Barbara by road, rail, and commercial airlines. ARC relief cost of $1,000,000 (Level IV operation). Also affected San Luis Obispo and Ventura County Chapters. Homes in Guadalupe and Orcutt were affected.
Thunderstorm	Dec. 9, 1996	Severe thunderstorms with winds over 77 MPH. Downed power lines, trees, fences, and roof damage. Some broken windows.
Flood	Feb. 1998	DR 593 Central Coast Floods. Anticipated El Niño event. Associated landslides, coastal erosion, and coastal flooding. 126 cases assisted, 11 shelters, 210 shelter residents, over 4,400 meals served. ARC relief cost of $132, 000 (Data includes Level IV operation overall) Ojai Valley, Ventura County, and San Luis Obispo County chapters were also affected. (Level III in Santa Barbara County). Homes in Guadalupe, Orcutt, and Los Alamos were affected. Santa Maria levee breached near Bonita School Road. High winds (over 60 MPH) downed power lines, fences, trees, and damaged roofs.
Freeze	Dec. 21, 1998	Freeze. 3 nights of below-freezing temperatures with low daytime temps. Numerous broken pipes and crop failures.
Fire	June 9, 2001	Cassiano Berry Supply Fire. No casualties. Required mutual aid from Santa Barbara and San Luis Obispo Counties. Water system pressure drop required booster pumps. On-scene vehicle refueling required.

Event	Date	Description
Floods	Dec. 2004-Jan. 2005	A series of strong storms affected the area with large amounts of rain. Multiple floods and flash flood events. Homes in Guadalupe affected.
Heat	22-Jul-06	Excessive heat. The heat index (temp and humidity) in Santa Maria was between 100 and 119 degrees Fahrenheit.
Freeze	January 13-15, 2007	Freeze. Several nights of below-freezing temperatures with low daytime temps. Widespread frozen and broken water pipes and backflow prevention valves. Widespread crop failure. Federal Disaster Declaration for agricultural losses. Impact on farmworker populations with lost employment.
Power Outage	June 23-24, 2013	Region-wide power outage from PG&E equipment failure Sunday night through Monday morning. Medically fragile populations requiring power overwhelm 9-1-1 and hospital resources.
Flood/Winds	Dec. 11, 2014	An intense thunderstorm band passed through the area with high winds and rainfall over 1" per hour. Widespread power outages, property damage from wind, and downed trees. Street flooding impaired emergency vehicles. Fire Station 1 residential quarters flooded.

5.2 HAZARD SCREENING/PRIORITIZATION

The Hazard Assessment presented here reflects the City'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. Applicable hazard information from the City's 2017 LHMP was incorporated during the development of this section. A comprehensive treatment of hazards and their descriptions may be found in Chapter 5.0 of the Santa Barbara County 2022 MJHMP.

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 City. The City 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 5-2, the local priority hazards in the City 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 Santa Maria LPT as their top priorities (Appendix A). A brief rationale for each hazard is included below. This assessment of key hazards in the City is provided in addition to the 2022 MJHMP's comprehensive assessment of regional hazards that may affect the City.

Table 5-2. City of Santa Maria Local Priority Hazards

Hazard Type and Ranking	Score	Planning Consideration Based on Hazard Level
Earthquake	13	Significant
Pandemic/Public Health Emergency	13	Significant
Drought	11	Significant

Hazard Type and Ranking	Score	Planning Consideration Based on Hazard Level
Extreme Heat	11	Significant
Cyber Hazards	11	Significant
Power Outages/Utility Failure	11	Significant
Severe Weather	10	Moderate
Dam/Levee Failure	9	Moderate
Freeze	8	Moderate
Hazardous Materials Releases	8	Moderate
Transportation Hazards	8	Moderate
Civil Disturbance	7	Moderate
Flooding	6	Moderate
Landslide	4	Low

To continue compliance with the DMA of 2000, the City 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 City in subsections below. The City of Santa Maria LPT acknowledged the following hazards are either not a threat, are highly unlikely within the City limits, or are adequately addressed by the 2022 MJHMP and do not require additional information to be relevant to the City's hazard setting; therefore, these hazards are not addressed further in the City's LHMP: wildfires, mudflow/debris flows, coastal hazards, landslides, geologic hazards, tsunamis, invasive species/agricultural pests, terrorism, natural gas pipeline rupture, and storage facility incidents, oil spills, and radiological incidents.

Further, the City does not agree with the assessment that Well Stimulation/Hydraulic Fracking is a hazard, but rather an oil extraction method. The hazard is groundwater contamination or uncontrolled venting to the atmosphere of hazardous gases if those (or other) extraction methods are done incorrectly or their safety systems fail. However, it is listed in the State required list and was incorporated into the Operational Area list. Because it is or has been a technique of petroleum extraction in the Santa Maria Valley, the assessment of this hazard in Chapter 5.0, *Hazard Assessment* of the 2022 MJHMP relates to the City.

For informational purposes, Section 6.0, *Vulnerability Assessment* discloses the City's critical facilities and population that lies within mapped wildfire hazard areas; however, as described therein, the mapping of wildfire threat within the City may overestimate vulnerabilities and the City does not consider wildfire to be a substantial risk to the City (see Table 5-2 for the top ranking priority hazards in the City).

5.3 EARTHQUAKE & LIQUEFACTION

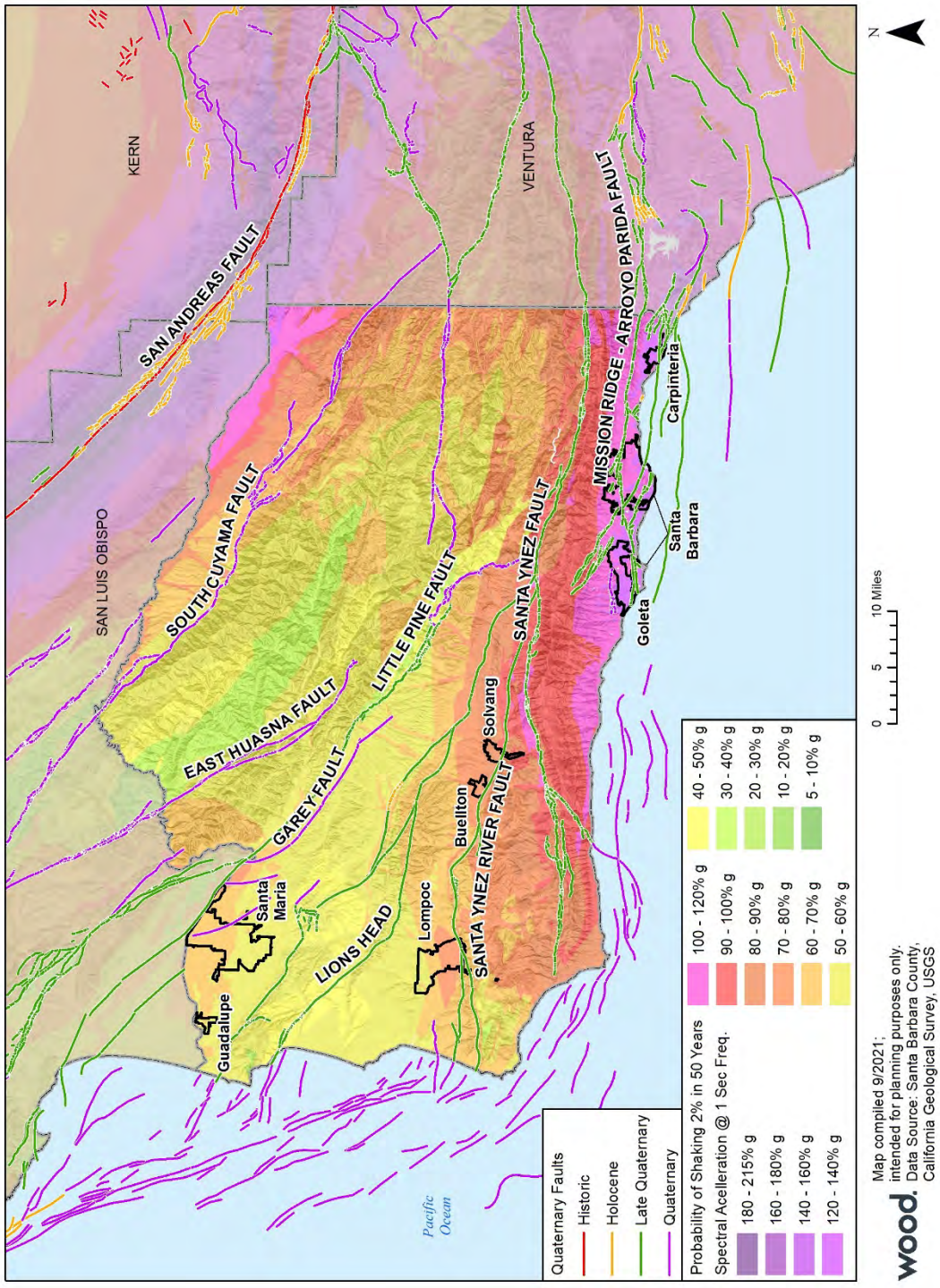
A more complete description of the earthquake and liquefaction hazards is found in Chapter 5.0, *Hazard Assessment* of the 2022 MJHMP. The City is in Seismic Zone 4, which is the highest potential status for an earthquake in California. Many potential quake faults have been mapped in the Santa Maria Valley, as well as some areas that may be subject to liquefaction. However, there is a high

likelihood that there are unidentified faults and unidentified areas of potential liquefaction in the area. Maps included in this plan are based on data provided by the County of Santa Barbara, consistent with the MJHMP that this report is an annex to. Actual shaking during an earthquake will vary depending on the location and nature of the fault rupture. Peak ground acceleration (PGA) is a measure of the strength of ground shaking. Larger peak ground accelerations result in greater damage to structures. PGA is used to depict the risk of damage from future earthquakes by showing earthquake ground motions that have a specified probability (10, 5, or 2 percent) of being exceeded in 50 years return period. Figure 5-1 shows the probability of areas of the county experiencing 2 percent shaking within the next 50 years. These values are often used for reference in construction design, and in assessing relative hazards when making economic and safety decisions.

The City lies within a moderate liquefaction potential zone. When liquefaction of the soil does occur, buildings and other objects on the ground surface may tilt or sink, and lightweight buried structures (such as pipelines) may float toward the ground surface. Liquefied soil may be unable to support its weight or that of structures, which could result in loss of foundation bearing or differential settlement. Liquefaction may also result in the development of cracks in the ground surface followed by the emergence of a sand/water mixture, typically referred to as a sand-boil. In areas underlain by thick deposits of saturated, loose granular sediment (such as alluvial valleys or beaches), subsidence as much as several feet may result.

Both direct and indirect consequences of a major earthquake will severely stress the resources of the City and will require a high level of self-help, coordination, and cooperation. Out-of-city assistance from other local, regional, state, federal, and private agencies may be delayed since earthquakes tend to be large regional events.

Figure 5-1. Santa Barbara County Probability of Shaking 2% in 50 Years



5.4 PANDEMIC/PUBLIC HEALTH EMERGENCY

The City, as well as the county, state, nation, and the entire world, is vulnerable to outbreaks, epidemics, and pandemics caused by either newly emerging or existing diseases spread person to person, through a vector such as a mosquito, or both. A significant public health emergency can have a considerable impact on the population, the economy, and essential public services (e.g., fire and police protection, medical services, etc.). Populations identified by the county as especially vulnerable to human health hazards include undocumented persons, senior citizens, senior citizens living alone, persons with existing chronic health conditions, persons experiencing houselessness, overcrowded households and neighborhoods, low-resourced ethnic minorities people of color, households in poverty, communities with a high-pollution burden, and those without health insurance. Undocumented or non-English speaking individuals may be less able to understand such pandemic-related instructions or receptive to responding to government outreach, while lower-income households may lack the means to comply with the direction. Trends of the COVID-19 pandemic further revealed vulnerable groups within Santa Barbara County population, including residents of Santa Maria.

The Novel Corona Virus Pandemic (2019 to current as of March 2022) exposed the fragility of effectively managing a pandemic. It is essential that protective measures are enacted quickly and accessible messaging is unified across all sectors of Government, businesses, communities and cultural groups. The impacts of the pandemic on local populations was exacerbated by the large number of at risk populations that reside in the City (11 Census Tracts are rated below the 50th percentile in the California Healthy Places Index (HPI)) with age, language and cultural diversity contributing to significant communication barriers. The unsuccessful efforts to convince the Santa Barbara County Public Health Department to engage in recommended Whole Community and Whole of Government response in the spirit of SEMS (Standardized Emergency Management System) and NIMS (National Incident Management System) significantly attenuated an effective response as well as the politization of public health protocols in general. The lack of culturally competent validated and accessible information early on allowed the spread of the disease to go unabated and for the development of alternative narratives that exacerbated disease transmission. While the City understood this, and advocated at the Operational Area and State level, the response was delayed and insufficient. Since the City does not have its own Health Department or Social Services Department, it is likely that similar failures in the future will occur as the City is not the Authority Having Jurisdiction in these matters. This bodes ill for an effective response to future pandemics or similar responses such as radiological, nuclear, and chemical warfare or terrorist events. The City is also limited in its ability to produce timely information in multiple languages and through multiple modalities that are used by different cultures and populations due to limited staffing and budget.

The result was that the local hospital, clinics, residential care facilities, and assisted living facilities were quickly overwhelmed. Ambulance and Fire/EMS services were stretched to failure. Local businesses and services were impacted to the point where some businesses, especially small, locally owned businesses, were unable to continue. The City Utilities department suffered significant economic loss that jeopardized operations due to the inability of many residents to pay water, sewer, and trash bills due to unemployment or loss of wage earner in the household.

The ability of large national retailers to maintain some supply chain capability, while impacted, was significant and contributed to sustaining the supplies necessary for the community and to an increase in tax revenue to the City which was not anticipated. The engagement of City Management with community leaders and Chamber of Commerce significantly attenuated the impact of the pandemic on the City as a whole (while acknowledging that sub populations were disproportionately affected). While extremely challenging, the cooperation between the different sector leaders helped to maintain the viability of critical services in the City and local communities and to effectively use Federal and State relief to maximize mitigation. The City management team effectively used ICS to address emergent challenges and adapted to the changing regulatory environment as well as the practical aspects of continuity of government and business continuity. Because of this, there were minimal deaths from the City employee base and minimal infections within the first year of the pandemic, allowing the City to continue its services to the public.

Residents' health care needs are met by medical resources in Santa Maria, and medical resources within the City also serve the region, including unincorporated communities and the City of Guadalupe. As demonstrated by the COVID-19 pandemic, health care resources were strained throughout the county. Further, hospitality, retail, tourism, and hospitality industries have been adversely affected economically through reduced activity and a limited workforce, including business in the City. The City relies on the Federal, State, and County Health and Human Services systems to monitor and mitigate potential catastrophic disease outbreaks. The City as one of the largest local employers will implement workplace safety protocols to limit the spread of disease and maintain critical services.

5.5 DROUGHT & WATER STORAGE

The City of Santa Maria has an extensive aquifer that is fed by the Sisquoc and Cuyama watersheds. The City actively participates with regional partners and manages the groundwater basin in coordination with other basin stakeholders in the Santa Maria Valley Management Area. The City's Utility Department is the lead agency in the City on water management. The City is also a participant in the Coastal Aqueduct/State Water system. For additional information, the reader is referred to the 2020 Annual Report of Hydrogeologic Conditions, Water Requirements, Supplies, and Disposition: https://www.cityofsantamaria.org/home/showdocument?id=27796. An example of the City partnering with other basin stakeholders to improve the water quality of the basin is a water pipeline to Nipomo Community Services District, which is on the periphery of the basin from the main portion of the basin in Santa Maria. This provides higher quality water to the Nipomo urban area and prevents overdraft of the periphery of the basin which can jeopardize the quality of the water in the basin as well as the overall capacity of the basin http://ncsd.ca.gov/news-info/nipomo-supplemental-water-project/ .)

While the City is not experiencing a water shortage, as of May 2021, Governor Gavin Newsom has declared a drought emergency in 41 California counties in northern and central California (CalMatters 2021). Currently, Santa Barbara County has been in a state-declared drought since July 8, 2021when Governor Gavin Newsom proclaimed a drought emergency, which included 50 of the 58 counties in California. On July 13, 2021, the County Board of Supervisors passed a resolution proclaiming a Local Emergency caused by Drought Conditions. The County resolution cites Newsom's drought declaration, as well as below-average rainfall, received last winter, reduced

storage in reservoirs, and reduced State Water Project supply. Further, low rainfall from 2020 to 2021 has resulted in Classification D3 – Extreme Drought conditions in over 99 percent of the county as identified by the U.S. Drought Monitor (USDM). The City will continue to identify ways to enhance water security and conservation.

5.6 EXTREME TEMPERATURES AND SEVERE WEATHER

The City is susceptible to the same weather patterns as other parts of Central and Southern California. While most of the time, the climate is mild, significant wind, rain, and temperature extremes can and do occur. As planetary warming continues, the severity of storms and weather extremes are predicted to occur. The impacts on the community mostly manifest as stress on the power grid and impacts on persons otherwise not protected from the elements in resilient structures. Impacts traditionally are limited requiring very few evacuations and limited casualties. The number of casualties may increase as the dependency on electricity continues to increase for home oxygen concentrators and other independent living assistive devices.

Table 5-3. Weather Extremes, Santa Maria

Event	Date	Record
Highest Temperature	June 20th, 2008	110 degrees Fahrenheit
Lowest Temperature	January 2nd, 1976 and December 7th, 1978	20 degrees Fahrenheit
Highest Rainfall	February 10th, 1938	3.55 inches
Highest Recorded Wind Speed	NA	NA

Source: National Weather Service eHalt Records Database: http://www.wrh.noaa.gov/lox/climate/ehalt.php?stn=alltime_min) and SANTA MARIA PUBLIC AP, CALIFORNIA - Climate Summary (dri.edu)

Extreme temperatures, particularly heat, pose the greatest danger for the City's outdoor laborers who support the county's agriculture economy. Exertional heat illness occurs across a wide age range and in numerous industries and occupations, including the following: agriculture, construction, firefighting, warehousing, delivery, and service work. Outdoor laborers are exposed to extreme temperatures and at higher risk of heat-related illnesses than other populations of the county. The elderly, children, people with certain medical conditions, and the houseless are also vulnerable to exposure. However, any populations working or recreating outdoors during periods of extreme cold or heat are exposed, including otherwise young and healthy adults and houseless populations. Adults and young people are commonly out in temperatures of extreme heat, whether due to commuting for work or school, conducting property maintenance such as lawn care, or for recreational reasons.

Windstorms, especially sundowner winds, could have a considerable impact on the population, built environment, lifeline infrastructure, and the economy of the City. Severe winds can directly impact the City by damaging or destroying buildings, knocking over trees, and damaging power lines and electrical equipment. Secondary impacts of damage caused by wind events often result from damage to communication, transportation, or medical infrastructure. High winds can lead to Public Safety Power Shutdowns (PSPS) that can impact the local economic drivers and key services. During severe wind events, electricity transmission lines can be damaged or turned off by Pacific Gas and

Electric Company (PG&E), causing widespread power outages and hardships for City residents. Downed power and communications transmission lines, coupled with disruptions to transportation, create difficulties in reporting and responding to emergencies. These indirect impacts of a wind event put tremendous strain on a community. In the immediate aftermath, the focus is on emergency services. Vulnerable groups are especially exposed to the indirect impacts of high winds, particularly the loss of electrical power. These populations include the elderly or disabled, especially those with medical needs and treatments dependent on electricity. Nursing homes, community-based residential facilities, and other special needs housing facilities are also vulnerable if electrical outages are prolonged since backup power generally operates only minimal functions for a short period.

5.7 CYBER ATTACKS & TERRORISM

Cyber-attacks can and have occurred in every location regardless of geography, demographics, and security posture. Incidents may involve a single location or multiple geographic areas. A disruption can have far-reaching effects beyond the location of the targeted system; disruptions that occur far outside the state can still impact people, businesses, and institutions within the county. Between 2012 and 2015, 50 million records of Californians were breached, and the majority of these breaches resulted from security failures, with malware and hacking; physical breaches constituted three-quarters of all events. As the use of digital information expands, Californians will increasingly become more vulnerable to the slow-moving, potential technological hazard of cyber damage (Cal OES 2018). The Santa Barbara County Grand Jury determined in 2020 that cyber-attacks and related threats are an ongoing security issue for all public entities within the county, which requires prompt and aggressive actions to prevent significant disruption (Santa Barbara County Grand Jury 2020).

The City of Santa Maria faces the same vulnerability to cybercrime as any modern municipality. The City has an Information Technology division in the City Manager's Office which has a security plan. The City participates in security audits per Dept. of Justice regulations and other State and Federal laws, policies, and procedures. Under a cyberattack, economic impacts on the banking, financial, and retail sectors could be significant. Some life necessary systems are currently vulnerable in the City (not connected to the internet). Continued security audits and additional attention to this continually developing threat are warranted. The City's security monitoring system interdicts hundreds of attacks and threats to the network daily. Persistent threat actors continually attempt to exploit vulnerabilities across all sectors. While in the past, most attacks were against "large" targets such as Federal agencies or multinational corporations, more recent data indicates a shift in methodology to breach any target. While most of these threats are from criminal organizations with a goal to obtain wealth, similar tools are used by adversary organizations to gain access to critical systems to exploit vulnerabilities in any area of a nation to sow discord or disrupt national supply chains and capabilities and to supply data for AI data aggregation to identify targets for adversary nations. Recent breaches in the infrastructure of Cloud and SAS services have far reaching implications on the ability to maintain access to critical systems. Interdicted Pipeline and power distribution systems can impact huge regions (Colonial Pipeline June 2021) In 2020 and 2021, breaches in the SolarWinds, Microsoft 365, Microsoft Exchange, threatened networks worldwide. More recently in December 2021, the Kronos Workforce Telestaff

breach caused hundreds of governments to lose the ability to pay employees including the City of Santa Maria. Fortunately for the City, it had a continuity plan in place and was able to mitigate the impactThe 2018 California State Hazard Mitigation Plan refers to terrorism as the use of weapons of mass destruction, including biological, chemical, nuclear, and radiological weapons; arson, incendiary, explosive, and armed attacks; industrial sabotage and intentional hazardous materials releases; and cyber terrorism. Terrorism can occur throughout the entire county but due to its intended purpose would most likely happen in more populous urban areas where more devastation and panic would ensue, such as the City of Santa Maria. Other crimes can occur that have the same impact on a community, but may not be politically motivated and therefore would not be classified as Terrorism. In some cases, the intent of the event may not be known, but the impact on the community is the same. For example, an industrial accident or transportation accident may be intentional or an act of sabotage.

In any event, the mitigation of such actions is a challenge. Regulation of potentially harmful substances during their manufacture and transportation certainly is helpful. The identification and tracking of individuals and organizations who may have the intent to harm are balanced against civil liberties in the United States. People who intend to create mayhem are only limited by their imagination.

Fortunately, except in a very few instances, the ability to debilitate a community is more difficult than the perpetrators may have imagined. Certainly, such acts are shocking, painful, and despicable, but rarely do they result in mass evacuations. Casualties can exceed local response capability (classified as Mass Casualty Incidents) but are transitory. The psychological and social impacts of the event will likely create more challenges than the initial incident.

5.8 ENERGY SHORTAGE & RESILIENCE

Energy access is one of the key impacts of disasters that mitigation actions can have a significant influence on resiliency. Any event that disrupts power for more than a day, can cause significant social disruption, energy, and potential deaths. The current reliance on relatively few power production stations with a power distribution grid spreading over thousands of miles of terrain with the myriad of threats and hazards that the distribution system is subject to makes the normal operation of the system seem miraculous. The City of Santa Maria receives all of its commercial power from Pacific Gas and Electric (PG&E) and is near the end of its distribution system, making it more susceptible to power disruptions (as any failure has more area to occur between the end and the origin(s) of the system).

The City has limited ability to affect resiliency in the power distribution system. It actively participates in reducing its power usage and partners with PG&E, the State of California, and Federal energy conservation programs.

Legislative opportunities exist at the State level to encourage a more geographically disbursed and redundant power distribution system, including urban solar systems. The need exists for more backup generator capacity in our daily supply system (fueling stations, grocery stores, clinics, dialysis centers, independent living senior housing, etc.) The State is encouraged to find opportunities to require backup generation for key societal infrastructure. We require fire suppression systems

and Carbon Monoxide detectors. It can be argued that backup generation is more critical in life safety and certainly more impactful on community resiliency.

As more people continue to live independently, the distribution of life-sustaining equipment that requires power is also increasing. The City will continue to have limited ability to respond to this challenge. Residents are encouraged to work with their support systems and neighbors to enhance their preparedness.

5.9 DAM/LEVEE FAILURE

The Santa Maria River Levee System is located in the northern portion of the county, to the north of the City of Santa Maria, and extends from the City of Guadalupe to the community of Garey. The levee system consists of 17 miles of a stone-revetted levee along the south side of the Santa Maria River, which protects the City of Santa Maria, and approximately 5 miles of stone-revetted levee along the north side of the river, which largely protects agricultural land (see Figure 5-3). The Santa Maria River is formed by the confluence of the Cuyama and Sisquoc Rivers. The Santa Maria River Levee System was designed to convey the peak flow of the design flood on the Santa Maria River from the confluence of the Cuyama and Sisquoc Rivers downstream to the Highway 1 bridge (USACE 2011). Runoff from the Cuyama River watershed is largely controlled by Twitchell Dam which is located upstream of the confluence. When combined with the flood retention capacity of Twitchell Dam, this levee system protects the City of Santa Maria; including the main business district, commercial, industrial and residential property, as well as agricultural lands in the Santa Maria Valley.

Several floods have occurred since the levees were constructed, each with relatively low peak discharges. Because the natural channel averages about 2,000 feet in width, the floods did not fill the channel but meandered and impinged against the existing levees. This impingement undermined the levee toe causing considerable damage and jeopardized adjacent properties, demonstrating that the levee was vulnerable to smaller discharges and as a result would not provide the protection for which it was designed. In 2009, the USACE began the Santa Maria River Levee Improvement Project to strengthen an approximately 6.5-mile reach of the existing south levee with sheet pile and soil cement to address the above-described deficiency in preventing flooding from Blosser Road to the Bradley Canyon confluence (USACE 2009). In 2013, the Bradley Canyon Levee Extension project was approved and implemented to strengthen approximately 3,700 feet of the Bradley Canyon Levee, which is a part of the Santa Maria Levee Rehabilitation and provides comprehensive flood protection for the Santa Maria Valley and substantially reduces historical flood risk (USACE 2013). These recent improvements by the USACE to the Santa Maria River Levee have greatly reduced the probability of impinging flows undermining the levee in critical areas.

However, levee maintenance is needed. Recent USACE reports document damage to the levees by rodents, erosion, and human activity. (Santa Maria River 3a Levee Segment Santa Barbara County, California NLD System ID # 3805010095 Periodic Inspection Report No. 1 Generalized Executive Summary Final System Rating: Minimally Acceptable Final Rating Date: May 6, 2015, Santa Maria River 4 Levee System Santa Barbara County, California NLD System ID # 3805010094 Periodic Inspection Report No 1 Generalized Executive Summary Final System Rating: Unacceptable Final Rating Date: May 8, 2015, Santa Maria River 1 Levee System San Bernardino (SIC) County,

California NLD System ID # 3805010096 Periodic Inspection Report No 1 Generalized Executive Summary Final System Rating: Unacceptable Final Rating Date: December 19, 2013)

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.

The Twitchell Dam was constructed in the early 1950s to serve as a flood control and groundwater basin recharge tool. The dam receives runoff water from approximately 1,135 square miles of Cuyama watershed areas north and east of Santa Maria. The dam has a storage capacity of approximately 224,300 acre-feet of water. The dam is a seasonal water collection system and water is released on a regularly scheduled basis to recharge the groundwater basin in the Santa Maria Valley or to manage flooding in high rain events. The Twitchell Dam is maintained by an on-site caretaker, and while the likelihood of a catastrophic failure of the dam is remote, the potential damage to the City of Santa Maria is significant should a failure occur. Twitchell Reservoir and Dam is a U.S. Department of the Interior, Bureau of Reclamation facility. The Bureau maintains a plan that is available to response agencies.

5.10 HAZARDOUS MATERIALS RELEASE

Hazardous materials are addressed in Chapter 5.0, *Hazard Assessment* of the 2022 MJHMP. The City of Santa Maria has numerous commercial and industrial businesses that utilize hazardous materials as part of their daily operations. In addition, the Santa Maria Valley is home to agricultural operations that produce a multitude of crops that are distributed both locally and worldwide. With these agricultural activities comes the use of agricultural-related chemicals and refrigerants such as anhydrous ammonia. Hazardous materials that may be released from petroleum production, transportation accidents, or radiological accidents from Diablo Canyon Nuclear Power Plant are addressed collectively in this section.

Figure 5-2. Location of Santa Maria River Levee Segments

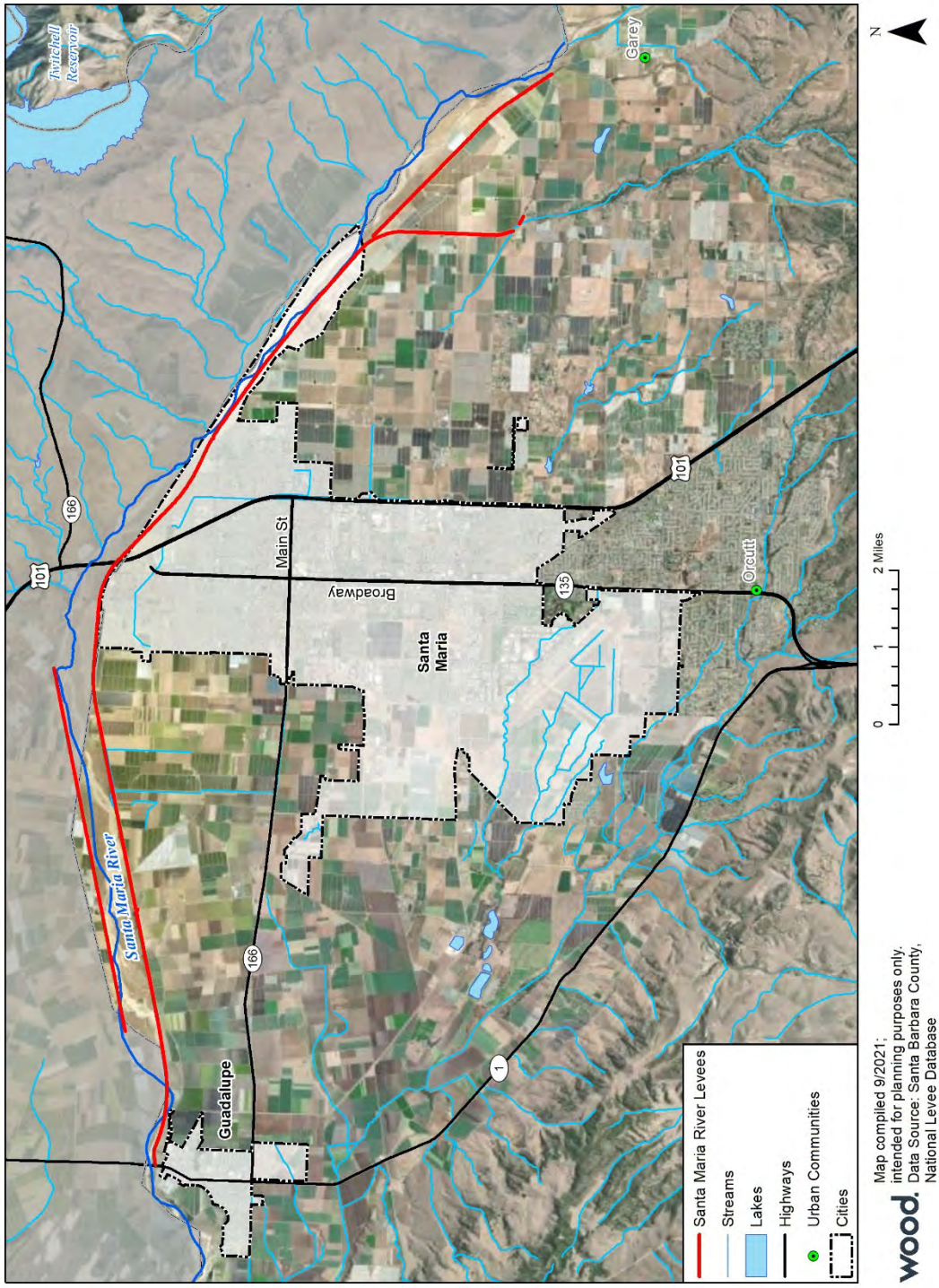
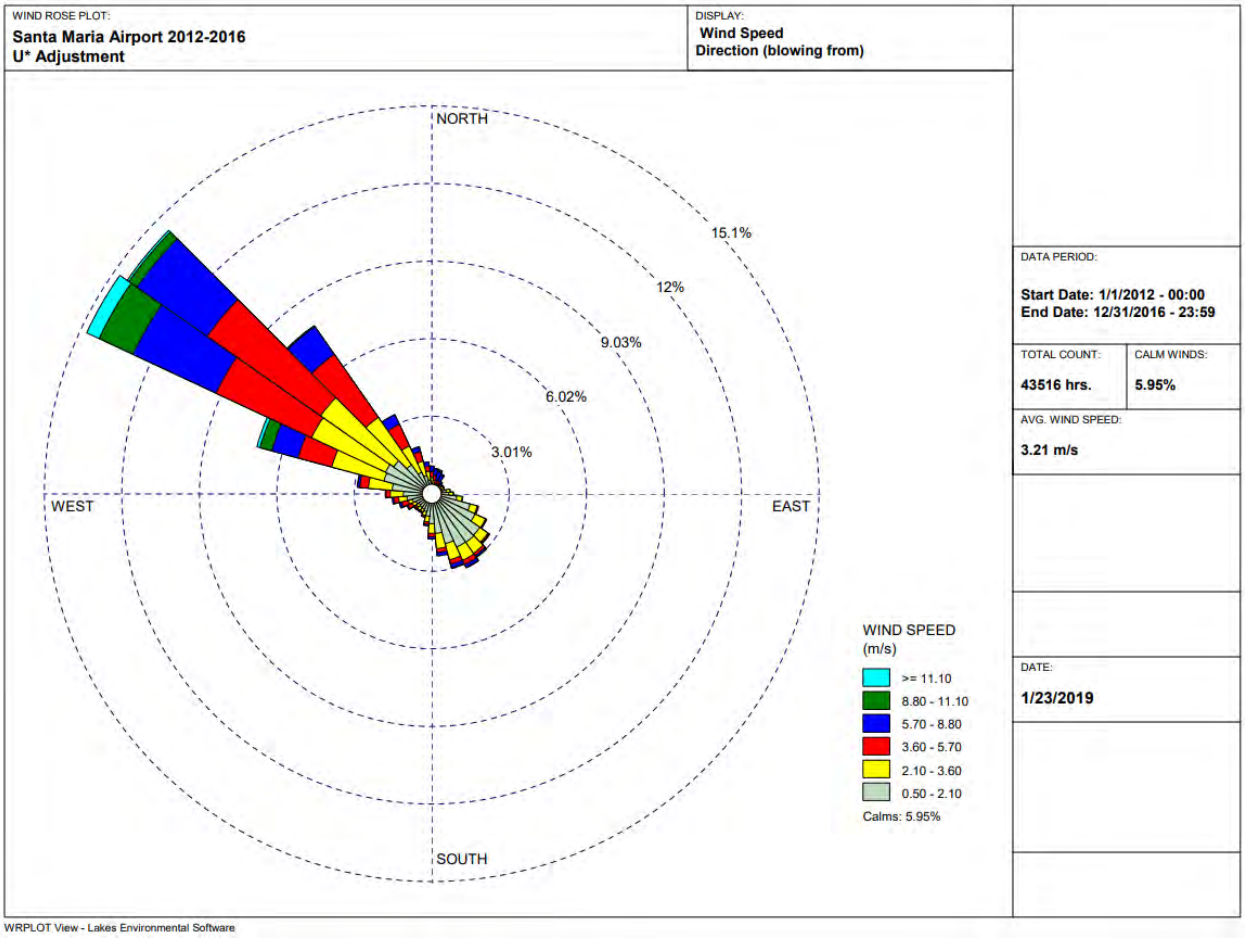


Figure 5.3. Wind Rose for Santa Maria Airport



Source: Santa Maria Airport U* 2012-2016 Wind Rose (ourair.org)

5.10.1 Chemical Release

Petroleum production and transportation is an industry in the Santa Maria Valley with over 100 years of history. The City relies on the California Department of Conservation, Division of Oil, Gas, and Geothermal Resources (DOGGR) to monitor and manage the safety of well drilling and eventual decommissioning or abandonment. The County of Santa Barbara also monitors and regulates oil production in the Santa Maria Valley with an emphasis on environmental compliance and safety. Adequate monitoring and adherence to regulations are critical for the City as almost all petroleum wells (past and present) pass through the City's aquifer. Petroleum production in the Santa Maria Basin is also noteworthy in that it has the highest concentrations of Hydrogen Sulfide (H_2S) in the State, with concentrations of 270,000 ppm. The reader is referred to Publication No. M10 *Drilling and Operating Oil, Gas, and Geothermal Wells in an H_2S Environment* (Dosch & Hodgson, 1997) published by DOGGR. Short-term exposure and inhalation of over 600 ppm result in death within 15 minutes. Longer-term exposures over 100 ppm can also result in death within hours.

For an annotated map of oil wells and status, the reader is referred to the California Division of Oil, Gas, and Geothermal Resources, Map 312:

(http://www.conservation.ca.gov/dog/maps/pages/d3_index_map1.aspx .)

In addition to the use and storage of hazardous materials in the City and surrounding valley, Santa Maria is near Vandenberg Space Force Base (VSFB) where a significant amount of hazardous materials are stored and used. While VSFB has an excellent safety record related to its hazardous materials, the threat of a significant release due to accidental or intentional acts is ever-present. Should a significant release occur at VSFB, regional impacts would affect the City, but it would be unlikely to result in casualties as the prevailing winds would normally keep any airborne release South of the City.

The City has been very fortunate in the past and has had no serious releases of hazardous materials. Businesses that have sufficient material to pose a threat to large areas of the community are required to submit Risk Management Plans to the Santa Barbara County Environmental Health and Safety Division (CUPA) and to Santa Barbara County Fire Department which maintains the Hazardous Materials Response Unit for the Operational Area. The City Fire Department is not large enough, nor has sufficient human and financial resources to create and maintain a certified hazardous materials response unit. Therefore, the immediate response will be focused on area denial and either evacuation or Shelter in Place. Shelter in Place or evacuation will be determined by the City Fire Incident Commander based on the variables of the event (toxicity, concentration, humidity, winds, ability to move the population, etc.). In most cases, Shelter In Place will be required, as most material is too close to high-density residential areas to allow for sufficient time to evacuate and to bring in busses for those who do not have transportation.

There are a variety of hazardous materials, from individually packaged items available in stores and homes to large amounts used in manufacturing and industrial processes. In most cases, the larger amounts have the most potential for area-wide impacts and are regulated by a variety of Federal, State, and County agencies and programs. It is because of this regulatory framework that the probability is listed as medium. Leaks and releases have, and will occur, however, they are usually limited in scope and rarely result in significant evacuations or casualties.

The potential exists as infrastructure ages and as political will changes for this category of hazard to increase in potential and effect. In the Santa Maria area, many significant users and producers of hazardous materials are upwind and close enough to high-density housing areas that there will be no warning between a release and its impact on people in their homes.

The agricultural industry uses large quantities of ammonia to operate their refrigeration systems, and there are significant quantities of fertilizers and pesticides stored and dispensed in the community. Anhydrous ammonia is an efficient and widely used source of nitrogen fertilizer. However, it is one of the most potentially dangerous chemicals used in agriculture. Ammonia gas is colorless and has a sharp, penetrating odor. When used as an agricultural fertilizer, it is compressed into a liquid. In the liquid state, it is stored in specially designed tanks strong enough to withstand internal pressures of at least 250 pounds per square inch (psi). During warm weather, the temperature of the liquid anhydrous ammonia in the tank increases and the liquid expands, causing the vapor pressure in the tank to increase. When pressure is released, liquid anhydrous ammonia quickly converts to a gas. When injected into the soil, the liquid ammonia expands into a gas and is readily absorbed in the soil moisture. Similarly, in contact with the eyes, skin, or mucous membranes, ammonia will cause rapid dehydration and severe burns. There are other chemicals

used in industrial processes that may be safe in their normal form but can create toxic byproducts if burned.

5.10.2 Oil Spills & Well Stimulation/Hydraulic Fracturing

The City is located in a historic oil production area, with a history of oil production extending over a century. Native Americans collected asphaltum from surface seeps and beach deposits for thousands of years in this area. Petroleum and petroleum byproducts are inherently flammable and toxic if ingested, inhaled, or otherwise handled improperly. Petroleum products are refined and transported daily in large quantities, with most automobiles carrying approximately two gallons of lubrication/hydraulic oil and twenty gallons of fuel, usually gasoline. Commercial equipment has considerably more, and all of those needs are transported and stored daily over highways, railroads, and pipelines to fueling stations widely distributed over the landscape. While the potential for localized events remains and has occurred, the fact that so few events have created any significant impact illustrates this as a low impact event. The role of regulatory compliance and safety engineering should not be underestimated in mitigating this potentially lethal material.

The continued safe production of petroleum is reliant on a robust regulatory system to ensure compliance. The City has had thousands of oil production wells within its jurisdiction over the last 100 years, but as our population has increased, high-density residential areas now exist next to oil production and transportation systems, and in some cases on top of decommissioned wells and other infrastructure. These wells also traverse through the City's aquifer. Any failure or inadequately decommissioned well has the potential to contaminate the aquifer. The extremely high Hydrogen Sulfide gas concentrations in the oil production basin, in addition to the normal risks of petroleum, require continued vigilance to ensure the safety of our residents and visitors. These regulatory processes exist outside of the City's legal jurisdiction. Continued engagement with County, State, and Federal agencies are required to ensure the safety of Santa Maria area residents.

For a map of interstate pipelines, qualified government and emergency services personnel are referred to the National Pipeline Mapping System of the Dept. of Transportation: https://www.npms.phmsa.dot.gov/default.aspx. Pipelines in California (intrastate) are regulated by the State Fire Marshal. Natural Gas pipeline infrastructure maps are available California Dept. of Energy:

https://www.energy.ca.gov/sites/default/files/2020-10/Natural_Gas_Pipelines_ADA.pdf.

Hydrogen Sulfide releases in Santa Maria would likely result in very large evacuations (thousands) and result in significant casualties. Impact modeling is an opportunity for future hazard mitigation plan updates.

5.10.3 Radiological Accident

The Diablo Canyon Nuclear Power Plant, operated by the Pacific Gas and Electric Company (PG&E), is located on the San Luis Obispo County coast approximately 12 miles west of the City of San Luis Obispo and 30 miles northwest of the City of Santa Maria. PG&E announced in June 2016 that it intends to completely halt operations there by 2025 and retire the complex – California's last operating nuclear power plant.

Figure 5-4. Ingestion Pathway Map, Diablo Canyon NPP

Source: San Luis Obispo County Office of Emergency Services

Emergency response action plans are not specifically required for Santa Barbara County for a nuclear power emergency at the Diablo Canyon Power Plant. There are no Protective Action Zone (PAZs) or Public Education Zones (PEZs) in Santa Barbara County or Santa Maria. However, the City of Santa Maria is located in the Ingestion Pathway Zone (IPZ) and is committed to a support role in the event of an emergency in San Luis Obispo County involving Diablo Canyon. While there is no plan to house or decontaminate evacuees in Santa Maria, the presumption is that evacuees will impact Santa Maria and Santa Barbara County based on evacuation patterns following the north/south transportation grid within the areas involved.

While current plans are to shut down the nuclear power plant, onsite storage of radioactive material will continue until the regulatory system creates an acceptable reprocessing, waste diversion, and sequestration system. The DCNPP is highly regulated and a catastrophic release of radiological material is extremely remote. However, if such an event did occur, it would have long-term sociological and economic impacts.

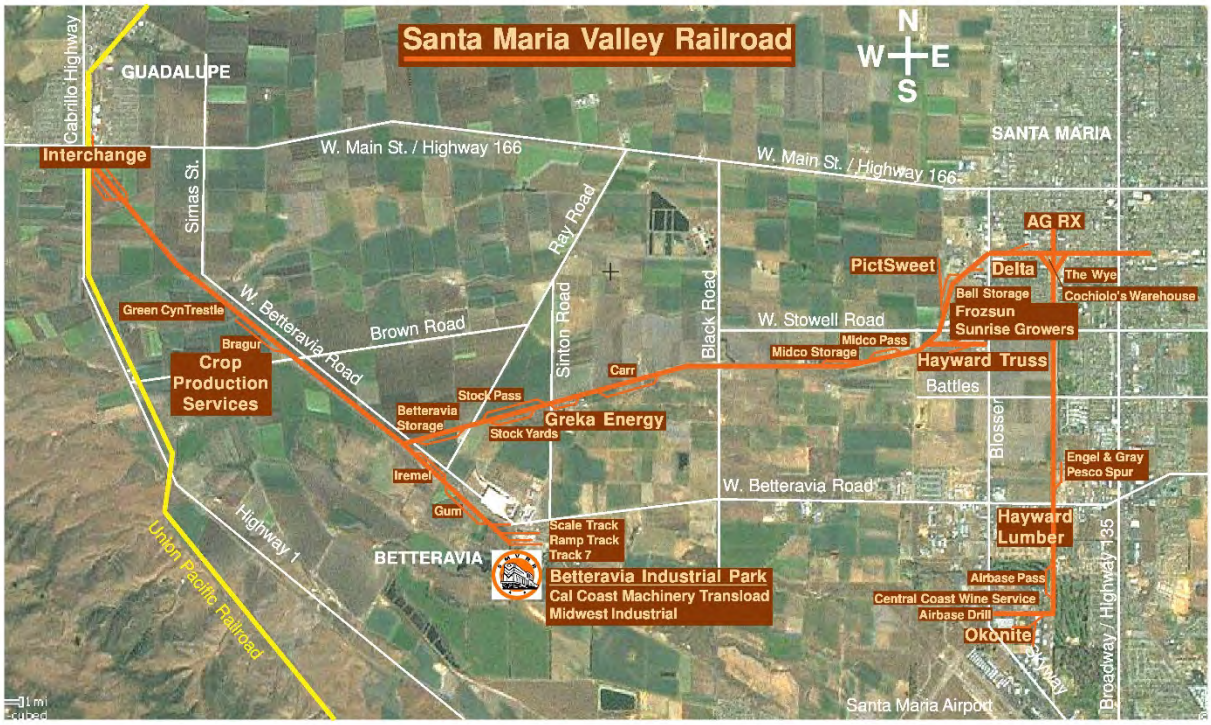
Santa Maria lies outside of the current State and Federal Emergency Protective Zones (which could include shelter in place or evacuation.) Emergency planning requirements for nuclear power plants are based on guidance from the Nuclear Regulatory Commission (NRC), Federal Emergency

Management Agency (FEMA) and State Office of Emergency Services (OES). The State OES has established a planning area for the Diablo Canyon Power Plant that is larger than that required by the NRC and FEMA. The City of Santa Maria has adopted the official State emergency planning zones. However, the City and environs are well within the 50-mile IPZ, which extends for 50 miles from the plant. As the City is downwind from the nuclear power plant, long-term impacts would probably result in spontaneous mass evacuation and collapse of the local economy. While it would likely be safe to live here, the stigmatization would make it highly likely that there would be significant long-term social disruption and community relocation.

5.10.4 Transportation Accidents

The City of Santa Maria is home to the Santa Maria Valley Railroad (SMVR). The SMVR is a low-speed system that serves local industries in the transportation of bulk materials needed for manufacture and in the export of products. The SMVR also stores products in rail cars on sidings and track for a variety of customers. The low speed of rail cars and small consists (number of cars in the train) in the area minimizes the risk of spillage or rupture as most railcars are built to be resilient. While the risk of an accident is small, the potential impact has dramatically increased as population density and development have occurred downwind and next to rail transportation corridors and their industrial customers. Most rail accidents happen at significant speeds or during the loading or unloading of products. Therefore, the most likely scenario would be an accident during the transfer of hazardous material. The City currently does not have a regulatory method to monitor or manage rail operations in the City. The City does not have sufficient resources to respond to a hazardous material spill of any significant size. As most materials within rail cars are unknown to initial responders, any gaseous or odiferous spill would immediately result in area denial and evacuations. Impacts would be determined by the toxicity, volatility, or flammability of the material. Worst case scenario would be thousands of evacuees and hundreds of casualties, especially if it occurred next to high density residential areas. It is important to note that there have been very few accidents on the SMVR system throughout its history, and none have resulted in evacuations or a significant number of casualties.

Figure 5-5. Santa Maria Valley Railroad

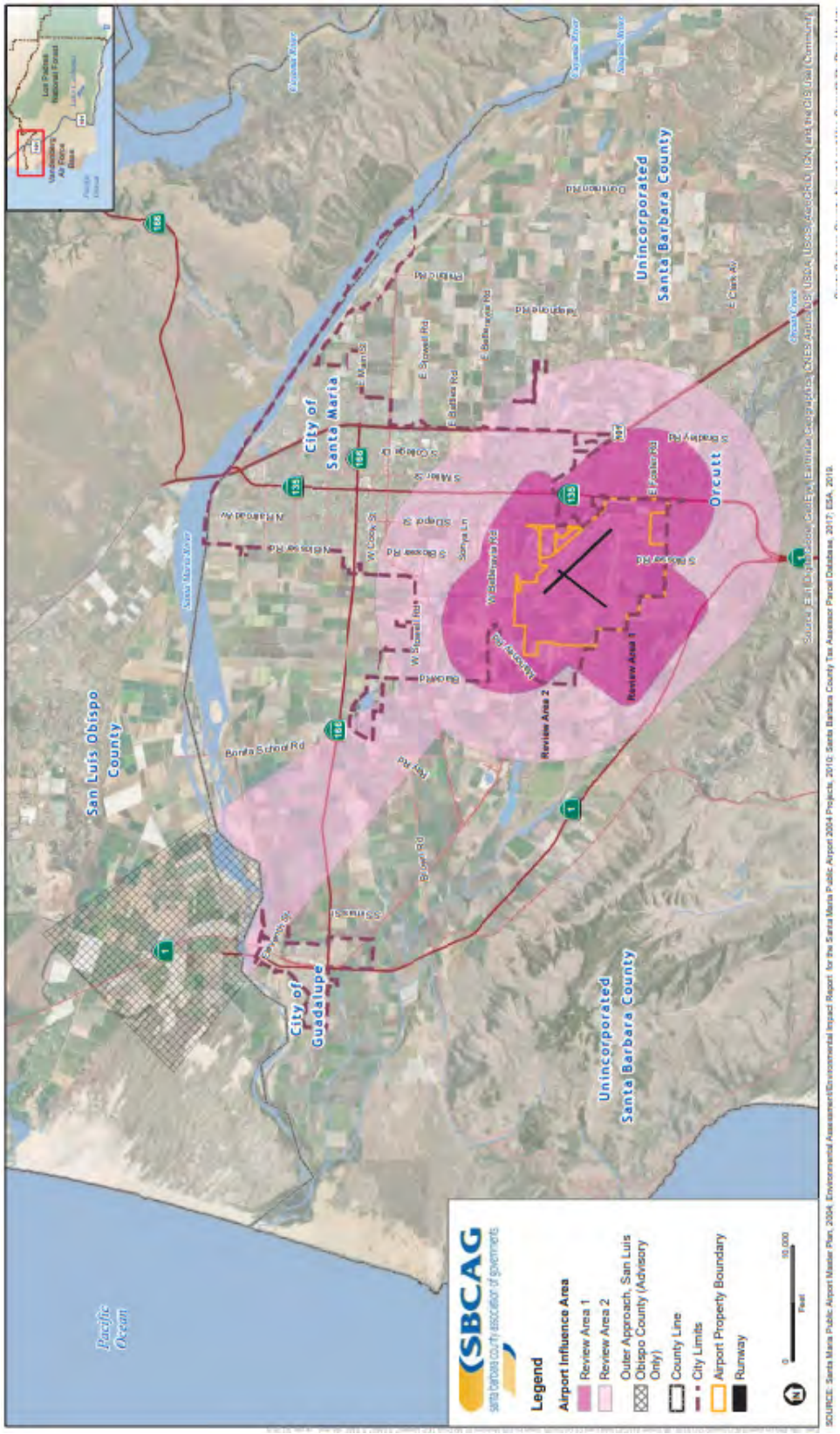


Source: http://www.smvrr.com/map.html)

The Santa Maria Public Airport District is located adjacent to the City of Santa Maria. Private and leased aircraft use the airport and a National Forest Service Air Attack base is hosted at the airport. Santa Maria is located along the Pacific Flyway so aircraft traveling along the Pacific Coast of the United States are often in or near the airspace controlled by the Santa Maria FAA tower.

The airport and neighboring jurisdictions, including the City, maintain special zoning to manage appropriate development in the approach and take-off zones of the airport, which are potentially the most hazardous times in flight operations. The scarcity of aircraft crashes, and their relatively small area of effect place this event as a low probability/low impact event. There are no high-density housing areas within the approach and take-off zones. There are single-family residences, commercial, and industrial facilities near approach and takeoff zones (Figure 5-3).

Figure 5-6. Santa Maria Public Airport Influence Zone



5.11 CIVIL DISTURBANCE

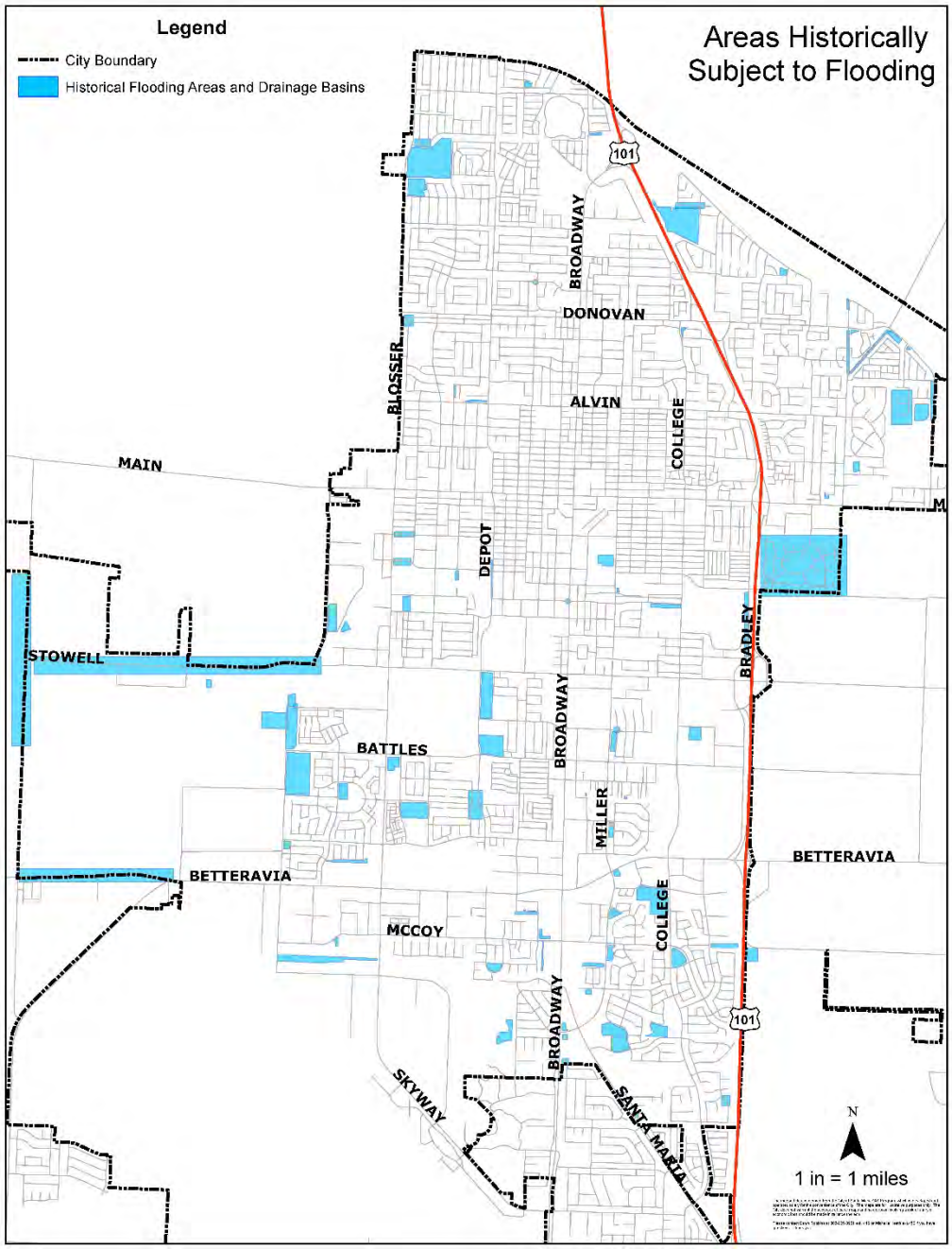
Civil disturbances in Santa Maria have been limited to Constitutionally protected speech, with very little social disruption, violence, or destruction, with the largest demonstrations associated with agricultural labor movements and social justice issues. As the City becomes more diverse and the population continues to increase, the problems of larger urban centers will likely manifest here as well. The City can mitigate those impacts by concerted efforts at whole community outreach, perceived fairness to all residents, and earnestly addressing issues of grave concern to any segment of the community. City leaders are encouraged to take Crisis Communications courses and the City is evolving its ability to constructively engage with the community using emerging social media tools. While the risk of a Civil Disturbance is low given local history, the potential impacts are also relatively low and would likely be transitory.

5.12 FLOOD

The City of Santa Maria is located on the floor of a valley, in a reclaimed riverbed. When the City was first developed, the pioneers diverted the Santa Maria River to create the corporate City limits. The U.S. Army Corps of Engineers subsequently constructed the Santa Maria River Levee to contain the river flow to the north end of the valley. Due to the relatively flat terrain, the City is subject to localized urban flooding during rainstorms and from agricultural irrigation runoff from the east side of the City. While the City has generally developed and maintained infrastructure to control stormwater and agricultural water runoff, there are areas of the City which were annexed from the County which did not have adequate stormwater and agriculture water runoff infrastructure in place. At-risk of flooding areas in Santa Maria include (depends on rainfall intensity): This is not meant to be a comprehensive list.

- Black Road between Betteravia Road and Stowell Road (and sometimes to Main Street (Hwy 166)
- West Stowell Road from around Kameo Way to Black Road
- Hancock Park neighborhood and South Bradley Road near Allan Hancock College
- Harding and Dejoy, off North Blosser Road near Donovan Road
- West Canal Street near North Blosser and Rancho Verde
- North Panther Drive and the Edwards Basin
- The area bounded by Thornburg Street, Depot Street, Carmen Lane, Sonya Lane
- East Main Street at the Philbric Road entrance to the Santa Maria Regional Landfill

Figure 5-7. City of Santa Maria with Historic Flood Prone Areas



Source: http://www.cityofsantamaria.org/city-government/departments/fire-services/emergency-and-wet-weather-preparedness

The City's LPT has identified two areas of the City that could benefit from the allocation of disaster mitigation funds to reduce the potential for damage from localized urban flooding.

- The Country Club Estates Subdivision was annexed from the County of Santa Barbara and the downstream area (west) of that subdivision does not have adequate infrastructure to carry storm and agriculture water runoff and localized flooding has occurred.

- The Hancock Park Subdivision has inadequately sized piping to carry the storm and agriculture water runoff and localized flooding has occurred. The existing infrastructure runs under the subdivision and adding to or expanding the existing piping is not feasible. An alternative routing of the new infrastructure needs to be done to adequately meet the needs.
- As development increases and agricultural practices change (aka Hoop Structures), drainage, percolation, and run off patterns will change. The City currently mitigates this by the construction of storm water percolation basins co-located with parks. However, the chance for unintended consequences is present. For example, agricultural runoff is not regulated by the City and many properties lie outside of the City's jurisdiction (unincorporated Santa Barbara County).

6.0 VULNERABILITY ASSESSMENT

The vulnerability assessment builds on the hazard assessment provided in Section 5.0 to estimate losses where data is available and consider a specific list of critical facilities identified within the City of Santa Maria. The City identified 118 critical facilities to be included in the Vulnerability Assessment portion of the LHMP. These facilities primarily included utilities, government, and educational structures. Of the available data, it was shown that these buildings are worth approximately $94,509,416 in total value (Table 6-1).

However, this list should be considered a best estimate as no systematic study has been done to identify critical facilities and their dependencies, nor to identify which facilities are critical to which parts of the population. For example, a radio station that transmits information in Mixtec dialects would be critical to provide life safety information to a significant proportion of the population in the Santa Maria Valley but is not traditionally listed as a critical facility.

Table 6-1. Critical Facilities in the City of Santa Maria

Type	Name	Address	Total Building Value
Cellular Tower	SANTA BARBARA CELLULAR SYSTEMS, LTD.	1952 ROEMER CT	-
Cellular Tower	GTE MOBILNET OF SANTA BARBARA LIMITED PARTNERSHIP	2220 SOUTH BRADLEY ROAD & HIGHWAY 101	-
Communications	Foster -48V		-
Government	SM CORP. YARD FUEL ISLAND CANOPY	912 W. FOSTER ROAD	$33,548
Power Plant	COSSA	NOT AVAILABLE	-
Power Plant	SANTA MARIA COGEN PLANT	802 S. HANSON WAY	-
Power Plant	SANTA MARIA LFG POWER PLANT	1400 EAST CHURCH STREET	-
Power Plant	J&A-SANTA MARIA II LLC	2065 EAST MAIN STREET	-
Water Tank	SM CORP YARD WATER TOWER	912 W. FOSTER ROAD	$90,423
Hazmat	SM AG COMMISIONER'S PESTICIDE BLDG	624B W. FOSTER ROAD	$257,928
RMP Facilities	GOLD COAST PACKING INC	840 W BOONE	-

Type	Name	Address	Total Building Value
RMP Facilities	CITY OF SANTA MARIA BLENDING STATION	1301 FAIRWAY DRIVE	-
RMP Facilities	CALIFORNIA GIANT	1900 W. STOWELL RD.	-
RMP Facilities	NH3 SERVICE CAMPANY	609 S. DEPOT ST.	-
RMP Facilities	BONITA PACKING REFRIGERATION FACILITY	1850 W. STOWELL RD.	-
RMP Facilities	LINEAGE LOGISTICS - SANTA MARIA	1349 WEST LA BREA AVENUE	-
RMP Facilities	SANTA MARIA RAIL TERMINAL	755 SOUTH BLOSSER	-
RMP Facilities	FROZ-SUN FOODS, INC.	1315 SOUTH BLOSSER ROAD	-
Animal Shelter	SM ANIMAL SERVICES SHELTER	548 W. FOSTER RD	$6,174,190
Clinic	BETTERAVIA BLDG B, SM PHD HEALTH CLINIC	2115 CENTERPOINTE PKWY.	$7,156,372
Clinic	SM MENTAL HEALTH CENTER	500 W. FOSTER ROAD	$2,646,203
Clinic	Santa Maria Care Center	820 West Cook Street	-
Clinic	Community Health Centers Of The Central Coast- Santa Maria II	201 W. Mill St	-
Clinic	Marian Community Health Clinic-Santa Maria	117 W. Bunny Ave	-
Clinic	Community Health Centers Of The Central Coast- CHOP	2801 Santa Maria Way	-
Clinic	Community Health Centers Of The Central Coast- Santa Maria III	1414 S. Miller	-
Clinic	Villa Maria Health Care Center	425 East Barcellus Avenue	-
Clinic	Country Oaks Care Center	830 East Chapel Street	-
Clinic	Central Coast Kidney Disease	1401 East Main Street	-
Clinic	Marian Medical Center	1400 East Church Street	-
Clinic	PHD Santa Maria Women's Health	116 S. Palisade Dr.	-
Clinic	Marian Extended Care	1530 East Cypress Way	-
EMS Station	SANTA MARIA FIRE DEPARTMENT STATION 1	300 WEST COOK STREET	-
EMS Station	SANTA MARIA FIRE DEPARTMENT STATION 2	416 WEST CARMEN LANE	-
EMS Station	SANTA MARIA FIRE DEPARTMENT STATION 3	1527 NORTH COLLEGE DRIVE	-
EMS Station	SANTA MARIA FIRE DEPARTMENT STATION 4	2637 S. COLLEGE DRIVE	
EMS Station	SANTA MARIA FIRE DEPARTMENT STATION 5	1670 E. DONOVAN ROAD	
EMS Station	SANTA MARIA FIRE DEPARTMENT STATION 6	3339 TERMINAL DRIVE	
EMS Station	CALSTAR 7 - SANTA MARIA	3996 MITCHELL ROAD	-

Type	Name	Address	Total Building Value
EMS Station	AMERICAN MEDICAL RESPONSE STATION 9	625 SOUTH MCCLELLAND STREET	-
Nursing Home	VILLA MARIA HEALTHCARE CENTER	425 BARCELLUS AVE	-
Nursing Home	MERRILL GARDENS AT SANTA MARIA	1220 SUEY ROAD	-
Nursing Home	COUNTRY OAKS CARE CENTER	830 E CHAPEL ST	-
Nursing Home	MARIAN REGIONAL MEDICAL CENTER DP/SNF	1530 CYPRESS WAY	-
Nursing Home	SANTA MARIA TERRACE	1405 EAST MAIN STREET	-
Nursing Home	SANTA MARIA CARE CENTER	820 W COOK ST	-
College Police	ALLAN HANCOCK COLLEGE POLICE DEPARTMENT	800 SOUTH COLLEGE DRIVE	-
Colleges / Universities	ALLAN HANCOCK COLLEGE	800 SOUTH COLLEGE DRIVE	-
Colleges / Universities	CET-SANTA MARIA	509 W MORRISON AVE	-
Colleges / Universities	SANTA BARBARA BUSINESS COLLEGE-SANTA MARIA	303 E PLAZA DR STE 1	-
Corrections	SM JUVENILE HALL HOLDING FACILITY	4263 CALIFORNIA BLVD	$9,041,957
Corrections	SM JUVENILE HALL INTAKE/ADMINISTRATION	4263 CALIFORNIA BLVD	$6,137,024
Corrections	SM JUVENILE HALL	4263 CALIFORNIA BLVD	$3,799,526
Court	SM COURT COMPLEX SUP CRT/DA BLDG G	312 E. COOK STREET	$8,513,522
Court	SM JUVENILE COURT BUILDING	4285 CALIFORNIA BLVD	$3,008,935
Court	SM COURT COMPLEX SUPERIOR COURT BLDG C	312 E. COOK STREET	$2,087,988
Court	SM COURT COMPLEX COURTHOUSE BLDG D	312 E. COOK STREET	$2,598,819
Court	SM COURT COMPLEX PUB. DEFEND BLDG A	312A E. COOK STREET	$1,618,720
Court	SM COURT COMPLEX COURT CLERKS BLDG E	312E E. COOK STREET	$693,256
Court	SM COURT COMPLEX SUPERIOR COURT BLDG H	312 E. COOK STREET	$654,776
Court	SM COURT COMPLEX JURY ASSY BLDG F	312F E. COOK STREET	$456,197
Court	COURT BAIL REVIEW OFFICE	624B W. FOSTER ROAD	$369,423
Court	SM COURT COMPLEX SUP CRT/DA BLDG	312G E. COOK STREET	$40,311
Education	JIM?NEZ ROBERTO AND DR. FRANCISCO ELEMENTARY SCHOOL	1970 S. BISCAYNE ST.	-
Education	EL CAMINO JUNIOR HIGH	219 W. EL CAMINO	-

Type	Name	Address	Total Building Value
Education	TAYLOR (IDA REDMOND) ELEMENTARY	1921 N. CARLOTTI DR.	-
Education	SANTA MARIA HIGH	901 S. BRD.WAY	-
Education	FESLER (ISAAC) JUNIOR HIGH	1100 E. FESLER ST.	-
Education	ALVIN ELEMENTARY	301 E. ALVIN AVE.	-
Education	KUNST (TOMMIE) JUNIOR HIGH	930 HIDDEN PINES WAY	-
Education	SANCHEZ (DAVID J.) ELEMENTARY	804 W. LIBERTY ST.	-
Education	ONTIVEROS (JUAN PACIFICO) ELEMENTARY	930 W. RANCHO VERDE	-
Education	ADAM (WILLIAM LAIRD) ELEMENTARY	500 W. WINDSOR	-
Education	BRUCE (ROBERT) ELEMENTARY	601 W. ALVIN AVE.	-
Education	PIONEER VALLEY HIGH	675 PANTHER DR.	-
Education	TUNNELL (MARTIN LUTHER) ELEMENTARY	1248 E. DENA WAY	-
Education	OAKLEY (CALVIN C.) ELEMENTARY	1120 W. HARDING ST.	-
Education	BATTLES (WASHINGTON) ELEMENTARY	605 E. BATTLES RD.	-
Education	FAMILY PARTNERSHIP HOME STUDY CHARTER	625 S. MCCLELLAND	-
Education	LIBERTY ELEMENTARY	1300 W. SONYA LN.	-
Education	RICE (WILLIAM) ELEMENTARY	700 E. VICKIE AVE.	-
Education	FAIRLAWN ELEMENTARY	120 N. MARY DR.	-
Education	MILLER (ISAAC) ELEMENTARY	410 E. CAMINO COLEGIO	-
Education	AGAPE SCHOOL OF CHRISTIAN EDUCATION	109 W FESLER ST	-
Government	BETTERAVIA BLDG C, SOCIAL SERIVCES	2125 CENTERPOINTE PKWY.	$18,753,217
Government	BETTERAVIA BLDG A, PROBATION	2121 CENTERPOINTE PKWY.	$7,129,302
Government	BETTERAVIA CENTER, BLDG D. ADMIN.	511 LAKESIDE PKWY.	$3,580,845
Government	SM CORP YARD GS GARAGE/ OFFICE BLDG	912 W. FOSTER ROAD	$1,856,641
Government	NORTH COUNTY TECHNICAL SERVICE BLDG	624A W. FOSTER ROAD	$1,168,435
Government	SM CORP. YARD STEEL GARAGE/SHOPS	912 W. FOSTER ROAD	$541,237
Government	LIGHT WAREHOUSE SHELL BUILDING	912 W. FOSTER ROAD	$179,719
Government	SM CORP YARD OFFICE TRAILER	912 W. FOSTER ROAD	$60,646
Government	SM CORP YARD GS STORAGE GARAGE	912 W. FOSTER ROAD	$37,009
Government	CHILD SUPPORT SERVICES OFFICES	201 SO. MILLER	$458,457

Type	Name	Address	Total Building Value
Government	SOCIAL SERVICES ONE-STOP OFFICE	1410/1444 S. BROADWAY	$1,058,138
Government	CITY OF SANTA MARIA CITY HALL	110 E. COOK ST	
Government	CITY OF SANTA MARIA FINANCE & CITY ATTORNEY'S OFFICE	204 E. COOK ST	
Highway Patrol	CALIFORNIA HIGHWAY PATROL - SANTA MARIA	1710 NORTH CARLOTTI DRIVE	-
Police	SANTA MARIA POLICE DEPARTMENT	222 EAST COOK STREET	-
Sheriff	SM SHERIFF'S SUB-STATION	812A W. FOSTER ROAD	$3,058,702
Sheriff	SM SHERIFF'S OFFICE MODULAR	812A W. FOSTER ROAD	$118,101
Bridge - Non Scour Fair Condition	Bridge	'STOWELL RD' / 'US HIGHWAY 101'	-
Bridge - Non Scour Fair Condition	Bridge	'U.S. HIGHWAY 101' / 'JONES STREET'	-
Bridge - Non Scour Fair Condition	Bridge	'U.S. HIGHWAY 101' / 'STATE ROUTE 166'	-
Bridge - Non Scour Fair Condition	Bridge	'N135-N101 N101-S13' / 'US HWY 101 (@PM 90.75)'	-
Bridge - Non Scour Fair Condition	Bridge	'STATE ROUTE 135' / 'BRADLEY CHANNEL'	-
Bridge - Non Scour Fair Condition	Bridge	'N101-MAIN ST OFF' / 'BRADLEY CHANNEL'	-
Bridge - Non Scour Fair Condition	Bridge	'MAIN ST-N101 ON RP' / 'BRADLEY CHANNEL'	-
Bridge - Non Scour Fair Condition	Bridge	'SUEY CROSSING RD' / 'SANTA MARIA RIVER'	-
Bridge - Non Scour Fair Condition	Bridge	'RANCHO VERDE ST' / 'BLOSSER CHANNEL'	-
Bridge - Non Scour Fair Condition	Bridge	'MAGELLAN DRIVE' / 'BRADLEY CHANNEL'	-
Bridge - Non Scour Fair Condition	Bridge	'STOKES AVENUE' / 'BRADLEY CHANNEL'	-
Bridge - Non Scour Fair Condition	Bridge	'COX LANE' / 'BLOSSER CHANNEL'	-
Bridge - Non Scour Good Condition	Bridge	'ALVIN AVE' / 'US HWY 101 & BRADLEY CHN'	-
Bridge - Non Scour Good Condition	Bridge	'DONOVAN RD' / 'US HIGHWAY 101'	-
Bridge - Non Scour Good Condition	Bridge	'BETTERAVIA ROAD' / 'US HIGHWAY 101'	-
Bridge - Non Scour Good Condition	Bridge	'MAIN STREET' / 'BRADLEY CHANNEL'	-
Bridge - Non Scour Good Condition	Bridge	'TAYLOR STREET' / 'BLOSSER CHANNEL'	-
Bridge - Non Scour Good Condition	Bridge	'RAILROAD AVENUE' / 'BRADLEY CHANNEL'	-

Type	Name	Address	Total Building Value
Bridge - Non Scour Good Condition	Bridge	'CARLOTTI DRIVE' / 'BRADLEY CHANNEL'	-
Bridge - Non Scour Good Condition	Bridge	'LAUREN LANE' / 'BRADLEY CHANNEL'	-
Bridge - Non Scour Good Condition	Bridge	'BLOSSER ROAD' / 'BLOSSER CHANNEL'	-
Government	SM CORP YARD VEHICLE OPS BLDG	912 W. FOSTER ROAD	$1,129,849

Using a GIS and the mapped extents of the hazards affecting the City, it was determined which critical facilities are exposed to which hazards depending on whether they fall within the mapped hazard area. The results of the exposure analysis are included in this section. A further description of the threats and methodologies used in this analysis is provided in Chapter 6.0, *Vulnerability Assessment* of the 2022 MJHMP. As the City continues to assess its vulnerability, the collection of better and more complete data will help to improve the risk assessment process to direct planning and mitigation decisions.

Table 6-2. Summary of Potential Impacts on Critical Facilities

Hazard Type	Specific Risk	Count	% of Critical Facilities Impacted	Exposure ($)
Flood	FEMA 1% Chance Flood Zone	4	3%	$-
	FEMA 0.2% Chance Flood Zone	14	12%	$17,122,046
Dam Inundation/Levee Failure	Twitchell Dam Failure	88	75%	$18,180,184
Wildfire	Low Wildfire Threat	2	2%	$-
	Moderate Wildfire Threat	2	2%	$-
	High Wildfire Threat	8	7%	$3,929,072
Earthquake	Moderate Liquefaction Potential	118	100%	$94,509,416
	Regional Ground Shaking	118	100%	$94,509,416

6.1 EARTHQUAKE & LIQUEFACTION

Chapter 6.0, *Vulnerabilities Assessment* of the 2022 MJHMP addresses regional seismicity under two scenarios that include the City of Santa Maria. The 2,500-year scenario considers general seismicity

from multiple faults in the region and a 7.0 magnitude event. The methodology utilizes probabilistic seismic hazard contour maps developed by the U.S. Geological Survey (USGS) for the 2018 update of the National Seismic Hazard Maps that are included with Hazus-MH. A deterministic scenario was also prepared to predict the outcome of a specific earthquake event. The deterministic scenarios used USGS provided ShakeMap datasets to model a Magnitude 7.2 earthquake of the San Luis Range would generate in terms of damages and losses for the chosen area of interest (i.e., northern Santa Barbara County, including the City). Figure 6-1 is the ShakeMap produced for this scenario.

As described in the MJHMP, regional losses to people and property would include the City. As shown in the San Luis Range ShakeMap scenario, the north and central parts of the county would perceive much stronger shaking and would likely receive the most severe damage when compared to the rest of the county. The entire City would perceive severe to extreme shaking and would likely receive moderate/heavy to very heavy damage. Direct effects of ground shaking could damage buildings and create dangerous debris and unstable structures. Displaced residents would likely seek shelter in the City, including residents from outside the City. Further, fires often occur after an earthquake. Because of the number of fires and the lack of water to fight the fires, they can often burn out of control.

Unreinforced masonry building type structures consist of buildings made of unreinforced concrete and brick, hollow concrete blocks, clay tiles, and adobe. Buildings constructed of these materials are heavy and brittle and typically provide little earthquake resistance. In small earthquakes, unreinforced buildings can crack, and in strong earthquakes, they tend to collapse. These types of structures if unreinforced pose the greatest structural risk to the life and safety of all general building types. Due to the public safety risks that are posed by unreinforced masonry buildings, the California legislature passed Senate Bill 547 (Government Code Section 8875 et seq.). This legislation went into effect January 1, 1987, and required all cities and counties located in Seismic Zone 4, which includes Santa Barbara County, to conduct an inventory of potentially hazardous structures, including unreinforced masonry buildings.

To comply with the requirements of SB 547, Santa Maria City Council adopted an unreinforced masonry (URM) implementation ordinance in 1989. The ordinance adopted a standard and a schedule for reinforcing URM buildings based on the type of building and its occupancy load. All known unreinforced masonry buildings have been retrofitted to meet seismic requirements. The City does have a significant number of buildings that are over 50 years old, and are subject to damage from a major quake but are not required to be retrofitted because of low occupancy. The Building Division has a list of buildings that have been retrofitted, need retrofitting, and those that are not required to be retrofitted.

The City's water reservoirs are located primarily below ground and are designed to resist a strong earthquake. However, the piping from the reservoirs to the City water system may be vulnerable to damage from a quake. Two of the City's reservoirs do not have seismic valves that would close in the event of an earthquake and retain the water in the reservoirs for domestic and firefighting use. The City also relies on well water and State Water pipeline for its drinking water. It is not uncommon for wells to fail (changes in the water table or failure of well casing) during an earthquake. Pipelines are equally vulnerable to rupture if deformation or displacement is sufficient to cause pipe failure.

The City has sufficient capability to provide generator power to operate the water wells, and water reservoirs for life and safety needs, and full capability to provide generator power to operate the wastewater treatment plant during a prolonged power outage. The City also has significant capabilities to operate City fuel facilities during prolonged power outages. This was not the case during earlier LHMPs (2004, 2011). Those plans were used to prioritize projects that have increased the City's ability to maintain services.

The City lies in an area with a moderate liquefaction severity class. Regional earthquakes could cause liquefaction in the City, which could damage buildings and utilities when soils become unstable. Based on the GIS analysis conducted for the 2022 MJHMP, the City has 21,993 improved parcels valued at over $11 billion in the moderate liquefaction severity zone. Based on this analysis, which accounts for residents only and not workers, 75,756 residents are living in this hazard zone within the City. While liquefaction would not likely affect all areas uniformly during an earthquake, this analysis indicates the extent and scale of vulnerabilities to liquefaction during a large earthquake.

Table 6-3. City of Santa Maria at Risk to the Moderate Liquefaction Hazard by Property Type

Property Tyle	Improved Parcel Count	Total Value	Population
Agricultural	6	$2,836,490	
Commercial	1,055	$2,125,217,550	
Exempt	126	$1,127,554,408	
Industrial	472	$1,739,666,455	
Mixed Use	8	$15,317,928	30
Residential	20,302	$6,404,131,299	75,726
Improved Vacant	24	$8,798,864	
Total	**21,993**	**$11,423,522,994**	**75,756**

As listed in Table 6-4, all critical facilities in the City would be vulnerable to damage or destruction from ground shaking and liquefaction during a significant regional earthquake (see also, Section 6.2.1, *Earthquake (Groundshaking)* and Section 6.3.3, *Liquefaction (Earthquake)* of the 2022 MJHMP).

Table 6-4. City of Santa Maria Critical Facilities Vulnerable to Groundshaking & Liquefaction

Type	Name	Address	Total Building Value
Cellular Tower	SANTA BARBARA CELLULAR SYSTEMS, LTD.	1952 ROEMER CT	-
Cellular Tower	GTE MOBILNET OF SANTA BARBARA LIMITED PARTNERSHIP	2220 SOUTH BRADLEY ROAD & HIGHWAY 101	-
Communications	Foster -48V		-
Government	SM CORP. YARD FUEL ISLAND CANOPY	912 W. FOSTER ROAD	$33,548
Power Plant	COSSA	NOT AVAILABLE	-
Power Plant	SANTA MARIA COGEN PLANT	802 S. HANSON WAY	-

Type	Name	Address	Total Building Value
Power Plant	SANTA MARIA LFG POWER PLANT	1400 EAST CHURCH STREET	-
Power Plant	J&A-SANTA MARIA II LLC	2065 EAST MAIN STREET	-
Water Tank	SM CORP YARD WATER TOWER	912 W. FOSTER ROAD	$90,423
Hazmat	SM AG COMMISIONER'S PESTICIDE BLDG	624B W. FOSTER ROAD	$257,928
RMP Facilities	GOLD COAST PACKING INC	840 W BOONE	-
RMP Facilities	CITY OF SANTA MARIA BLENDING STATION	1301 FAIRWAY DRIVE	-
RMP Facilities	CALIFORNIA GIANT	1900 W. STOWELL RD.	-
RMP Facilities	NH3 SERVICE CAMPANY	609 S. DEPOT ST.	-
RMP Facilities	BONITA PACKING REFRIGERATION FACILITY	1850 W. STOWELL RD.	-
RMP Facilities	LINEAGE LOGISTICS - SANTA MARIA	1349 WEST LA BREA AVENUE	-
RMP Facilities	SANTA MARIA RAIL TERMINAL	755 SOUTH BLOSSER	-
RMP Facilities	FROZ-SUN FOODS, INC.	1315 SOUTH BLOSSER ROAD	-
Animal Shelter	SM ANIMAL SERVICES SHELTER	548 W. FOSTER RD	$6,174,190
Clinic	BETTERAVIA BLDG B, SM PHD HEALTH CLINIC	2115 CENTERPOINTE PKWY.	$7,156,372
Clinic	SM MENTAL HEALTH CENTER	500 W. FOSTER ROAD	$2,646,203
Clinic	Santa Maria Care Center	820 West Cook Street	-
Clinic	Community Health Centers Of The Central Coast- Santa Maria II	201 W. Mill St	-
Clinic	Marian Community Health Clinic-Santa Maria	117 W. Bunny Ave	-
Clinic	Community Health Centers Of The Central Coast- CHOP	2801 Santa Maria Way	-
Clinic	Community Health Centers Of The Central Coast- Santa Maria III	1414 S. Miller	-
Clinic	Villa Maria Health Care Center	425 East Barcellus Avenue	-
Clinic	Country Oaks Care Center	830 East Chapel Street	-
Clinic	Central Coast Kidney Disease	1401 East Main Street	-
Clinic	Marian Medical Center	1400 East Church Street	-
Clinic	PHD Santa Maria Women's Health	116 S. Palisade Dr.	-
Clinic	Marian Extended Care	1530 East Cypress Way	-
EMS Station	SANTA MARIA FIRE DEPARTMENT STATION 1	300 WEST COOK STREET	-
EMS Station	CALSTAR 7 - SANTA MARIA	3996 MITCHELL ROAD	-
EMS Station	SANTA MARIA FIRE DEPARTMENT STATION 2	416 WEST CARMEN LANE	-
EMS Station	SANTA MARIA FIRE DEPARTMENT STATION 3	1527 NORTH COLLEGE DRIVE	-
EMS Station	AMERICAN MEDICAL RESPONSE STATION 9	625 SOUTH MCCLELLAND STREET	-

Type	Name	Address	Total Building Value
Nursing Home	VILLA MARIA HEALTHCARE CENTER	425 BARCELLUS AVE	-
Nursing Home	MERRILL GARDENS AT SANTA MARIA	1220 SUEY ROAD	-
Nursing Home	COUNTRY OAKS CARE CENTER	830 E CHAPEL ST	-
Nursing Home	MARIAN REGIONAL MEDICAL CENTER DP/SNF	1530 CYPRESS WAY	-
Nursing Home	SANTA MARIA TERRACE	1405 EAST MAIN STREET	-
Nursing Home	SANTA MARIA CARE CENTER	820 W COOK ST	-
College Police	ALLAN HANCOCK COLLEGE POLICE DEPARTMENT	800 SOUTH COLLEGE DRIVE	-
Colleges / Universities	ALLAN HANCOCK COLLEGE	800 SOUTH COLLEGE DRIVE	-
Colleges / Universities	CET-SANTA MARIA	509 W MORRISON AVE	-
Colleges / Universities	SANTA BARBARA BUSINESS COLLEGE-SANTA MARIA	303 E PLAZA DR STE 1	-
Corrections	SM JUVENILE HALL HOLDING FACILITY	4263 CALIFORNIA BLVD	$9,041,957
Corrections	SM JUVENILE HALL INTAKE/ADMINISTRATION	4263 CALIFORNIA BLVD	$6,137,024
Corrections	SM JUVENILE HALL	4263 CALIFORNIA BLVD	$3,799,526
Court	SM COURT COMPLEX SUP CRT/DA BLDG G	312 E. COOK STREET	$8,513,522
Court	SM JUVENILE COURT BUILDING	4285 CALIFORNIA BLVD	$3,008,935
Court	SM COURT COMPLEX SUPERIOR COURT BLDG C	312 E. COOK STREET	$2,087,988
Court	SM COURT COMPLEX COURTHOUSE BLDG D	312 E. COOK STREET	$2,598,819
Court	SM COURT COMPLEX PUB. DEFEND BLDG A	312A E. COOK STREET	$1,618,720
Court	SM COURT COMPLEX COURT CLERKS BLDG E	312E E. COOK STREET	$693,256
Court	SM COURT COMPLEX SUPERIOR COURT BLDG H	312 E. COOK STREET	$654,776
Court	SM COURT COMPLEX JURY ASSY BLDG F	312F E. COOK STREET	$456,197
Court	COURT BAIL REVIEW OFFICE	624B W. FOSTER ROAD	$369,423
Court	SM COURT COMPLEX SUP CRT/DA BLDG	312G E. COOK STREET	$40,311
Education	JIM?NEZ ROBERTO AND DR. FRANCISCO ELEMENTARY SCHOOL	1970 S. BISCAYNE ST.	-
Education	EL CAMINO JUNIOR HIGH	219 W. EL CAMINO	-
Education	TAYLOR (IDA REDMOND) ELEMENTARY	1921 N. CARLOTTI DR.	-
Education	SANTA MARIA HIGH	901 S. BRD.WAY	-

Type	Name	Address	Total Building Value
Education	FESLER (ISAAC) JUNIOR HIGH	1100 E. FESLER ST.	-
Education	ALVIN ELEMENTARY	301 E. ALVIN AVE.	-
Education	KUNST (TOMMIE) JUNIOR HIGH	930 HIDDEN PINES WAY	-
Education	SANCHEZ (DAVID J.) ELEMENTARY	804 W. LIBERTY ST.	-
Education	ONTIVEROS (JUAN PACIFICO) ELEMENTARY	930 W. RANCHO VERDE	-
Education	ADAM (WILLIAM LAIRD) ELEMENTARY	500 W. WINDSOR	-
Education	BRUCE (ROBERT) ELEMENTARY	601 W. ALVIN AVE.	-
Education	PIONEER VALLEY HIGH	675 PANTHER DR.	-
Education	TUNNELL (MARTIN LUTHER) ELEMENTARY	1248 E. DENA WAY	-
Education	OAKLEY (CALVIN C.) ELEMENTARY	1120 W. HARDING ST.	-
Education	BATTLES (WASHINGTON) ELEMENTARY	605 E. BATTLES RD.	-
Education	FAMILY PARTNERSHIP HOME STUDY CHARTER	625 S. MCCLELLAND	-
Education	LIBERTY ELEMENTARY	1300 W. SONYA LN.	-
Education	RICE (WILLIAM) ELEMENTARY	700 E. VICKIE AVE.	-
Education	FAIRLAWN ELEMENTARY	120 N. MARY DR.	-
Education	MILLER (ISAAC) ELEMENTARY	410 E. CAMINO COLEGIO	-
Education	AGAPE SCHOOL OF CHRISTIAN EDUCATION	109 W FESLER ST	-
Government	BETTERAVIA BLDG C, SOCIAL SERIVCES	2125 CENTERPOINTE PKWY.	$18,753,217
Government	BETTERAVIA BLDG A, PROBATION	2121 CENTERPOINTE PKWY.	$7,129,302
Government	BETTERAVIA CENTER, BLDG D. ADMIN.	511 LAKESIDE PKWY.	$3,580,845
Government	SM CORP YARD GS GARAGE/ OFFICE BLDG	912 W. FOSTER ROAD	$1,856,641
Government	NORTH COUNTY TECHNICAL SERVICE BLDG	624A W. FOSTER ROAD	$1,168,435
Government	SM CORP. YARD STEEL GARAGE/SHOPS	912 W. FOSTER ROAD	$541,237
Government	LIGHT WAREHOUSE SHELL BUILDING	912 W. FOSTER ROAD	$179,719
Government	SM CORP YARD OFFICE TRAILER	912 W. FOSTER ROAD	$60,646
Government	SM CORP YARD GS STORAGE GARAGE	912 W. FOSTER ROAD	$37,009
Government	CHILD SUPPORT SERVICES OFFICES	201 SO. MILLER	$458,457
Government	SOCIAL SERVICES ONE-STOP OFFICE	1410/1444 S. BROADWAY	$1,058,138
Highway Patrol	CALIFORNIA HIGHWAY PATROL - SANTA MARIA	1710 NORTH CARLOTTI DRIVE	-

Type	Name	Address	Total Building Value
Police	SANTA MARIA POLICE DEPARTMENT	222 EAST COOK STREET	-
Sheriff	SM SHERIFF'S SUB-STATION	812A W. FOSTER ROAD	$3,058,702
Sheriff	SM SHERIFF'S OFFICE MODULAR	812A W. FOSTER ROAD	$118,101
Bridge - Non Scour Fair Condition	Bridge	'STOWELL RD' / 'US HIGHWAY 101'	-
Bridge - Non Scour Fair Condition	Bridge	'U.S. HIGHWAY 101' / 'JONES STREET'	-
Bridge - Non Scour Fair Condition	Bridge	'U.S. HIGHWAY 101' / 'STATE ROUTE 166'	-
Bridge - Non Scour Fair Condition	Bridge	'N135-N101 N101-S13' / 'US HWY 101 (@PM 90.75)'	-
Bridge - Non Scour Fair Condition	Bridge	'STATE ROUTE 135' / 'BRADLEY CHANNEL'	-
Bridge - Non Scour Fair Condition	Bridge	'N101-MAIN ST OFF' / 'BRADLEY CHANNEL'	-
Bridge - Non Scour Fair Condition	Bridge	'MAIN ST-N101 ON RP' / 'BRADLEY CHANNEL'	-
Bridge - Non Scour Fair Condition	Bridge	'SUEY CROSSING RD' / 'SANTA MARIA RIVER'	-
Bridge - Non Scour Fair Condition	Bridge	'RANCHO VERDE ST' / 'BLOSSER CHANNEL'	-
Bridge - Non Scour Fair Condition	Bridge	'MAGELLAN DRIVE' / 'BRADLEY CHANNEL'	-
Bridge - Non Scour Fair Condition	Bridge	'STOKES AVENUE' / 'BRADLEY CHANNEL'	-
Bridge - Non Scour Fair Condition	Bridge	'COX LANE' / 'BLOSSER CHANNEL'	-
Bridge - Non Scour Good Condition	Bridge	'ALVIN AVE' / 'US HWY 101 & BRADLEY CHN'	-
Bridge - Non Scour Good Condition	Bridge	'DONOVAN RD' / 'US HIGHWAY 101'	-
Bridge - Non Scour Good Condition	Bridge	'BETTERAVIA ROAD' / 'US HIGHWAY 101'	-
Bridge - Non Scour Good Condition	Bridge	'MAIN STREET' / 'BRADLEY CHANNEL'	-
Bridge - Non Scour Good Condition	Bridge	'TAYLOR STREET' / 'BLOSSER CHANNEL'	-
Bridge - Non Scour Good Condition	Bridge	'RAILROAD AVENUE' / 'BRADLEY CHANNEL'	-
Bridge - Non Scour Good Condition	Bridge	'CARLOTTI DRIVE' / 'BRADLEY CHANNEL'	-
Bridge - Non Scour Good Condition	Bridge	'LAUREN LANE' / 'BRADLEY CHANNEL'	-
Bridge - Non Scour Good Condition	Bridge	'BLOSSER ROAD' / 'BLOSSER CHANNEL'	-
Government	SM CORP YARD VEHICLE OPS BLDG	912 W. FOSTER ROAD	$1,129,849

Figure 6-1. City of Santa Maria Critical Facilities and Earthquake Groundshaking Potential (San Luis Range 7.2 Magnitude ShakeMap)

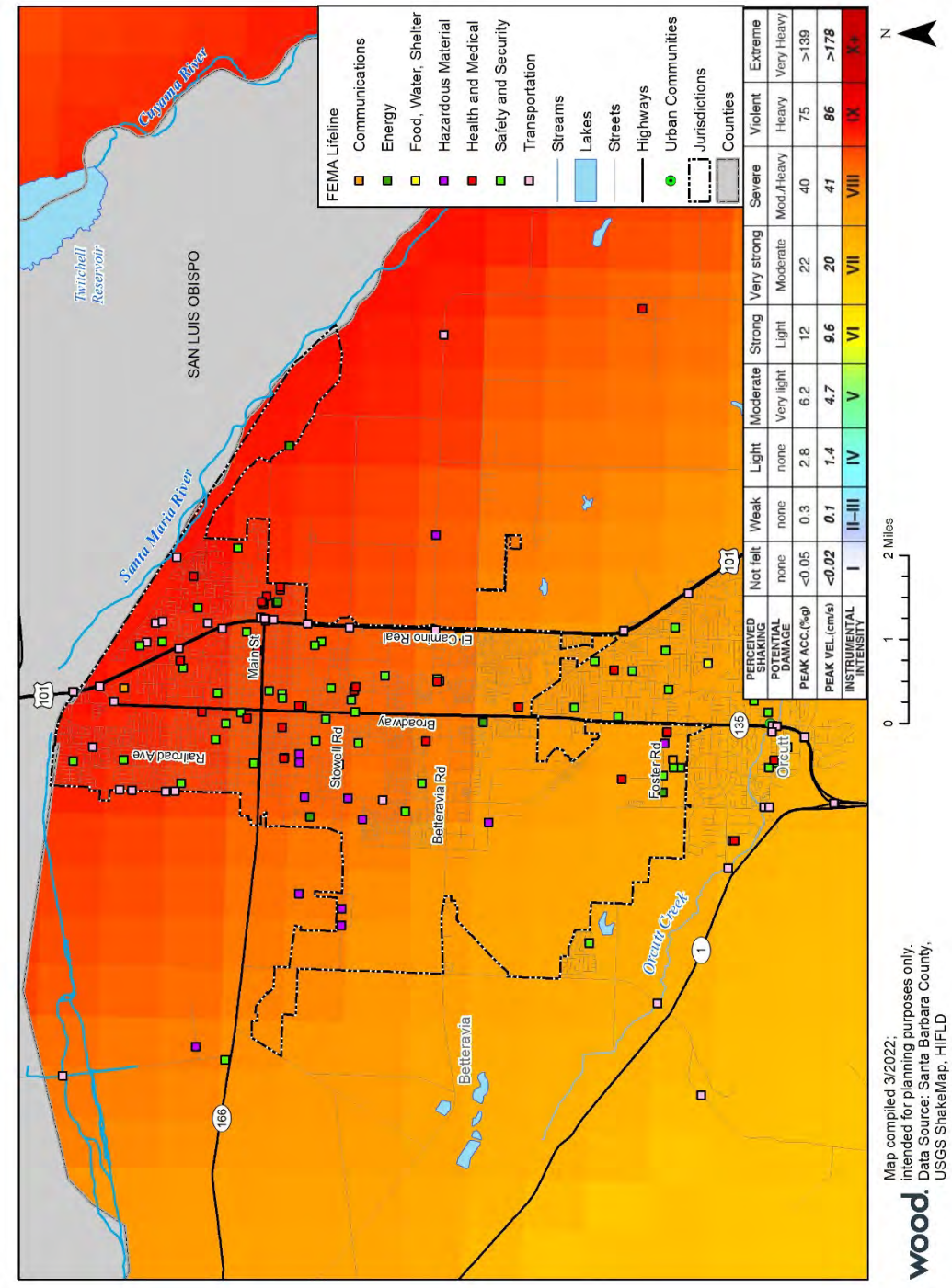
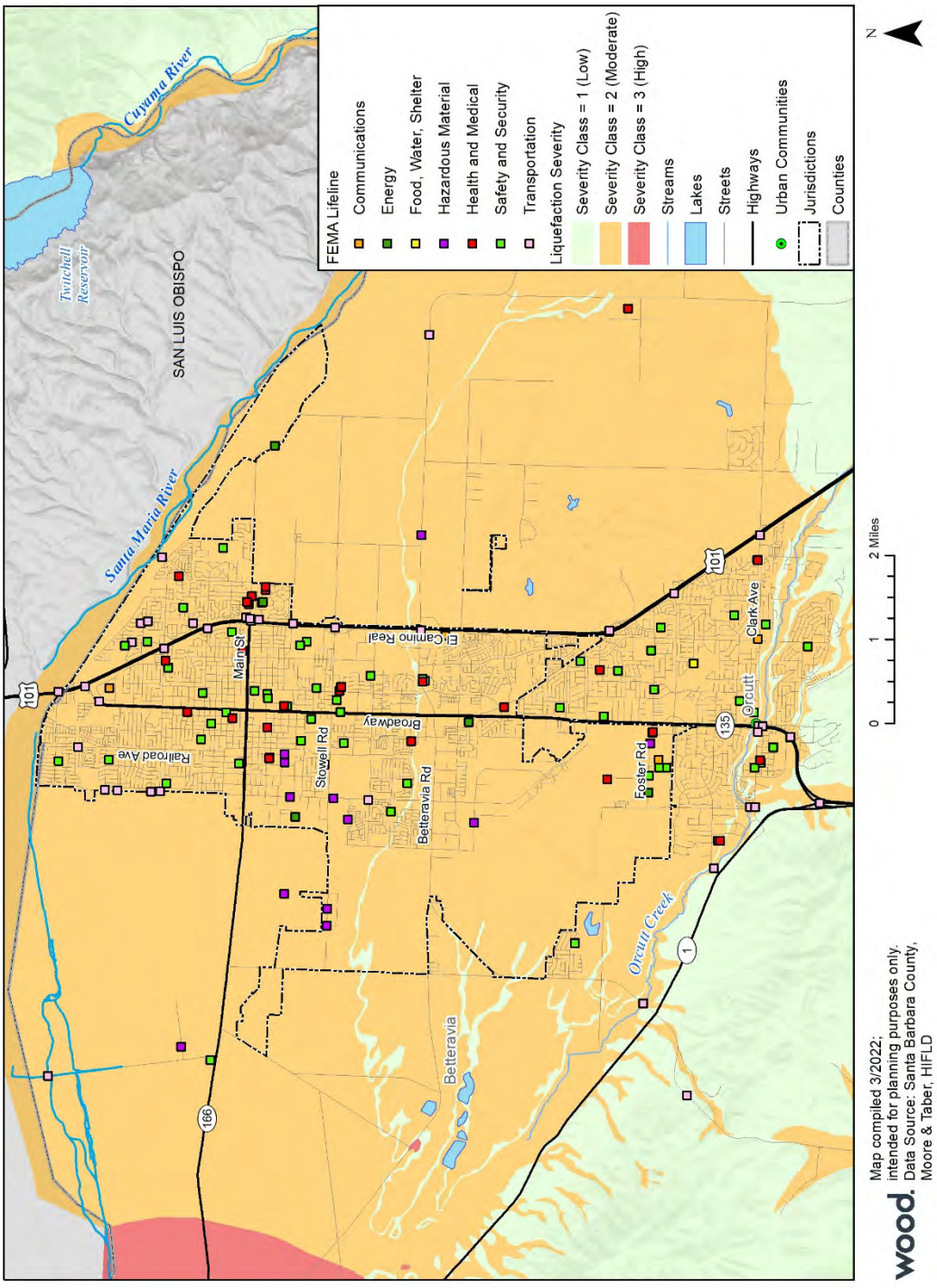


Figure 6-2. City of Santa Maria Critical Facilities and Liquefaction Potential



6.2 DAM/LEVEE FAILURE

Dam failure is a remote possibility for the Santa Maria area. The Twitchell Dam is under the authority of the Department of the Interior, Bureau of Reclamation. The daily operations of the dam are overseen by the Santa Maria Valley Water Conservation District (SMVWCD). The SMVWCD oversees the daily operations, maintenance, and emergency planning for the dam in coordination with Santa Barbara County Public Works. Please also refer to the SMVWCD annex to the 2022 MJHMP for more information about Twitchell Dam Management, as well as the District's website: http://www.smvwcd.org/.

As the dam is a groundwater recharge tool, it does not normally retain water but manages the release of water to minimize downstream flooding and enhance the Santa Maria Valley Basin aquifer. The dam has a significant spillway to prevent the overtopping of the earthen fill dam structure. The reader is referred to the Bureau of Reclamation Santa Maria Project website for details on the project and relevant response plans at: https://www.usbr.gov/projects/index.php?id=513. Some documents are protected under the Department of Homeland Security and may not be available to the public.

Levee failure in the Santa Maria area has occurred with an impact on local farming operations, but no evacuations or casualties. The Santa Maria River Levee is managed by the United States Army Corps of Engineers and Santa Barbara County Flood Control. The reader is referred to the USACE website at: http://www.spl.usace.army.mil/Missions/Civil-Works/Levee-Safety-Program/. The Levee is divided into management sections, with section 3a being most relevant to the City of Santa Maria.

While levee failure has been partially mitigated by structural improvements (see Section 5.10, *Dam/Levee Failure* of this plan), the levee is at a fixed height and could be overtopped if sufficient flow existed. The watershed comprises an area of approximately 1,880 square miles. One of the predicted impacts of continued warming is energetic storms, which could produce rainfall amounts that would exceed infiltration rates and potentially be high runoff events. Impacts would be large evacuations, with minimal casualties (probably as a result of evacuation.) Current modeling does not take into consideration building elevations. This is an opportunity for further impact analysis.

Failure of Twitchell Dam would inundate portions of the cities of Santa Maria and Guadalupe, as well as Highway 1, with relatively little evacuation time. Based on the GIS analysis conducted for the 2022 MJHMP, in Santa Maria, 17,620 properties with a total value of $7.965 billion are vulnerable to the catastrophic flooding that would occur if the Twitchell Dam and levee system on the Santa Maria River failed. In Santa Maria, approximately 61,303 residents within the inundation zone may need to be evacuated, cared for, and possibly permanently relocated. This information is summarized in Table 6-5 below.

Table 6-5. City of Santa Maria at Risk to Dam Inundation Hazard

Property Type	Improved Parcel Count	Total Value	Population
Agricultural	3	$2,664,956	
Commercial	855	$1,157,439,996	
Exempt	111	$1,090,169,976	

Property Type	Improved Parcel Count	Total Value	Population
Industrial	196	$680,703,628	
Mixed Use	8	$15,317,928	30
Residential	16,427	$5,012,836,743	61,273
Improved Vacant	20	$6,100,436	
Total	**17,620**	**$7,965,233,663**	**61,303**

Further, as listed in Table 6-6, 88 critical facilities in the City would be vulnerable to damage or destruction from flooding due to dam and levee failure (see also, Section 6.6.3, *Dam Failure* and Section 6.6.8, *Levee Failure* of the 2022 MJHMP).

Table 6-6. City of Santa Maria Critical Facilities Vulnerable to Inundation from Dam/Levee Failure

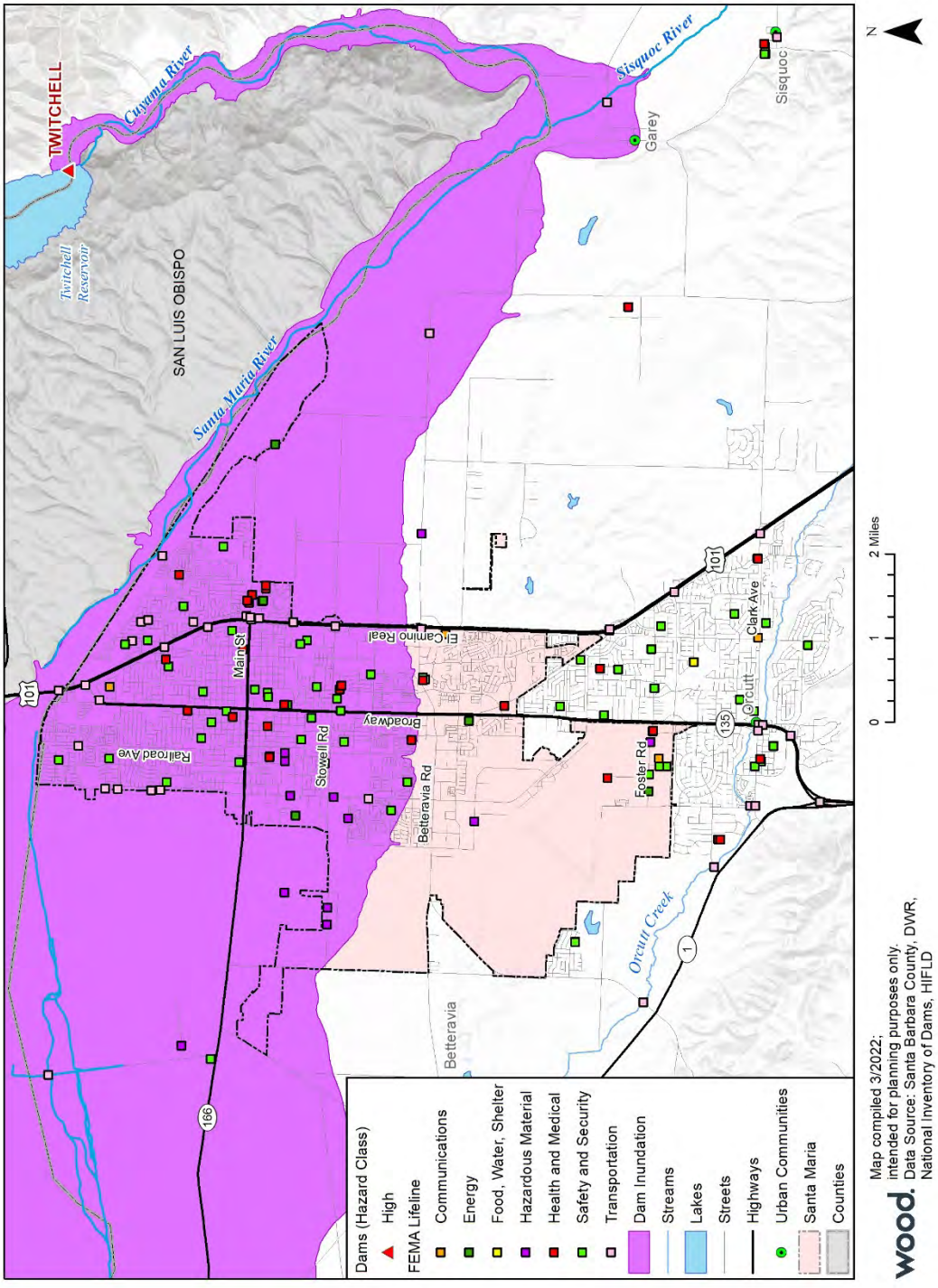
Type	Name	Dam_Name	Total_Value
Cellular Tower	SANTA BARBARA CELLULAR SYSTEMS, LTD.	Twitchell Dam Inundation	-
Power Plant	SANTA MARIA COGEN PLANT	Twitchell Dam Inundation	-
Power Plant	SANTA MARIA LFG POWER PLANT	Twitchell Dam Inundation	-
Power Plant	J&A-SANTA MARIA II LLC	Twitchell Dam Inundation	-
RMP Facilities	GOLD COAST PACKING INC	Twitchell Dam Inundation	-
RMP Facilities	CALIFORNIA GIANT	Twitchell Dam Inundation	-
RMP Facilities	NH3 SERVICE CAMPANY	Twitchell Dam Inundation	-
RMP Facilities	BONITA PACKING REFRIGERATION FACILITY	Twitchell Dam Inundation	-
RMP Facilities	LINEAGE LOGISTICS - SANTA MARIA	Twitchell Dam Inundation	-
RMP Facilities	SANTA MARIA RAIL TERMINAL	Twitchell Dam Inundation	-
RMP Facilities	FROZ-SUN FOODS, INC.	Twitchell Dam Inundation	-
Clinic	Santa Maria Care Center	Twitchell Dam Inundation	-
Clinic	Community Health Centers of the Central Coast-Santa Maria II	Twitchell Dam Inundation	-
Clinic	Marian Community Health Clinic- Santa Maria	Twitchell Dam Inundation	-
Clinic	Community Health Centers of the Central Coast-Santa Maria III	Twitchell Dam Inundation	-
Clinic	Villa Maria Health Care Center	Twitchell Dam Inundation	-
Clinic	Country Oaks Care Center	Twitchell Dam Inundation	-
Clinic	Central Coast Kidney Disease	Twitchell Dam Inundation	-
Clinic	Marian Medical Center	Twitchell Dam Inundation	-
Clinic	PHD Santa Maria Women's Health	Twitchell Dam Inundation	-
Clinic	Marian Extended Care	Twitchell Dam Inundation	-
EMS Station	SANTA MARIA FIRE DEPARTMENT STATION 1	Twitchell Dam Inundation	-
EMS Station	SANTA MARIA FIRE DEPARTMENT STATION 2	Twitchell Dam Inundation	-
EMS Station	SANTA MARIA FIRE DEPARTMENT STATION 3	Twitchell Dam Inundation	-
EMS Station	AMERICAN MEDICAL RESPONSE STATION 9	Twitchell Dam Inundation	-
Nursing Home	VILLA MARIA HEALTHCARE CENTER	Twitchell Dam Inundation	-
Nursing Home	MERRILL GARDENS AT SANTA MARIA	Twitchell Dam Inundation	-

Type	Name	Dam_Name	Total_Value
Nursing Home	COUNTRY OAKS CARE CENTER	Twitchell Dam Inundation	-
Nursing Home	MARIAN REGIONAL MEDICAL CENTER DP/SNF	Twitchell Dam Inundation	-
Nursing Home	SANTA MARIA TERRACE	Twitchell Dam Inundation	-
Nursing Home	SANTA MARIA CARE CENTER	Twitchell Dam Inundation	-
College Police	ALLAN HANCOCK COLLEGE POLICE DEPARTMENT	Twitchell Dam Inundation	-
Colleges / Universities	ALLAN HANCOCK COLLEGE	Twitchell Dam Inundation	-
Colleges / Universities	CET-SANTA MARIA	Twitchell Dam Inundation	-
Colleges / Universities	SANTA BARBARA BUSINESS COLLEGE-SANTA MARIA	Twitchell Dam Inundation	-
Court	SM COURT COMPLEX SUP CRT/DA BLDG G	Twitchell Dam Inundation	$8,513,522
Court	SM COURT COMPLEX SUPERIOR COURT BLDG C	Twitchell Dam Inundation	$2,087,988
Court	SM COURT COMPLEX COURTHOUSE BLDG D	Twitchell Dam Inundation	$2,598,819
Court	SM COURT COMPLEX PUB. DEFEND BLDG A	Twitchell Dam Inundation	$1,618,720
Court	SM COURT COMPLEX COURT CLERKS BLDG E	Twitchell Dam Inundation	$693,256
Court	SM COURT COMPLEX SUPERIOR COURT BLDG H	Twitchell Dam Inundation	$654,776
Court	SM COURT COMPLEX JURY ASSY BLDG F	Twitchell Dam Inundation	$456,197
Court	SM COURT COMPLEX SUP CRT/DA BLDG	Twitchell Dam Inundation	$40,311
Education	JIM?NEZ ROBERTO AND DR. FRANCISCO ELEMENTARY SCHOOL	Twitchell Dam Inundation	-
Education	EL CAMINO JUNIOR HIGH	Twitchell Dam Inundation	-
Education	TAYLOR (IDA REDMOND) ELEMENTARY	Twitchell Dam Inundation	-
Education	SANTA MARIA HIGH	Twitchell Dam Inundation	-
Education	FESLER (ISAAC) JUNIOR HIGH	Twitchell Dam Inundation	-
Education	ALVIN ELEMENTARY	Twitchell Dam Inundation	-
Education	KUNST (TOMMIE) JUNIOR HIGH	Twitchell Dam Inundation	-
Education	SANCHEZ (DAVID J.) ELEMENTARY	Twitchell Dam Inundation	-
Education	ONTIVEROS (JUAN PACIFICO) ELEMENTARY	Twitchell Dam Inundation	-
Education	ADAM (WILLIAM LAIRD) ELEMENTARY	Twitchell Dam Inundation	-
Education	BRUCE (ROBERT) ELEMENTARY	Twitchell Dam Inundation	-
Education	PIONEER VALLEY HIGH	Twitchell Dam Inundation	-
Education	TUNNELL (MARTIN LUTHER) ELEMENTARY	Twitchell Dam Inundation	-
Education	OAKLEY (CALVIN C.) ELEMENTARY	Twitchell Dam Inundation	-
Education	BATTLES (WASHINGTON) ELEMENTARY	Twitchell Dam Inundation	-
Education	FAMILY PARTNERSHIP HOME STUDY CHARTER	Twitchell Dam Inundation	-
Education	LIBERTY ELEMENTARY	Twitchell Dam Inundation	-
Education	RICE (WILLIAM) ELEMENTARY	Twitchell Dam Inundation	-
Education	FAIRLAWN ELEMENTARY	Twitchell Dam Inundation	-
Education	MILLER (ISAAC) ELEMENTARY	Twitchell Dam Inundation	-
Education	AGAPE SCHOOL OF CHRISTIAN EDUCATION	Twitchell Dam Inundation	-

Type	Name	Dam_Name	Total_Value
Government	CHILD SUPPORT SERVICES OFFICES	Twitchell Dam Inundation	$458,457
Government	SOCIAL SERVICES ONE-STOP OFFICE	Twitchell Dam Inundation	$1,058,138
Highway Patrol	CALIFORNIA HIGHWAY PATROL - SANTA MARIA	Twitchell Dam Inundation	-
Police	SANTA MARIA POLICE DEPARTMENT	Twitchell Dam Inundation	-
Bridge - Non Scour Fair Condition	Bridge	Twitchell Dam Inundation	-
Bridge - Non Scour Fair Condition	Bridge	Twitchell Dam Inundation	-
Bridge - Non Scour Fair Condition	Bridge	Twitchell Dam Inundation	-
Bridge - Non Scour Fair Condition	Bridge	Twitchell Dam Inundation	-
Bridge - Non Scour Fair Condition	Bridge	Twitchell Dam Inundation	-
Bridge - Non Scour Fair Condition	Bridge	Twitchell Dam Inundation	-
Bridge - Non Scour Fair Condition	Bridge	Twitchell Dam Inundation	-
Bridge - Non Scour Fair Condition	Bridge	Twitchell Dam Inundation	-
Bridge - Non Scour Fair Condition	Bridge	Twitchell Dam Inundation	-
Bridge - Non Scour Fair Condition	Bridge	Twitchell Dam Inundation	-
Bridge - Non Scour Fair Condition	Bridge	Twitchell Dam Inundation	-
Bridge - Non Scour Fair Condition	Bridge	Twitchell Dam Inundation	-
Bridge - Non Scour Good Condition	Bridge	Twitchell Dam Inundation	-
Bridge - Non Scour Good Condition	Bridge	Twitchell Dam Inundation	-
Bridge - Non Scour Good Condition	Bridge	Twitchell Dam Inundation	-

Type	Name	Dam_Name	Total_Value
Bridge - Non Scour Good Condition	Bridge	Twitchell Dam Inundation	-
Bridge - Non Scour Good Condition	Bridge	Twitchell Dam Inundation	-
Bridge - Non Scour Good Condition	Bridge	Twitchell Dam Inundation	-
Bridge - Non Scour Good Condition	Bridge	Twitchell Dam Inundation	-
Bridge - Non Scour Good Condition	Bridge	Twitchell Dam Inundation	-

Figure 6-3. City of Santa Maria Critical Facilities in Twitchell Dam Inundation Zone



6.3 FLOOD

The geographical location, climate, and topography of the Santa Maria Valley make some areas of the City prone to flooding. While there are some benefits associated with flooding, such as maintaining natural riparian processes along creeks and replenishing nutrients to agricultural lands, flooding presents a hazard to development in floodplains. In addition to the damage to properties, flooding can also cut off access to utilities, emergency services, transportation, and may impact the overall economic well-being of an area. Emergency response can be interrupted by damaged roads and infrastructure. Fire can break out as a result of dysfunctional electrical equipment. Hazardous materials can also get into floodways, causing health concerns and polluted water supplies. During a flood, the drinking water supply can be contaminated. Climate change is expected to increase the frequency and intensity of heavy rainstorms that cause riverine flooding.

Based on the GIS analysis conducted for the 2022 MJHMP, the City has 66 improved parcels valued at over $50 million in the 1-percent annual chance floodplain. Based on this analysis, which accounts for residents only and not workers, 220 residents are living in the 1-percent annual chance floodplain throughout the City. An additional 1,792 improved parcels and over $755 million in value fall within the 0.2-percent annual chance floodplain. Areas of the City vulnerable to the 0.2-percent annual chance riverine flood are home to 5,804 residents. Development in the 0.2-percent annual chance floodplain is typically not regulated, thus a large flood event could be extremely damaging in the City. This information is summarized in Table 6-7 below.

Table 6-7. City of Santa Maria FEMA Floodplain Exposure and Loss

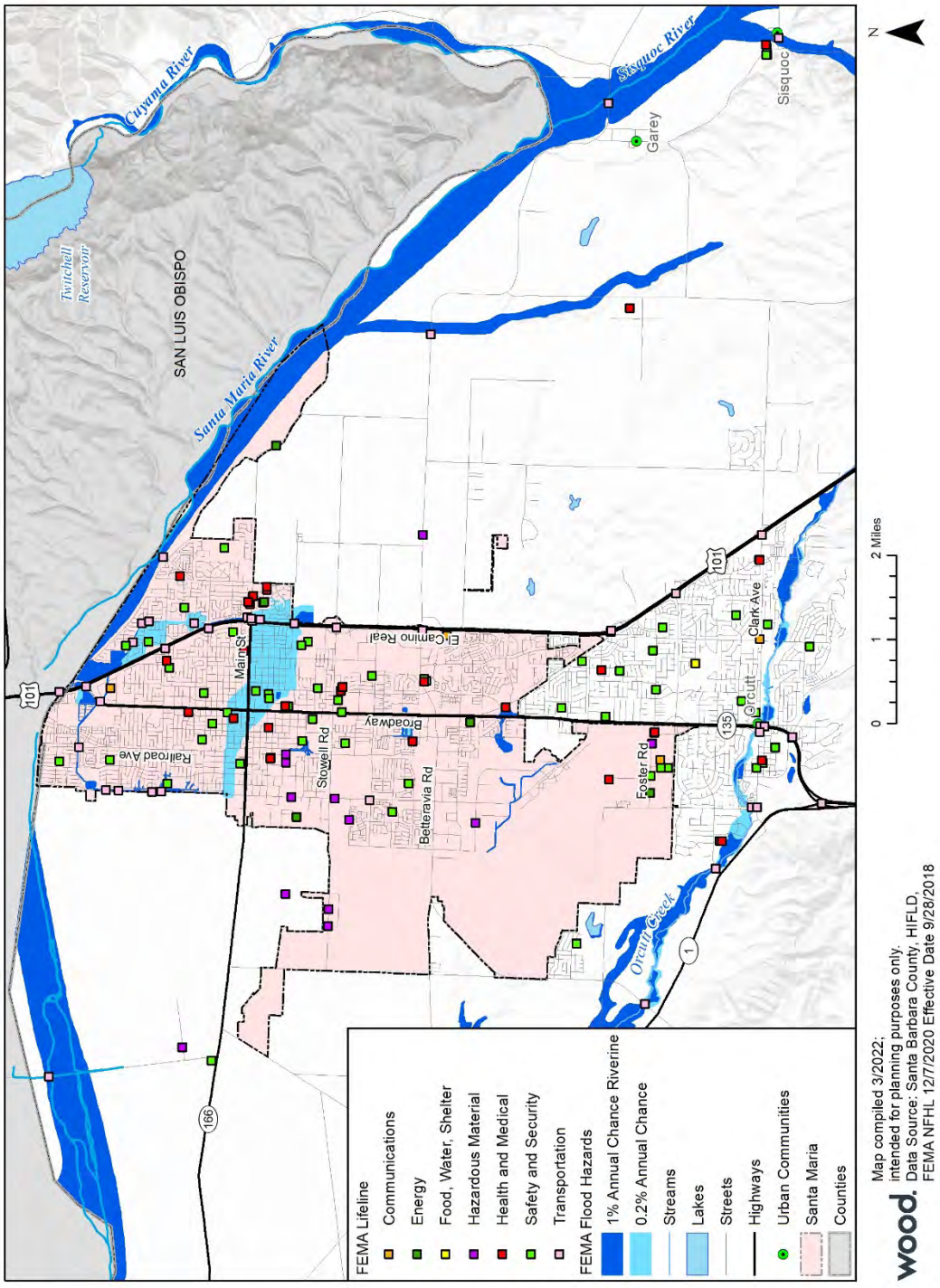
Property Type	Improved Parcel Count	Total Value	Estimated Loss	Population
Riverine 1% Annual Chance Floodplain Exposure and Loss				
Commercial	6	$16,517,446	$4,129,362	
Industrial	1	$1,708,165	$427,041	
Residential	59	$32,616,569	$8,154,142	
Total	**66**	**$50,842,180**	**$12,710,545**	220
Riverine 0.2% Annual Chance Floodplain Exposure and Loss				
Commercial	192	$168,324,292	$42,081,073	
Exempt	17	$16,051,774	$4,012,944	
Industrial	26	$49,354,655	$12,338,664	
Residential	1,556	$521,331,297	$130,332,824	
Improved Vacant	1	$9,696	$2,424	
Total	**1,792**	**$755,071,714**	**$188,767,929**	5,804

As listed in Table 6-8, 18 critical facilities in the City with a total value of $17,122,046 would be vulnerable to damage or destruction from 1-percent or 0.2-percent annual chance flood (Figure 6-4; see also, Section 6.3.3, *Flood* of the 2022 MJHMP).

Table 6-8. City of Santa Maria Critical Facilities at Risk to Flood Hazard

Type	Critical Facility	FEMA_Flood	Total_Value
Clinic	Community Health Centers of the Central Coast- Santa Maria II	0.2% Chance	-
Court	SM COURT COMPLEX SUP CRT/DA BLDG G	0.2% Chance	$8,513,522
Court	SM COURT COMPLEX SUPERIOR COURT BLDG C	0.2% Chance	$2,087,988
Court	SM COURT COMPLEX COURTHOUSE BLDG D	0.2% Chance	$2,598,819
Court	SM COURT COMPLEX PUB. DEFEND BLDG A	0.2% Chance	$1,618,720
Court	SM COURT COMPLEX COURT CLERKS BLDG E	0.2% Chance	$693,256
Court	SM COURT COMPLEX SUPERIOR COURT BLDG H	0.2% Chance	$654,776
Court	SM COURT COMPLEX JURY ASSY BLDG F	0.2% Chance	$456,197
Court	SM COURT COMPLEX SUP CRT/DA BLDG	0.2% Chance	$40,311
Government	CHILD SUPPORT SERVICES OFFICES	0.2% Chance	$458,457
Highway Patrol	CALIFORNIA HIGHWAY PATROL - SANTA MARIA	0.2% Chance	-
Police	SANTA MARIA POLICE DEPARTMENT	0.2% Chance	-
Bridge - Non Scour Fair Condition	Bridge	0.2% Chance	-
Bridge - Non Scour Fair Condition	Bridge	1% Chance	-
Bridge - Non Scour Fair Condition	Bridge	1% Chance	-
Bridge - Non Scour Good Condition	Bridge	0.2% Chance	-
Bridge - Non Scour Good Condition	Bridge	1% Chance	-
Bridge - Non Scour Good Condition	Bridge	1% Chance	-

Figure 6-4. City of Santa Maria Critical Facilities in FEMA Flood Hazard Zones



6.4 WILDFIRE

The county has areas within mapped Fire Hazard Severity Zones and Wildland-Urban Interface (WUI) areas. These hazard areas generate vulnerability for life and structures, including critical facilities, throughout the county, but most severely within rural foothills areas where dry vegetation, steep slopes, and difficult access combine to create a high probability of wildfire. Based on these maps, the City has 41 acres (0.3 percent) within Very High Wildfire Threat areas, 427 acres (2.8 percent) within High Fire Wildfire Threat areas, 1,554 acres (10.3 percent) within Moderate Wildfire Threat areas, and 2,317 acres (15.5 percent) within Low Wildfire Threat areas. Most of these areas are residential with limited vulnerabilities in commercial and industrial areas.

Based on the GIS analysis conducted for the 2022 MJHMP, in Santa Maria, 1,164 properties with a total value of $1.4 billion are vulnerable to wildfire. In Santa Maria, approximately 3,969 residents live in high, moderate, or low wildfire threat areas. There are no areas of extreme or very high wildfire threat in the City. This information is summarized in Table 6-9 below.

Table 6-9. City of Santa Maria at Risk to Wildfire Threat

Property Type	Improved Parcel Count by Wildfire Threat Level						Total Value	Population
	Extreme	Very High	High	Moderate	Low	Total		
Agricultural	0	0	0	0	2	2	$2,495,160	
Commercial	0	0	5	25	12	42	$551,198,784	
Exempt	0	0	0	5	4	9	$12,167,656	
Industrial	0	0	2	12	27	41	$297,281,323	
Mixed Use	0	0	0	0	0	0	$0	0
Residential	0	0	77	267	720	1,064	$542,399,237	3,969
Improved Vacant	0	0	0	2	4	6	$3,401,194	
Total	**0**	**0**	**84**	**311**	**769**	**1,164**	**$1,408,943,353**	**3,969**

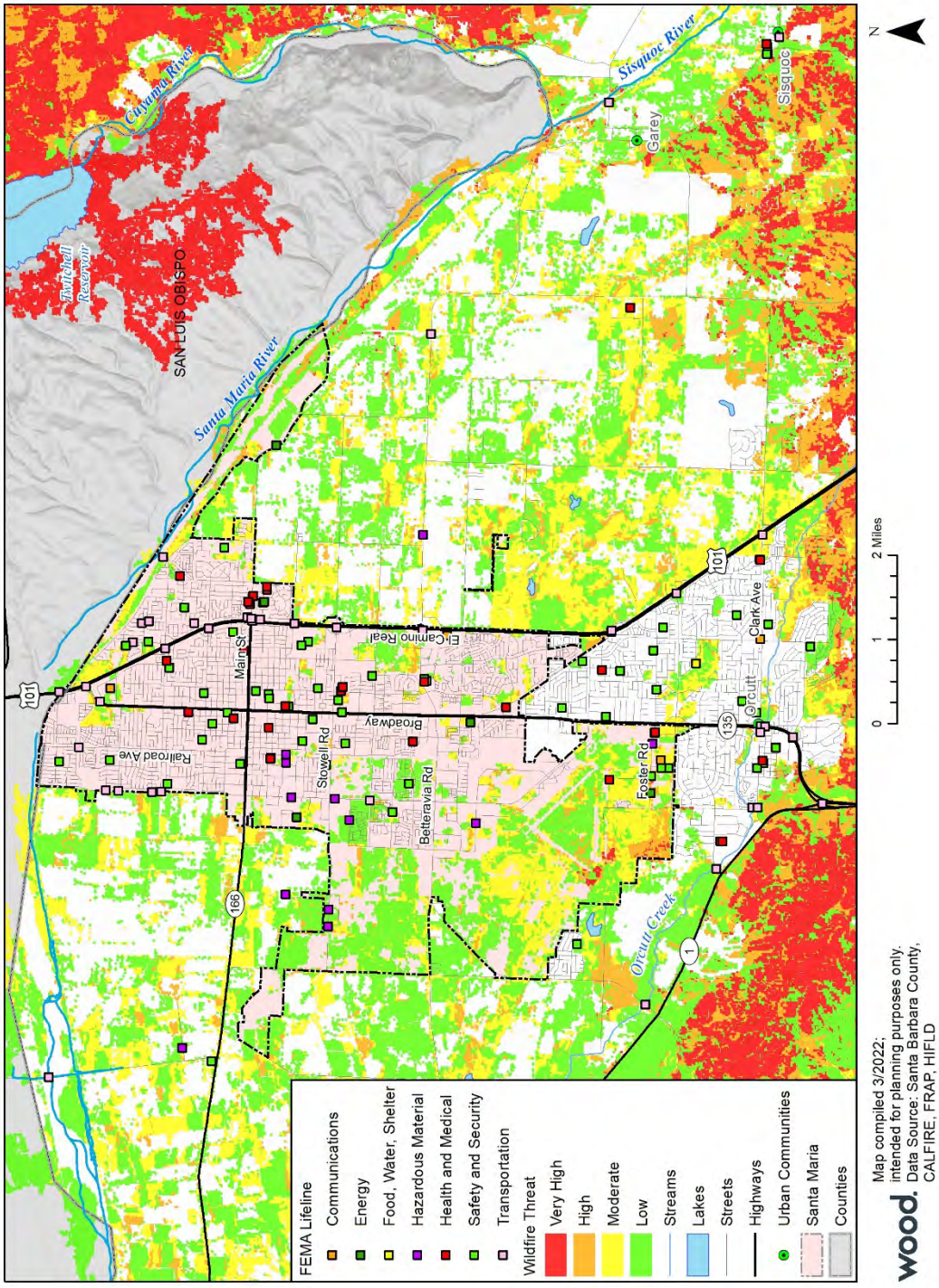
Twelve of the City's critical facilities fall within high, moderate, or low wildfire threat areas, as listed in Table 6-10 (see also, Section 6.3.1, *Wildfire* of the 2022 MJHMP).

Table 6-10. City of Santa Maria Critical Facilities Vulnerable to Wildfire

Type	Critical Facility	Hazard Source/Type	Total Building Value
Communications	Foster -48V	Moderate	-
Government	SM CORP. YARD FUEL ISLAND CANOPY	High	$33,548
Power Plant	COSSA	Moderate	-
Water Tank	SM CORP YARD WATER TOWER	High	$90,423
Education	JIM?NEZ ROBERTO AND DR. FRANCISCO ELEMENTARY SCHOOL	Low	-
Government	SM CORP YARD GS GARAGE/ OFFICE BLDG	High	$1,856,641

Type	Critical Facility	Hazard Source/Type	Total Building Value
Government	SM CORP. YARD STEEL GARAGE/SHOPS	High	$541,237
Government	LIGHT WAREHOUSE SHELL BUILDING	High	$179,719
Government	SM CORP YARD OFFICE TRAILER	High	$60,646
Government	SM CORP YARD GS STORAGE GARAGE	High	$37,009
Bridge - Non Scour Fair Condition	Bridge	Low	-
Government	SM CORP YARD VEHICLE OPS BLDG	High	$1,129,849

Figure 6-5. City of Santa Maria Critical Facilities within Wildfire Threat Zones



Mapping of wildfire threat within the City may overestimate vulnerabilities, as described above. Santa Maria is surrounded by irrigated row crop farms and has not experienced a wildfire environment since the late 19th Century and very early 20th Century. Although there are undeveloped lots and right-of-ways, vegetation growth is limited and required to be maintained. Landscaping and buildings are generally well maintained within the City Limits and do not currently create a regional wildfire hazard. The City's Recreation and Parks Department has an Urban Forestry unit that maintains public rights of way in addition to the park properties. The City also has an active Code Enforcement and Fire Prevention program that identifies at-risk properties and requires timely remediation where allowed by law. The City has an ISO (Insurance Services Office) Public Protection Classification of 3 (with 1 being the best and 10 not meeting minimum standards), last assessed in 2018. (as referenced on page 51 of the Community Risk Assessment: Standards of Cover (2021)

https://www.cityofsantamaria.org/home/showpublisheddocument/27128/637774990996200000.)

There are potentially higher risk areas for urban fires, high occupancy housing units, and older mobile home parks. The political challenges to enhance the safety of these areas and maintain sufficient cost-effective housing is a growth area for most urban areas, including the City. The largest urban fires would likely be limited in geographic scope, but potentially high in displaced persons and casualties.

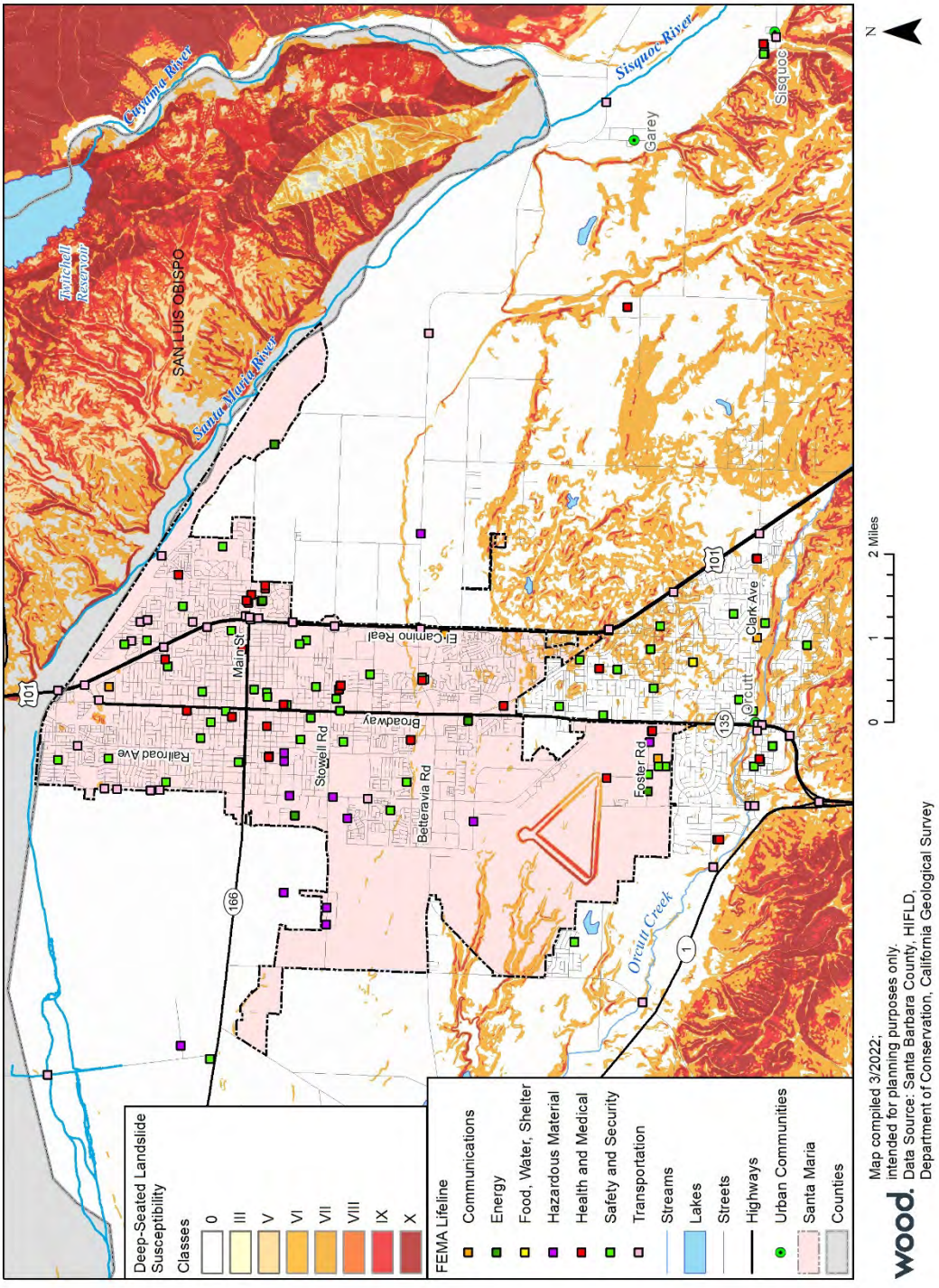
6.5 LANDSLIDE

There are no critical facilities located in landslide hazard zones in the City. The City has 463 improved parcels that lie within Class 7, 9, or 10 landslide hazard zone, amounting to $228 million, and home to 1,682 residents. However, Santa Maria is a gently sloping area in a riverine flood plain where the risk of landslide is generally low. An increase in risk related to landslides would be man-made through excavation or other soil disturbance. While not a concern for the City, data related to areas within the landslide hazard zone is included to be consistent with the 2022 MJHMP.

Table 6-11. City of Santa Maria Improved Properties at Risk to Landslide Summary

Class 7 Parcel Count	Class 9 Parcel Count	Class 10 Parcel Count	Total Improved Parcel Count	Total Value	Population
438	23	2	463	$228,715,669	1,682

Figure 6-6. City of Santa Maria Critical Facilities within Landslide Susceptibility Zones



7.0 MITIGATION STRATEGY

In preparation for the 2022 LHMP update, the City's LPT made no revisions to the countywide goals and objectives because they continue to reflect the needs of the City; see also, Chapter 7.0, *Mitigation Plan* of the 2022 MJHMP. This section contains the City's updated and most current mitigation strategy as of 2022.

7.1 MITIGATION PRIORITIES

7.1.1 Goals and Objectives

The City'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.

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

Since 2017, the City has incorporated the LHMP goals, objectives, and mitigation actions into its local plans and processes, including the General Plan Safety Element by reference, specific hazard planning efforts (e.g., Stormwater Plan), the City's grant pursuits, and capital improvement planning. Ongoing monitoring and evaluation of the LHMP by the City ensured mitigations are implemented and tracked. Key mitigation actions completed since 2017 include completing a new police headquarters and dispatch center. The City's LPT reviewed the mitigation actions listed in the 2017 LHMP to determine the status of each action. Once reviewed, deferred projects from 2017 were renumbered to reflect 2022 updates (see Table 7-1).

Table 7-1. Status of City of Santa Maria Previous Mitigation Actions

Mitigation Action No.	Mitigation Action Description	Status	Comments	In 2022 Update?
2011 LHMP				
GEN 3 Replaced by 2022-11	Critical Facility Audit	In Progress	The consistent application and definition of a Critical Facility need to be addressed. Non-City facilities and infrastructure need to be incorporated into the planning process.	Yes
GEN 4 Replaced by 2022-2 and 2022-3	Critical Facility Retrofit and Mitigation	In Progress	Competition for limited capital funds and limited staffing.	Yes
GEN 5 Replaced by 2022-12	Provide CERT training to population	Ongoing	CERT offered through a partnership with Allan Hancock College. City also offers CERT in English and Spanish. The City is part of the Operational Area CERT collaborative.	Yes
GEN 7 Replaced by 2022-13	Provide training to City employees with EOC responsibilities	Ongoing	Training officer position reinstated. Emergency Services Specialist position created. CSTI and OSFM authorized instructors on staff. Coordinating training offerings with State and Operational Area. City Disaster Planning Group working with Emergency Services Specialist to establish training program and calendar. The City holds annual tabletop EOC exercises as well as function-specific field exercises using unified command principles.	Yes

Mitigation Action No.	Mitigation Action Description	Status	Comments	In 2022 Update?
FLD 2 Removed. Operationalized by other regulations and processes.	Evaluate the effectiveness of Floodplain Management Ordinance	Ongoing	Reviewed annually after seasonal rain events. Comprehensive review and map needs to be reviewed.	No
HAZ 1 Removed. City does not have resources or jurisdiction.	Develop site-specific HazMat response plans	In Progress	CUPA sites on City GIS. RMP/RMPP not linked. The City does not have a HazMat response team.	No
N/A Removed. Completed.	New Police Headquarters and Dispatch Center	Completed	The City has built a new Police Headquarters facility to California Essential Services Building Standard and is updating and moving the Dispatch Center to the new facility.	No
N/A Replaced by 2022-14	Information Technology Upgrades/Continuity of Operations	In Progress	System had become deprecated since last LHMP. System is currently being upgraded. This is likely to be an Ongoing process as technology changes and new risks emerge.	Yes
2017 LHMP				
2017-1	Earthquake: Non-Structural Hazard Reduction	In Progress	No specific budget line item. Is included in monthly workplace safety checklist	Yes
2017-2	Earthquake: Structural Hazard Reduction	No progress	No existing retrofit project currently funded. New structures fall under current building code.	Yes
2017-3	Earthquake: Auxiliary Hazard Reduction	No progress	No budgeted projects.	Yes
2017-4	Ground Water Enhancement and Sustainability	No progress	City follows regulatory requirements.	Yes
2017-5	Storm Water Capacity Enhancement	In progress	Part of the development review process.	Yes

Mitigation Action No.	Mitigation Action Description	Status	Comments	In 2022 Update?
2017-6	Electrical Power Resiliency Project	In progress	Not budgeted. Multiple grant requests not funded.	Yes
2017-7	Critical Systems Cyber Resiliency Project	In progress	This is a continual and dynamic effort.	Yes
2017-8	Hazardous Material Air Monitoring and Alerting Project	No progress	Not budgeted.	Yes
2017-9	Public Weatherization Support Program	In progress	Partner agencies/NGO's provide some services. Some receive CDBG and other grants.	Yes
2017-10	Urban Forestry Hazard Assessment and Hazard Reduction	In progress	Not funded.	Yes
2017-11	Critical Infrastructure Threat Assessment Identification Project	In progress	Not funded	Yes

The City of Santa Maria will also participate to the extent it can with the County to implement the following actions included in the 2022 MJHMP:

- 2022-20 Bradley Channel Relining and Improvements, Santa Maria
- 2022-19 Blosser Basin, Santa Maria
- 2022 -9 Groundwater Basin Management
- 2022-47 Critical Facilities Database Maintenance

7.3 MITIGATION APPROACH

Similar to the 2022 MJHMP, the City LPT used a STAPLEE methodology developed by FEMA to allow emergency managers to apply consistent analysis to the range of mitigation options available. Once the available mitigation actions were identified by the City LPT, each was evaluated against the STAPLEE criteria to assist in prioritizing each measure. The STAPLEE criteria include the following:

- **Social:** Will the measure be accepted by the community? Does the measure adversely affect or inequitably benefit any segment of the population? (e.g., disadvantaged communities, vulnerable populations, different groups or areas)?
- **Technical:** How effective will the action be at protecting lives and preventing injuries? How significant will the action be at eliminating or reducing damage to structures and infrastructure? Would the action solve the root problem rather than a symptom?
- **Administrative:** Does the City have the personnel and administrative capabilities to implement and manage the project (i.e., adequate staffing and operational capabilities to implement the project)?

- **Political:** Will the measure have political and/or public support? Does the measure have a local champion to lead its development and implementation?
- **Legal:** Does the jurisdiction have the legal authority to implement the action? Is it legal? Is there potential for a legal challenge?
- **Economic:** Are the costs to implement the action commensurate with the benefits achieved? Is there funding available? Will the action contribute to the local economy?
- **Environmental:** Does the action comply with environmental regulations? Will there be negative environmental consequences from the action?

The City LPT used STAPLEE criteria to evaluate and prioritize the mitigation actions included in the LHMP. Each mitigation action was assigned a numeric rank (-1, 0, or 1) for each of the evaluation criteria, as follows

1 = Highly effective or feasible

0 = Neutral or not applicable

-1 = Ineffective or not feasible

Based on the evaluation score of each STAPLEE Criteria, mitigation actions received a cumulative score. The cumulative score indicates the priority of mitigation actions as:

"Low" = 1 – 5

"Medium" 6 – 10

"High." 10+

Per the DMA requirements, an emphasis was placed on the importance of benefit-cost analysis in determining action priority. Other criteria used to assist in evaluating the benefit-cost of a mitigation action included:

- Does the action address hazards or areas with the highest risk?
- Does the action protect lives?
- Does the action protect infrastructure, community assets, or critical facilities?
- Does the action meet multiple objectives (Multiple Objective Management)?
- What will the action cost?
- What is the timing of available funding?

The process of identification and analysis of mitigation options allowed the City LPT to come to a consensus and to collectively prioritize recommended mitigation actions. During the City's planning process, emphasis was placed on the importance of a benefit-cost review in determining project priority; however, this was not a quantitative analysis.

Benefit-cost was considered in the development of the Mitigation Implementation Plan detailed below in Section 7.4. Each action developed for this plan contains a description of the proposed project, expected project benefits, the entity or entities with primary responsibility for implementation, a cost estimate (if available), potential funding sources (if known or available), and a conceptual implementation schedule. Development of these project details relative to the STAPLEE

Criteria for each action led to the determination of priority for each action. Cost-effectiveness will be further considered in greater detail through formal benefit-cost analyses when seeking FEMA mitigation grant funding for eligible actions associated with this plan.

The intent of prioritizing mitigation actions is to help the City focus and concentrate its efforts; however, it should be noted that when and if specialized grants and/or funds are made available that could finance a mitigation action, the City may adjust the ranking to enable them to implement the mitigation action.

This plan also carries forward some mitigation actions developed during the 2017 and 2011 planning processes (refer to Section 7.2, *Status of Previous Mitigation Actions*). The City LPT reviewed their existing mitigation actions and reported on the progress made toward implementation to decide whether any incomplete actions should be carried forward for continued or future implementation or be deleted. In some cases, mitigation actions were adjusted to reflect new situations or priorities. These measures were previously prioritized using the STAPLEE approach in 2017; however, to account for changes to goals and objectives and changes to hazard priorities for this plan, the MAC re-evaluated the priority of all measures included in Section 7.4.

Table 7-2 presents the prioritized list of mitigation actions that will be considered and implemented. See attached STAPLEE scoring matrix that informed this plan update.

Table 7-2. 2022 City of Santa Maria Mitigation Actions and Prioritization

ID No.	Action Title	Total Score	Priority
2022-1	Earthquake: Non-Structural Hazard Reduction	7	6
2022-2	Earthquake: Structural Hazard Reduction	1	7
2022-3	Earthquake: Auxilliary Hazard Reduction	7	8
2022-4	Ground Water Enhancement and Sustainability	2	14
2022-5	Storm Water Capacity Enhancement	9	13
2022-6	Electrical Power Resiliency	4	3
2022-7	Critical Systems Cyber Resiliency	13	2
2022-8	Hazardous Material Air Monitoring and Alerting	6	10
2022-9	Public Weatherization Support	7	12
2022-10	Urban Forestry Hazard Assessment and Hazard Reduction	6	11
2022-11	Critical Infrastructure Identification and Assessment (formerly GEN 3 and 2017-11)	1	4
2022-12	All hazards community education programs (formerly GEN 5)	11	5
2022-13	Core Capabilities Development and ICS/SEMS/NIMS training (formerly GEN 7)	6	9
2022-14	Information Technology, Communications, Interoperability and resiliency	7	1

7.4 IMPLEMENTATION PLAN

2022-1. Earthquake: Non-Structural Hazard Reduction

- Survey City-owned buildings and infrastructure to identify potential hazards and non-structural failures from an earthquake.
- Use engineering best practices and existing non-structural hazard reduction methods, including the most recent publication FEMA E74 or subsequent guidance.
- Prioritize projects and establish a budget and project calendar.
- Identify ongoing costs to maintain and monitor.

Mitigation Priority and Performance	
Priority	6
Hazards Mitigated	Earthquake
Estimated Timeline	10 years
Estimated Cost/Funding Source	$10 Million/ General Fund, Department-specific maintenance funds, PDM funds, Homeland Security Grants, and other Federal and State grants and funds.
Responsible Agency/Department	Public Works, with support from City Manager's Office and other City departments
Comments	This project was adapted from 2017-1 included as part of the 2017 LHMP. Nonstructural hazards from earthquakes can range from simple rearranging of non-secured items, simple bracing of shelves and cabinets, to significant engineered restraint systems for HVAC and other machinery. While some items can be incorporated or prioritized using future budgeting processes, the fiscal reality for the City is that some projects will require significant grant funding.

2022-2. Earthquake Structural Hazard Reduction

- Survey City-owned buildings, bridges, and other infrastructure to identify potential structural failures from an earthquake.
- Conduct engineering, environmental, and cost-benefit analysis
- Use engineering best practices. Evaluate efficacy/viability of using a higher standard of structural survivability and functionality vs. a lower standard of life safety in current building codes.
- Prioritize projects and establish a budget and project calendar.
- Identify ongoing costs to maintain and monitor.

Mitigation Priority and Performance	
Priority	7
Hazards Mitigated	Earthquake, Hazardous Materials, Climate Change
Estimated Timeline	20 Years
Estimated Cost/Funding Source	$120 Million/ PDM funds, Homeland Security grants, CDBG and other Federal and State infrastructure grants and funds, local capital funds.

Mitigation Priority and Performance	
Responsible Agency/Department	Public Works, with support from City Manager's Office and other City departments
Comments	This project was adapted from 2017-2 included as part of the 2017 LHMP. The City uses many structures and facilities of various ages and capabilities for daily operations. Many have been re-purposed or modified to meet expanding needs of the City over the last 100 years. The costs will be considerable and likely beyond the financial capability of the City.

2022-3. Earthquake Auxiliary Hazard Reduction

- Survey City-owned buildings and infrastructure to identify potential hazards from an earthquake not otherwise categorized as structural or non-structural. Examples may include mitigated in place Asbestos, secondary impacts of hazardous materials releases, mold, dust, flooding, fire, water well casing failure/aquifer failure, etc. that are not otherwise mitigated.
- Conduct engineering, environmental, and cost-benefit analysis
- Use engineering best practices. Evaluate efficacy/viability of using a higher standard of structural survivability and functionality vs. a lower standard of life safety in current building codes.
- Prioritize projects and establish a budget and project calendar.
- Identify ongoing costs to maintain and monitor

Mitigation Priority and Performance	
Priority	8
Hazards Mitigated	Earthquake, Hazardous Materials, Climate Change, Terrorism
Estimated Timeline	10 years
Estimated Cost/Funding Source	$40 Million/ General Fund, Capital funds, PDM funds, CDBG, Homeland Security grants, and other Federal and State infrastructure grants and funds.
Responsible Agency/Department	Public Works, with support from City Manager's Office and other City departments
Comments	This project was adapted from 2017-3 included as part of the 2017 LHMP. Recent events, such as the 2015 Napa Earthquake, have shown that otherwise structurally sound structures may be uninhabitable or unusable due to unforeseen secondary impacts. While it may be fundamentally impossible to predict all potential impacts, a review of post-event analysis of events will likely reveal some impacts that can be addressed.

2022-4. Ground Water Enhancement and Sustainability

- Conduct engineering, environmental, and cost-benefit analysis of potential groundwater enhancement projects in the Santa Maria basin.
- Projects may include groundwater quality rehabilitation, increase water permeability of built landscape, increase potable water storage, additional stormwater retention, and percolation basins as identified.
- Identify viable projects and prioritize.

- Establish budgets and project calendars.

Mitigation Priority and Performance	
Priority	14
Hazards Mitigated	Drought, Water Safety, Flood Prevention, Earthquake (Potable Water), Climate Change
Estimated Timeline	20 years
Estimated Cost/Funding Source	$100 Million/ Capital Projects budget, maintenance budget, CDBG funds, HMP funds, Homeland Security grants, and other Federal and State infrastructure grants and funds.
Responsible Agency/Department	Public Works Utilities Division, Ground water basin partners, flood control partners.
Comments	This project was adapted from 2017-4 included as part of the 2017 LHMP. While the Santa Maria Valley Management Area is a significant aquifer, the City relies mostly on State Water from the Coastal Aqueduct due to the superior quality of the water. To increase the City's resiliency and reduce its dependence on State Water, the current aquifer and/or the water from it will need significant rehabilitation.

2022-5. Storm Water Capacity Enhancement

- Conduct engineering, flow modeling (including micro topographical and variable precipitation models), environmental, and cost-benefit analysis
- Projects may include property acquisition, groundwater retention/percolation basins, flow control channels/enhancements, roadbed or bridge elevation/realignment, or other infrastructure projects as informed by research and history.
- Prioritize projects and establish a budget and project calendar.
- Identify ongoing costs to maintain and monitor

Mitigation Priority and Performance	
Priority	13
Hazards Mitigated	Flood Prevention, Water Safety, Drought, Climate Change
Estimated Timeline	20 years
Estimated Cost/Funding Source	$15 Million/ Capital Projects budget, maintenance budget, CDBG funds, HMP funds, Homeland Security grants, and other Federal and State infrastructure grants and funds.
Responsible Agency/Department	Public Works Utilities Division, Groundwater basin partners, flood control partners.
Comments	This project was adapted from 2017-5 included as part of the 2017 LHMP. While Environmental assessments are conducted on development projects per NEPA and CEQA, constraints limiting the analysis to project boundaries and the general exceptions granted to agriculture have allowed development that has modified the flood control landscape of the Santa Maria area. New agricultural methods such as hoop structures and hydroponic/greenhouse structures in addition to residential development outside of the City's regulatory sphere have decreased the available area for storm water percolation into the landscape. A re-analysis of the current and projected landscape requirements to maintain open roads and keep peak rain events

Mitigation Priority and Performance	
	from impacting homes and the necessary infrastructure is warranted as indicated in the recent rain events of Feb. 2017.

2022-6. Electrical Power Resiliency Project

- Conduct engineering, environmental, and cost-benefit analysis of existing City buildings and infrastructure to identify power requirements, efficiency, and resiliency during short-term and extended power failures.
- Identify and prioritize projects based on critical systems and life safety.
- Identify and retrofit or establish multi-purpose facilities to be used for medically fragile shelters, cold/warming shelters
- Projects may include equipment hardening, power management/monitoring systems, alternative power generation, capability design/retrofit to allow the use of temporary alternative power generation when permanent alternative generation installation is otherwise not warranted.
- Prioritize projects and establish a budget and project calendar.
- Identify ongoing costs to maintain and monitor

Mitigation Priority and Performance	
Priority	3
Hazards Mitigated	Energy Shortage, Earthquake, Severe Weather, Climate Change
Estimated Timeline	7 Years
Estimated Cost/Funding Source	$15 Million/ Capital Projects budget, maintenance budget, CDBG funds, HMP funds, Homeland Security grants, and other Federal and State infrastructure grants and funds.
Responsible Agency/Department	Public Works, with support from City Manager's Office and other City Departments.
Comments	This project was adapted from 2017-6 included as part of the 2017 LHMP. The Public and the City's reliance on power to provide life safety necessary systems has continued to increase. Per the Public Health Emergency HHS emPOWER Map, over 500 Medicare recipients are electricity dependent in the Santa Maria area. This number is a conservative estimate considering others who may also be electricity-dependent that are not Medicare recipients (private funding, insurance, CPAP, etc.) Also as our population continues to age, common medications can reduce an individual's resiliency to heat and cold. With effects of Climate Change, the extremes and frequency of those events will rise. The City currently does not have a public facility that has backup generation suitable for short or long-term shelter. The decommissioning of the Diablo Canyon NPP and the transition from fossil fuels are occurring. As with any transition from a known and mature system to a new and innovative one, the transition will introduce uncertainty and challenge reliability in the interim while likely to result in a diverse and more sustainable system in the long term. As critical systems become more dependent on telemetry and remote controls, power hardening of the communication paths becomes necessary and has only emerged as new technologies have been retrofit or replaced existing systems.

2022-7. Critical Systems Cyber Resiliency Project

- Conduct security audit, power audit, engineering, environmental, and cost-benefit analysis of critical systems (communications networks, telemetry networks, system controls, etc.)
- Identify and prioritize projects based on critical systems and life safety.
- Projects may include software/hardware upgrades, power hardening/resiliency, "sandboxing" or isolating systems from the Internet or other networks.
- Prioritize projects and establish a budget and project calendar.
- Identify ongoing costs to maintain and monitor

Mitigation Priority and Performance	
Priority	2
Hazards Mitigated	Cyber Threat, Energy Shortage, Severe Weather, Earthquake, Terrorism
Estimated Timeline	5 years
Estimated Cost/Funding Source	$5 Million/ Capital Projects budget, maintenance budget, CDBG funds, HMP funds, Homeland Security grants, and other Federal and State infrastructure grants and funds.
Responsible Agency/Department	City Manager's Office, Information Technology Division, Public Works, Fire Department, Police Department, other Departments, and partner agencies.
Comments	This project was adapted from 2017-7 included as part of the 2017 LHMP. The "Internet of Things" as well as the ubiquitous use of ICs and intelligent controls has provided the unprecedented capability to provide services and manage infrastructure. It has also provided a pathway for independent "Lone Wolf" and State Sponsored attacks that can range from annoying to life-threatening. A systems risk assessment and mitigation/hardening is warranted to protect the City's ability to serve the public.

2022-8. Hazardous Material Air Monitoring and Alerting Project

- Conduct engineering, atmospheric/meteorological studies, environmental, and cost-benefit analysis
- The project includes identifying sensor arrays, telemetry, and alert system integration, property/right of way acquisition, and other requirements as may be identified.
- Prioritize projects and establish a budget and project calendar.
- Identify ongoing costs to maintain and monitor

Mitigation Priority and Performance	
Priority	10
Hazards Mitigated	Hazardous Materials Release, Train Accident, Radiological Accident, Terrorism, Cyber Attack
Estimated Timeline	4 years
Estimated Cost/Funding Source	$1 Million/ Capital Projects budget, maintenance budget, CDBG funds, HMP funds, Homeland Security grants, and other Federal and State infrastructure grants and funds.
Responsible Agency/Department	City Manager's Office, Information Technology Division, Public Works, Fire Department, Police Department, other Departments, and partner agencies.

Mitigation Priority and Performance	
Comments	This project was adapted from 2017-8 included as part of the 2017 LHMP. The City hosts an active railroad, as well as industrial, petroleum, and agricultural chemical producers, users, and transporters in and near the City as well as the Diablo Canyon Nuclear Power Plant. The City has limited capability/authority to manage these hazards and is generally managed by the County of Santa Barbara and the County of San Luis Obispo. However, low-level events have shown an inherent weakness in the system in that budgets no longer support full-time monitoring and staffing of response personnel trained in HazMat response as well as the inability of the City to elicit timely information from responsible parties. The proximity of these hazards to high-density population centers leaves very little time to identify and enact protective measures. A real-time monitoring system that is integrated into a public warning system is warranted.

2022-9. Public Weatherization Support Program

- Conduct environmental, and cost-benefit analysis
- Projects may include low/no-interest loans, grants, property acquisition, or other infrastructure projects as informed by research and history.
- Prioritize projects and establish a budget and project calendar.
- Identify ongoing costs to maintain and monitor

Mitigation Priority and Performance	
Priority	12
Hazards Mitigated	Hazardous Materials Release, Severe Weather, Petroleum Accident, Train Accident, Radiological Accident, Climate Change, Terrorism, Cyber Attack
Estimated Timeline	20 years
Estimated Cost/Funding Source	$1 Billion/ Capital Projects budget, maintenance budget, CDBG funds, HMP funds, Homeland Security grants, and other Federal and State infrastructure grants and funds, community partners.
Responsible Agency/Department	TBD
Comments	This project was adapted from 2017-9 included as part of the 2017 LHMP. Weatherization of structures is an effective mitigation method of protecting inhabitants from various hazardous materials (“Sheltering in Place as a Public Protective Action” NRC000071, March 30, 2012). While recent construction over the last several decades has included, per code, adequate weatherization, older structures, including high density rentals are less resilient to weather, energy use, and hazardous material infiltration. The City has limited ability to affect change to privately owned, existing built infrastructure. Establishing a program/partnership to enhance the resiliency of private residences will serve the safety of residents if legal and sustainability goals can be met.

2022-10. Urban Forestry Hazard Assessment and Hazard Reduction

- Conduct environmental, and cost-benefit analysis
- Catalog, identify, and map trees within the City
- Assess their health

- Assess a risk and failure profile for each tree.
- Identify lower risk trees for reforestation while supporting environmental and habitat benefits of urban forests.
- Prioritize projects and establish a budget and project calendar.
- Identify ongoing costs to maintain and monitor

Mitigation Priority and Performance	
Priority	11
Hazards Mitigated	Severe Weather, Drought, Earthquake, Agricultural Pests/Disease, Climate Change
Estimated Timeline	5 Years
Estimated Cost/Funding Source	$10 Million/ Capital Projects budget, maintenance budget, CDBG funds, HMP funds, Homeland Security grants, and other Federal and State infrastructure grants and funds, community partners.
Responsible Agency/Department	Recreation and Parks
Comments	This project was adapted from 2017-10 included as part of the 2017 LHMP. Drought has weekend trees throughout California, making them more susceptible to disease and increasing their risk to neighboring structures, vehicles, and passersby. Recent storms have caused extensive failure of trees in Santa Maria, causing damage to infrastructure, vehicles, and homes. Urban forests serve a necessary function in providing mitigation for 'heat island' effects of urbanization, carbon sequestration, and habitat for protected, threatened, and endangered species such as Monarch Butterflies and raptors. Removing and replacing existing trees with resilient species that can provide the same benefits, but with a lower risk profile is a priority for the City.

2022-11. Critical Infrastructure Threat Assessment Identification Project

- Establish project deliverables to meet goals and objectives
- Establish budget and timeline
- Assess current capabilities to achieve project objectives and address resource shortfalls.
- Establish a comprehensive list of built infrastructure resources, their owners, and metadata relevant to risk assessment.
- Identify facilities and infrastructure that are necessary to minimize loss of life and property or to facilitate response or recovery activities.
- Prioritize projects and establish a budget and project calendar.
- Identify ongoing costs to maintain and monitor

Mitigation Priority and Performance	
Priority	4
Hazards Mitigated	Earthquake, Drought/Water Shortage, Flooding, Severe Weather, Cyber Threat, Hazardous Materials Release, Energy Shortage, Well Stimulation/Hydraulic Fracking, Oil Spill, Agricultural Pests/Disease, Terrorism, Natural Gas, Pipelines and Storage, Epidemic/Pandemic/Vector-Borne Disease, Dam Failure, Levee Failure, Radiological Incident, Train Accident, Civil Disturbance, Landslide/Other Earth Movement, Commercial/Military Aircraft Accident

Mitigation Priority and Performance	
Estimated Timeline	2 years
Estimated Cost/Funding Source	$250 Thousand/ Capital Projects budget, maintenance budget, CDBG funds, HMP funds, Homeland Security grants, and other Federal and State infrastructure grants and funds, community partners.
Responsible Agency/Department	Public Works, City Manager's Office, Information Technology, with support from other departments as required.
Comments	This project was adapted from 2017-11 included as part of the 2017 LHMP. Currently, there is not a countywide agreed-upon list of Critical or Essential Facilities. While there are several lists of Critical and Essential Facilities, the criteria are not standardized. Additionally, the list of Critical and Essential Facilities lacks the necessary metadata (i.e., construction type, elevation level, replacement value, content cost) that would be beneficial to assessing risk to threats and hazards. Past emphasis was on City/Government infrastructure. However, what creates resiliency and provides needs to the population are mostly private enterprise (fuel, food, medical care, logistics, communications, manufacturing, agriclture, etc.). Also, the infrastructure that is needed by one population may be significantly different from another (medically fragile, economically challenged, personal transportation, fiscal resiliency, etc.) Because there is not a comprehensive list of Critical or Essential Facilities, portions of the HMP utilized the HAZUS default data. While the HAZUS default data provided better insight into the earthquake and flood risk, the assumptions (i.e. structural characteristics of building) do not adequately reflect the true vulnerabilities of the facilities and/or the community. To remedy this, The City of Santa Maria is proposing to coordinate with Santa Barbara County to create a comprehensive Critical or Essential Facilities List and utilize it in HAZUS.

2022-1212. All Hazards Community Education Programs

- Establish project deliverables to meet goals and objectives
- Establish budget and timeline
- Assess current capabilities to achieve project objectives and address resource shortfalls.
- Prioritize projects and establish a budget and project calendar.
- Identify ongoing costs to maintain and monitor

Mitigation Priority and Performance	
Priority	5
Hazards Mitigated	All
Estimated Timeline	Continuous
Estimated Cost/Funding Source	$$250,000 per anum/ Department budgets, public safety funding/assessments, HMP funds, Homeland Security grants, and other Federal and State infrastructure grants and funds, community partners.
Responsible Agency/Department	Fire Departmetn, Police Department, Recreation and Parks Department, Library
Comments	Culturally competent, accessible emergency preparedness and response education and skills to build a resilient population that can effectively coordinate with response agencies to mitigate the effects of known and

	emergent crisis and disasters. Promote and provide programs such as CERT (FEMA), and Listos (California) and other programs as identified.

2022-1313.Core Capabilities Development and ICS/SEMS.NIMS Training

- Establish project deliverables to meet goals and objectives
- Establish budget and timeline
- Assess current capabilities to achieve project objectives and address resource shortfalls.
- Prioritize projects and establish a budget and project calendar.
- Identify ongoing costs to maintain and monitor

Mitigation Priority and Performance	
Priority	9
Hazards Mitigated	All
Estimated Timeline	Continuous
Estimated Cost/Funding Source	$75,000 per anum/ General fund, public safety funds/assessments, HMP funds, Homeland Security grants, and other Federal and State infrastructure grants and funds, community partners.
Responsible Agency/Department	Fire Department, City Managers Office.
Comments	Maintain the training and readiness of City Departments, staff and community partners to develop and maintain emergency management skills necessary to minimize losses during crisis and disasters and to facilitate recovery using a Whole Community perspective.

2022-1414. Information Technology, Communications, Interoperability and Resiliency

- Establish project deliverables to meet goals and objectives
- Establish budget and timeline
- Assess current capabilities to achieve project objectives and address resource shortfalls.
- Prioritize projects and establish a budget and project calendar.
- Identify ongoing costs to maintain and monitor

Mitigation Priority and Performance	
Priority	1
Hazards Mitigated	All
Estimated Timeline	4 years
Estimated Cost/Funding Source	$20 Million/ Capital Projects budget, maintenance budget, HMP funds, Homeland Security grants, and other Federal and State infrastructure grants and funds, community partners.
Responsible Agency/Department	City Manager's Office, Information Technology, Fire Department, Police Department
Comments	Our recent experience is that communication systems are rapidly changing and with staff and leadership changes, systems become deprecated rapidly. Continuous training on best practices, maintenance of effective systems and incorporation of new technologies requires constant effort. Interoperability, a keystone SEMS/NIMS, requires constant effort not just in the technology

Mitigation Priority and Performance	
	arena, but more importantly in interagency and public relationships, training and exercises. Traditional siloed communications are ineffective in mitigating whole community needs during crisis and disasters. Flexibility to establish emergent strike teams and task forces will help minimize casualties and maximize effectiveness of responses.

8.0 PLAN MAINTENANCE

8.1 MONITORING, EVALUATING, AND UPDATING THE PLAN

Since the last LHMP in 2017, the LPT has monitored, evaluated, and updated the plan on a continuing and as-needed basis. The City was very successful in implementing the 2017 mitigation actions as noted in Table 7-1. The remaining mitigation actions outlined in the 2017 LHMP are ongoing at the time of this 2022 update.

The City of Santa Maria will be responsible for ensuring that this annex is monitored on an ongoing basis. The City will continue to participate in the countywide MAC and attend the annual meeting organized by the County Office of Emergency Management 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 City's LHMP will be forwarded to the County Office of Emergency Management for inclusion in further updates to the MJHMP.

Major disasters affecting the City of Santa Maria's community, legal changes, notices from Santa Barbara County (lead agency for the County-wide Plan), and other significant events may trigger revisions to this plan or the convening of the LPT. The City LPT, in collaboration with the Santa Barbara County Office of Emergency Management, 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 City is committed to revising the plan at a minimum of every five years. The City's Emergency Services Specialist or the City'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 the multi-jurisdictional plan, including this annex.

8.2 IMPLEMENTATION THROUGH EXISTING PLANS AND PROGRAMS

The City 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., General Plan, building codes, floodplain management ordinance). The General Plan and the LHMP annex are complementary documents that work together to achieve the goal of reducing risk exposure to the City's citizens. An update to a general plan 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 City incorporates the LHMP by reference into its General Plan Safety Element. Under AB 2140, the City may adopt its current, FEMA-approved LHMP into the Safety Element of the General Plan. This adoption makes the City eligible to be considered for part or all of its local-share costs on eligible Public Assistance funding to be provided by the state through the California Disaster Assistance Act (CDAA) (see Section 2.0, *Plan Purpose and Authority* for the adopting resolutions). The LHMP has also been prepared to support the City's General Plan and Stormwater Plan. The Floodplain Management Ordinance applies in concert with the City's zoning ordinance and building codes to reduce flooding hazards from land use. The LHMP includes several mitigations addressing flood control infrastructure to support the City's efforts to reduce flooding hazards.

The information contained within this LHMP, including results from the Vulnerability Assessment and the Mitigation Strategy, is used by the City to help inform updates and the development of local plans, programs, and policies. The City may utilize the hazard information when developing and implementing the City's capital improvement programs and the Planning and Building Divisions may utilize the hazard information when reviewing a site plan or other type of development applications.

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 City 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 City 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 Roy Dugger, Emergency Services Specialist, using the following information:

Roy Dugger, Emergency Services Specialist
City of Santa Maria

314 West Cook Street #8
Santa Maria, CA 93458
rdugger@cityofsantamaria.org
(805) 925-0951 x 2334

9.0 REFERENCES

1995. City of Santa Maria. General Plan Safety Element

City of Solvang
Local Hazard Mitigation Plan

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

February 2023

The City of SOLVANG Danish Capital of America

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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 City of Solvang (City) 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 City. The LHMP was last comprehensively updated in 2017 as an annex to the 2017 MJHMP. Since 2017, the City has:

- Incorporated the LHMP goals, objectives, and mitigation actions into its local plans and processes, including the General Plan Safety Element by reference and specific hazard planning efforts (e.g., Stormwater Management Program).
- Used the LHMP's assessment of capabilities, hazards, and vulnerabilities to inform planning, capital improvements, programs, decision-makers, and the public.
- Implemented mitigation actions through the City's general plan, capital improvement program, maintenance programs, grant programming, community outreach, and budget process.
- Reviewed and evaluated mitigation actions before and after disasters, including the Alisal Fire.

This update to the LHMP builds on and refines the MJHMP's assessment of hazards and vulnerabilities countywide to develop a mitigation plan for the City. The City participated in the 2022 MJHMP Mitigation Advisory Committee (MAC) and Local Planning Team (LPT), reviewed all portions of the MJHMP pertaining to the City, 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 City is a participating agency in the County's MJHMP update.

The City'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 City. Vulnerability assessments summarize the identified hazards' impact on the City. 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 City's 2022 LHMP.

[INSERT CITY RESOLUTION(S) ADOPTING PLAN UPDATE]

[INSERT CITY 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 City'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 Mitigation Advisory Committee (MAC) and the second is the Local Planning Team (LPT).

All eight incorporated cities and the six special districts joined the County as participating agencies in the preparation of the MJHMP update, including the 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 Santa Maria Valley Water Conservation District (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 City participated as a MAC member to prepare this LHMP as an annex to the 2022 MJHMP. The City was represented by Xenia Bradford, City Manager, and David Packard, Assistant to the City Manager, 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	**MAC Meeting #1 (virtual)** 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	**MAC Meeting #2 (virtual)** 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	**MAC Meeting #3 (virtual)** 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	**MAC Meeting #4 (virtual)**

Date	Purpose
	Collected feedback on 2017 mitigation strategies Conducted interactive exercise on mitigation strategies for key hazards unaddressed in previous MJHMP Discussed annex updates
January 2022	**MAC Meeting #5 (virtual)** Presented draft plan Discussed key MAC/LPT review needs and key issues Discussed annex updates to dovetail with plan update
March 2022	**MAC Meeting #6 (virtual)** 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 City's LPT. These individuals collaborated to identify the City's critical facilities, provide relevant plans, report on the progress of City mitigation actions, and provide suggestions for new mitigation actions.

Table 3-2. City of Solvang Local Planning Team 2022

Department	Name	Title
City Administration	Xenia Bradford	City Manager
City Administration	David Packard	Assistant to the City Manager
Emergency Preparedness Program	Matt van der Linden	Public Works Director

The Solvang LPT members worked directly with the Santa Barbara 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 City 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 (1/19/22) to discuss LHMP priorities and mitigation approaches.
January and May 2022	Reviewed new maps and local vulnerabilities.

Meeting Dates	Summary of Activity
	Provided input on the status of 2017 LHMP mitigation strategies. Reviewed draft mitigation strategies and provide feedback. Reviewed and finalized 2022 LHMP

3.4 PUBLIC OUTREACH AND ENGAGEMENT

As a participating agency in the 2022 MJHMP update, the City 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 City'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.

Emergency preparedness information is also regularly distributed to the residents and businesses via the City's website.

In May 2022, the draft LHMP was completed and submitted for review by FEMA and CalOES as part of the MJHMP. The City's draft LHMP was published on the City website, as well as hard copies were available for review at City Hall. The opportunity for the community to be heard was permitted during the City Council meeting before the adoption of this plan.

4.0 CAPABILITY ASSESSMENT

The City identified current capabilities and mechanisms available for implementing hazard mitigation activities. This section presents a discussion of the roles of key departments, administrative and technical capacity, fiscal resources, and summaries of relevant planning mechanisms, codes, and ordinances.

4.1 DEVELOPMENT TRENDS AND DEMOGRAPHICS

The City of Solvang encompasses 2.43 square miles, located approximately 2 miles east of the City of Buellton within the Santa Ynez Valley. Solvang was founded in 1911 by a group of Danish teachers. Danish for "Sunny Fields", Solvang is now a popular tourist destination. The City is home to a variety of Danish festivals, the Hans Christian Andersen Park, Danish pastries, and Danish-themed shops. Solvang was incorporated as a city on May 1, 1985. The City lies at an elevation of

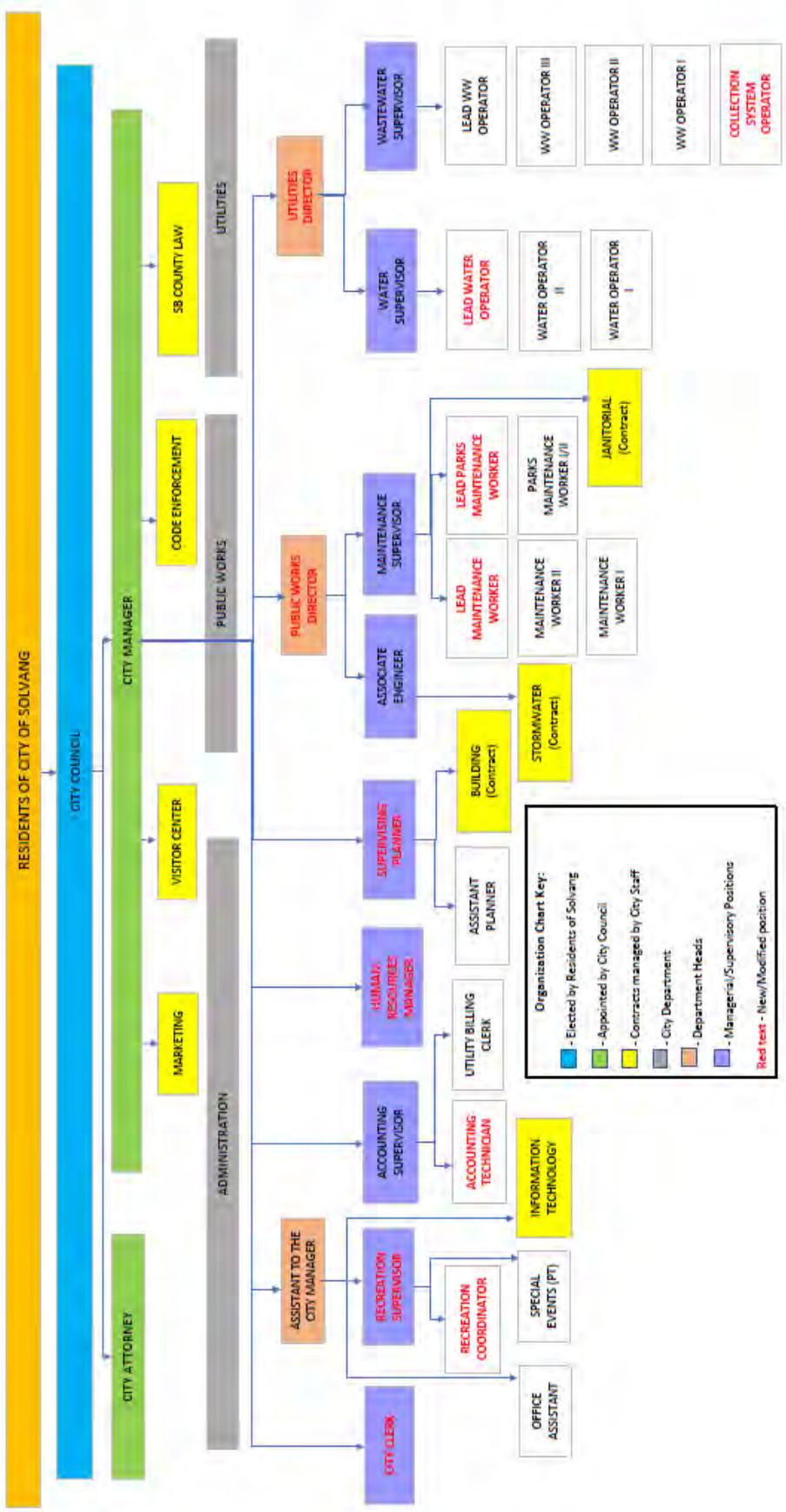
roughly 500 feet. Solvang, like the rest of the Santa Ynez Valley, continues to experience growth as people migrate from the coastal areas looking for affordable real estate within commuting distance to the more populous areas of the County, however, unlike the rest of the Valley, Solvang is close to full build-out with very few vacant, developable parcels remaining. Solvang enjoys a Mediterranean coastal climate with mild to hot, dry summers and cool winters.

According to the 2020 U.S. Census Bureau data, the City is home to 5,761 residents. This population is projected to grow to 6,298 residents by 2050 (SBCAG 2018). The average household size in the City is 2.39 and the median household income is $71,952. Approximately 71.4 percent of City of Solvang residents identify as White, 10.2 percent identify as Hispanic, and 18.4 percent identify as Asian, Black, Mixed, or Other (US Census Bureau 2019)

4.2 KEY DEPARTMENTS

Solvang utilizes the Council-Manager form of local governance, which includes both elected officials and an appointed City Manager. Solvang has five council members, which includes an elected mayor with a two-year term and a mayor pro-tem, who is appointed each calendar year to represent Solvang.

The City Council is Solvang's legislative body, setting policy, approving budgets, and setting tax rates. Members also hire the City Manager, who is responsible for the day-to-day administration of Solvang and serves as the Council's chief advisor. The City Manager prepares a recommended budget, recruits and hires most of the City's staff, and carries out the council's policies. While the City Manager may recommend policy decisions, the City Manager is ultimately bound by the actions of the Council. The Council appoints the City Attorney. Solvang's organizational chart is shown below.


RESIDENTS OF CITY OF SOLVANG
CITY COUNCIL
CITY ATTORNEY
CITY MANAGER
ADMINISTRATION
MARKETING
VISITOR CENTER
CODE ENFORCEMENT
SB COUNTY LAW
PUBLIC WORKS
UTILITIES
ASSISTANT TO THE CITY MANAGER
CITY CLERK
RECREATION SUPERVISOR
RECREATION COORDINATOR
SPECIAL EVENTS (PT)
OFFICE ASSISTANT
INFORMATION TECHNOLOGY
ACCOUNTING SUPERVISOR
ACCOUNTING TECHNICIAN
UTILITY BILLING CLERK
HUMAN RESOURCES MANAGER
SUPERVISING PLANNER
ASSISTANT PLANNER
BUILDING (Contract)
PUBLIC WORKS DIRECTOR
ASSOCIATE ENGINEER
STORMWATER (Contract)
MAINTENANCE SUPERVISOR
LEAD MAINTENANCE WORKER
MAINTENANCE WORKER II
MAINTENANCE WORKER I
LEAD PARKS MAINTENANCE WORKER
PARKS MAINTENANCE WORKER I/II
JANITORIAL (Contract)
UTILITIES DIRECTOR
WATER SUPERVISOR
LEAD WATER OPERATOR
WATER OPERATOR II
WATER OPERATOR I
WASTEWATER SUPERVISOR
LEAD WW OPERATOR
WW OPERATOR III
WW OPERATOR III
WW OPERATOR I
COLLECTION SYSTEM OPERATOR
Organization Chart Key:
- Elected by Residents of Solvang
- Appointed by City Council
- Contracts managed by City Staff
- City Department
- Department Heads
- Managerial/Supervisory Positions
Red text - New/Modified position

Departments involved in activities related to Hazard Mitigation include:

- **Fire Protection Services** (Solvang is part of the Santa Barbara County Fire District).
  - Administration: Develop, implement and monitor policies, procedures, budgets, fees, automatic aid agreements, mutual aid agreements, and liaison with other City departments and outside agencies.
  - Fire Prevention Bureau: Coordinate adoption of codes and ordinances, review site and building plans for fire code compliance, and develop and present public education programs.
  - Emergency Medical Services: Manage the department's paramedic and EMT programs, respond to medical emergencies and other calls for service, and participate with other community and regional health care providers to reduce public illness and injury.
  - Suppression Division: Maintain the department's personnel, apparatus, equipment, and fire stations in a state of readiness to respond to the community's needs, develop and implement standard operating procedures for various types of emergency responses, respond to all types of emergencies, and train and interact with neighboring jurisdictions and regional agencies.
- **Building & Safety Division** (Solvang contracts with a private company for issuance of building permits and for Building & Safety services related to plan check and inspection)
  - Coordinate adoption of building, plumbing, electrical, and mechanical codes. Develop building ordinances.
  - Review site and building plans for compliance with building codes and ordinances. Conduct inspections of building permit-related construction projects.
  - Conduct health and safety inspections relating to violations of the building, electrical, plumbing, and mechanical codes.
  - Damage assessment of structures from multiple causes to facilitate the repair and future occupancy.
- **Solvang City Manager/Planning Department**
  - Emergency Management: Coordinate Solvang's Disaster Preparedness Program, liaison with all City departments and divisions, as well as other public and private organizations, develop, coordinate and implement the EOP, and maintain the operational readiness of Solvang's Emergency Management Team, the E.O.C., and other key elements.
  - Develop and maintain Solvang's general plan, zoning ordinances, and development standards.
  - Oversee Solvang's development process assuring compliance with zoning and general plan, including environmental impact reports, design review, historic preservation, landscape review, habitat conservation, floodway prohibitions, and post-construction stormwater development standards.

- Through the Code Enforcement position, manage Solvang's weed abatement program along with County Fire.

- **Solvang Public Works Department**
  - Maintains Solvang's infrastructure (assets) ranging from streets to parks to buildings, vehicle fleet, and water and wastewater infrastructure.
  - Responds to Solvang's emergencies, including EOC response in disasters and assisting police and fire departments with hazardous materials clean up, debris removal, traffic, and perimeter control efforts, traffic accident clean up, and evacuation routing.
  - Reviews engineering on private and public grading, floodways, retention basins, and infrastructure to assure compliance with Federal, State, and local ordinances.
  - Develops engineering ordinances, policies, and standards that help protect and preserve Solvang's infrastructure.
  - Evaluates all circulation elements for projected traffic impacts.
  - Coordinates other response agencies assisting with damage assessment and assists with cost estimates for damage assessment.

- **Solvang Utilities Department**
  - Determines needed infrastructure improvements, water system, and water/wastewater treatment capabilities.
  - Provides response personnel for evaluation of damaged infrastructure.
  - Operates, maintains, and enhances both the water treatment/distribution and wastewater collection/treatment systems within Solvang.
  - Provides support as necessary to Solvang's EOC Team.
  - Responsible for planning and implementation associated with the following plans:
    - Bradbury Dam Emergency Action Plan
    - Water Quality Emergency Notification Plan
    - Water Division Emergency Response Plan
    - Wastewater Overflow Response & Prevention Plan
    - Wastewater Treatment Plant Operations Plan
    - Stormwater Management Plan

- **Police Department** (Solvang contracts with Santa Barbara County Sheriff's Department for Police Services).
  - Responds to safety concerns involving threats and/or damage to life or property. Acts as the enforcement entity for violations of State and local laws and ordinances.
  - Primary emergency responders to acts of civil disobedience and public disorders and terrorism. Support personnel for emergency rescue and management.

- Investigative services for criminal acts that result in personal injury/death and the destruction of property.
- Develops and implements emergency response plans and policies, focusing on evacuation procedures and traffic control.
- Primary responders to acts of terrorism, focusing on suspect intervention and facility and staff protection.

4.3 ADMINISTRATIVE AND TECHNICAL CAPACITY

The administrative and technical capabilities of the City, as shown in Table 4-1, include staff, personnel, and department resources available to implement the actions identified in Section 7.0, *Mitigation Plan* of this LHMP. 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. The City's department heads multitask in many areas because of budgetary constraints. The City Manager oversees all factors of Emergency Management within the City.

Table 4-1. City of Solvang Administrative and Technical Capacity

Personnel Resources	Yes/No	Department/Position
Planner/engineer with knowledge of land development/land management practices	Yes	Planning Director, Public Works Director / City Engineer
Engineer/professional trained in construction practices related to buildings and/or infrastructure	Yes	Public Works Director / City Engineer
Planner/engineer/scientist with an understanding of natural hazards	Yes	Contract City Planner, City Engineer
Personnel skilled in GIS	Yes	Public Works Staff, Consultants
Full-time building official	Yes	Contract Building Inspector and Building Official
Floodplain manager	Yes	Public Works Director / City Engineer
Emergency manager	Yes	City Manager
Grant writer	Yes	City staff
Other personnel	Yes	City staff
GIS Data Resources (Hazard areas, critical facilities, land use, building footprints, etc.)	Yes	Public Works Director

Personnel Resources	Yes/No	Department/Position
Warning Systems/Services (Reverse 9-11, cable override, outdoor warning signals)	Yes	City Manager
Other	N/A	City staff

4.4 LEGAL AND REGULATORY CAPABILITIES

The legal and regulatory capabilities of the City are shown in Table 4-2, including existing ordinances and codes that affect the physical or built environment of Solvang. Examples of legal and/or regulatory capabilities can include the City's 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. Note that the City's General Plan is currently undergoing a comprehensive update with an estimated completion date in spring 2023. Also, fire services in Solvang are provided by the Santa Barbara County Fire District.

Table 4-2. City of Solvang: Legal and Regulatory Capability

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

4.5 GIS, COMPUTER AND COMMUNICATION TECHNOLOGY

The City has a basic GIS system used by the Public Works and Planning Departments. Currently, parcels, zoning and flood hazards have been mapped including water, sewer, and storm drain systems. Hazard layers created for this plan can be incorporated into that system for future planning and updates. In the event it is needed, the GIS system is fully functional and can be used to provide the State of California Office of Emergency Services with preliminary damage assessments.

Through the Santa Barbara County Sheriff's Department, Solvang has a fully functional 911 emergency telephone system, dispatch capabilities, and a reverse 911 system to issue warnings in advance of disasters.

Solvang is fully functional on the internet and has its own website which will be used to assist with communication necessary for implementation and future updates of this plan. Emergency Alerts can be added to the City of Solvang website home page to provide essential information to residents.

Solvang also has a satellite phone for emergency communications.

4.6 FINANCIAL RESOURCES

Solvang's financial worth continues to grow. The General Fund balance is an important element that can show Solvang's financial strengths or weaknesses. For Fiscal Year 2021-2022 (FY 21-22), Solvang's General Fund operating budget is approximately $9.5M. The revenue budget for Solvang contains several funding sources, each governed by a distinct set of conditions particular to that revenue source. The largest General Fund revenue source for the City is Transient Occupancy Tax.

The largest revenue factor and the core of the resource base that enables Solvang's provision of community services is the local revenue portion of Solvang's General Fund. Solvang's revenue base is determined by different community conditions such as the current population, employment and income, economic activity within Solvang, the growth of invested value from residential and commercial construction, business investment in plant and equipment, and demand for local real property. National, State, and regional economic conditions can also affect Solvang's revenue base by creating demand for community goods and services produced within Solvang. The primary revenue sources for the City are transient occupancy tax, sales tax, and property tax. The majority of expenditures are for operation and maintenance, water, and employee salaries and benefits.

Solvang's major economic drivers for its revenue base are transient occupancy tax sales tax, population growth, employment, construction, property values, and commercial activities. Solvang will begin to see a deceleration of population growth and construction over the next seven years based on the fact that Solvang is nearly built out.

Over the last two years, California's budget has diminished rapidly due to decreased tax revenues from an economic recession caused by the COVID-19 pandemic. The overall health of California's economy has a significant influence on local cities and counties, as local government appropriations are usually the first to have their appropriations diminished due to downturns in the economy.

Solvang's long-term financial and programmatic policies to be achieved over the next few years demonstrate its dedication to protecting the life and property of Solvang residents and businesses include:

- Continued development of the storm water management system and continued qualitative drainage measures.
- Provide support in public safety to maintain current response time and professionalism, to limit injury, loss of life, and property.
- Funding of emergency preparedness training, including CERT.

Overall, Solvang has indirectly referenced mitigation and hazard reduction principles throughout many of the aforementioned documents, plans, and policies. Integrating more direct language referencing mitigation and hazard reduction will help to reinforce Solvang's commitment to these principles. The indirect references can also indicate that the responsibility for hazard reduction is shared among numerous departments within Solvang, making it a challenge to identify a particular department to take the lead in these efforts.

Table 4-3 shows specific financial and budgetary tools available to the City such as community development block grants; capital improvements project funding; authority to levy taxes for specific purposes; fees for water, sewer, gas, or electric services; ability to incur debt through general obligations bonds; and withholding spending in hazard-prone areas.

Table 4-3. City of Solvang Fiscal Capability

Financial Resources	Accessible or Eligible to Use (Yes/No)	Has This Been Used for Mitigation in the Past?	Comments
Community Development Block Grants (CDBG)	Yes	No	
Capital improvements	Yes	Yes	
Authority to levy taxes for specific purposes	Yes – Vote required	No	
Fees for water and sewer service	Yes	Yes	
Incur debt through general obligation bonds	Yes	No	
Incur debt through special tax bonds	Yes – Vote required	No	
Incur debt through private	No	No	

Financial Resources	Accessible or Eligible to Use (Yes/No)	Has This Been Used for Mitigation in the Past?	Comments
Federal Grant Programs (Hazard Mitigation Grant Program)	No	No	

4.7 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 City can capitalize on its existing educational capacities, even non-hazard related such as school partnerships, 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 City.

The City provides educational materials through the City website, social media, distribution of print materials at special events, and staff members periodic presentations to the community. The City Maintains an Emergency Management Plan and works closely with the County of Santa Barbara to ensure emergency communication channels are available and ready for the Solvang community.

4.8 RELEVANT PLANS, POLICIES, AND ORDINANCES

Solvang has a range of guidance documents and plans for each of its departments. These include a General Plan, Public Works Water/Sewer Plans, Capital Improvement Plans, Storm Water Management Program, Parks & Recreation Master Plan, and Standardized Emergency Management Plan. Solvang adopts building codes, zoning ordinances, subdivision ordinances, and various planning strategies to address how and where development occurs. One of the essential ways Solvang guides its future is through policies laid out in the General Plan.

4.8.1 City of Solvang General Plan

Land Use Element

The majority of land within the City boundaries has been developed, with a bulk of the land zoned for residential use. Solvang is separated from neighboring communities by a greenbelt of agricultural and open space areas. The Santa Ynez River, Alamo Pintado Creek, Alisal Creek, and Adobe Creek are sources of flooding concern for the City of Solvang. The land surrounding these water bodies will be held as riparian and publicly owned open spaces. The City provides water and wastewater services and also designs and manages roadway and pedestrian facilities to

minimize conflicts between automobiles, pedestrians, and bicyclists. To ensure that the demand for public facilities and services does not exceed the City's ability to provide these facilities and services, the City periodically reviews projected municipal service and public facility demands. Before approving the new development, Solvang determines that public services and resources are available to serve the new development. Public safety services are provided through a contract with the County of Santa Barbara's Fire and Sheriff's departments.

Since the last update of the City's LHMP in 2017, land use and population in the City have not substantially changed. In 2020 the City adopted an Urban Growth Boundary which consists of the existing City limits. As such, modest development has occurred consistent with the adopted Land Use Element and has primarily comprised infill development and redevelopment within the City limits. There has been no expansion of the City boundary or its Sphere of Influence (SOI) and no comprehensive changes to the Land Use Element that would result in substantial densification. Further, City population has not substantially changed. As a result, the City's level of vulnerability to hazards analyzed in Section 6.0, *Vulnerability Assessment*, has not substantially changed due to land use, development, or population growth since the last update of the LHMP.

Housing Element

Conserving and improving existing housing and residential neighborhoods in Solvang is regarded as an important goal. Forty percent of the City's housing stock is 30 years or older. The City will support and encourage neighborhood preservation and upgrading through participation in the CDBG Urban County Partnership (County and cities of Buellton, Carpinteria, Lompoc, and Solvang) and the HOME Consortium (Urban County members plus Goleta and Santa Maria). These partnerships receive federal affordable housing and community development funding under three programs administered by the U.S. Department of Housing and Urban Development (HUD):

- Community Development Block Grant (CDBG)
- HOME Investment Partnerships Program (HOME)
- Emergency Solutions Grant (ESG)

The City's participation is to pursue funds for housing repair assistance and residential rehabilitation assistance. The City also operates a code enforcement program. Code enforcement is a means to ensure that the character and quality of neighborhoods are enhanced and maintained. Code enforcement efforts in Solvang will focus on bringing substandard units into compliance with current building and development codes. The development review process is another important tool in ensuring that new housing meets safety codes and zoning regulations can be served by all necessary utilities and infrastructure before a development permit is issued.

Development in the City of Solvang is subject to the Zoning Ordinance and the California Building Code that establishes minimum standards for all classes of construction.

Safety Element

The Safety Element identifies existing conditions and issues involving potential hazards and public safety considerations relevant to Solvang. It sets forth goals, objectives, and policies to provide for public health, safety, and welfare. The key issues that affect Solvang are hazards associated with seismicity, slope stability, flooding, structural fires, and wildfires. By identifying the nature and location of potential hazards, Solvang has adopted a land use plan that reflects such hazards and

has been able to establish appropriate programs to prevent or minimize death, injuries, damage to property, and economic and social dislocation resulting from public safety hazards. The LHMP is incorporated by reference in the Safety Element.

Physical constraints affect potential land development in Solvang. Development along the Santa Ynez River, Alamo Pintado Creek, and Adobe Creek is constrained due to flood hazards and biological resource considerations. Similarly, steep slopes and other areas of potential geologic hazards limit the extent of development in hillside areas within and around the City. Development that is mapped in flood-prone areas is subject to FEMA requirements and any new development must minimize flood problems that are identified by the National Flood Insurance Rate Program. To prevent dam inundation, evacuations plans should be in place.

Flooding

Areas potentially subject to inundation by 100-year floods should be limited to land uses that do not interfere with the capacity of the drainage course and that minimize hazards posed to people and property. Thus, agricultural and recreation/open space land uses are considered the most appropriate land uses for the 100-year flood zone. The only area in Solvang where development has occurred within a 100-year flood zone is along Alamo Pintado Creek near State Route 246, and portions of the Alisal Golf Course. No new urban development should be permitted within any 100-year flood zone unless it can be demonstrated that building pads will be located above the 100-year flood level and/or floodproofing measures are incorporated into project design. Information prepared by a civil or hydrological engineer that certifies compliance with development standards must be submitted to the City before construction. To minimize the adverse effects of urbanization on drainage and flood control facilities, the City will require the implementation of adequate erosion control measures for development projects. Solvang will maintain its open space preserves and require developers to provide adequate open space to minimize impermeable surfaces throughout the city which can promote flooding. Urban land uses may be permitted within the 500-year floodplain with the understanding that some degree of risk is assumed for potential damage resulting from infrequent and typically shallow flooding. The only area in Solvang where development has occurred within a 500- year flood zone is the eastern portion of the Creekside neighborhood along Alamo Pintado Creek.

Seismic/Geologic Hazards

The suitability of land for development is influenced strongly by the presence of certain geologic and seismic hazards. These hazards range from the direct and indirect effects associated with earthquakes to problems associated with slope stability and soil conditions that are not conducive to development. To ensure that geologic hazards in areas for human use or habitation are mitigated properly or avoided before development, the City will require geotechnical investigations by an engineering geologist and civil engineer for all grading and construction proposed within any area of potential slope instability and/or areas subject to severe seismic hazards. All construction will be required to be in conformance with the California Building Code as it provides regulations for earthquake-resistant design and excavation and grading and with the City's adopted hillside development ordinance. The development of critical facilities is restricted in areas determined to be high-risk geologic hazard zones.

Fire

The Solvang Municipal Code includes the adoption of the Uniform Fire Code which contains specific development regulations for areas of high and severe fire hazard. Site plans for any development proposed in high hazard areas are subject to the review of the Fire Marshal during the City's site plan review process. Such plans must show that the site provides adequate emergency access, has adequate water supply and pressure to meet fire flow needs, and provides an adequate fuel break or buffer zone to prevent the spread of structural fires to wild land areas. Further, strict enforcement of building codes will minimize potential fire hazards resulting from inappropriate building materials or structural design. The City will enforce an ordinance that establishes criteria for land development in hillside areas with an emphasis on fire-retardant construction materials, access for fire-fighting personnel and equipment, and removal of combustible vegetation. Fire prevention and control measures include the removal or reduction of vegetation that constitutes fuel for fires in or near developed areas, controlled burning, and the development of a network of firebreaks that reduce the potential spread of wildfires.

Maintaining adequate emergency response capabilities is also necessary to ensure that fires are controlled. The Solvang Fire Department should be provided with sufficient financial resources to maintain its facilities, equipment, and personnel at a level appropriate to the needs identified by the City's Emergency Services Coordinator. City and County roads to access high fire hazard areas should remain unobstructed and in adequate condition so that emergency vehicles will continue to have access to these areas.

Hazardous Materials and Aircraft Hazards

Aside from natural hazards, the Safety Element identifies hazardous material incidents and aircraft hazards as man-made hazards. Aircraft hazards do not seem to pose a serious threat to the City because Solvang is located outside the Santa Ynez Valley Airport's area of influence. Therefore, no special planning measures are documented in the General Plan to manage potential aircraft hazards. Goals, policies, and mitigation measures to reduce the negative effects of hazardous material incidents are described in detail in the Safety Element.

Hazardous materials, such as household products, asbestos, lead-based paint, and aerially-deposited lead, can be found in the City. To reduce the negative effects of household products, Solvang participates in a quarterly Household Hazardous Waste and Electronics Collection and Recycling Day, when such materials are accepted free of charge. Santa Barbara County also has a hazardous waste management plan.

Solvang will respond to the unlikely event of a contaminant release from all City water treatment facilities per the City's emergency response procedures.

Disaster Preparedness

Disaster preparedness involves the development of response procedures, identification of evacuation routes, design and installation of warning systems, purchase of emergency equipment, and training of emergency personnel. Mitigation programs are akin to preparedness actions in that they are measures to reduce or eliminate the adverse effects of future hazard events. The principal forms of mitigation are land use controls to prevent or limit the location of development and populations in areas that are susceptible to hazard events, enforcement of building codes, and the

installation of structural barriers, such as dams and levees, to shield people and development from harm. The City of Solvang's Director of Emergency Services is responsible for overseeing the City's disaster preparedness program. Key aspects of Solvang's local emergency management program involve disaster evacuation and the operation of emergency shelters.

Public Facilities and Services

A shortage of critical materials, such as a clean water supply, is a hazard that jurisdictions strive to avoid. In Solvang, water is supplied by the City of Solvang Water Division. Potable water sources in Solvang include local groundwater wells and State water. The City's Water Master Plan and EIR indicate that the City has adequate water and sewer capacity to meet expected build-out needs. The water and sewer infrastructure varies in age. Both water and sewer facilities undergo regular maintenance activities to ensure the systems are operational.

Another hazard that jurisdictions strive to avoid is a utility mishap. All new development is required to underground all utilities. The undergrounding of utility cables can prevent a power/utility service outage in Solvang during flooding, high winds, and earthquakes.

Fire and police protection is also a concern of Solvang, as ensuring the capabilities of these departments helps aid hazard mitigation. The City of Solvang contracts with the Santa Barbara County Sheriff's Department for law enforcement services. The Sheriff's department responds to growth by assigning additional deputies to an area in direct proportion to its increase in population. To provide an adequate level of police protection throughout the City, a minimum of one full-time police officer per every 1,500 residents is required.

4.8.2 Zoning and Subdivision Ordinances

The State of California has empowered all cities and counties to adopt zoning ordinances. Solvang's original Zoning Ordinance was adopted on July 22, 1993, and has been amended several times. It is codified in Title 11 of the Municipal Code. Solvang adopted a Subdivision Ordinance on April 17, 1966, reference Solvang Municipal Code Title 12. Local land use controls include the Zoning Ordinance, which shapes the form and intensity of land use and residential development. Consistent with the General Plan, the City's Zoning Ordinance allows a range of zones and dwelling unit densities. Zoning ordinance regulations related to hazard mitigation relate to the risk assessment for hazards within the City, including flooding.

Solvang has a five-member Planning Commission, which is an advisory body to the City Council. The Commission was established under State law to provide relief in special cases where the exact application of the terms of the ordinance would be unduly restrictive and cause hardship, in addition to generally reviewing zoning and subdivision proposals. The Planning Commission hears and decides upon the interpretation and the application of the provisions of the Zoning and Subdivision Ordinances. Although the Commission has certain discretionary powers in making its decisions, the Commission must always abide by and comply with the powers granted to it by the local Zoning and Subdivision Ordinances and the State's enabling acts. Additionally, the Planning Commission may recommend actions to the City Council and the Planning Commission's actions may be appealed to the City Council.

4.8.3 Building Codes

The State of California has adopted the most recent California Building Codes, which have been adopted and are enforced in Solvang. Reference Title 10 of the Municipal Code.

Solvang contracts with a private company for permit processing, plan check and inspection services. The Building Division is principally responsible for enforcing State, City, and County Codes for building residential and commercial structures and enforcing environmental codes and guidelines for maintaining existing structures.

4.8.4 Floodplain Management Ordinance

The City participates in the National Flood Insurance Program (NFIP) and maintains Floodplain Management Ordinance No. 93-140 which was updated in August of 1995 and July of 2015. It is codified in Title 13 of the Municipal Code. The City contracts with the County for a Joint Exercise of Powers Agreement for flood control. When a project is proposed within the City of Solvang and lies within a FEMA-defined Special Flood Hazard Area (SFHA), the project review is contracted out to the Santa Barbara County Flood Control District and recommendations are given back to the City of Solvang.

When reviewing projects for new construction within an SFHA, the County Flood Control District will establish the Base Flood Elevation (BFE) and recommend that the lowest finished floor of the building be elevated to two feet above the BFE for a habitable structure. For those structures that are not habitable, (i.e. storage, detached garage, etc.) Flood Control recommends that those structures be floodproofed according to FEMA standards. The County Flood Control District reviews plans according to the Santa Barbara County Code Chapter 15A "Floodplain Management".

Additionally, floodplain districts identified in the FIRMs include the following flood hazard zones and definitions:

- **Zone A** is the flood insurance rate zone that corresponds to the 100-year floodplains that are determined in the Flood Insurance Study (FIS) by approximate methods. Because detailed hydraulic analysis is not performed for such areas, no Base Flood Elevations or flood hazard factors are determined.
- **Zone AO** is the flood insurance rate zone that corresponds to areas of 100-year shallow flooding where depths are between one (1) and three (3) feet; average depths of inundation are shown, but no flood hazard factors are determined.
- **Zone A1-A30** is the flood insurance rate zone that corresponds to areas of 100-year flood; base flood elevations and flood hazard factors are determined.
- **Zone B** is the flood insurance rate zone that corresponds to areas between limits of the 100-year flood and 500-year flood, or certain areas subject to 100-year flooding with average depths less than one (1) foot or where the contributing drainage area is less than one square mile; or areas protected by levees from the base flood.
- **Zone C** is the flood insurance rate zone that corresponds to areas of minimal flooding.

4.8.5 Repetitive Loss (RL) Properties

Repetitive Loss Properties are defined as property that is insured under the NFIP that has filed two or more claims above $1,000 each within any consecutive 10-year period since 1978. There are no Repetitive Loss Properties within the City of Solvang.

4.8.6 City of Solvang Storm Water Management Program

In California, the State Water Resources Control Board (SWRCB) has determined that urban runoff is a leading cause of pollution through the state, with impacts on both human health and aquatic ecosystems. The SWRCB identified the City of Solvang as a small municipal separate system requiring coverage under the National Pollutant Discharge Elimination System (NPDES) *General Permit for Storm Water Discharges from Small Municipal Separate Storm Sewer Systems (MS4s)*, Water Quality Order No. 2003-0005-DWQ (General Permit). A requirement of the General Permit is the development of a Storm Water Management Program (SWMP) to reduce the discharge of pollutants.

The General Permit also requires the development and implementation of Best Management Practices (BMPs) to address six Minimum Control Measures (MCMs). This includes the following:

1. Public Education and Outreach on Storm Water Impacts;
2. Public Involvement and Participation;
3. Illicit Discharge Detection and Elimination;
4. Construction Site Storm Water Runoff Control;
5. Post-Construction Storm Water Management in New Development and Redevelopment; and
6. Pollution Prevention/Good Housekeeping for Municipal Operations.

The Storm Water Management Plan has been prepared by the City of Solvang and describes the City's program necessary to comply with the General Permit. It also serves as a framework for identifying, assigning and implementing control measures and BMPs intended to reduce the discharge of pollutants and protect downstream water quality.

Its purpose is to serve as a planning and guidance document to be used by the City's regulatory body; to define techniques and measurable goals for measuring BMP effectiveness, and to define a five-year schedule for SWMP implementation to comply with the General Permit requirements.

Following a description of the City of Solvang, the document comprehensively describes the Minimum Control Measures. They comprise the most substantive section of the Storm Water Management Program:

1. Public Outreach and Education

This measure is intended to ensure greater public support and compliance for the storm water management program. Specifically, they teach the public the importance of protecting stormwater quality. The City has already begun and will continue to partner with other local municipalities, such as the County of Santa Barbara and the Cities of Lompoc, Santa Maria, Buellton, Goleta, Santa Barbara, and Carpinteria to develop materials and host civic events.

The City also implements BMPs, including the use of 1) Brochures; 2) Web Pages; 3) Events; 4) Educational programs for children; 5) Storm Drain Markings; 6) Stormwater Hotlines; 7) Direct Mail/Media campaigns; 8) Business outreach programs; 9) Botanical garden exhibits; 10) Public surveys; and 11) Ongoing assessments of social marketing strategies. The SWMP also includes effectiveness measures and measurable goals for each respective BMP.

2. Public Participation and Involvement

The goal is to foster active community support for the SWMP. The City implements BMPs, including 1) Regular public meetings; 2) Regular coordination efforts among local agencies/stakeholders; 3) Community clean-ups; 4) Water quality hotlines; 5) and Lists of interested parties. The SWMP also includes effectiveness measures and measurable goals for each respective BMP. Its purpose is to assure that the program will be supported by City residents and will provide input to guide the development of the program in the future.

3. Illicit Discharge Detection and Elimination

The City will enhance its current system to identify and eliminate illicit discharges throughout the permit area. A map identifying "trouble spots and potential illegal dumping areas" in the City has been developed and will be updated as needed.

The City implements BMPs, including 1) Maps of the storm drain system; 2) Storm water ordinances; 3) Education and outreach programs; 4) Education/Training of municipal employees; 5) Identification and elimination of illicit discharge sources; 6) Drain filters for commercial connections; 7) Wastewater programs; and 8) Pet waste disposal program. The city intends to maintain ongoing efforts to control illicit discharge at current levels by implementing these BMPs. The SWMP also includes effectiveness measures and measurable goals for each respective practice.

4. Construction Site Runoff Control

The purpose of construction site runoff controls is to prevent soil and construction waste from entering the storm water. The City will review its current Excavation and Grading Code and standard practices for compliance with the minimum requirements – according to the USEPA. It will also require all construction projects to collect construction waste and materials on-site and dispose of them legally and properly.

The City implements BMPs, including 1) Construction Site Enforcement, Inspections; 2) Development of construction site inspection and enforcement procedures; 3) Development of procedures for review of grading/erosion control/construction site plans; 4) Discretionary projects – conditions of approval; 5) Staff training; 6) Construction workshop; 7) Construction site stormwater control ordinance; and 8) Procedures for receipt and consideration of information from the public. The SWMP also includes effectiveness measures and measurable goals for each respective BMP.

5. Post-Construction Runoff Control

This minimum control measure focuses on site planning and design considerations, which are most effective when addressed in the early stages of project development. The goal of the program is to integrate basic and practical storm water management techniques into new development to protect water quality.

The City adopted and is implementing/applying water quality protection policies related to hydromodification control criteria (post-construction requirements – PCRs) to new development and redevelopment projects. The City has adopted/developed guidance for PCRs, including design, monitoring, maintenance, and inspection requirements and guidance to assist developers in the selection, design, and maintenance of hydromodification control measures.

The City implements BMPs, including 1) Review of regulations; 2) Staff training; 3) Plan review; 4) inspection of post-construction stormwater BMPs; 5) Long-term monitoring of post-construction stormwater BMPs; 6) Master drainage plan; 7) Long-term watershed protection and plan; 8) Use of low impact development in project design; 9) Adoption of hydromodification control criteria; and10) Education and outreach efforts. The SWMP also includes effective measurable goals for each respective practice.

6. Pollution Prevention Control and Good Housekeeping for Municipal Operations

The purpose of this minimum control measure for Municipal Operations/Good Housekeeping Practices is to assure that the City's delivery of public services occurs in a manner protective of storm water quality to the maximum extent practical and protect overall water quality. In this way, the City may serve as a model to the community.

The City implements BMPs, including 1) Training of employees on stormwater pollution prevention; 2) Street sweeping; 3) Storm drain cleaning; and 4) Trash, green waste, and recycling. Data collected for each measurable goal will be compiled, reviewed, and summarized as a part annual report to the Regional Water Quality Control Board (RWQCB).

Monitoring and Reporting Requirements. The purpose of monitoring and reporting is to document the successful implementation of the SWMP and determine the program's effectiveness at reducing pollutants to the MEP and protecting water quality. The General Permit requires that annual reports be submitted annually upon approval of the City's SWMP. The City intends these annual reports to cover the fiscal year immediately before the reporting period.

4.8.7 City of Solvang Wastewater Treatment Plant

The City of Solvang is located in northern Santa Barbara County and operates a publicly owned treatment works facility whose discharge influences the Santa Ynez River. In recognition of this important asset, the city has developed an examination to determine the true operating capacity of the existing wastewater treatment plant and to plan for the future. Its scope includes a forecast of demographic and planning development through General Plan build-out and an estimation of the respective wastewater flow characteristics.

4.8.8 City of Solvang Emergency Operations Plan

The 2014 Emergency Operations Plan (EOP) for the City of Solvang addresses the planned response to emergencies associated with natural disasters, technological incidents, and national security emergencies that occur within or affect the City. The plan does not address normal day-to-day emergencies. The Plan:

- Establishes the emergency management organization required to respond to and mitigate any significant emergency or disaster affecting the City;

- Identifies the policies, responsibilities, and procedures required to protect the health and safety of the city community, public and private property, and the environmental effects of natural and technological emergencies and disasters; and
- Establishes the operational concepts and procedures associated with field response to emergencies, the City's Emergency Operations Center (EOC) activities, and the recovery process.

It establishes the framework for implementation of the California Standardized Emergency Management System (SEMS) and the National Incident Management System (NIMS) in the City of Solvang. The document is a concept of operations guide, intended to facilitate multi-agency and multi-jurisdictional coordination in emergency operations, particularly between the City of Solvang, Special Districts, and the Santa Barbara County Operational Area.

The scope presented in the EOP applies to all elements of the City's Emergency Organization during all phases of emergency management. Its primary audience is intended for emergency management staff from the city and other interested parties (e.g. the Federal government, other State or local governments, and volunteer agencies).

The EOP is organized into three sections.

- **Part One - Basic Plan**. The overall organizational and operational concepts relative to response and recovery are described in this section. Its intended audience is the Emergency Operations Center (EOC) Management Team.
- **Part Two - Emergency Organization Functions**. It is a description of the emergency response organization and emergency action checklists. The intended audience is EOC staff.
- **Part Three – Supporting documents to the City's Emergency Operations Plan**. These documents identify both SEMS and NIMS compliance information.

Hazard mitigation is discussed in *Part One- Basic Plan* and includes a series of programs and best management practices to efficiently minimize the risks to natural hazards. They are:

1. Enhance public awareness and understanding;
2. Create a decision tool for management;
3. Promote compliance with State and Federal program requirements;
4. Enhance local policies for hazard mitigation capability;
5. Provide inter-jurisdictional coordination of mitigation-related programming;
6. Achieve regulatory compliance.

There are three emergency management goals outlined in the Emergency Operations Plan, which include:

- Provide effective life safety measures, reduce property loss, and protect the environment
- Provide for the rapid resumption of impacted businesses and community services
- Provide accurate documentation and records required for cost recovery efforts.

4.8.9 SEMS Multi-Hazard Functional Plan

In early July 2008, Solvang adopted its first Emergency Operations Plan including the integration of the Standardized Emergency Management System (SEMS) and the National Incident Management System (NIMS) Multi-Hazard Functional Plan into the Emergency Management System. The Plan discusses mitigation in the form of training and exercises, which are essential at all levels of government to make emergency operations personnel operationally ready. All emergency plans should include provisions for training. The objective is to train and educate public officials, emergency response personnel, and the public. The best method for training staff to manage emergency operations is through exercises. Exercises are conducted regularly to maintain the readiness of operational procedures. Exercises provide personnel with an opportunity to become thoroughly familiar with the procedures, facilities, and systems that will be used in emergencies. There are several forms of exercises:

- Tabletop exercises provide a convenient and low-cost method designed to evaluate policy, plans, and procedures and resolve coordination and responsibilities. Such exercises are a good way to see if policies and procedures exist to handle certain issues.
- Functional exercises are designed to test and evaluate the capability of an individual function such as evacuation, medical, communications, or public information.
- Full-scale exercises simulate an actual emergency. They typically involve complete emergency management staff and are designed to evaluate the operational capability of the emergency management system.

The SEMS Multi-Hazard Functional Plan will be updated to reflect the current hazard risk assessment and mitigation activities identified in this hazard mitigation plan annex.

4.9 OPPORTUNITIES FOR MITIGATION CAPABILITY IMPROVEMENTS

The City 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 City 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 City to expand or improve on these policies and programs to further protect the community:

- **Regulatory Opportunities**: As part of this update, the City will comply with AB 2140 by amending its Safety Element to incorporate the LHMP by reference. The City will consider the LHMP in policy, land use plans, and programs, including coastal hazard and sea level rise planning. The City's top priorities for improvements are public safety, public education, and reducing the potential economic impacts of disasters. The City will create defensible space around high fire areas by strategically managing vegetation to decrease the fuel available for fires adjacent to the structures. This is relatively inexpensive, accomplished quickly, and is effective as long as the vegetation is managed.

- **Administrative/Technical Opportunities**: The City aims to improve its resilience to ensure emergency response operations are sustained during a hazardous event, including upgrades to critical facilities. The City aims to reduce wildfire hazards with vegetation management Further, continued community outreach, emergency notifications, and trainings would further enhance the City's capabilities to respond to and recover from hazards. The City will develop and maintain a disaster warehouse or additional CERT trailers for the storage of emergency supplies. The City is also in process of developing a plan to fully equip the Veteran's Hall with a generator and solar capabilities. The Veteran's Hall Building has been identified as priority shelter and critical facility for the Santa Ynez Valley.
- **Outreach Opportunities**: Enhanced community outreach, emergency notifications, and trainings would further enhance the City's capabilities to respond to and recover from hazards. The City will conduct community outreach and will provide training including Community Emergency Response Team Training (CERT) and early warning & evacuation plans. The City could expand outreach through digital tools such as social media, participate in the Great California ShakeOut, and increase FireWise outreach events and media coverage.
- **Fiscal Opportunities**: The City can update its CIP to include hazard mitigation actions from the LHMP. The City will continue to seek grants (e.g., HMGP, BRIC) to fund these CIP projects and related projects in the City's mitigation strategy. The City can seek opportunities to partner with the County and/or other stakeholder agencies in grant applications to address regional hazards more effectively. The City could also consider expanding its fiscal capabilities through its annual budget process and other revenue measures (e.g., raising taxes, property assessments, bonds).

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 City of Solvang LHMP. The intent is to confirm and update the description, location and extent, and history of hazards facing the City now and in the future. This assessment also considers the potential exacerbating effects of climate change. The City of Solvang is not located along the coast so sea level rise associated with climate change would not occur. However, storms with increased severity could exacerbate flooding impacts within the City as well as increase fire hazards. Drought is also associated with climate change; however, drought does not pose a threat to the operation of the City's critical facilities. 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 City.

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 City LPT refined the list of hazards applicable to the City 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 City'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. Applicable hazard information from the City's 2017 LHMP was incorporated during the development of this section. A comprehensive treatment of hazards and their descriptions may be found in Chapter 5.0 of the Santa Barbara County 2022 MJHMP.

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

Table 5-1. City of Solvang Local Priority Hazards

Hazard Type and Ranking	Score	Planning Consideration Based on Hazard Level
Drought/Water Shortage	12	Significant
Wildfire	10	Significant
Extreme Heat & Severe Weather	10	Significant
Flooding	9	Moderate
Earthquake	9	Moderate
Cyber Threat	9	Moderate
Energy Shortage & Resilience	8	Moderate
Pandemic/Public Health Emergency	8	Moderate
Dam/Levee Failure	7	Moderate

To continue compliance with the DMA of 2000, the City 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 City in subsections below. The City of Solvang LPT acknowledged the following hazards are either not a threat, are highly unlikely within the City limits, or are adequately addressed by the 2022 MJHMP and do not require additional information to be relevant to the City's hazard setting; therefore, these hazards are not addressed further in

the City's LHMP: mudflow/debris flows, coastal hazards, landslides, geologic hazards, tsunamis, invasive species/agricultural pests, aircraft/ train accidents, terrorism, natural gas pipeline rupture, and storage facility incidents, oil spills, and radiological incidents.

5.3 DROUGHT & WATER STORAGE

The City of Solvang has four water supply sources. These include State Water, Upland Wells, River Wells, and the Santa Ynez Water District (ID #1). The Department of Water Resources (DWR) operates the State Water Project. The City holds entitlement to 1,500 acre-feet per year (AFY) of State Water. However, based on the rainfall, Sierra snow-pack, and State reservoir levels each year the percentage allocation of State Water varies. That is what percentage of the 1,500 AFY the City receives. In recent years, the allocation of State Water has varied from 0% (during drought) to as much as 85%.

As of May 2021, Governor Gavin Newsom has declared a drought emergency in 41 California counties in northern and central California (CalMatters 2021). Currently, Santa Barbara County has been in a state-declared drought since July 8, 2021 when Governor Gavin Newsom proclaimed a drought emergency, which included 50 of the 58 counties in California. On July 13, 2021, the County Board of Supervisors passed a resolution proclaiming a Local Emergency caused by Drought Conditions. The County resolution cites Newsom's drought declaration, as well as below-average rainfall, received last winter, reduced storage in reservoirs, and reduced State Water Project supply. Further, low rainfall from 2020 to 2021 has resulted in Classification D3 – Extreme Drought conditions in over 99 percent of the county as identified by the U.S. Drought Monitor (USDM). The City will continue to identify ways to enhance water security and conservation.

In August 2021, the City declared a stage two drought condition after the California State Water Resources Control Board reduced the city's allocation of state water. In stage two, City code calls for a mandatory reduction of all water usage by 20%. Previously in April 2021, the Council declared a stage one drought condition, which called for a voluntary 15% reduction in water use citywide, kicked in a variety of mandated water restrictions, and authorized the purchase of up to $400,000 in supplemental water. City code also places several mandates in place during the drought stages.

5.4 WILDFIRE

The threat of a wildland fire affecting Solvang is high due to the presence of dense, flammable vegetative fuels on land surrounding the City adjacent to the City's wildland-urban interface and especially in the hills surrounding the north and northwest portions of the City. The wildland-urban interface is where structures and other human development meet or intermingle with wildland or vegetative fuels. The threat is particularly significant during dry summer months and when there are strong Santa Ana winds. The fire season extends approximately 5 to 6 months, from late spring through fall.

Solvang is part of the Santa Barbara County Fire District. Fire Station No. 30 is located at the City's Municipal Center. Response times within the City are 3 to 5 minutes. All high fire zones within Solvang are mapped. The Fire Department, as well as the California Building Code, requires that all new

habitable development install indoor sprinklers and use fire-resistant building materials. Within the City Limits, the Solvang Code Enforcement Officer and County Fire undertake a weed abatement program in the Spring.

5.5 EXTREME TEMPERATURES AND SEVERE WEATHER

The City is susceptible to the same weather patterns as other parts of Central and Southern California. While most of the time, the climate is mild, significant wind, rain, and temperature extremes can and do occur. As planetary warming continues, the severity of storms and weather extremes are predicted to occur. The impacts on the community mostly manifest as stress on the power grid and impacts on persons otherwise not protected from the elements in resilient structures. Impacts traditionally are limited requiring very few evacuations and limited casualties. The number of casualties may increase as the dependency on electricity continues to increase for home oxygen concentrators and other independent living assistive devices.

Extreme temperatures, particularly heat, pose the greatest danger for the City's outdoor laborers who support the county's agriculture economy. Exertional heat illness occurs across a wide age range and in numerous industries and occupations, including the following: agriculture, construction, firefighting, warehousing, delivery, and service work. Outdoor laborers are exposed to extreme temperatures and at higher risk of heat-related illnesses than other populations of the county. The elderly, children, people with certain medical conditions, and the houseless are also vulnerable to exposure. However, any populations working or recreating outdoors during periods of extreme cold or heat are exposed, including otherwise young and healthy adults and houseless populations. Adults and young people are commonly out in temperatures of extreme heat, whether due to commuting for work or school, conducting property maintenance such as lawn care, or for recreational reasons.

Windstorms, especially sundowner winds, could have a considerable impact on the population, built environment, lifeline infrastructure, and the economy of the City. Severe winds can directly impact the City by damaging or destroying buildings, knocking over trees, and damaging power lines and electrical equipment. Secondary impacts of damage caused by wind events often result from damage to communication, transportation, or medical infrastructure. High winds can lead to Public Safety Power Shutdowns (PSPS) that can impact the local economic drivers and key services. During severe wind events, electricity transmission lines can be damaged or turned off by Pacific Gas and Electric Company (PG&E), causing widespread power outages and hardships for City residents. Downed power and communications transmission lines, coupled with disruptions to transportation, create difficulties in reporting and responding to emergencies. These indirect impacts of a wind event put tremendous strain on a community. In the immediate aftermath, the focus is on emergency services. Vulnerable groups are especially exposed to the indirect impacts of high winds, particularly the loss of electrical power. These populations include the elderly or disabled, especially those with medical needs and treatments dependent on electricity. Nursing homes, community-based residential facilities, and other special needs housing facilities are also vulnerable if electrical outages are prolonged since backup power generally operates only minimal functions for a short period.

5.6 FLOOD

In Solvang, hazardous flooding events are most commonly associated with the Santa Ynez River, Adobe Canyon Creek, Alisal Creek, and Alamo Pintado Creek.

Per Title 13 of the Municipal Code (Flood Plain Management), when a project is proposed within the City of Solvang and lies within a FEMA defined Special Flood Hazard Area (SFHA), the project review is contracted out to the Santa Barbara County Flood Control District and recommendations are given back to the City of Solvang.

When reviewing projects for new construction within a Special Flood Hazard Area, the County Flood Control District will establish the Base Flood Elevation (BFE) and recommend that the lowest finished floor of the building be elevated to two feet above the BFE for a habitable structure. For those structures that are not habitable, (i.e., storage, detached garage, etc.) Flood Control recommends that those structures be floodproofed according to FEMA standards. The County Flood Control District reviews plans according to the Santa Barbara County Code Chapter 15A "Floodplain Management".

5.7 EARTHQUAKE & LIQUEFACTION

A more complete description of the earthquake and liquefaction hazards is found in Chapter 5.0, *Hazard Assessment* of the 2022 MJHMP.

The City is located in the Santa Ynez Valley, a wedge-shaped topographic depression bounded by the Santa Ynez Mountains on the south, the San Rafael Mountains to the east and north, and the Purisima Hills on the west. It is a down-dropped structural block between two major faults. On the south, the east-west trending Santa Ynez Fault forms the base of the uplifted Santa Ynez Mountains and extends from Ventura County across the entire width of Santa Barbara County.

The City and its planning area are located in Seismic Zone 4, which is the highest potential status for earthquake activity in the state of California. Solvang's fault lines and liquefaction zones are mapped (see Section 5.0, *Hazard Assessment* of the MJHMP). The City previously examined all structures within the City limits and all un-reinforced masonry buildings located within Solvang have received seismic retrofitting.

Title 10, Chapter 1 of the Solvang Municipal Code (Building Codes) regulates construction activities within the City to protect the health, safety, and general welfare of the public and natural environment. All construction is required to be in conformance with the California Building Code (CBC), specifically Chapter 23 as it proves for earthquake-resistant design, Chapter 70 as it provides for excavation and grading, and with the City's adopted hillside development ordinance.

5.8 CYBER THREAT

Cyber-attacks can and have occurred in every location regardless of geography, demographics, and security posture. Incidents may involve a single location or multiple geographic areas. A disruption can have far-reaching effects beyond the location of the targeted system; disruptions that occur far outside the state can still impact people, businesses, and institutions within the county. Between 2012 and 2015, 50 million records of Californians were breached, and the majority of

these breaches resulted from security failures, with malware and hacking; physical breaches constituted three-quarters of all events. As the use of digital information expands, Californians will increasingly become more vulnerable to the slow-moving, potential technological hazard of cyber damage (Cal OES 2018). The Santa Barbara County Grand Jury determined in 2020 that cyber-attacks and related threats are an ongoing security issue for all public entities within the county, which requires prompt and aggressive actions to prevent significant disruption (Santa Barbara County Grand Jury 2020).

The City of Solvang faces the same vulnerability to cybercrime as any modern municipality. Under a cyberattack, economic impacts on the banking, financial, and retail sectors could be significant. Some life necessary systems are currently vulnerable in the City (not connected to the internet). Continued security audits and additional attention to this emerging threat are warranted. This hazard can occur anywhere within the City; however, cyber threats are generally targeted towards larger corporations or the government. While there have been several smaller cyber threats and hacking, none have reached a level of significance within the City.

5.9 ENERGY SHORTAGE & RESILIENCE

Energy access is one of the key impacts of disasters that mitigation actions can have a significant influence on resiliency. Any event that disrupts power for more than a day, can cause significant social disruption, energy, and potential deaths. The current reliance on relatively few power production stations with a power distribution grid spreading over thousands of miles of terrain with the myriad of threats and hazards that the distribution system is subject to makes the normal operation of the system seem miraculous. The City of Solvang receives all of its commercial power from Central Coast Community Energy (3CE) and Pacific Gas and Electric (PG&E).

The City has limited ability to affect resiliency in the power distribution system. It actively participates in reducing its power usage and partners with PG&E, the State of California, and Federal energy conservation programs.

5.10 PANDEMIC/PUBLIC HEALTH EMERGENCY

The City, as well as the county, state, nation, and the entire world, is vulnerable to outbreaks, epidemics, and pandemics caused by either newly emerging or existing diseases spread person to person, through a vector such as a mosquito, or both. A significant public health emergency can have a considerable impact on the population, the economy, and essential public services (e.g., fire and police protection, medical services, etc.). Populations identified by the county as especially vulnerable to human health hazards include undocumented persons, senior citizens, senior citizens living alone, persons with existing chronic health conditions, persons experiencing houselessness, overcrowded households and neighborhoods, low-resourced ethnic minorities people of color, households in poverty, communities with a high-pollution burden, and those without health insurance. Undocumented or non-English speaking individuals may be less able to understand such pandemic-related instructions or receptive to responding to government outreach, while lower-income households may lack the means to comply with the direction. Trends of the COVID-19 pandemic further revealed vulnerable groups within Santa Barbara County population, including residents of Solvang.

Residents' health care needs are met by medical resources in Solvang, and regionally in the City of Santa Maria and the City of Santa Barbara. As demonstrated by the COVID-19 pandemic, health care resources were strained throughout the county. Further, hospitality, retail, tourism, and hospitality industries have been adversely affected economically through reduced activity and a limited workforce, including business in the City. The City relies on the Federal, State, and County Health and Human Services systems to monitor and mitigate potential catastrophic disease outbreaks.

5.11 DAM/LEVEE FAILURE

Solvang lies downstream of Bradbury Dam (Lake Cachuma) and Gibraltar Dam and reservoir. Flooding associated with dam failure on one of the local or upstream dams has a low probability for occurrence. Solvang could experience flooding via the Santa Ynez River. A significant seismic retrofit of Bradbury Dam was completed in 2006 which brought the dam up to federal standards for seismic safety.

6.0 VULNERABILITY ASSESSMENT

The vulnerability assessment builds on the hazard assessment provided in Section 5.0 to estimate losses where data is available and consider a specific list of critical facilities identified within the City of Solvang. The City identified 34 critical facilities to be included in the Vulnerability Assessment portion of the LHMP. These facilities primarily included utilities, wastewater treatment facilities, and government structures. Of the available data, it was shown that these buildings are worth approximately $15,453,685 in total value (Table 6-1).

Table 6-1. Critical Facilities in the City of Solvang

Type	Name	Address	Total Building Value
Communications	Solvang -48V		-
Utilities	Alisal Heights Reservoir	720 Alisal	$1,339,060
Utilities	Alisal Ranch Reservoir	1054 Alisal	$535,623
Utilities	Fjord Lift Station	1411 Fjord Drive	$321,375
Utilities	Alisal Lift Station	120 S Alisal Rd.	$132,664
Utilities	Water Switch Gear Bldg	Fjord Drive and Glen Way	$45,313
Utilities	Well 22	891 Kolding Ave.	-
Utilities	Sewer Force Main	West End Fjord Drive and River	-
Utilities	Well 3	1692 Fjord Dr.	-
Utilities	Hans Christian Andersen (HCA) South Well	637 Atterdag Rd.	-
Utilities	Well 7A	150 Alisal Rd.	-
Utilities	State Pump	175 Alisal Rd.	-
Utilities	Well 4	367 First St.	-
Wastewater Treatment Plant	WWTP /tanks/pumps/blowers	101 S. Alisal Rd.	$3,145,693

Type	Name	Address	Total Building Value
Wastewater Treatment Plant	WasteWater Treatment Plant/Op	101 S. Alisal Rd.	$682,662
Wastewater Treatment Plant	WWTP/Digester/equipment	101 S. Alisal Rd.	$237,641
Wastewater Treatment Plant	WWTP/Pump/Gen. Bldg.	101 S. Alisal Rd.	$253,175
Wastewater Treatment Plant	WWTP/Bultler Bldg.	101 S. Alisal Rd.	$79,215
Wastewater Treatment Plant	WasteWater Awnings/Belt Press	101 S. Alisal Rd.	$367,876
Clinic	Santa Ynez Valley Recovery Residence	636 Atterdag Road	-
Clinic	Santa Ynez Valley Cottage Hospital	2050 Viborg Road	-
Clinic	Sansum Clinic- Solvang	2027 Village Lane	-
Clinic	Atterdag Village	636 Atterdag Road	-
Clinic	PHD COMM HLTH CLINIC & PHP	545 ALISAL ROAD	$12,065
EMS Station	SANTA BARBARA COUNTY FIRE DEPARTMENT STATION 30	1644 OAK STREET	-
Nursing Home	ATTERDAG VILLAGE OF SOLVANG	636 N ATTERDAG ROAD	-
Veteran Services	Veteran's Memorial Bldg.	1745 Mission Dr.	$2,415,921
Education	Solvang School/upper&lower	565 Atterdag Rd.	-
Fire Station	County Fire Station 30 (Solvang)	1644 Oak Street	$225,767
Government	Municipal Center/City Hall	1644 Oak Street	$2,820,301
Government	GOVERNMENTAL COMMUNITY SERVICES BUILDING	1745 MISSION DR.	$2,839,334
Sheriff	Santa Barbara Co Sheriffs Dept.	1745 Mission Dr.	-
Bridge - Non Scour Poor Condition	Bridge	'ALISAL ROAD' / 'SANTA YNEZ RIVER'	-
Bridge - Scour Fair Condition	Bridge	'STATE ROUTE 246' / 'ALAMO PINTADO CREEK'	-

Using GIS and the mapped extents of the hazards affecting the City, it was determined which critical facilities are exposed to which hazards depending on whether they fall within the mapped hazard area. The results of the exposure analysis are included in this section. A further description of the threats and methodologies used in this analysis is provided in Chapter 6.0, *Vulnerability Assessment* of the 2022 MJHMP. As the City continues to assess its vulnerability, the collection of better and more complete data will help to improve the risk assessment process to direct planning and mitigation decisions.

Table 6-2. Summary of Potential Impacts on Critical Facilities

Hazard Type	Specific Risk	Count	% of Critical Facilities Impacted	Exposure ($)
Flood	FEMA 1% Chance Flood Zone	2	6%	$-

Hazard Type	Specific Risk	Count	% of Critical Facilities Impacted	Exposure ($)
	FEMA 0.2% Chance Flood Zone	1	3%	$-
Dam Inundation/Levee Failure	Bradbury Dam Failure	14	41%	$5,801,237
Wildfire	Low Wildfire Threat	2	6%	$-
	High Wildfire Threat	1	3%	$535,623
Earthquake	Low Liquefaction Potential	14	41%	$8,313,388
	Moderate Liquefaction Potential	2	6%	$1,874,683
	High Liquefaction Potential	18	53%	$5,265,614
	Regional Ground Shaking	34	100%	$94,509,416
Landslide	Class 5, 7, or 9 Landslide Hazard Zone	7	21%	$1,705,748

6.1 WILDFIRE

The county has extensive areas within mapped Fire Hazard Severity Zones and Wildland-Urban Interface (WUI) areas. These hazard areas generate vulnerability for life and structures, including critical facilities, throughout the county, but most severely within rural foothills areas where dry vegetation, steep slopes, and difficult access combine to create a high probability of wildfire. The City is surrounded by wildland vegetation and the eastern slopes of the Santa Ynez Mountains. The entire City of Solvang is within the Wildland Urban Interface area and has therefore been designated as a WUI community at risk. Based on these maps, the City has 46 acres (3.0 percent) within Very High Wildfire Threat areas, 127 acres (8.1 percent) within High Fire Wildfire Threat areas, 99 acres (6.4 percent) within Moderate Wildfire Threat areas, and 181 acres (11.6 percent) within Low Wildfire Threat areas. Most of these areas are residential with limited vulnerabilities in industrial areas.

Based on the GIS analysis conducted for the 2022 MJHMP, in Solvang, 264 improved properties with a total value of $223 million are vulnerable to wildfire. In Solvang, approximately 612 residents live in high, moderate, or low wildfire threat areas. This information is summarized in Table 6-3 below.

Table 6-3. City of Solvang at Risk to Wildfire Threat

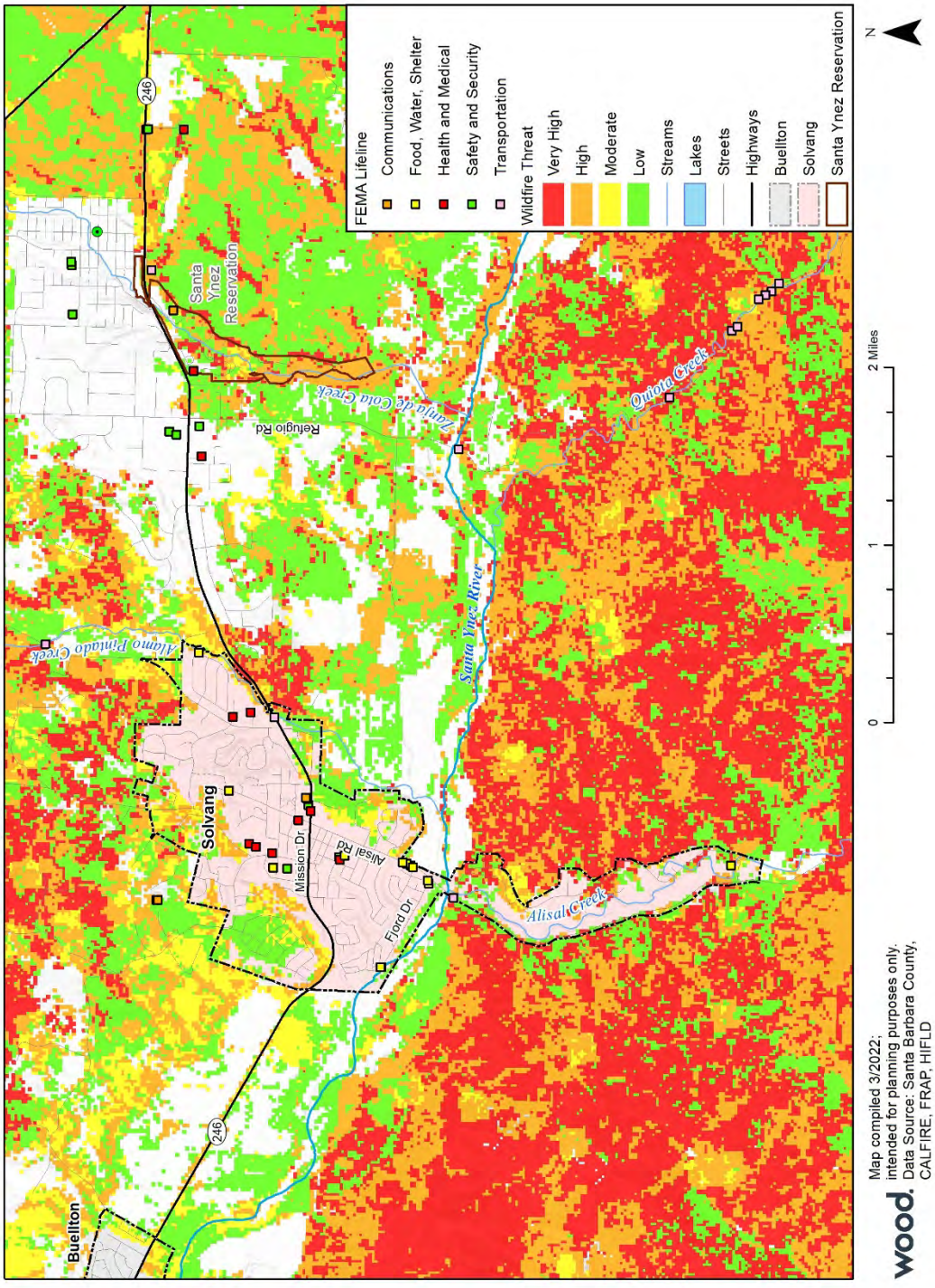
Property Type	Improved Parcel Count by Wildfire Threat Level						Total Value	Population
	Extreme	Very High	High	Moderate	Low	Total		
Agricultural	0	0	0	0	0	0	$0	
Commercial	0	0	0	2	1	3	$184,772	
Exempt	0	0	0	1	1	2	$5,250,202	
Industrial	0	0	0	0	0	0	$0	
Mixed Use	0	0	0	0	0	0	$0	0
Residential	0	0	55	62	139	256	$217,296,242	612
Improved Vacant	0	0	1	1	1	3	$482,770	
Total	**0**	**0**	**56**	**66**	**142**	**264**	**$223,213,986**	**612**

Three of the City's critical facilities fall within high or low wildfire threat areas, as listed in Table 6-4 (see also, Section 6.3.1, *Wildfire* of the 2022 MJHMP).

Table 6-4. City of Solvang Critical Facilities Vulnerable to Wildfire

Type	Critical Facility	Hazard Source/Type	Total Building Value
Utilities	Alisal Ranch Reservoir	High	$535,623
Bridge - Non Scour Poor Condition	Bridge	Low	-
Bridge - Scour Fair Condition	Bridge	Low	-

Figure 6-1. City of Solvang Critical Facilities within Wildfire Threat Zones



6.1 FLOOD

The geographical location, climate, and topography of the Santa Ynez Valley make some areas of the City prone to flooding particularly related to the seasonal flows of the Santa Ynez River. Flooding presents a hazard to development in floodplains. In addition to the damage to properties, flooding can also cut off access to utilities, emergency services, transportation, and may impact the overall economic well-being of an area. Emergency response can be interrupted by damaged roads and infrastructure. Fire can break out as a result of dysfunctional electrical equipment. Hazardous materials can also get into floodways, causing health concerns and polluted water supplies. During a flood, the drinking water supply can be contaminated. Climate change is expected to increase the frequency and intensity of heavy rainstorms that cause riverine flooding.

Based on the GIS analysis conducted for the 2022 MJHMP, the City has 35 improved parcels valued at over $19 million in the 1-percent annual chance floodplain. Based on this analysis, which accounts for residents only and not workers, 65 residents are living in the 1-percent annual chance floodplain throughout the City. An additional 107 improved parcels and over $71 million in value fall within the 0.2-percent annual chance floodplain. Areas of the City vulnerable to the 0.2-percent annual chance riverine flood are home to 244 residents. Development in the 0.2-percent annual chance floodplain is typically not regulated, thus a large flood event could be extremely damaging in the City. This information is summarized in Table 6-5 below.

Table 6-5. City of Solvang FEMA Floodplain Exposure and Loss

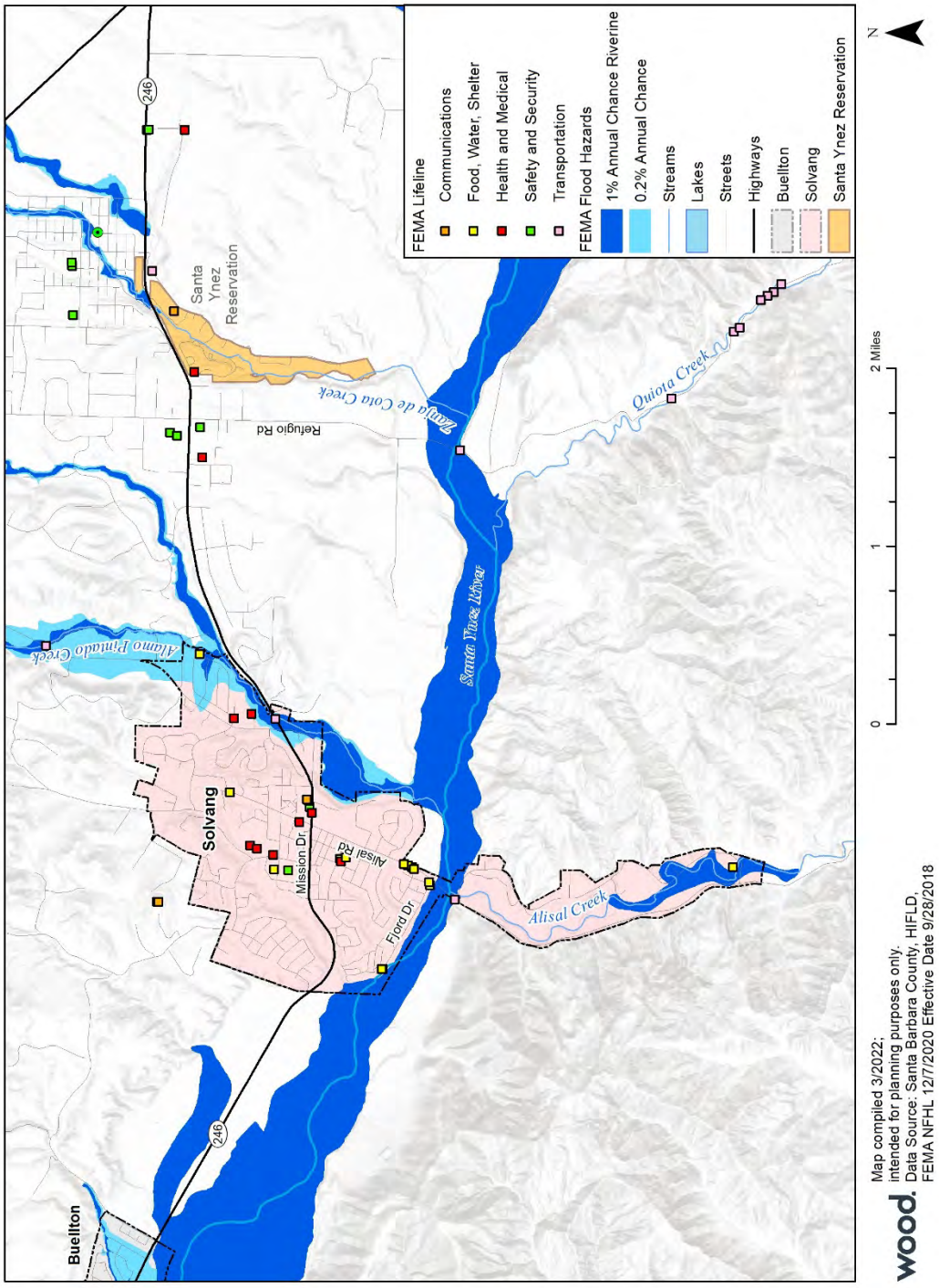
Property Type	Improved Parcel Count	Total Value	Estimated Loss	Population
Riverine 1% Annual Chance Floodplain Exposure and Loss				
Commercial	8	$7,523,092	$1,880,773	
Residential	27	$11,568,881	$2,892,220	
Total	**35**	**$19,091,973**	**$4,772,993**	65
Riverine 0.2% Annual Chance Floodplain Exposure and Loss				
Commercial	5	$26,695,246	$6,673,812	
Residential	102	$44,981,879	$11,245,470	
Total	**107**	**$71,677,125**	**$17,919,281**	244

As listed in Table 6-6, 3 critical facilities in the City with an unknown total value would be vulnerable to damage or destruction from 1-percent or 0.2-percent annual chance flood (Figure 6-2; see also, Section 6.3.3, *Flood* of the 2022 MJHMP).

Table 6-6. City of Solvang Critical Facilities at Risk to Flood Hazard

Type	Critical Facility	FEMA Flood	Total Value
Utilities	Well 22	0.2% Chance	$-
Bridge - Non Scour Poor Condition	Bridge	1% Chance	$-
Bridge - Scour Fair Condition	Bridge	1% Chance	$-

Figure 6-2. City of Solvang Critical Facilities in FEMA Flood Hazard Zones



6.2 EARTHQUAKE & LIQUEFACTION

Chapter 6.0, *Vulnerabilities Assessment* of the 2022 MJHMP addresses regional seismicity under two scenarios that include the City of Solvang. The 2,500-year scenario considers general seismicity from multiple faults in the region and a 7.0 magnitude event. The methodology utilizes probabilistic seismic hazard contour maps developed by the U.S. Geological Survey (USGS) for the 2018 update of the National Seismic Hazard Maps that are included with Hazus-MH. A deterministic scenario was also prepared to predict the outcome of a specific earthquake event. The deterministic scenarios used USGS provided ShakeMap datasets to model a Magnitude 7.2 earthquake of the San Luis Range would generate in terms of damages and losses for the chosen area of interest (i.e., northern Santa Barbara County, including the City). Figure 6-3 is the ShakeMap produced for this scenario.

As described in the MJHMP, regional losses to people and property would include the City. As shown in the San Luis Range ShakeMap scenario, the north and central parts of the county would perceive much stronger shaking and would likely receive the most severe damage when compared to the rest of the county. The entire City would perceive severe to extreme shaking and would likely receive moderate/heavy to very heavy damage. Direct effects of ground shaking could damage buildings and create dangerous debris and unstable structures. Displaced residents would likely seek shelter in the City, including residents from outside the City. Further, fires often occur after an earthquake. Because of the number of fires and the lack of water to fight the fires, they can often burn out of control.

Unreinforced masonry building type structures consist of buildings made of unreinforced concrete and brick, hollow concrete blocks, clay tiles, and adobe. Buildings constructed of these materials are heavy and brittle and typically provide little earthquake resistance. In small earthquakes, unreinforced buildings can crack, and in strong earthquakes, they tend to collapse. The City does not have any known unreinforced masonry buildings.

The City lies in an area with low, moderate, and high liquefaction severity classes. Regional earthquakes could cause liquefaction in the City, which could damage buildings and utilities when soils become unstable. Based on the GIS analysis conducted for the 2022 MJHMP, the City has 42,038 improved parcels valued at over $1.3 billion in the liquefaction severity zones. Based on this analysis, which accounts for residents only and not workers, 4,312 residents are living in this hazard zone within the City. While liquefaction would not likely affect all areas uniformly during an earthquake, this analysis indicates the extent and scale of vulnerabilities to liquefaction during a large earthquake.

Table 6-7. City of Solvang at Risk to the Liquefaction Hazard by Property Type

Property Type	Improved Parcel Count	Total Value	Population
High Liquefaction Hazard			
Agricultural	0	$0	
Commercial	54	$56,988,078	
Exempt	1	$33,171,012	
Industrial	2	$3,867,400	

Property Type	Improved Parcel Count	Total Value	Population
Mixed Use	0	$0	0
Residential	295	$120,641,139	705
Improved Vacant	0	$0	
Total High Liquefaction	**352**	**$214,667,629**	**705**
Moderate Liquefaction Hazard			
Agricultural	0	$0	
Commercial	5	$1,990,218	
Exempt	0	$0	
Industrial	0	$0	
Mixed Use	0	$0	0
Residential	106	$79,814,060	253
Improved Vacant	0	$0	
Total Moderate Liquefaction	**111**	**$81,804,278**	**253**
Low Liquefaction Hazard			
Agricultural	0	$0	
Commercial	149	$168,314,722	
Exempt	13	$56,752,436	
Industrial	0	$0	
Mixed Use	3	$3,144,530	7
Residential	1,400	$810,954,875	3,346
Improved Vacant	10	$1,900,976	
Total Low Liquefaction	**1,575**	**$1,041,067,539**	**3,353**
Total Liquefaction Hazard	**2,038**	**$1,337,539,445**	**4,312**

As listed in Table 6-8, all critical facilities in the City would be vulnerable to damage or destruction from ground shaking and liquefaction during a significant regional earthquake (see also, Section 6.2.1, *Earthquake (Groundshaking)* and Section 6.3.3, *Liquefaction (Earthquake)* of the 2022 MJHMP).

Table 6-8. City of Solvang Critical Facilities Vulnerable to Groundshaking & Liquefaction

Type	Name	Address	Total Building Value
Communications	Solvang -48V		-
Utilities	Alisal Heights Reservoir	720 Alisal	$1,339,060
Utilities	Alisal Ranch Reservoir	1054 Alisal	$535,623
Utilities	Fjord Lift Station	1411 Fjord Drive	$321,375
Utilities	Alisal Lift Station	120 S Alisal Rd.	$132,664
Utilities	Water Switch Gear Bldg	Fjord Drive and Glen Way	$45,313
Utilities	Well 22	891 Kolding Ave.	-
Utilities	Sewer Force Main	West End Fjord Drive and River	-
Utilities	Well 3	1692 Fjord Dr.	-

Type	Name	Address	Total Building Value
Utilities	Hans Christian Andersen (HCA) South Well	637 Atterdag Rd.	-
Utilities	Well 7A	150 Alisal Rd.	-
Utilities	State Pump	175 Alisal Rd.	-
Utilities	Well 4	367 First St.	-
Wastewater Treatment Plant	WWTP /tanks/pumps/blowers	101 S. Alisal Rd.	$3,145,693
Wastewater Treatment Plant	WasteWater Treatment Plant/Op	101 S. Alisal Rd.	$682,662
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Clinic	Santa Ynez Valley Recovery Residence	636 Atterdag Road	-
Clinic	Santa Ynez Valley Cottage Hospital	2050 Viborg Road	-
Clinic	Sansum Clinic- Solvang	2027 Village Lane	-
Clinic	Atterdag Village	636 Atterdag Road	-
Clinic	PHD COMM HLTH CLINIC & PHP	545 ALISAL ROAD	$12,065
EMS Station	SANTA BARBARA COUNTY FIRE DEPARTMENT STATION 30	1644 OAK STREET	-
Nursing Home	ATTERDAG VILLAGE OF SOLVANG	636 N ATTERDAG ROAD	-
Veteran Services	Veteran's Memorial Bldg.	1745 Mission Dr.	$2,415,921
Education	Solvang School/upper&lower	565 Atterdag Rd.	-
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Government	GOVERNMENTAL COMMUNITY SERVICES BUILDING	1745 MISSION DR.	$2,839,334
Sheriff	Santa Barbara Co Sheriffs Dept.	1745 Mission Dr.	-
Bridge - Non Scour Poor Condition	Bridge	'ALISAL ROAD' / 'SANTA YNEZ RIVER'	-
Bridge - Scour Fair Condition	Bridge	'STATE ROUTE 246' / 'ALAMO PINTADO CREEK'	-

Figure 6-3. City of Solvang Critical Facilities and Earthquake Groundshaking Potential (San Luis Range 7.2 Magnitude ShakeMap)

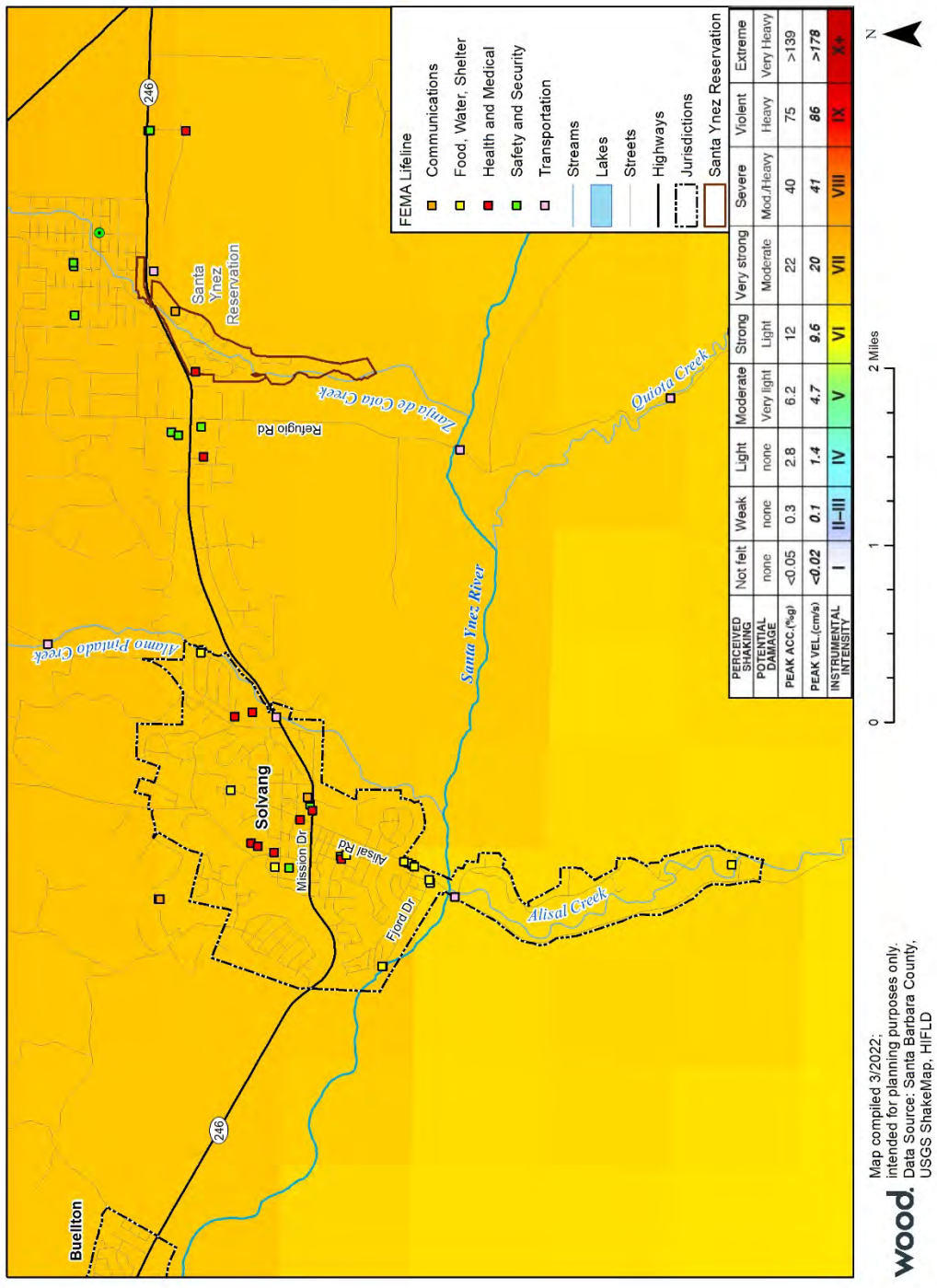
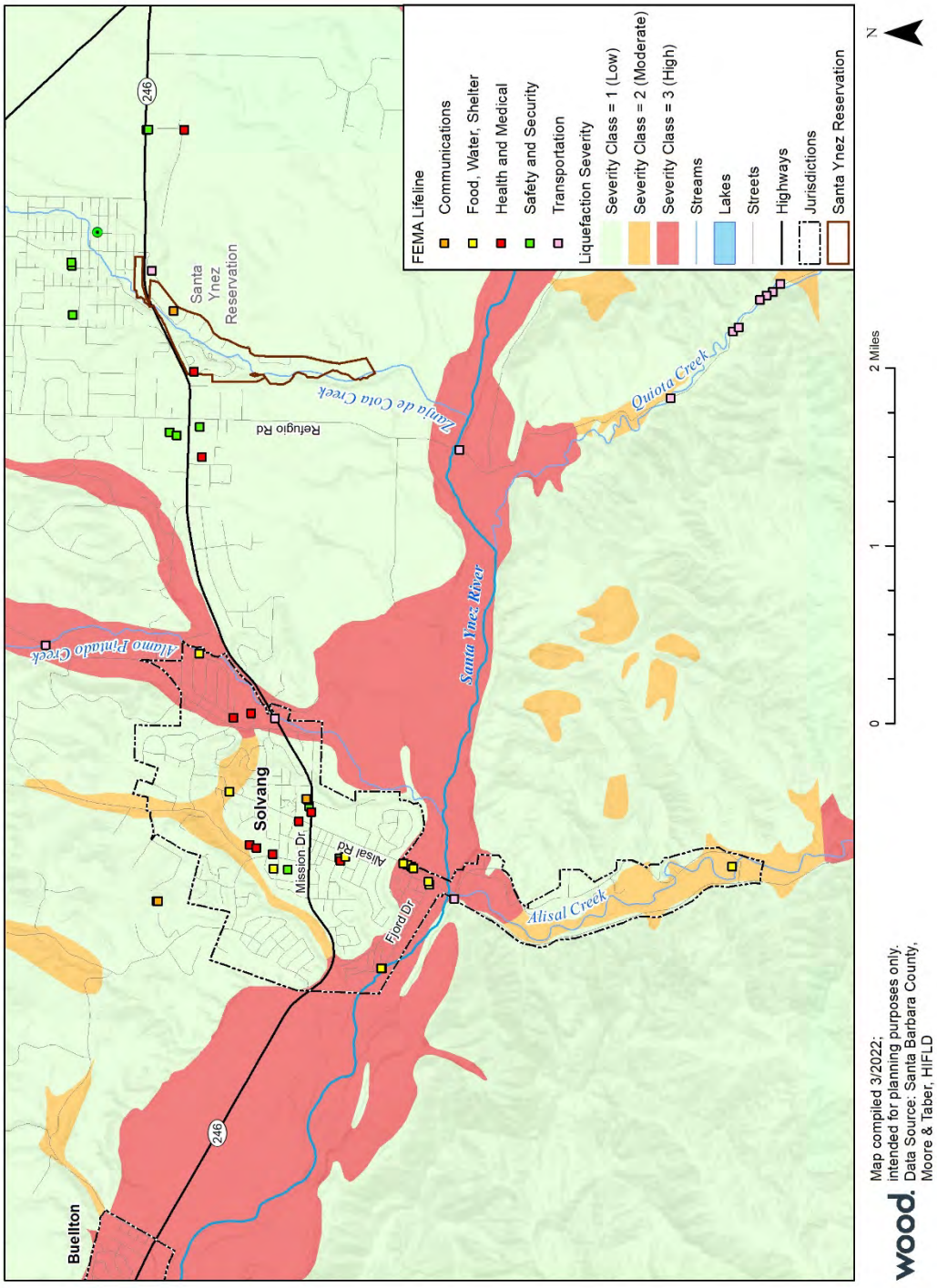


Figure 6-4. City of Solvang Critical Facilities and Liquefaction Potential



6.3 DAM/LEVEE FAILURE

Bradbury Dam is of the largest concern to the City of Solvang. Failure of Bradbury Dam would inundate portions of the cities of Solvang and Buellton with relatively little evacuation time. Based on the GIS analysis conducted for the 2022 MJHMP, in Solvang, 159 properties with a total value of $92 million are vulnerable to the catastrophic flooding that would occur if the Bradbury Dam failed. In Solvang, approximately 356 residents within the inundation zone may need to be evacuated, cared for, and possibly permanently relocated. This information is summarized in Table 6-9 below.

Table 6-9. City of Solvang at Risk to Dam Inundation Hazard

Property Type	Improved Parcel Count	Total Value	Population
Commercial	8	$7,638,980	
Industrial	2	$3,867,400	
Residential	149	$80,568,344	356
Total	**159**	**$92,074,724**	**356**

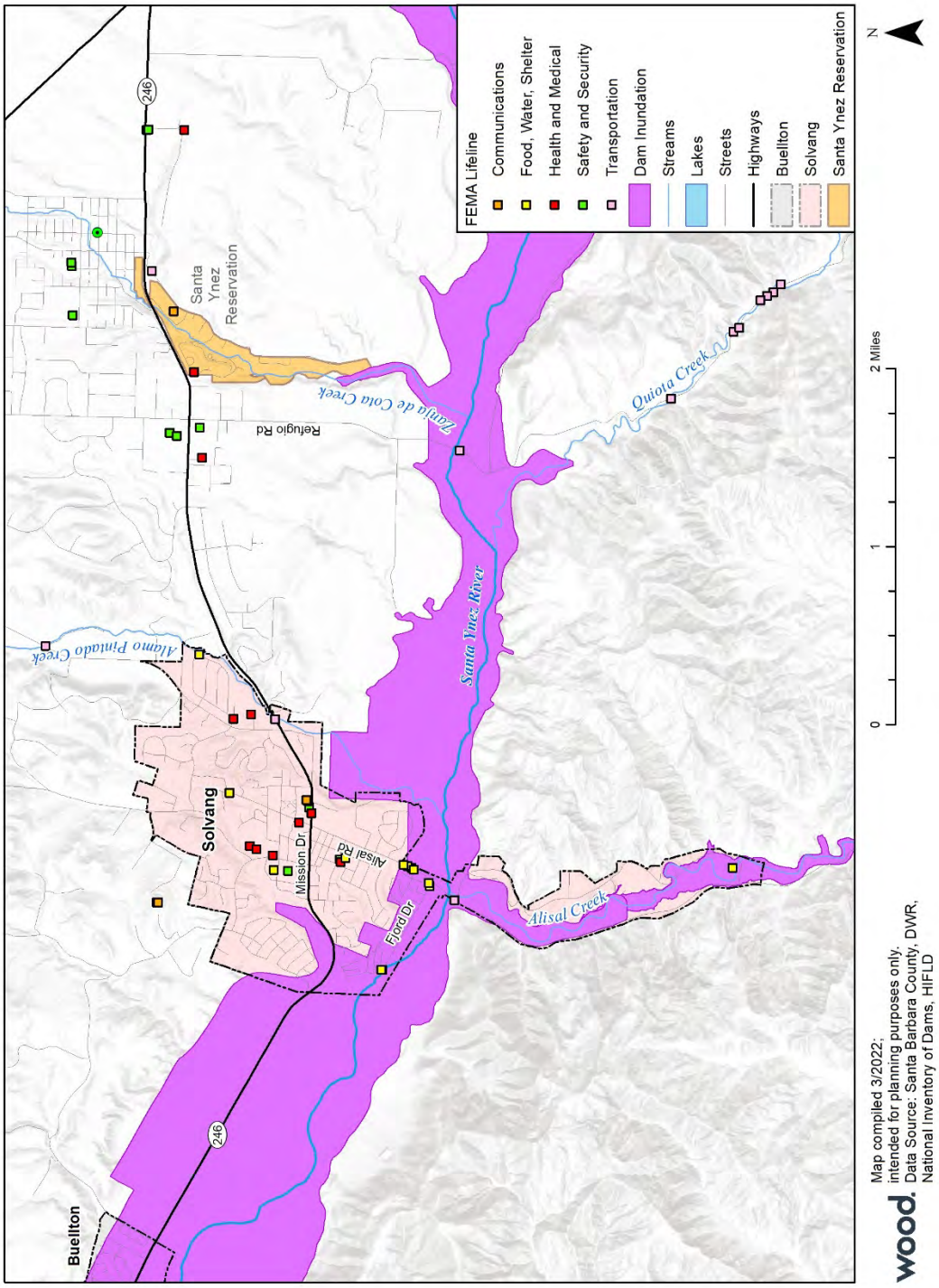
Further, as listed in Table 6-10, 14 critical facilities with a value of $5,801,237 in the City would be vulnerable to damage or destruction from flooding due to dam and levee failure (see also, Section 6.6.3, *Dam Failure* and Section 6.6.8, *Levee Failure* of the 2022 MJHMP).

Table 6-10. City of Solvang Critical Facilities Vulnerable to Inundation from Dam/Levee Failure

Type	Name	Dam Name	Total Value
Utilities	Alisal Ranch Reservoir	Alisal Creek	$535,623
Utilities	Fjord Lift Station	Bradbury	$321,375
Utilities	Alisal Lift Station	Bradbury	$132,664
Utilities	Water Switch Gear Bldg	Bradbury	$45,313
Utilities	Sewer Force Main	Bradbury	-
Utilities	Well 3	Bradbury	-
Utilities	Well 7A	Bradbury	-
Wastewater Treatment Plant	WWTP /tanks/pumps/blowers	Bradbury	$3,145,693
Wastewater Treatment Plant	WasteWater Treatment Plant/Op	Bradbury	$682,662
Wastewater Treatment Plant	WWTP/Digester/equipment	Bradbury	$237,641
Wastewater Treatment Plant	WWTP/Pump/Gen. Bldg.	Bradbury	$253,175
Wastewater Treatment Plant	WWTP/Bultler Bldg.	Bradbury	$79,215

Type	Name	Dam Name	Total Value
Wastewater Treatment Plant	WasteWater Awnings/Belt Press	Bradbury	$367,876
Bridge - Non Scour Poor Condition	Bridge	Bradbury	-

Figure 6-5. City of Solvang Critical Facilities in Dam Inundation Zone



6.4 LANDSLIDE

Several landslides have been mapped in the hillside area east of Alisal Creek which is outside the City limits and Plan area. The City has 848 improved parcels that lie within Class 5, 7, 9, or 10 landslide hazard zones, amounting to $511 million, and home to 1,907 residents. However, the City is a gently sloping area in a riverine flood plain where the risk of landslide is generally low. An increase in risk related to landslides would be man-made through excavation or other soil disturbance. While not a concern for the City, data related to areas within the landslide hazard zone is included to be consistent with the 2022 MJHMP.

Table 6-11. City of Solvang Improved Properties at Risk to Landslide Summary

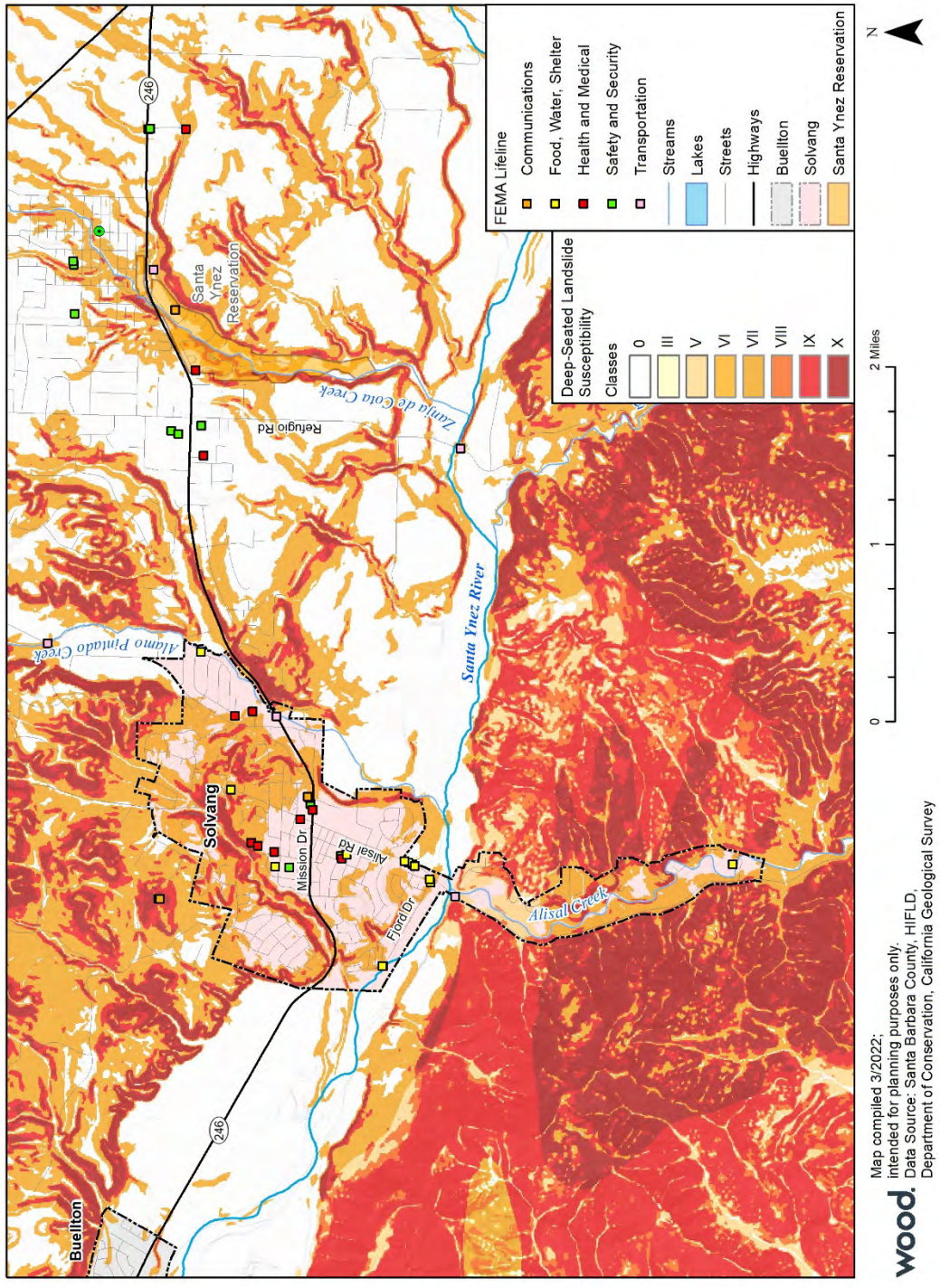
Class 5 Parcel Count	Class 7 Parcel Count	Class 9 Parcel Count	Class 10 Parcel Count	Total Improved Parcel Count	Total Value	Population
13	697	95	43	848	$511,346,700	1,907

Further, as listed in Table 6-12, 7 critical facilities with a value of $1,705,748 in the City would be vulnerable to damage or destruction from landslides (see also, Section 6.3.7, *Landslide* of the 2022 MJHMP).

Table 6-12. City of Solvang Critical Facilities Vulnerable to Landslide

Type	Name	Landslide Class Zone	Total Value
Utilities	Alisal Heights Reservoir	9	$1,339,060
Utilities	Fjord Lift Station	7	$321,375
Utilities	Water Switch Gear Bldg	7	$45,313
Clinic	Santa Ynez Valley Recovery Residence	7	-
Clinic	Santa Ynez Valley Cottage Hospital	7	-
Nursing Home	ATTERDAG VILLAGE OF SOLVANG	7	-
Bridge - Non Scour Poor Condition	Bridge	5	-

Figure 6-6. City of Solvang Critical Facilities within Landslide Susceptibility Zones



7.0 MITIGATION STRATEGY

In preparation for the 2022 LHMP update, the City's LPT made no revisions to the countywide goals and objectives because they continue to reflect the needs of the City; see also, Chapter 7.0, *Mitigation Plan* of the 2022 MJHMP. This section contains the City's updated and most current mitigation strategy as of 2022.

7.1 MITIGATION PRIORITIES

The City of Solvang identified several strengths and weaknesses regarding the implementation of hazard mitigation strategies. The following strengths, weaknesses, and priorities were identified.

7.1.1 General Observations — Strengths

- The City of Solvang has several policies that deal with hazard mitigation elements such as existing development and building code regulations including the Floodplain Ordinance, updated in 2016 and the Zoning Ordinance.
- The General Plan has been consistently updated and contains policies and programs for hazard mitigation. Currently, the City is performing a comprehensive update to the General Plan. The Safety Element of the General Plan was last revised and adopted in 2016.
- The current Housing Element was adopted in 2015. A new revision is currently in process, and will be completed in Spring 2023.
- Existing codes will ensure that new development (including tear-down and rebuild projects) will be built to modern standards. With the current trend of replacing existing substandard buildings with new ones, through attrition a safer community will be constructed.
- Better mapping of floodplains and other hazard areas is now available.
- The Bradbury Dam has been mapped for inundation.
- Area fault lines and liquefaction zones have been mapped.
- All flooding areas have been mapped.
- All high fire areas have been mapped.
- All unreinforced masonry buildings within the City limits have been brought up to code.
- The County Fire Department has a vegetative program whereby all lots are inspected in the spring and property owners are required to cut vegetation by July 1 for unincorporated areas surrounding the City. Solvang's Code Enforcement Program and County Fire handle weed abatement within the City Limits in the Spring.
- The City, in partnership with the Santa Barbara County Fire Department and the City of Buellton, has conducted CERT Training for citizens throughout the Santa Ynez Valley utilizing a shared grant.

7.1.2 General Observations — Weaknesses

- The City of Solvang is located along the Santa Ynez River, downstream from Bradbury Dam, and could sustain substantial flooding in the event of a dam failure.
- Solvang is surrounded by mountains with steep terrain that is covered with brush and trees. During fire season, Solvang is susceptible to wildfire damage.
- Solvang is located in Seismic Zone 4, which is the highest potential status for earthquake activity in the state of California.
- Solvang is a tourist town and sheltering and evacuation of those transient visitors could pose a large problem in case of major flooding or earthquake for major egress and accessing the area. County OES and the Santa Barbara County Sheriff's Department, however, have completed a countywide evacuation plan. Solvang City staff and the Solvang Conference & Visitors Bureau also completed a Crisis Communication Plan.

7.1.3 General Observations — Priorities

During the presentation of findings for the hazard identification and risk assessment and capabilities assessment, the LPT provided preliminary input and ideas for mitigation strategies. In formulating goals, the following priorities were identified:

- Top priorities for Solvang are public safety, public education, and reducing the potential economic impacts of disasters.
- Experiences from past disasters should be built upon.
- Outreach and training should be a major component, including Community Emergency Response Team Training (CERT) and early warning & evacuation plans.
- Create defensible space around high fire areas by strategically managing vegetation to decrease the fuel available for fires adjacent to the structures. This is relatively inexpensive, accomplished quickly, and is effective as long as the vegetation is managed.
- Solvang should develop and maintain a disaster warehouse or additional CERT trailers for the storage of emergency supplies.

7.1.4 Goals and Objectives

The City'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.

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

Since 2017, the City has incorporated the LHMP goals, objectives, and mitigation actions into its local plans and processes, including the General Plan Safety Element by reference, specific hazard planning efforts (e.g., Emergency Operations Plan), the City's grant pursuits, and capital improvement planning. Ongoing monitoring and evaluation of the LHMP by the City ensured mitigations are implemented and tracked. Key mitigation actions completed since 2017 include the Alisal Bridge Seismic Retrofit and the Second Street/Mission Drive Drainage Improvements projects. The City's LPT reviewed the mitigation actions listed in the 2017 LHMP to determine the status of each action. Once reviewed, deferred projects from 2017 were renumbered to reflect 2022 updates (see Table 7-1).

Table 7-1. Status of City of Solvang Previous Mitigation Actions

Mitigation Action No.	Mitigation Action Description	Status	Comments	In 2022 Update?
2017 LHMP				
2016-1	Continue to implement hazard mitigation training for all residents to include Community Emergency Response Training (CERT)	Ongoing		X
2016-2	Alisal Road Bridge Seismic Retrofit	Completed		
2016-3	Second Street/Mission Drive Drainage Improvements	Completed		
2016-4	Structural Upgrades to the Veterans Memorial Building (Emergency Shelter) and addition of Emergency Generator	Not Started	Included in the 10-Year Capital Improvement Plan	X
2016-5	Alisal Bridge Pier Repair Project	Not Started	Included in the 10-Year Capital Improvement Plan	X

Mitigation Action No.	Mitigation Action Description	Status	Comments	In 2022 Update?
2016-6	Tree Trimming and Weed Abatement in Hans Christian Andersen Park	Ongoing		X

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 City'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. CERT Training

Continue to implement hazard mitigation training for all residents to include Community Emergency Response Team (CERT).

Mitigation Priority and Performance	
Priority	High
Hazards Mitigated	Earthquake, Landslides, Wildfire, Flood, Dam Failure, Extreme Temperatures and Severe Weather
Estimated Timeline	Ongoing
Estimated Cost/Funding Source	$15,000 annually/ General Fund, and other Federal and State grants and funds.
Responsible Agency/Department	City Manager
Comments	This project was adapted from 2016-1 included as part of the 2017 LHMP.

2022-2. Upgrades to Emergency Shelter

Structural upgrades to the Veterans Memorial Building to increase the possibility of the building withstanding an earthquake, and the addition of a new emergency generator.

Mitigation Priority and Performance	
Priority	Medium
Hazards Mitigated	Earthquake, Landslides, Wildfire, Flood, Dam Failure, Extreme Temperatures and Severe Weather
Estimated Timeline	2027
Estimated Cost/Funding Source	$1.5 million/ HMP funds, and other Federal and State infrastructure grants and funds, local capital funds.
Responsible Agency/Department	Public Works, with support from City Manager's Office and other City departments
Comments	This project was adapted from 2016-4 included as part of the 2017 LHMP. To be considered for the future. The facility would act as an emergency shelter during any disaster type. The project is included the 10-Year Capital Improvement Program.

2022-3. Alisal Bridge Pier Repair Project

Wrap/repair piers 4, 5, 6 & 7 of Alisal Bridge per recommendations of 2012 Alisal Bridge Structural Evaluation Report.

Mitigation Priority and Performance	
Priority	Medium
Hazards Mitigated	Earthquake, Flood, Dam Failure
Estimated Timeline	2023-24
Estimated Cost/Funding Source	$500,000/ General Fund, Capital funds, PDM funds, and other Federal and State infrastructure grants and funds.
Responsible Agency/Department	Public Works, with support from City Manager's Office and other City departments
Comments	This project was adapted from 2017-5 included as part of the 2017 LHMP. The project is included the 10-Year Capital Improvement Program.

2022-4. Tree Trimming and Weed Abatement at Hans Christian Andersen Park

Tree trimming and weed and poison oak eradication utilizing goats to aid in fire prevention

Mitigation Priority and Performance	
Priority	High
Hazards Mitigated	Wildfire
Estimated Timeline	Ongoing
Estimated Cost/Funding Source	$5,000/ General fund, maintenance budget, CDBG funds, HMP funds, and other Federal and State infrastructure grants and funds.
Responsible Agency/Department	Parks Department
Comments	This project was adapted from 2017-6 included as part of the 2017 LHMP.

8.0 PLAN MAINTENANCE

8.1 MONITORING, EVALUATING, AND UPDATING THE PLAN

Since the last LHMP in 2017, the LPT has monitored, evaluated, and updated the plan on a continuing and as-needed basis. The City was very successful in implementing the 2017 mitigation actions as noted in Table 7-1. The remaining mitigation actions outlined in the 2017 LHMP are ongoing at the time of this 2022 update.

The City of Solvang will be responsible for ensuring that this annex is monitored on an ongoing basis. The City will continue to participate in the countywide MAC and attend the annual meeting organized by the County Office of Emergency Management 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 City's LHMP will be forwarded to the County Office of Emergency Management for inclusion in further updates to the MJHMP.

Major disasters affecting the City of Solvang's community, legal changes, notices from Santa Barbara County (lead agency for the County-wide Plan), and other significant events may trigger revisions to this plan or the convening of the LPT. The City LPT, in collaboration with the Santa Barbara County Office of Emergency Management, 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 City is committed to revising the plan at a minimum of every five years. The City Manager or the City'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 the multi-jurisdictional plan, including this annex.

8.2 IMPLEMENTATION THROUGH EXISTING PLANS AND PROGRAMS

The City 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., General Plan, building codes, floodplain management ordinance). The General Plan and the LHMP annex are complementary documents that work together to achieve the goal of reducing risk exposure to the City's citizens. An update to a general plan 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 City incorporates the LHMP by reference into its General Plan Safety Element. Under AB 2140, the City may adopt its current, FEMA-approved LHMP into the Safety Element of the General Plan. This adoption makes the City eligible to be considered for part or all of its local-share costs on eligible Public Assistance funding to be provided by the state through the California Disaster Assistance Act (CDAA) (see Section 2.0, *Plan Purpose and Authority* for the adopting resolutions). The LHMP has also been prepared to support the City's efforts to reduce wildfire risks. The Floodplain Management Ordinance applies in concert with the City's zoning ordinance and building codes to reduce flooding hazards from land use.

The information contained within this LHMP, including results from the Vulnerability Assessment and the Mitigation Strategy, is used by the City to help inform updates and the development of local plans, programs, and policies. The City may utilize the hazard information when developing and implementing the City's capital improvement programs and the Planning and Building Divisions may utilize the hazard information when reviewing a site plan or other type of development applications. Further, the City incorporates the LHMP by reference into its General Plan Safety Element. Under AB 2140, the City may adopt its current, FEMA-approved LHMP into the Safety Element of their General Plans. This adoption makes the City eligible to be considered for part or all of its local-share costs on eligible Public Assistance funding to be provided by the state through the California Disaster Assistance Act (CDAA) (see Section 2.0, *Plan Purpose and Authority* for the adopting resolutions).

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 City 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 City 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 Brad Vidro, Interim City Manager, using the following information:

Brad Vidro, Interim City Manager
City of Solvang
1644 Oak Street
Solvang, CA 93463
BradV@CityofSolvang.com
(805) 688-5575

Cachuma
Operation and Maintenance Board
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 activities.

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.

Cachuma Operation and Maintenance Board (COMB) 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 COMB. The LHMP was last comprehensively updated as an annex to the 2017 MJHMP. Since then, COMB has:

- Incorporated the LHMP goals, objectives, and mitigation actions into its operations, management, and infrastructure planning and processes, including the infrastructure improvement and emergency response plans.
- Used the LHMP's assessment of capabilities, hazards, and vulnerabilities to inform planning, infrastructure improvements, and programs, including COMB's risk and resiliency assessment.
- Implemented mitigation actions through COMB's infrastructure improvement program, maintenance programs, grant programming, community outreach, and budget process.
- Reviewed and evaluated mitigation actions before and after disasters, including wildfires within the Lake Cachuma watershed.

This update to the LHMP builds on and refines the MJHMP's assessment of hazards and vulnerabilities countywide to develop a mitigation plan for COMB. COMB participated in the 2022 MJHMP Mitigation Advisory Committee (MAC) and Local Planning Team (LPT), reviewed all portions of the MJHMP pertaining to COMB, 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). COMB is a participating agency in the County's MJHMP update.

COMB'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 COMB. Vulnerability assessments summarize the identified hazards' impact on COMB. 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*).

1.1 BACKGROUND

During the last decade, wildfires, severe drought, and natural disasters within the Lake Cachuma watershed and the South Coast of Santa Barbara County have devastated life, property, and the natural environment. The long-term impacts of these natural disasters on water supply and water quality are still under investigation. Responding and recovering from these natural disasters deplete financial resources that otherwise would be dedicated to other important programs of work within the Cachuma Project. This plan, the COMB LHMP Annex to the Santa Barbara County MJHMP 2022 update, details current hazard mitigation strategies and future projects to improve system resilience against hazards.

FEMA defines hazard mitigation as "any action taken to reduce or eliminate the long-term risk to human life and property from natural hazards." For this document, hazards include natural hazards, and also select anthropogenic hazards as applicable. FEMA defines a "hazard" as "any event or condition with the potential to cause fatalities, injuries, property damage, infrastructure damage, agricultural loss, environmental damage, business interruption, or other losses." Effective mitigation begins with identifying the threats and hazards that could affect a community and determining the associated vulnerabilities and consequences. Understanding risks makes it possible to develop strategies and plans to manage them. The purpose of mitigation planning is to identify policies and actions that can be implemented over the long term to reduce risk and future losses.

The Directors of COMB recognize the need to address, prepare, and mitigate natural disasters within the watershed and the Cachuma Project system to protect water conveyance structures and safeguard valuable resources. Emergency preparedness will ensure a prompt response to hazardous scenarios for the protection of public safety and financial stability. In short, COMB is interested in hazard mitigation planning to reduce or eliminate the long-term risk to human safety and property caused by natural and anthropogenic hazards.

This COMB LHMP intends to identify potential hazards within our area of responsibility, assess vulnerability and risk to assets, implement adequate measures to reduce losses from natural and anthropogenic disasters, and ensure that critical services and facilities that sustain the South Coast communities of Santa Barbara County will continue to function after a disaster.

The purpose of developing any Hazard Mitigation Plan (HMP) is to initiate and eventually implement construction projects to achieve the stated goal of hazard mitigation. One of the larger projects currently being considered is the Lake Cachuma Emergency Pumping Facility Secured Pipeline Project, which would provide an alternate intake and restore access to water supplies during prolonged drought. Each proposed project will be designed to mitigate hazards occurring in Santa Barbara County. The COMB LHMP will be reviewed and periodically updated to include additional projects as they are added to approved COMB capital planning documents, described in Section 8.0, *Plan Maintenance* below.

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 in 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 COMB'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 COMB'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 the cities of Buellton, Carpinteria, Goleta, Guadalupe, Lompoc Santa Barbara, Santa Maria, and Solvang; and special districts Carpinteria Valley Water District (CVWD), Goleta Water District (GWD), Montecito Fire Protection District (MFPD), Montecito Water District (MWD), and Santa Maria Valley Water Conservation District (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)

COMB participated as a MAC member to prepare this LHMP as an annex to the 2022 MJHMP. COMB 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	**MAC Meeting #1 (virtual)** 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	**MAC Meeting #2 (virtual)** 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	**MAC Meeting #3 (virtual)** 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	**MAC Meeting #4 (virtual)** 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	**MAC Meeting #5 (virtual)** Presented draft plan Discussed key MAC/LPT review needs and key issues Discussed annex updates to dovetail with plan update
March 2022	**MAC Meeting #6 (virtual)** Review and discuss public comments received on the draft plan Recommend a revised draft plan to decision-makers Review annex updates for review and approval

3.3 LOCAL PLANNING TEAM (LPT)

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

Table 3-2. COMB Local Planning Team 2022

Name	Title
Janet Gingras	General Manager
Edward Lyons	Administrative Manager / CFO
Joel Degner	Operations Division Manager / Engineer
Tim Robinson	Senior Resource Scientist
Shane King	Operations Supervisor
Elijah Papen	Program Analyst

The COMB 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 COMB 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 (12/14/21) to discuss LHMP priorities and mitigation approaches.

Meeting Dates	Summary of Activity
January and March 2022	Reviewed new maps and local vulnerabilities. Provided input on the status of LHMP mitigation strategies. Reviewed draft mitigation strategies and provide feedback. Two COMB employees completed FEMA ICS 100 and became certified in the Incident Command System (ICS). COMB staff presented updates to the COMB Board on the LHMP and local annex status, contents, and purpose at the 1/24/22 and 3/28/22 Board Meetings. Reviewed and finalized 2022 LHMP

3.4 PUBLIC OUTREACH AND ENGAGEMENT

As a participating agency in the 2022 MJHMP update, COMB 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. COMB'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 April 2022, the LHMP was completed and made available for public review, concurrent with review by FEMA and CalOES. In addition, the opportunity for the community to be heard was permitted during the COMB Board of Directors meeting before the adoption of this plan.

4.0 CAPABILITY ASSESSMENT

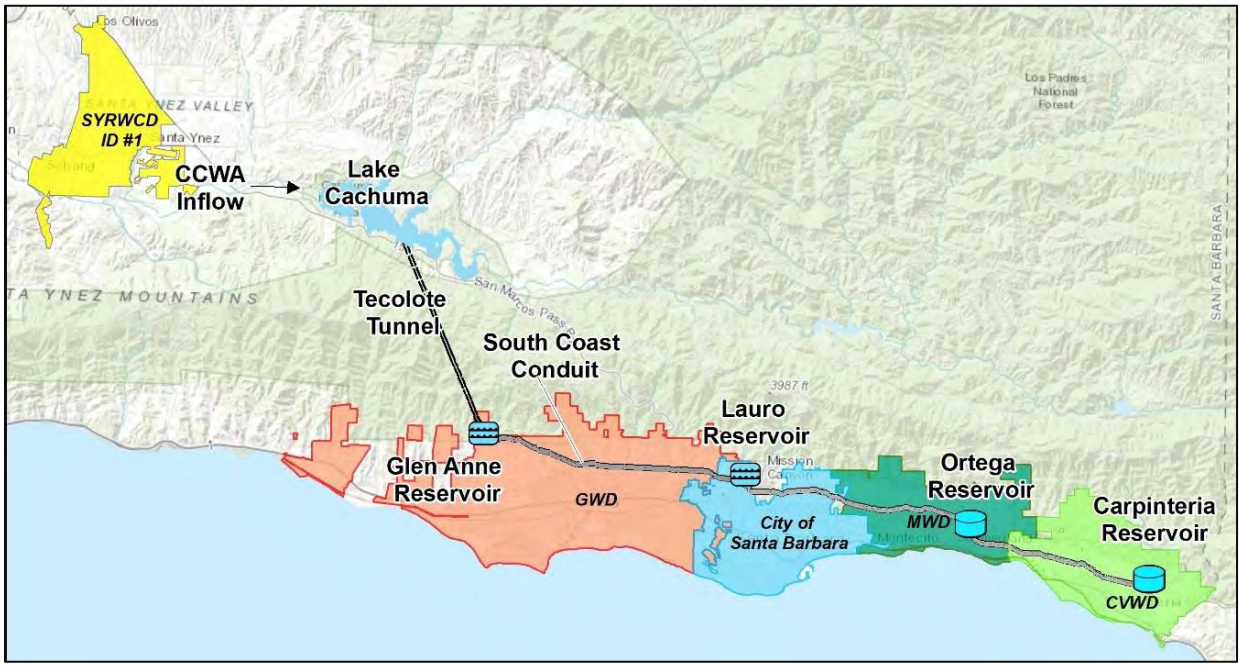
COMB's LPT identified current capabilities available for implementing hazard mitigation activities, including administrative, technical, legal, and fiscal capabilities. This assessment includes a summary of departments and their responsibilities associated to hazard mitigation planning, as well as codes, ordinances, and plans already in place associated to hazard mitigation planning. The assessment also provides COMB's fiscal capabilities that may apply to providing financial resources to implement identified mitigation action items. The COMB LHMP annex documents the process used for improving disaster resiliency and for meeting regulatory requirements, including the Disaster Mitigation Act of 2000 (DMA 2000), its amendments, and regulatory implementation. In addition, having an approved plan allows agencies to apply for funding through the Building Resilient Infrastructure and Communities (BRIC) grant, Flood Mitigation Assistance (FMA) grant, and Hazard Mitigation Grant Program (HGMP) should the agency have need.

4.1 STUDY AREA

Lake Cachuma, through the Tecolote Tunnel, serves as the primary source of water for the South Coast of Santa Barbara County (Figure 4-1). Water from the lake is allocated among five water districts; the City of Santa Barbara, Goleta Water District, Montecito Water District, Carpinteria Valley Water District, and the Santa Ynez River Water Conservation District, Improvement District No. 1 (ID No. 1). ID No. 1 receives its lake water through an exchange agreement with the COMB Member Agencies and others who participate in the State Water Project delivered by the Central Coast Water Authority (CCWA). The CCWA pipeline passes through the Santa Ynez Valley and terminates at Lake Cachuma. The South Coast Member Agencies receive their water via the North Portal Intake Tower, which carries water through the Tecolote Tunnel to the South Coast Conduit (SCC) and the Goleta West Conduit. COMB operates and maintains the SCC conveyance system. The water is normally gravity fed from the lake into the Intake Tower, but in years of severe and persistent drought when the lake level recedes below the lowest gates of the Intake Tower, an Emergency Pumping Facility (EPF) is installed.

The COMB LHMP annex service area includes Lake Cachuma, as well as the SCC conveyance system and associated balancing reservoirs located on the South Coast and maintained by COMB. Bradbury Dam, which forms Lake Cachuma, is owned and operated by the U.S. Bureau of Reclamation (Reclamation). Reclamation holds the water permits issued by the State Water Resources Control Board (SWRCB) on behalf of the United States for diverting water from the Santa Ynez River for the Cachuma Project. COMB, as the agency that operates and maintains the Cachuma Project facilities (except Bradbury Dam), participated in MJHMP 2022 Update.

Figure 4-1. COMB Service Area



During the past several years, extensive field investigation and analysis have been performed by external engineering consultants to inform and produce three reliability studies on the SCC. The focus of these investigations was to assess the condition, reliability, and capacity of the SCC and to

identify alternatives to increase the reliability of the asset. Included in these studies were aerial surveying and mapping, field reconnaissance, pipe pressure analysis, hydraulic modeling and surge potential, geotechnical assessments, initial corrosion examination, and an alternatives analysis. In addition to these documents, the Bureau of Reclamation continually updates its Standard Operating Guidelines and Emergency Action Plan for the Cachuma Project facilities, which was also used as a resource. COMB works closely with Reclamation to review, update, and exercise the Emergency Action Plan, including orientation seminars (annually), communications drills (quarterly), tabletop exercises (every three years), functional exercises (every six years), and full-scale exercises (when requested). Since the initial COMB LHMP annex was developed in 2019, COMB has created a Risk and Resilience Assessment and an Emergency Response Plan to satisfy the America's Water Infrastructure Act (AWIA), completed a Water Quality and Sediment Management Study, and updated our Infrastructure Improvement Plan (IIP). Several mitigation projects have been identified in these documents, which have also informed the development of this COMB LHMP annex.

Water from Lake Cachuma is conveyed to the COMB Member Agencies through the Tecolote Tunnel intake tower located at the east end of the reservoir. The Tecolote Tunnel extends from Lake Cachuma 6.4 miles west through the Santa Ynez Mountains to the western terminus (South Coast Conduit) located in the foothills of Goleta. The South Coast Conduit is a concrete-lined, concrete-encased steel pipeline extending 26 miles from Goleta to Carpinteria. This conveyance system is comprised of the North Portal Intake Tower, the Tecolote Tunnel, the South Coast Conduit, the Sheffield Tunnel, four regulating reservoirs, flow control valves, meters, instrumentation at control stations, turnouts, and appurtenant structures within the entire system.

Since the 2017 LHMP, growth within the South Coast Member Agencies has been relatively low and has not substantially changed the demands or capabilities of COMB for South Coast Member Agencies. According to the 2050 Regional Growth Forecast for Santa Barbara County, the Santa Barbara County share of the state population has historically been declining, ranging between 1.25 to 1.10 percent and is forecasted to continue to trend lower with the Santa Barbara County share of state population at 1.05 percent by 2050. The countywide annual average population growth rate has ranged from over two percent between 1980-1990 to between 0.5 and one percent between 1991 and 2020. The annual average is forecast to drop to less than the historical average to 0.5 percent from 2026 onward. The population of Santa Barbara County could grow from approximately 447,200 (2020) to 521,700 by the year 2050. Prolonged periods of drought, coupled with steady population increases, will require proper water resource planning in order to avoid future water shortages. As the water agencies which COMB serves expand their water sources (desalination, groundwater, recycled water, imported water, etc.) and implement water conservation and efficiency measures, COMB is also planning for future drought scenarios. Other operational risks following a population increase include higher tourism and risk for quagga/zebra mussel infestation (risk to infrastructure), and higher risk for anthropogenic wildfires (risk to infrastructure and utility outages).

More specifically, the population served through COMB's wholesale conveyance of water to the receiving community water districts is reported within their individual Urban Water Management Plans and updated every 5 years. These plans support the suppliers' long-term resource planning to ensure that adequate water supplies are available to meet existing and future water needs. Urban Water Management Plans were completed for each of COMB's Member Agencies in 2015

and 2020, and presented the population served at the time the plan was created. Overall, COMB's Member Agencies (Goleta Water District, City of Santa Barbara, Montecito Water District, and Carpinteria Valley Water District) served a population of 202,464 in 2015, 208,254 in 2020, and is estimated to serve 213,707 in 2025 (based on 2020 plans). This equals an increase in population served of 2.9% from 2015 to 2020, and a projected increase of 2.6% from 2020 to 2025. Individually, the increase in population served from 2015 to 2020 was 1,893 persons, or 2.3% (Goleta Water District), 2,495 persons, or 2.7% (City of Santa Barbara), 399 persons, or 3.5% (Montecito Water District), and 1,003 persons, or 6.7% (Carpinteria Valley Water District).

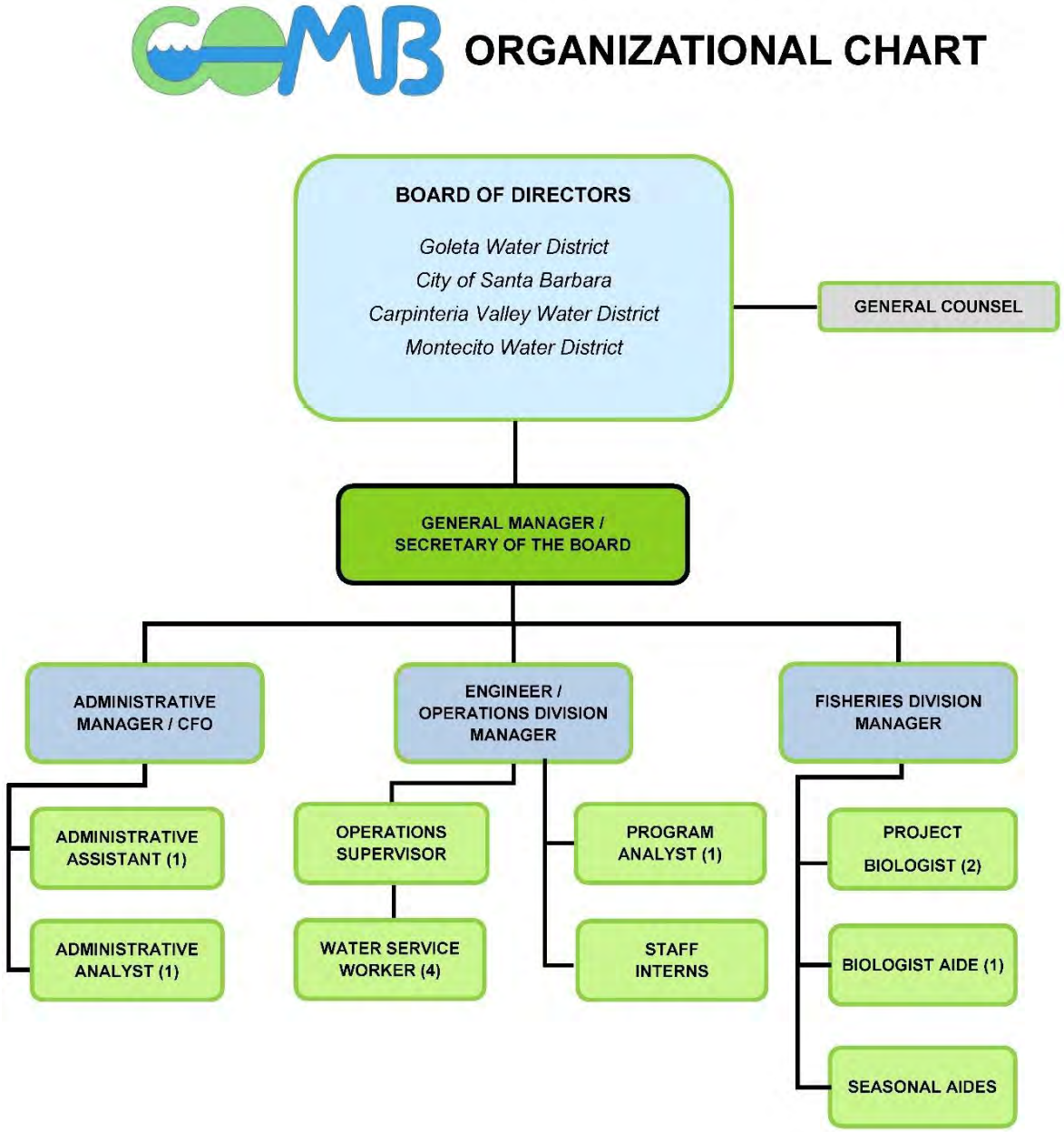
Since the last update of COMB's LHMP in 2017, land use and population have not substantially changed. Modest development has occurred consistent with the adopted Land Use Elements of COMB's member agencies and has primarily comprised infill development and redevelopment within jurisdictional limits. There has been no expansion of urban area boundaries and no comprehensive changes to land use plans that would result in substantial densification. Further, member agency population has not substantially changed. As a result, COMB's level of vulnerability to hazards analyzed in Section 6.0, *Vulnerability Assessment*, has not substantially changed due to land use, development, or population growth since the last update of the LHMP.

4.2 ADMINISTRATIVE AND TECHNICAL CAPACITY

On January 1, 1957, Cachuma Operation and Maintenance Board (COMB) was formed as a Joint Powers Authority (JPA) through an agreement organized by the Cachuma Member Units under the provisions of Articles 1, 2, and 4 of Chapter 5, Division 7, Title 1 of the California Government Code. The JPA agreement was created to provide for the joint exercise of powers by the Member Agencies for the rights to, the facilities of, and the operation, maintenance, and use of the United States, Department of the Interior, Bureau of Reclamation project known as the Cachuma Project, including storage, treatment, transport, and appurtenant facilities, and all necessary tangible and intangible property and rights. COMB also has the authority for the financing costs for the capture, development, treatment, storage, transport, and delivery of water. The Governing Board is composed of one publicly elected representative member from each of the governing bodies and is appointed by appropriate action of each governing board to serve on the COMB Board. The appointed Board members are authorized to carry out the provisions of the JPA agreement and any other agreements entered into by the Governing Board. The Board of Directors is responsible for setting policy on matters such as financial management and planning, Board administration, infrastructure improvements, and long range planning documents. Day-to-day operations are executed by the General Manager who serves at the pleasure of the Board. The General Manager oversees a staff of full-time employees including division managers, certified distribution operators, senior biology staff, a water resources engineer, program analyst, and administrative personnel. COMB's organizational structure is provided below.

COMB coordinates closely with Reclamation and Member Agency staff to ensure that water supplies meet daily demands. COMB staff reads meters and accounts for Project water deliveries monthly and performs repairs and preventative maintenance on Project facilities and equipment. COMB safeguards Project lands and rights-of-way on the South Coast as the contractor for Reclamation. COMB is responsible for issuing Project water production and use reports, operations reports,

fisheries reports, and financial and investment reports which track operation and maintenance expenditures.



COMB's internal technical staff consists of an Engineer / Operations Division Manager who is responsible for infrastructure improvement projects, hydrologic modeling, project planning and implementation, GIS resources and production, land use, and right-of-way management. COMB's Operations Supervisor has SCADA operation and maintenance experience and water resources facility and infrastructure experience. In addition, COMB employs a Senior Resource Scientist who provides environmental documentation review, project planning, sensitive species expertise (steelhead, red-legged frogs, nesting birds, etc.), and hydrologic analysis. COMB provides the financial resources necessary to contract with expert consultants and engineers on an as-needed basis when necessary for the protection of assets. COMB's administrative resources include an

Administrative Manager / Chief Financial Officer who is responsible for financial reporting requirements related to the operation of the system.

The administrative and technical capabilities of COMB, as shown in Table 4-1, include staff, personnel, and other resources available to implement the actions identified in Section 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. COMB Administrative and Technical Capacity

Personnel Resources	Yes/No	Department/Position
Planner/engineer with knowledge of land development/land management practices		
Engineer/professional trained in construction practices related to buildings and/or infrastructure	Yes	Engineer / Operations Division Manager
Planner/engineer/scientist with an understanding of natural hazards		
Personnel skilled in GIS	Yes	Multiple Positions
Full-time building official		
Floodplain manager		
Emergency manager	Yes	Administrative Manager / CFO
Grant writer	Yes	Multiple Positions
Other personnel		
GIS Data Resources (Hazard areas, critical facilities, land use, building footprints, etc.)	Yes	Operations/Fisheries
Warning Systems/Services (Reverse 9-11, cable override, outdoor warning signals)	Yes	Operations/Administration
Other		

4.3 LEGAL AND REGULATORY CAPABILITIES

COMB has a range of guidance documents and plans related to operations. Concerning hazard mitigation, the most relevant plans include Reclamations' Standard Operating Procedures and Emergency Action Plan, various phased Reliability Studies for the South Coast Conduit and regulating reservoirs, AWIA Risk and Resilience Assessment, AWIA Emergency Response Plan,

Water Quality and Sediment Management Study, Cybersecurity Response Plan, and an Infrastructure Improvement Planning document. In addition, the Bureau of Reclamation provides oversight involving annual reviews (1- year intervals), periodic facility reviews (3-year intervals), and comprehensive facility reviews (6- year intervals) and provides recommendations for facility improvements.

The legal and regulatory capabilities of COMB are shown in Table 4-2, including existing ordinances and codes that affect the physical or built environment of COMB. 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. COMB Regulatory Capability

Regulatory Tool (ordinances, codes, plans)	Yes/No
General Plan	No
Zoning ordinance	No
Subdivision ordinance	No
Growth management ordinance	No
Floodplain ordinance	No
Other special-purpose ordinances (stormwater, steep slope, wildfire)	No
Building code	No
Fire code	No
Fire department ISO rating	No
Erosion or sediment control program	No
Stormwater management program	No
Site plan review requirements	No
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	No
Elevation certificates (for floodplain development)	No

4.4 FINANCIAL RESOURCES

COMB's current fiscal year (FY) 2022 annual budget is $5,292,34, an increase of ~$130,531 over FY 2021. Annual debt obligations are $345,933, the majority of which are costs associated with

financing COMB's United States Safety of Dams Act, and projects associated with COMB's recently completed Capital Improvement Program. COMB reviews and adjust rates on an annual basis.

Table 4-3. COMB Fiscal Capability

Financial Resources	Accessible or Eligible to Use (Yes/No)	Has This Been Used for Mitigation in the Past?	Comments
Community Development Block Grants (CDBG)	No		
Capital improvements project funding	Yes	Yes	Infrastructure Improvement Projects funded through Member Assessments and Grants
Authority to levy taxes for specific purposes	No		
Fees for water and sewer service	No		
Incur debt through general obligation bonds	Yes	Yes	
Incur debt through special tax bonds	No		
Incur debt through private activity bonds	Yes	Yes	A portion of the Emergency Pumping Facility Project was financed through a line of credit and short term loan with a financial institution
Federal Grant Programs (Hazard Mitigation Grant Program)	Yes	Yes	USBR WaterSmart Grant – Secured Pipeline Project CDFW-FRGP – Quiota Creek Crossing Project CalOES/FEMA Hazard Mitigation Grant – Sycamore Canyon Slope Stabilization Project

4.5 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.

- Pursuant to California Government Code sections 54953(b)(1), (b)(2), (e)(1) and (e)(3) (AB 361), members of the COMB Board of Directors, COMB staff, and members of the public participate in meetings every month (or more often). This is the primary and most effective way COMB interfaces with the general public for participation, input, and communication.
- COMB maintains a website (https://www.cachuma-board.org/) to educate the public on agency information, to openly communicate upcoming meeting information, and to post materials from previous meetings. The website also provides contact information for how best to reach staff.
- COMB's primary document which guides emergency response and communication during natural/anthropogenic hazards is the U.S. Bureau of Reclamation's Emergency Action Plan (EAP), which is annually reviewed and practiced. The EAP provides a comprehensive communications list to facilitate notifications, and contains detailed protocol and incident command roles when responding to events in real-time.
- COMB participates in EAP Tabletop and Functional Exercises, which occur every fourth year and typically include the U.S. Bureau of Reclamation, the County of Santa Barbara, Emergency Services, Emergency Responders, Water Districts, and other community agencies. The purpose of the tabletops/exercises is to practice implementation of the EAP by role-playing hazard event scenarios at high-risk facilities and to practice coordination between various community agencies.
- On September 26, 2016, the COMB Board of Directors approved a Media Relations Policy, which provides communication guidance to the directors, management, and staff. COMB is committed to effective communications with the media which shall be accomplished both responsively and pro-actively in an honest, professional, and transparent manner. Having this policy in place ensures timely and accurate dissemination of information to the media and their broader public audience, and establishes procedures for emergency communications.
- Every Monday, the Operations Division holds a special safety meeting for staff. A wide range of safety topics are discussed based on the meeting materials provided. Previous topics have included driving safety, confined space protocols, herbicide application, etc. Topics also include hazard mitigation issues including how to respond to threats from wildfires, earthquakes, floods, and other natural/anthropogenic disasters.
- Bimonthly meetings are held between technical staff from COMB and the two primary water treatment plants: Corona Del Mar Water Treatment Plant (owned and operated by Goleta Water District), and Cater Water Treatment Plant (owned and operated by the City of Santa Barbara). These operations and sampling meetings are intended to keep open communication

between all local agencies involved in treatment, to encourage the best water quality outcomes for the community, and to mitigate any potential threats to water quality before they occur.

- COMB participates in monthly Santa Barbara County Integrated Regional Water Management (IRWM) meetings. IRWM is a collaborative effort to identify and implement water management solutions on a regional scale that increase regional self-reliance, reduce conflict and manage water to concurrently achieve social, environmental, and economic objectives. IRWM meetings include multiple agencies, non-profit organizations, other groups, and interested individuals.
- Annually, COMB technical staff attends and/or presents at the ESRI User Conference in San Diego, CA. Thousands of GIS users attend this conference every year and benefit from technical workshops, peer-to-peer information sharing, networking, presentation opportunities, and development of problem solving tools, including hazard mitigation mapping and GIS analysis. For example, COMB staff completed a GIS project about large-diameter water supply pipeline safety and land elevation tracking, which was subsequently presented at the 2022 Users Conference.
- The annual Salmonid Restoration Conference offers an opportunity for professionals, academics, and scientists to present their research to a large audience of fisheries restoration enthusiasts. The four-day annual conference highlights regional and topical issues that affect salmonids and their diverse habitats through field tours, technical workshops, panel discussions, and a plenary session on the state of salmonid recovery in California. COMB fisheries staff attends this conference and presents when given the opportunity.
- COMB staff also collaborates with universities and colleges when appropriate. For example, the Senior Resources Scientist has been a guest lecturer at the University of California, Santa Barbara (among others) on several occasions. We have worked with the Bren School of Environmental Science & Management for several student thesis projects, and consider them to be an invaluable community resource. For example, we are currently collaborating with a PhD candidate on a special sampling project to relate aerial images to in-lake samples, with implications for lake metabolism, total organic carbon, harmful algal blooms, and other important topics.

4.6 RELEVANT PLANS, POLICIES, AND ORDINANCES

COMB has a range of guidance documents and plans that help guide COMB operations and facilities. COMB implements the LHMP through existing plans, programs, and procedures, as detailed in Section 8.0, *Plan Maintenance*. The LHMP annex complements these plans and programs, working together to achieve the goal of reducing risk exposure to COMB's customers and assets.

4.6.1 COMB Infrastructure Improvement Plan (IIP)

The IIP formalizes the strategy for implementation of capital projects and programs needed to carry out the goals and policy objectives of the COMB Board. The IIP is organized and structured to identify and prioritize rehabilitation projects necessary to protect, improve, and sustain a reliable source of water conveyed from the Cachuma Project to the COMB Member Agencies. Projects

outlined in the IIP have been identified based on Reclamation inspection recommendations, COMB asset inventory analysis, and other staff observations and recommendations. The identification of a project within the five-year plan does not guarantee construction. The initiation of any project requires Board approval for a project to advance to design and ultimately construction. Additionally, the Board of Directors has the ongoing ability to review and revise projects based upon unforeseen conditions, priorities, and financial resources. The LHMP is used as a guiding document when developing, selecting, and prioritizing projects within the IIP and the 5-year time horizon used for planning purposes within the project implementation schedule.

4.6.2 Integrated Regional Water Management (IRWM) Plan

The IRWM is a collaborative effort created by a group of cooperating partners with mutual interest who have identified and implemented water management solutions to achieve social, environmental, and economic objectives throughout the Central Coast region. COMB has been a part of the group's formation since 2007, participating in monthly discussions to implement sustainable water projects in the area.

COMB's affiliation with IRWM Plan made it possible to apply for and receive grant monies with funding applied to the much-needed infrastructure improvement projects. Participation in IRWM continues to allow COMB to be aware of various funding opportunities which may contribute to the improvement and sustainability of managed infrastructure.

The IRWM Region has undertaken public processes and completed documents as well as implemented various projects to prepare for and adapt to climate change. The 2016 Santa Barbara County Multi-Jurisdictional Hazard Mitigation Plan was cited in the Santa Barbara County IRWM Plan 2019 Update as a guiding document for planning work related to climate change vulnerabilities and sea level rise in the IRWM region (pg. 180).

4.6.3 Risk and Resiliency Assessment (RRA) / Emergency Response Plan (ERP)

COMB's RRA was performed according to the 2018 America's Water Infrastructure Act (AWIA) guidelines and requirements. AWIA requires community water systems to assess the risks to and resilience of specified assets from both malevolent acts and natural hazards. This assessment utilizes the U.S. Environmental Protection Agency's (EPA) Vulnerability Self-Assessment Tool (VSAT) Web Version 2.0. This tool guides operators in identifying the threats that present the highest risks to their facilities and in evaluating the costs associated with those risks.

The results from the RRA were used to produce the ERP, which considers risk prioritization in the development of resilience strategies, emergency plans/procedures, detection strategies, and implementable mitigation actions. The plan satisfies AWIA requirements and is used for developing hazard mitigation projects to be included within COMB's Infrastructure Improvement Plan.

4.6.4 Lake Cachuma Water Quality and Sediment Management Study (WQ&SM)

The purpose of the WQ&SM is to understand and address issues of water quality and sedimentation at Lake Cachuma, through coordination with a broad range of stakeholders that manage, operate, and use Lake Cachuma. Ultimately, the WQ&MS identifies viable and actionable solutions that can

be incorporated into a long-term program for water quality and sediment management throughout the Upper Santa Ynez River watershed and Cachuma Reservoir. The WQ&SM was completed by consultants in August 2020, and several management actions resulted and are in various stages of planning/implementation, including drought hazard mitigation projects such as the Secured Pipeline Project.

4.7 OPPORTUNITIES FOR MITIGATION CAPABILITY IMPROVEMENTS

COMB 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, COMB 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 COMB to expand or improve on these policies and programs to further protect the community. COMB has identified three primary opportunities for mitigation capability improvements, including 1) incorporating existing plans into project development, 2) pursuing hazard mitigation grant money in order to fund resiliency projects, and 3) continuing to foster community interagency relationships to achieve common goals and support mutually beneficial efforts.

- **Regulatory Opportunities**: In alignment with COMB's purpose, continued assessment of vulnerability and water source sustainability would improve COMB's capabilities to ensure safe, reliable, and sustainable water sources to agencies. Over the last five years, COMB has worked diligently in updating planning documents. Some of these planning documents, including the IIP and the WQ&SM have identified hazard mitigation projects which need further refinement. Refining those projects through feasibility studies, alternatives studies, cost-benefit analyses, and eventually complete designs will help expand COMB's pool of projects to implement.
- **Administrative/Technical Opportunities**: As part of this update, COMB aims to improve its resilience to ensure reliability and back-up systems for core infrastructure and facilities. Existing plans, inclusive of the plans aforementioned and this LHMP, will be updated periodically with the best available information. COMB views plan creation as an opportunity to assess current conditions and move project elements forward for later development.
- **Outreach Opportunities**: Agencies outside of COMB are also developing plans/projects which may have synergy with our water supply and water quality objectives. Open communication between federal, state, and local agencies can allow overlapping goals to be realized. Participating in interagency meetings, offering letters of support, or offering financial/staff/other support are ways in which COMB is able to achieve goals more efficiently while helping the community at large. For example, in September 2022, COMB staff under the approval of the Board of Directors, sent a letter of support to the Los Padres National Forest for their Ecological Restoration Project during their scoping process. Although the project's primary goal is fuel reduction, secondary benefits include water quality improvements to drainages within the watershed (including Lake Cachuma). We believe expanding interagency communication will improve the community's mitigation capabilities.

- **Fiscal Opportunities:** COMB's hazard mitigation capabilities are constrained by the approved budget each fiscal year. When creating the budget, COMB administrative staff considers long-term infrastructure improvement project categories for hazard mitigation. Outside funding opportunities like grants and loans offer additional financial ability to move projects forward. COMB staff will continue to expand grant awareness and apply for funding as appropriate. Additional funding allows greater opportunity to build resilience against future hazards.

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 COMB LHMP. The intent is to confirm and update the description, location and extent, and history of hazards facing COMB 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 COMB.

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 COMB LPT refined the list of hazards applicable to COMB 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 COMB'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 COMB. The COMB 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 COMB 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 COMB 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 COMB such as extreme temperatures or dam failure.

Table 5-1. COMB Local Priority Hazards

Hazard Type and Ranking	Planning Consideration Based on Hazard Level
Drought / Water Shortage	Significant
Wildfire	Significant
Flooding / Mud Flow / Debris Flow	Significant
Earthquake	Significant
Landslide / Other Earth Movements	Significant
Pandemic / Public Health Emergency	Moderate
Agricultural Pests / Invasive Species	Moderate
Terrorism / Civil Unrest	Moderate
Power Outage / Energy Shortage	Low
Cyber Threat	Low

To continue compliance with the DMA of 2000, COMB 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 COMB in subsections below. COMB's LPT acknowledged other hazards are either not a threat, are highly unlikely within COMB boundaries, or are adequately addressed by the 2022 MJHMP and do not require additional information to be relevant to the COMB hazard setting; therefore, these hazards are not addressed further in COMB's LHMP. These additional hazards are being addressed in the more comprehensive 2022 MJHMP.

5.3 HAZARD PROFILES

Based on the revised list of hazards and utilizing the approach described in Section 5.2 above, the hazards were screened (Table 5-1). Hazards identified as "Significant" are discussed in greater detail herein. Chapter 5.0, *Hazard Assessment* of the 2022 MJHMP provides a comprehensive analysis of hazards within Santa Barbara County, including COMB and its member agencies. Refer also to the LHMPs for the City of Santa Barbara, Carpinteria Valley Water District (CVWD), Goleta Water District (GWD), and Montecito Water District (MWD) for an expanded description of vulnerabilities in each jurisdiction (MJHMP Annexes F, J, K, and M, respectively).

5.3.1 Drought & Water Shortage

Drought and water shortages are a gradual phenomenon and generally are not signified by one or two dry years. California's and southern Santa Barbara County's extensive system of water supply infrastructure (reservoirs, groundwater basins, and interregional conveyance facilities) can mitigate the effects of short-term dry periods for most water users. However, drought conditions are present when a region receives below-average precipitation, resulting in prolonged shortages in its water supply. Climate change may impact the duration and severity of drought in the future, decreasing the reliability of continuous surface water supplies.

North Portal Intake Tower during drought conditions with pipeline connection to the Emergency Pumping Facility

Vulnerabilities and Potential Impacts of Hazard

Lake Cachuma is the primary source of drinking water for five water agencies and 208,500 people living on the South Coast of Santa Barbara County. The average rainfall in Santa Barbara County is 17.6 inches. Since 2012, Santa Barbara County has experienced significantly less than average rainfall on an annual basis. During periods of sustained drought, lake levels recede causing a direct impact on the water supply. In 2016, Lake Cachuma's elevation receded to 7% of capacity, the lowest elevation on record since the reservoir was built. Drought and the circumstances resulting from prolonged dry conditions, such as water shortages, represent a high-risk hazard.

Prolonged periods of drought can drop lake levels below the inlet gates at the Intake Tower. The Intake Tower design enables water to gravity flow from Lake Cachuma into the Tecolote Tunnel; however, the ability to gravity flow (normal operations) is lost once the lake level falls below the intake gates. This condition impacts both surface water deliveries from the lake, as well as State Water deliveries, which are transported via Lake Cachuma. In addition, Lake Cachuma serves as a critical conveyance facility for all supplemental water purchases.

To maintain access to available water supplies, COMB has requested permission from the Bureau of Reclamation to periodically install a temporary Emergency Pumping Facility (EPF) during drought conditions to allow available water supplies to be pumped from a floating platform (pumping barge) to the Intake Tower until sufficient inflow to the lake occurs and reservoir levels return to normal operating conditions. The 36" high-density polyethylene floating pipeline is connected to the lowest inlet gate, Gate 5, and stretches across the lake 3,500 feet to a floating pumping station, which allows water to be pumped at lower elevations to continue Cachuma Project and State Water Project deliveries to the South Coast communities of Santa Barbara County. If the lake elevation continues to drop, the pipeline can be extended an additional 7,000 feet and the barge relocated to a deeper site to continue conveyance operations.

Although the EPF allows COMB to continue delivering water to the South Coast users during a drought, installing the EPF is an expensive and temporary fix. The cumulative costs of the implementation and operation of the Emergency Pumping Facility Project during the 2014 to 2017 period were approximately $8.6 million. A repeat of the 2014-2017 drought would cost approximately $4.3 million under the current terms of a change order for extended operations. If the EFP is not installed once the lake level falls below the lowest intake gate, or if the drought/water shortage lowers lake levels below the minimum pool (643 feet elevation, 12,000 AF storage), lake water deliveries would cease, affecting about 208,500 customers on the South Coast. COMB has currently received 100% designs for installing a more permanent system, comprised of a pipeline secured to the bottom of the lake (Secured Pipeline Project) with concrete collars and extending out into the lake to provide additional water supply during a drought.

Beyond water supply, prolonged periods of drought can also impact water quality at Lake Cachuma. When lake levels are low during a drought, vegetation will begin to colonize previously submerged areas. After subsequent large rain events when lake levels increase again, newly established growth becomes submerged and will begin decaying underwater. Declining lake water quality at Lake Cachuma is a growing concern to the Member Agencies of COMB because increasing levels of organic matter make it more difficult to maintain consistent chlorine residual in the system and meet the drinking water standard for trihalomethanes (THMs). While COMB's Member Agencies are pursuing treatment solutions for their respective systems, there is a shared interest in reducing organic concentrations coming into the treatment plants. A Water Quality and Sediment Management Study was recently completed at COMB, and several potential projects were identified to address water quality issues at the lake including THM precursors.

Droughts increase the chances of catastrophic wildfire risks. Drought is a major determinant of wildfire hazard, in that it creates a greater propensity for fire starts and larger, more prolonged conflagrations fueled by excessively dry vegetation, along with reduced water supply for firefighting purposes (see also, Section 5.3.2, *Wildfire*).

History of Hazard

The construction of Bradbury Dam began in 1951 and was completed in 1953. The lake first filled and spilled in 1958. There have been two major multi-year dry periods (1987-1991 and 2012-2017) in the history of the lake where the lake elevations receded below the limit of gravity flow requiring an emergency pumping facility (Figure 5-1). In addition, the period when the dam was constructed was a multi-year dry (1951-1957) period and it took several years for the lake to fill. Installation of the EPF has occurred in the past during drought conditions (1990-1991 and 2014-2017) and is anticipated to occur in the future during drought conditions.

Currently, Santa Barbara County has been in a state-declared drought since July 8, 2021when Governor Gavin Newsom proclaimed a drought emergency, which was expanded on October 19, 2021, to include all 58 counties in California. Also on July 13, 2021, the County Board of Supervisors passed a resolution proclaiming a Local Emergency caused by Drought Conditions. The County resolution cites Newsom's drought declaration, as well as below-average rainfall, received last winter, reduced storage in reservoirs, and reduced State Water Project supply. As of April 8, 2022, Lake Cachuma was at 710.12 feet above mean sea level or 45.8% of reservoir capacity.

Probability of Occurrence

Based on the history of the lake elevations, an emergency pumping system is likely required at least once every thirty years and would be required to be utilized for several years. However, increased downstream release requirements, reduced capacity due to sedimentation, and potential climate changes will likely require the implementation of the emergency pumping system more frequently in the future. A drought year has been defined in this plan as any year in which the percent average rainfall at Lake Cachuma is less than 80% of the mean, which has occurred in 18 of the last 41 years. In over 67 years of operation (1954-2021), the need for EPF deployment has been met on 3 occasions (4.5% for any year being an installation year).

Climate Change Considerations

Climate change has the potential to make drought increasingly common along the west coast, including in California and Santa Barbara County. The drought of record for Lake Cachuma began in 2012 and continued with a minor reprieve in 2017. The combined last eight years are the driest eight years on record. A recent study of climate change impacts (Swain et al. 2018, UCLA CCS 2018) found extreme dry years will be 2.4 times more frequent. The drought extremes experienced in the Lake Cachuma watershed in the last decade are likely to continue and potentially worsen due to the effects of climate change. More frequent droughts mean that critical water supplies for the community can be expected to be reduced in the future, that lake deliveries will depend increasingly on an emergency pumping barge, and that water quality issues will likely be more common.

5.3.2 Wildfire

A wildfire is an unplanned fire that is fueled by natural areas or wildlands, such as the Los Padres National Forest, particularly in the Santa Ynez Mountains or San Rafael Mountains. Wildfire can be classified as either a wildland fire or a wildland-urban interface (WUI) fire. The former involves situations where wildfire occurs in a relatively undeveloped area, while the latter can contain elements of human development, undeveloped wildland, and vegetative fuels. Certain conditions must be present for a wildfire hazard to occur; a large source of fuel must be present, the weather must be conducive (generally hot, dry, and windy), and fire suppression sources must not be able to easily suppress and control the fire. The cause of a majority of wildfires is human-induced or lightning.

The 2017 Thomas Fire burned approximately 281,893 acres in Ventura and Santa Barbara counties, including significant portions of the Lake Cachuma watershed.

Vulnerabilities and Potential Impacts of Hazard

One of the primary ways that wildfires impact COMB assets and operations is through water quality hazards, including increased sedimentation. Water quality constituents affected by fires include color, sediment, organic material, suspended material, and turbidity. Subsequent floods and debris flows can entrain large material, which can physically damage infrastructure associated with the beneficial utilization of water (e.g., water conveyance structures; transportation networks). The loss of riparian shading and the sedimentation of channels by floods and debris flows may increase stream temperature. Fire-induced increases in mass wasting along with extensive tree mortality can result in increases in floating material – primarily in the form of large woody debris. Post-fire delivery of organic debris to stream channels can potentially decrease dissolved oxygen concentrations in streams. Fire-derived ash inputs can increase pH, alkalinity, conductivity, and nutrient flux (e.g., ammonium, nitrate, phosphate, and potassium), although these changes are generally short-lived.

The original design capacity for Lake Cachuma was 205,000 acre-feet. Recent fires within the Lake Cachuma watershed have contributed greatly to siltation within the reservoir. Sedimentation has reduced the overall capacity by 11% and has buried the lowest gate of the Intake Tower, reducing the operational capacity of the reservoir. The sedimentation reduces the overall yield of the Cachuma Project and increases the operational costs of delivering water during times of drought. The pumping facility's operation during the drought from 2014 to 2017 increased water delivery costs by $8.6 million. Lauro and Glen Anne regulating reservoirs are also vulnerable to sedimentation from wildfires.

In addition to causing water quality and sedimentation issues, wildfires can burn critical infrastructure, particularly in difficult-to-reach areas. Vulnerable structures include those associated with the North Portal Intake Tower and the Tecolote Tunnel, appurtenances to the South Coast Conduit which include laterals and turnout structures, structures associated with regulating reservoirs, access roads, and critical equipment/buildings located at organizational headquarters. If any critical structure is destroyed in a wildfire, it could delay operations and may cause complications in delivering water.

History of Hazard

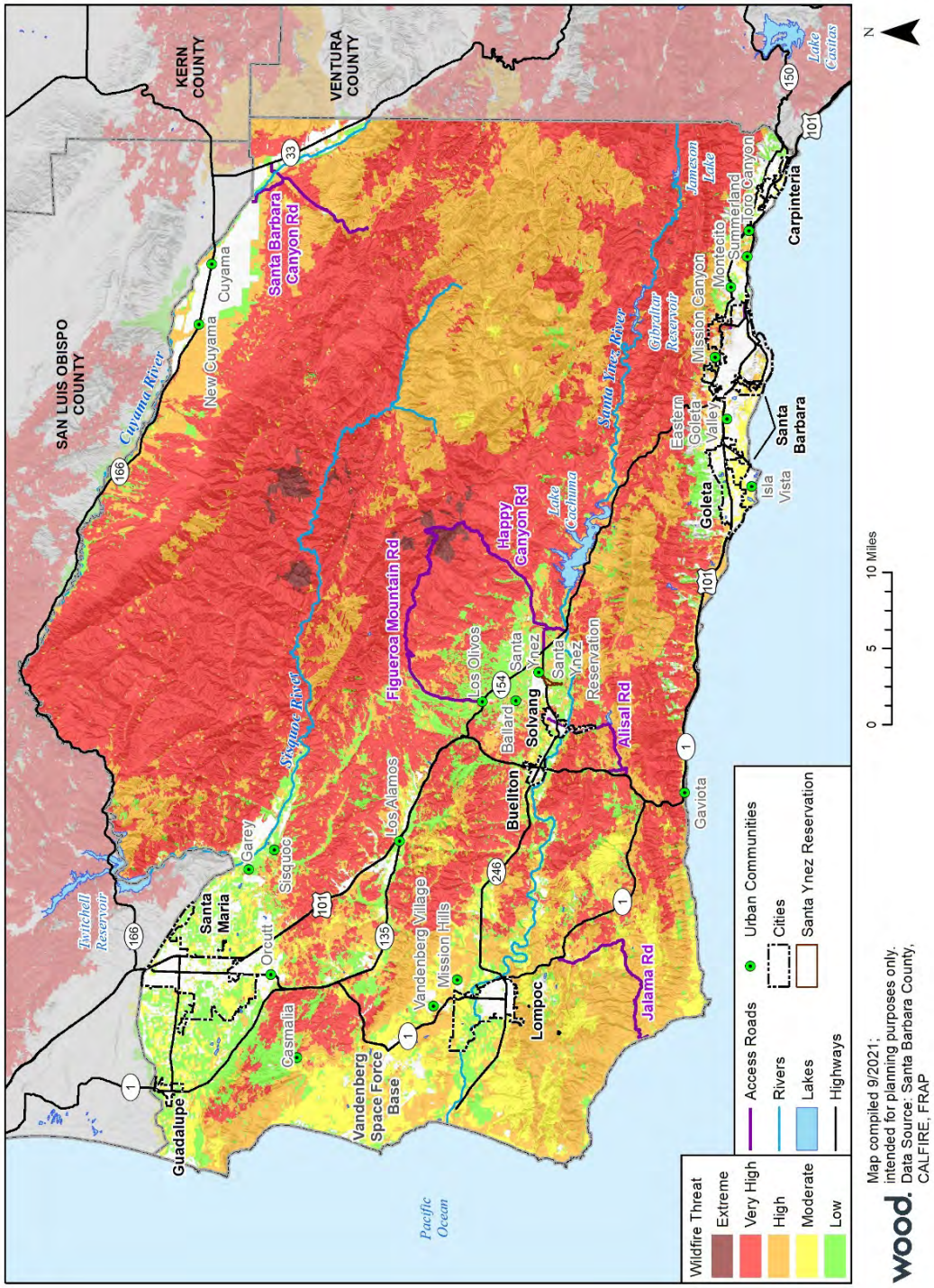
More than half of the Lake Cachuma watershed has been burned by wildfire in the last decade with the Zaca Fire (2007), White Fire (2010), Rey Fire (2016), Whittier Fire (2017), and Thomas Fire (2017). Between the five fires listed, approximately 180,000 acres of the Lake Cachuma watershed have burned. Most recently, the Thomas Fire has destroyed 166 structures, damaged 395 more, andresulted in 21 fatalities due to subsequent debris flow in Santa Barbara County alone.

Figure 5-1. Recent Wildfires within the Lake Cachuma Watershed

Probability of Occurrence

Vegetation and topography are significant elements in the identification of fire threat zones. A substantial amount of the vegetation in Santa Barbara is commonly called chaparral, a dense and scrubby bush that has evolved to persist in a fire-prone habitat. Chaparral plants will eventually age and die; however, they will not be replaced by new growth until a fire rejuvenates the area. Chamise, manzanita, and ceanothus are all examples of chaparral which are quite common in Santa Barbara County. Santa Barbara County was subject to 42 major wildfires over 88 years, resulting in a 48 percent chance of occurrence in any given year. In addition, Figure 5-2 shows the threat of fire to Santa Barbara County as mapped by CAL FIRE. Fire threat is a combination of two factors: 1) fire frequency or the likelihood of a given area burning, and 2) potential fire behavior. These two factors are combined to create four threat classes ranging from moderate to extreme.

Figure 5-2. Wildfire Threat in Santa Barbara County



Climate Change Considerations

Climate change plays a significant role in wildfire hazards. Over the past several decades the occurrence of severe autumn wildfires has been increasing. Recent research has found a link between these increasingly severe wildfires and climate change as a result of vegetation drying and a progressively later onset of the start of the rainy season (Swain 2021). In addition, high wind events increase the risk and present challenges during drought conditions which can hinder the ability to contain wildfires. Larger wildfires also have several indirect effects beyond those of a smaller, local fire. These may include air quality and health issues, road closures, business closures, and other forms of losses. Furthermore, large wildfires increase the threat of other disasters such as landslides and flooding. More frequent fires associated with climate change are anticipated to result in increased sedimentation and water quality challenges in the future.

5.3.3 Flood & Mudflow/Debris Flow

A flood is a general and temporary condition of partial or complete inundation on land that is normally dry. Several factors determine the severity of floods, including rainfall intensity and duration, antecedent moisture conditions, surface permeability, and geographic characteristics of the watershed such as shape and slope. Mud flows are defined as flows or rivers of liquid mud down a hillside on the surface of normally dry land. They occur when water saturates the ground, usually following long and heavy rainfalls or rapid snow melt. Mud can form and flows down the slope if there is no ground cover such as brush or trees to hold the soil in place. Debris flow is defined as when water begins to wash material from a slope or when water sheets off of a newly burned stretch of land. Chaparral land is especially susceptible to debris flows after a fire. The flow will pick up speed and debris as it descends the slope. As the system gradually picks up speed it takes on the characteristics of a basic river system, carrying everything in its path along with it.

When flood control infrastructure fails, water builds up and washes into normally dry areas, where it can cause significant harm to buildings, people, infrastructure, and ecosystems. Floods can be caused by heavy rainfall, long periods of moderate rainfall, or blocked-off drainage areas during rainfall. A break in a dam or levee, water pipe, or water tank can also cause flooding in rare instances.

Repetitive Loss Information and NFIP Participation

COMB 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.

Vulnerabilities and Potential Impacts of Hazard

Damage to SCC vault after 1/9/18 debris flows

Flooding and debris flows are a major risk to COMB assets. In the event of a storm, the South Coast Conduit (SCC) and Secondary Pipeline are at risk of being exposed and damaged. When a section of conduit is exposed, it is vulnerable to pipeline failure resulting from structural damage, corrosion, and or additional erosion material sliding over the conduit. A failed pipeline can quickly cause flood damage to the surrounding area, posing a significant risk.

Other susceptible areas include creek crossings and locations experiencing elevated flow during a storm surge. In early 2017, the Quiota Creek Crossing Project was damaged by flood events. Damage to the project included: several feet of deposition under the precast arch bridge, bank erosion upstream of the bridge, and minor damage to the rock vanes upstream of the project. There are also examples of the South Coast Conduit becoming exposed at creek crossings. For example, following the winter storm events in 2019, approximately 6 feet of the South Coast Conduit was found exposed in the San Jose Creek bottom. The surface of the pipe was being impacted by stream erosion resulting in the loss of concrete material and aggregate exposure. A break in the SCC at this location would likely be explosive, sudden, and catastrophic. This area was successfully repaired in October 2019.

Flooding and debris flows can be exacerbated by wildfires. After a significant wildfire, bare earth is exposed without significant vegetation to stabilize the soil. During the January 9, 2018 debris flow event in Montecito, nine structures along the SCC were impacted with two structures severely damaged. Because wildfires are becoming more common in the Santa Barbara backcountry near COMB assets, the possibility of damaging debris flows is becoming more likely.

Post-wildfire debris flows can also cause sedimentation and water quality issues within Lake Cachuma. Debris flows can introduce large amounts of organic material into surface waters, as well as increased nutrient loading, dissolved organic carbon, major ions, fire-fighting compounds, turbidity, and other compounds present in the watershed. Debris flows accelerate ongoing sedimentation in the reservoirs, effectively reducing storage capacity. Mono and Big Caliente debris dams, located upstream of Gibraltar Reservoir, were constructed to collect sediment. Both debris dams are now full, and Gibraltar Reservoir is significantly reduced in capacity due to sedimentation. As upstream storage continues to be reduced, the sediment loading on Cachuma could increase.

The EPF infrastructure is especially vulnerable during flood events and rapid lake elevation. During the installation of the EPF, the first step is driving piles into the lake bottom to secure the floating pipe. These anchor piles are 45 to 60-feet tall steel H-beams or pipes and are driven to where the elevation at the top of the piles is 700 ft amsl. The pile driving must begin before the lake reaches an elevation of 695 ft amsl. Once the piles are driven, the working barge must remain on standby during the winter months. During storm events, the reservoir can rise rapidly. In February 2017, the

reservoir rose 23 feet in one day at the peak of the inflow. The reservoir nearly rose above the piles before they could be removed. COMB's contractor worked around the clock in the rain to remove the piles before the lake level overtopped the pilings. Within the current design, the requirement to drive the piles well before the pumping barge is needed results in the Emergency Pumping Facility being placed in standby mode for an extended period (refer also to Section 5.3.4, *Flood* and Section 5.3.5, *Mudflow & Debris Flow* of the 2022 MJHMP).

History of Hazard

Flooding has been a major problem throughout Santa Barbara County's history. The most common flooding in Santa Barbara County is due to riverine flooding, debris flows, and flash flood events. Between 1907 and 2018, Santa Barbara County experienced 20 significant inland flood events. Eight of these floods received Presidential Disaster Declarations.

Probability of Occurrence

By definition, a 100-year flood event has a 1% chance and a 500-year flood event has a 0.2% chance of occurring in a given year based on historical events. Figure 5-3 shows the location of the 100-year flood hazard zones in Santa Barbara County as mapped by FEMA's Flood Insurance Rate Maps (FIRM). Figure 5-4 shows the location of known debris flow hazard zones in Santa Barbara County following the Thomas Fire and recent debris flow events; however, this hazard zone is not applicable countywide. In response to the debris flow disaster in Montecito on January 9, 2018, the Santa Barbara County Office of Emergency Management (OEM) has published a map showing high and extreme risk areas for debris flow. Below is a map showing these boundaries in relation to the South Coast Conduit, the major pipeline maintained by COMB (Figure 5-5). The sections of the South Coast Conduit from Montecito through Carpinteria have the highest risk for debris flow according to OEM findings.

Climate Change Considerations

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. A recent study of climate change impacts in California (Swain et al. 2018, UCLA CCS 2018) found extreme wet years would be 2.5 times more frequent in Southern California. If this is true for Santa Barbara County, more extreme debris flow events can be expected, especially over recently burned areas.

Figure 5-3. Santa Barbara County FEMA Flood Hazard Areas

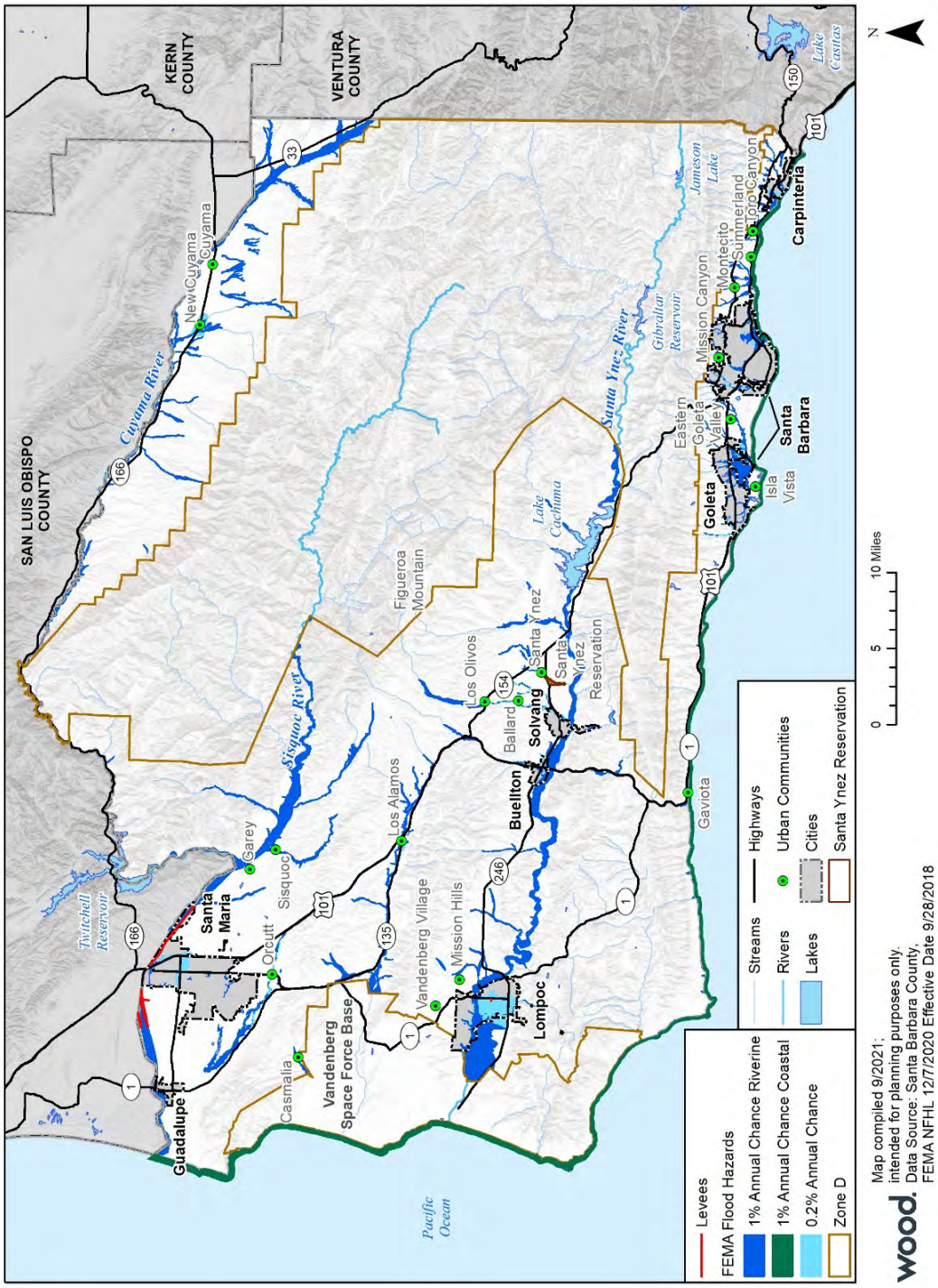


Figure 5-4. Santa Barbara County Known Debris Flow Hazard Areas

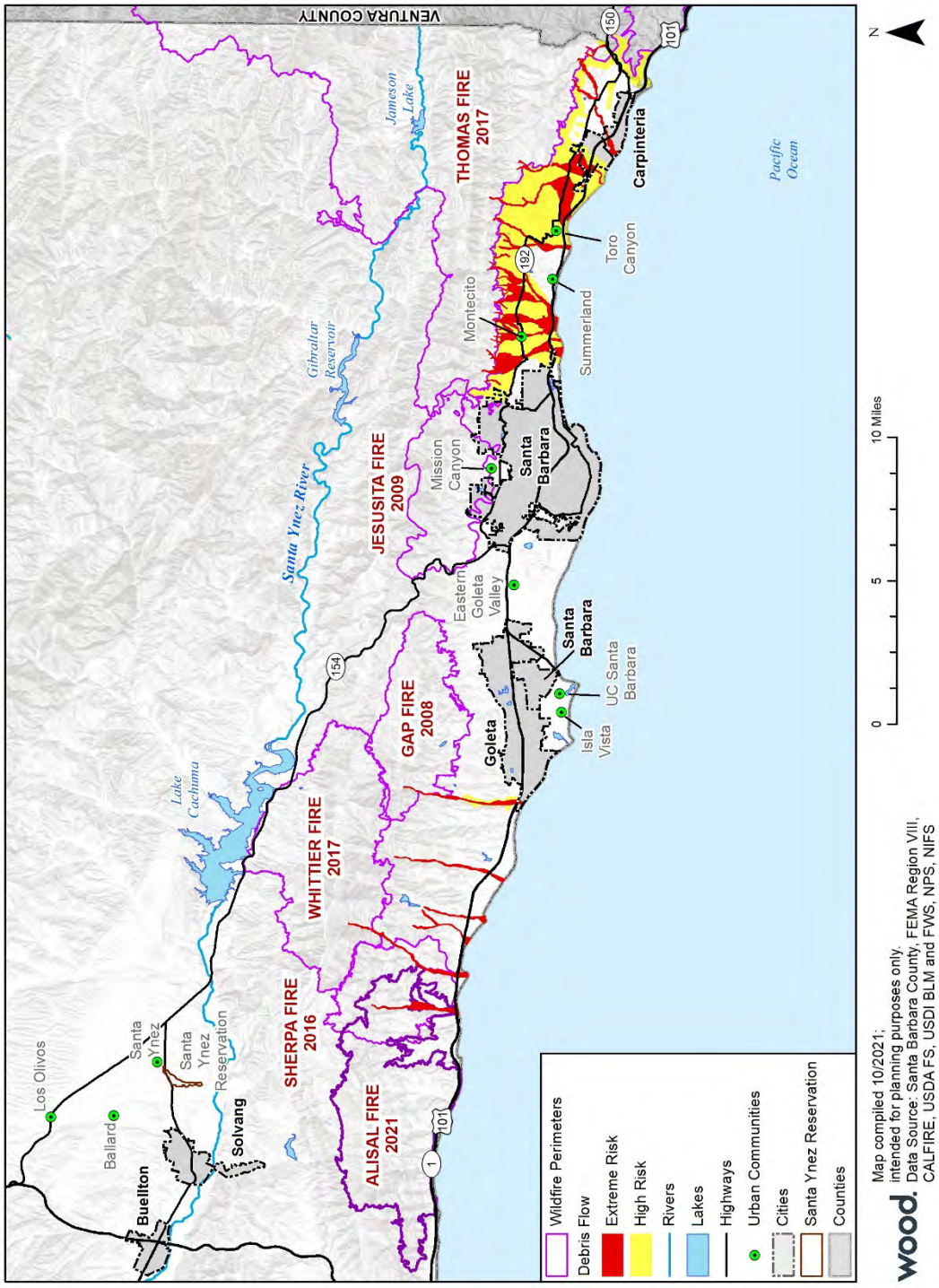


Figure 5-5. Debris Flow Risks for the South Coast Conduit

5.3.4 Earthquake

An earthquake is caused by a release of strain within or along the edge of the Earth's tectonic plates producing ground motion and shaking, surface fault rupture, and secondary hazards, such as ground failure. The severity of the motion increases with the amount of energy released, decreases with distance from the causative fault or epicenter, and is amplified by soft soils. After just a few seconds, earthquakes can cause massive damage and extensive casualties.

The effect of an earthquake on the Earth's surface is called the "intensity." The intensity scale consists of a series of certain key responses such as movement of furniture and facilities, and/or total failure and destruction. The Richter scale currently used in the United States is composed of 12 increasing levels of intensity that range from imperceptible shaking to catastrophic destruction. The Richter scale is logarithmic; each one-point increase corresponds to a 10-fold increase in the amplitude of the seismic shock waves and a 32-fold increase in energy released.

Table 5-2. Richter Scale.

Richter Magnitudes	Earthquake Effects
Less than 3.5	Generally not felt but recorded.
3.5 - 5.9	Often felt, but rarely causes damage.
Under 6.0	Slight damage to well-designed buildings. Can cause major damage to poorly constructed buildings over small regions.
6.1-6.9	Can be destructive in areas up to about 100 kilometers across residential areas.
7.0-7.9	Can cause serious damage to larger areas.
8 or greater	Can cause serious damage in areas several hundred kilometers across.

Peak ground acceleration (PGA) is a measure of the strength of ground shaking. Larger peak ground accelerations result in greater damage to structures. PGA is used to depict the risk of damage from future earthquakes by showing earthquake ground motions that have a specified probability (10, 5, or 2 percent) of being exceeded in a 50-year return period. Figure 5-6 shows fault lines in the county and the probability of areas of the county experiencing 2 percent shaking within the next 50 years. These values are often used for reference in construction design, and in assessing relative hazards when making economic and safety decisions.

Vulnerabilities and Potential Impacts of Hazard

The North Portal of the Tecolote Tunnel is located on the south shore of Lake Cachuma, This critical point in the water delivery system is potentially vulnerable to earthquake damage. The North Portal contains several facilities including the Tecolote Tunnel Intake Tower and access bridge, the North Portal Control Station, and the beginning of the Tecolote Tunnel. Water enters through the 120-foot intake tower, a five-sided structure with 36- by 48-inch slide gates on each side, into the Tecolote Tunnel and is delivered to the South Coast water purveyors. Damage to critical North Portal structures from seismic activity could result in suspended water deliveries to over 200,000 people.

Damage from the 1925 Santa Barbara earthquake

The Tecolote Tunnel is 6.4 miles long and passes through the Santa Ynez Fault in the Santa Ynez Mountains. The entire zone of rock visibly affected by the Santa Ynez fault within Tecolote Tunnel is approximately 1,090 feet wide. Movement along the Santa Ynez Fault zone could cause major damage to the Tecolote Tunnel, taking months to repair and restore water deliveries to the South Coast. In the event of an earthquake resulting in a power outage during a tunnel inspection, a stand-by Caterpillar Diesel generator at the North Portal automatically and instantly starts providing power within seconds for the tunnel ventilation blower, gate chamber sump pump, building lights, and elevator. An earthquake near Lake Cachuma could also result in damage to the Intake Tower. An earthquake with very strong shaking to severe shaking could be strong enough to cause moderate or heavy damage to the integrity of the structure. If the Intake Tower was damaged beyond repair, it would also disrupt deliveries to the South Coast.

Earthquakes have the potential to affect the four regulating reservoirs along the South Coast Conduit. Lauro Reservoir Dam underwent a major seismic retrofit in 2005 to reduce the potential impacts that earthquakes may have on the dam. Glen Anne Dam has also been taken out of service with water no longer being stored in the reservoir due to seismic concerns.

A large earthquake is capable of damaging any existing COMB structure within the buried pipeline network. Seismic failure for large diameter segmented pipelines is primarily due to distress at

pipeline joints. With over 26 miles of segmented conduit within the water delivery system extending from the foothills above Goleta to the Carpinteria valley, a large seismic event could cause pipeline failure and structural damage. If a pipeline failure was to occur, life, property, and the environment in the area immediately downstream of the break could be threatened until a shutoff was established.

In addition to direct damage to COMB structures, other vulnerabilities include damage to access roads that COMB uses to deploy equipment and staff in the field, as well as the potential for utility outages. Currently, COMB has working generators in place at all critical facilities for use in the event of a power outage, but if fuel deliveries are interrupted for significant lengths of time the ability to operate the system would be threatened.

History of Hazard

Seismic events near Santa Barbara County are historically common with multiple minor earth tremors happening every day. For example, in 1978 a series of small earthquakes occurred underneath the northeastern end of the Santa Barbara Channel. In 2003, a 6.5 magnitude earthquake called the "San Simeon Earthquake" had an epicenter just northeast of San Simeon where two fatalities occurred and over forty buildings collapsed, also causing damage to thirty buildings within Santa Barbara County.

Several dam-safety modifications were constructed at Bradbury Dam between 1994 and 2003 to address potential seismic failure modes. The work included the excavation and replacement of foundation materials in the downstream foundation of the dam, along with the construction of a stability berm on the downstream face of the dam to stabilize it, construction of terrace filters on the dam abutments to prevent internal erosion caused by fault rupture in the foundation, reinforcement, and stabilization of the spillway crest structure, and reinforcement of the spillway gates. Lauro Dam also underwent seismic retrofits to prevent liquefaction, including enhancement of the water inflow infrastructure to bring the dam up to federal standards for seismic safety.

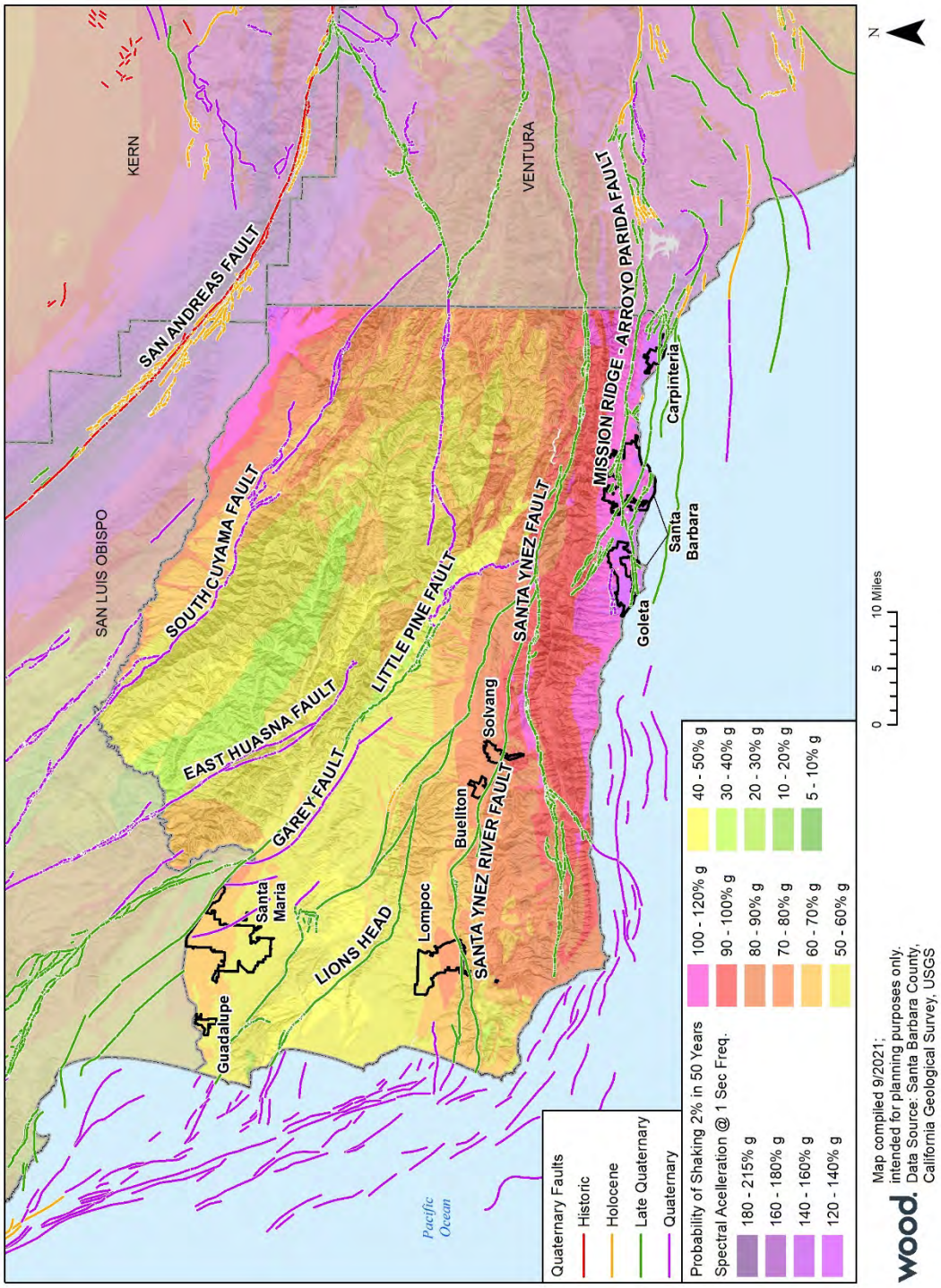
Probability of Occurrence

Santa Barbara County is located in a high seismic activity zone in the Transverse Range geologic province. The movement of continental plates manifests primarily along the San Andreas Fault system. The San Andreas Fault is situated seven miles northeast of Santa Barbara County; active faults in the San Andreas Fault system that fall within Santa Barbara County include the Nacimiento, Ozena, Suey, and Little Pine faults. Other active faults in the region include the Big Pine, Mesa, Santa Ynez, Graveyard-Turkey Trap, More Ranch, Pacifico, Santa Ynez, and Santa Rose Island faults. The U.S. Geological Survey (USGS) and their partners have estimated the chances of having large earthquakes throughout California over the next 30 years. Statewide, the rate of earthquakes around magnitude 6.7 (the size of the 1994 Northridge earthquake) has been estimated to be one per 6.3 years (more than 99 percent likelihood in the next 30 years); in southern California, the rate is one per 12 years (93 percent likelihood in the next 30 years) (refer to Table 5-10 of the MJHMP).

Climate Change Considerations

To date, no credible evidence has been provided that links climate to earthquakes; however, climate and weather do play a significant role in the response and recovery from earthquakes.

Figure 5-6. Santa Barbara County Probability of Shaking 2% in 50 Years



5.3.5 Landslide & Other Earth Movements

Landslides can be defined as the movement of a mass of rock, debris, or earth down an incline. Types of landslides include rock falls, rockslides, deep slope failures, shallow debris flows, and mud flows. Slope failure occurs when there is erosion of slopes by surface-water runoff. The intensity of slope wash is dependent on the discharge and velocity of surface runoff and the resistance of surface materials to erosion. The most common cause of a landslide is an increase in the downslope gravitational stress applied to slope materials, also known as over-steepening. Over-steepening can be caused by natural processes or by man-made activities. Undercutting of a valley wall by stream erosion or a sea cliff by wave erosion are ways in which over-steeping may occur naturally.

Vulnerabilities and Potential Impacts of Hazard

Similar to debris flows, landslides have the potential to damage critical water delivery structures. Existing slope instability has the potential to cover the South Portal configuration on the Modified Upper Reach Reliability Project, adversely affecting access and causing soil infiltration into the South Coast Conduit. In the 1980s, a portion of the South Coast Conduit was re-aligned in Greenwell Canyon due to landslide and earth movement concerns. In 1995, a slide engulfed the former South Portal structure. In 2005 storms exposed the South Coast Conduit in the Goleta reach which required slope stabilization and drainage improvement. The storms in February 2017resulted in slope failure in the Sycamore Canyon area which exposed the conduit. Additional erosionor slope movement could result in damage to the conduit and surrounding area.

Landslides around Lake Cachuma and COMB's reservoirs can also impact water quality and sedimentation. The hillsides above Lauro Reservoir are highly susceptible to washouts and landslides and numerous landslides and washouts have occurred in the past impacting water quality (1962, 1964, 1967, 1969, 1973, 1978, and 1995). Landslides can be triggered by heavy rainfall, snowmelt, reservoir drawdown, and seismic activity, especially in the mountainous terrain within the Lake Cachuma watershed. Negative impacts of landslide events on Lake Cachuma and COMB's reservoirs include increased suspended sediment, turbidity, organic material, ions of concern, mercury, and other metals of concern found within surrounding soils. Sedimentation within Lake Cachuma has reduced the capacity of Lake Cachuma by 11% and has buried the lowest gate of the Intake Tower, reducing the operational capacity of the reservoir. The Intake Tower and other structures at the North Portal are vulnerable to increased sedimentation resulting from landslides within the watershed.

History of Hazard

The South Coast Conduit has been subject to landslides along the alignment. The original South Coast Conduit in Greenwell Canyon had to be relocated in the 1980s due to landslide concerns. Landslides also exposed the conduit in the Goleta area requiring extensive measures to stabilize the pipeline. More recently a slope failure in 2017 exposed the conduit in the Sycamore Canyon area. The Sycamore slope failure was successfully repaired in 2019. Earth movements have also impacted access roads, such as the access road to the North Portal.

Probability of Occurrence

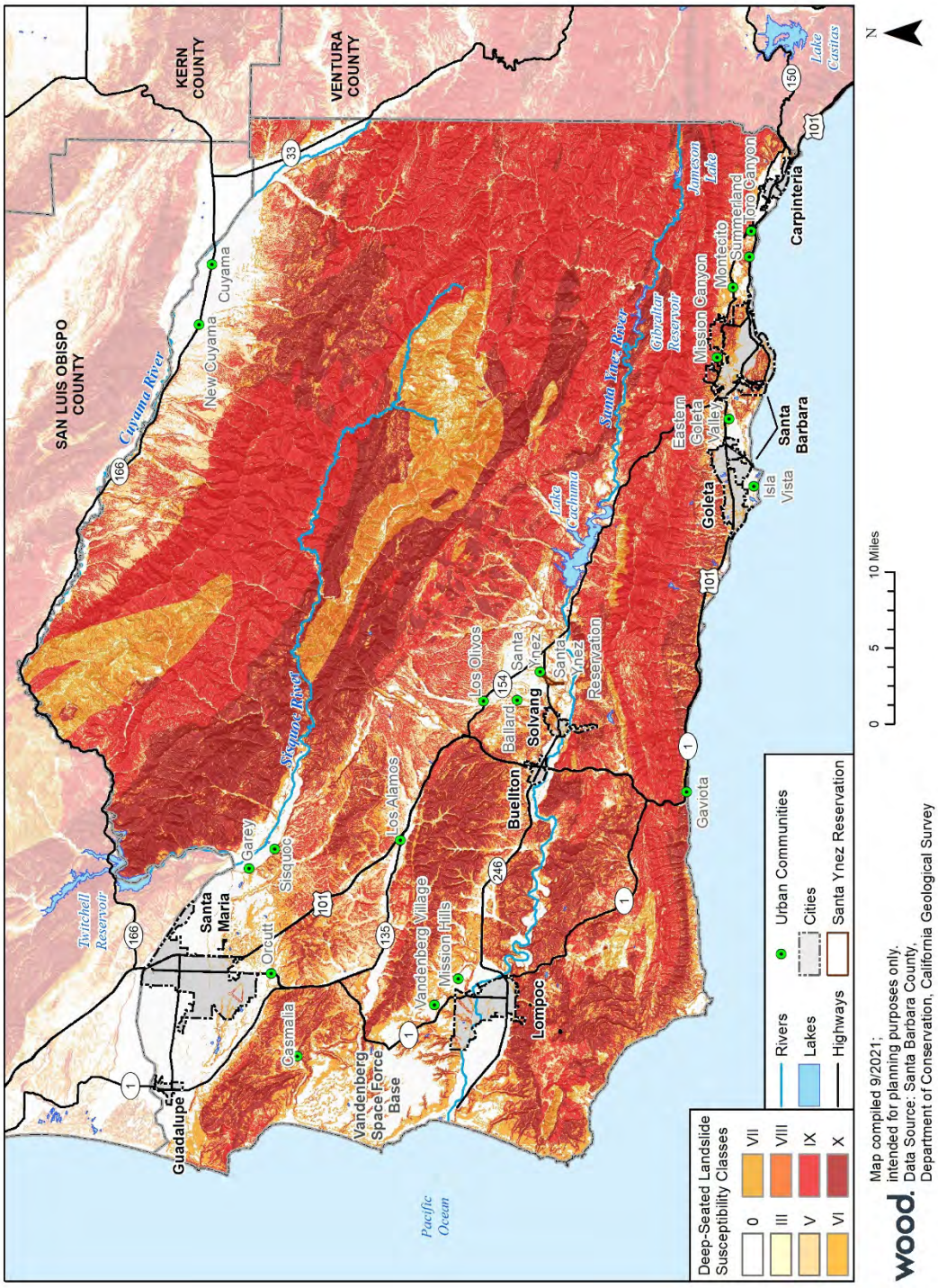
Landslides have the potential to impact the conduit where the pipeline alignment is located along the sides of slopes in the foothills of the Santa Ynez Mountains. Figure 5-7 shows the locations of

deep-seated landslide susceptibility in Santa Barbara County as mapped by the California Geological Survey. This map shows the relative likelihood of deep landslide based on the three site factors that most determine susceptibility: prior failure (from a landslide inventory), regional estimates of rock or soil strength, and steepness of slopes. The areas shaded in darker red in Figure 5-7 are considered to have a higher probability of landslide occurrence than the low landslide risk areas in the county.

Climate Change Considerations

A 2021 study by the USGS finds that Southern California is likely to see increased post-wildfire landslides caused by climate change-induced shifts in the state's wet and dry seasons. Wildfires make the landscape more susceptible to landslides when rainstorms pass through as the water liquefies unstable, dry soil and burned vegetation. Major landslides capable of damaging 40 or more structures can be expected every 10 to 13 years – about as frequently as magnitude 6.7 earthquakes occur in California. Combined with recent research showing California's wildfire season is getting longer and the rainy season is getting shorter and more intense, the new findings suggest Californians face a higher risk of wildfires and post-wildfire landslides that can damage property and endanger people's lives (USGS 2021).

Figure 5-7. Santa Barbara County Landslide Susceptibility Areas



6.0 VULNERABILITY ASSESSMENT

The purpose of this section is to estimate the potential vulnerability (impacts) of hazards on COMB assets. This assessment informs the development of mitigation strategies to avoid or lessen potential impacts through the 2022 LHMP update. To accomplish this, an assessment of COMB assets that may be vulnerable to these hazards is provided as well. A further description of the threats and methodologies used to assess vulnerabilities countywide, including COMB and its member agencies, is provided in Chapter 6.0, *Vulnerability Assessment* of the 2022 MJHMP. Refer also to the LHMPs for the City of Santa Barbara, Carpinteria Valley Water District (CVWD), Goleta Water District (GWD), and Montecito Water District (MWD) for an expanded description of vulnerabilities in each jurisdiction (MJHMP Annexes F, J, K, and M, respectively).

6.1 COMB ASSETS & LOSS ESTIMATE

The loss estimate began with a review of COMB's asset inventory. COMB assets that are vital to the delivery of water to the South Coast communities include over $572 million of facilities that may be vulnerable to damage or loss from drought, wildfire, flood/debris flow, earthquake, and/or landslide, as described in Section 5.0 (Table 6-1).

Table 6-1. COMB Asset Inventory and Values of the Cachuma Transferred Project Works and Member Unit Projects

Project Components	Construction Cost	Year	2020 Index-Adjusted Cost*
Intake Tower / Tecolote Tunnel	$14,615,513	1950-1956	$328,600,000
South Coast Conduit – Goleta Reach	$2,789,096	1950-1953	$62,700,000
South Coast Conduit – Carpinteria Reach	$3,761,224	1950-1953	$84,600,000
Glen Anne Reservoir	$1,148,750	1951-1954	$24,300,000
Upper Reach Secondary Pipeline(MURRP)	$3,950,000	2011-2012	$5,000,000
Lauro Reservoir	$1,195,933	1951-1954	$25,300,000
Lauro Dam SOD Modification	$8,000,000	2005	$12,300,000
Ortega Reservoir	$960,943	1951-1954	$20,300,000
Carpinteria Regulating Reservoir	$464,218	1951-1954	$9,800,000
Total	**$36,885,677**		**$572,900,000**

*Index-adjusted costs are estimated by adjusting the construction costs by the ENR historical construction cost index. Replacement costs would likely be greater due to increased design standards and regulatory requirements since the water facilities were completed.

COMB LPT members reviewed each asset 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 6-2 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 6-2. COMB Vulnerability Assessment Calculations

		Drought & Water Shortage		Wildfire		Flood/Debris Flow		Earthquake		Landslide	
Name	**TOTAL**	**% Damage**	**$ Loss Estimate**	**% Damage**	**$ Loss Estimate**	**% Damage**	**$ Loss Estimate**	**% Damage**	**$ Loss Estimate**	**% Damage**	**$ Loss Estimate**
Intake Tower / Tecolote Tunnel	$328,600,000	2.6%	$8,600,000*					7.8%	$25,700,300t		
SCC – Goleta Reach	$62,700,000					2.4%	$1,500,000***	1.7%	$1,050,000tt	2.4%	$1,500,000ttt
SCC – Carpinteria Reach	$84,600,000					1.4%	$1,200,000***	1.2%	$1,000,000tt	1.4%	$1,200,000ttt
Glen Anne Reservoir	$24,300,000										
Upper Reach Secondary Pipeline (MURRP)	$5,000,000										
Lauro Reservoir	$25,300,000			1.2%	$300,000**	1.2%	$300,000				
Lauro Dam SOD Modification	$12,300,000										
Ortega Reservoir	$20,300,000										
Carpinteria Reservoir	$9,800,000										
Total Vulnerability	**$572,900,000**		**$8,600,000**		**$300,000**		**$2,700,000**		**$27,750,300**		**$2,700,000**

* Cost of EPF installation, operation, maintenance, and demobilization during the last drought
** Estimate for manufacturing and purchase of two new mobile offices totaling 1,680 ft2 at Lauro Office site
*** Assumes 500-year flood and 5 breaks (Goleta Reach) or 6 breaks (Carpinteria Reach) at select creek crossings
t Assumes temporary bypass and permanent solutions needed at Intake Tower, and 1,000ft replacement of Tecolote Tunnel
tt Loss estimate for an earthquake with PGA > 0.1 causing 0.4 repairs/kilometer, or 7 repairs (Goleta Reach, 48-inch pipe) and 10 repairs (Carpinteria Reach, 27-36 inch pipe)
ttt Duplication of flood/debris flow loss estimate

7.0 MITIGATION STRATEGY

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

7.1 MITIGATION GOALS AND OBJECTIVES

As described in Section 3.0, COMB's MAC participated in the development of the goals and objectives for the 2022 MJHMP update. Subsequently, the COMB LPT refined these goals into unique goals for the COMB LHMP, reflective of the specific hazards and vulnerabilities of COMB-managed facilities. These refined goals and objectives represent a vision of long-term hazard reduction or enhancement of capabilities for COMB; see also, Chapter 7.0, *Mitigation Plan* of the 2022 MJHMP.

The updated goals and objectives of this plan are presented in Table 7-1.

Table 7-1. COMB LHMP Goals and Objectives

Goal 1. Promote Disaster Resiliency for Existing Assets
Objective 1.1: Mitigate the long-term vulnerability of structures and critical water infrastructure to reduce impacts from hazards
Objective 1.2: Participate in initiatives that provide mutual hazard mitigation benefits for COMB and the Member Agencies
Objective 1.3: Continue to identify, prioritize and implement mitigation actions as directed by the COMB Board

Goal 2. Promote Disaster Resiliency for Future Development Projects
Objective 2.1: Facilitate the rehabilitation of current and development of new critical water infrastructure to make the South Coast Water System more resilient

7.2 MITIGATION PROGRESS

Since the 2017 MJHMP, COMB has incorporated the LHMP goals, objectives, and mitigation actions into its local plans and processes, including the COMB IIP, budget planning, and capital improvement planning. Ongoing monitoring and evaluation of the LHMP by COMB ensured mitigations are implemented and tracked. Key mitigation actions completed include stabilizing the Sycamore Canyon slope and partially completing measures to protect South Coast Conduit creek crossings. The COMB LPT reviewed the mitigation actions listed in the former LHMP to determine the status of each action. Once reviewed, deferred projects were renumbered to reflect 2022 updates (see Table 7-1).

Table 7-1. Status of Previous Mitigation Actions

Mitigation Action No	Mitigation Action Description	Status	Comments	In 2022 Update?
2017-1	Lake Cachuma Emergency Pumping Facility Project	In Progress	COMB has completed engineering designs for a water delivery pipeline secured to the bottom of Lake Cachuma, to provide access	X

Mitigation Action No	Mitigation Action Description	Status	Comments	In 2022 Update?
			to lower reservoir levels during prolonged drought. NEPA/CEQA has been complete, permitting is in process, and construction is scheduled for late summer 2022 for the secured pipeline element.	
2017-2	Sycamore Canyon Slope Stabilization	Completed	In September 2019, the Sycamore Canyon Slope Stabilization project was completed, which involved the installation of three buried caisson walls, slope stabilization measures, and drainage improvements. These mitigation measures are protecting the pipeline in this area by improving surface drainage, stabilizing the slope slip planes, and preventing future streambank erosion from undercutting the slope. This project is complete and functions as designed by stabilizing the slope and keeping cover over the pipeline in the project area.	
2017-3	South Coast Conduit Creek Crossing Protection Measures	Partially Complete	One project is complete, but the category remains open and is included in the 2022 LHMP annex update. The San Jose Creek Emergency Pipeline Repair Project was completed in October 2019, and functions as designed, including pipeline repair and pool-riffle elements. Crossing surveys are completed annually for inclusion in post-project annual reports.	X

7.3 MITIGATION APPROACH

The proposed mitigation actions are shown in Table 7-2 below in order of priority. The priorities are based on the South Coast population that would be impacted by the disruption in water supply if a disaster occurred. A cost-benefit analysis will be performed on a project-by-project basis for grant funding sub-applications utilizing the FEMA Benefit-Cost-Analysis Toolkit.

Table 7-2. 2022 Mitigation Actions

Mitigation Action No.	Project Name/Description	Population Affected
2022-1	Lake Cachuma Emergency Pumping Facility Project	208,500 people with disruption in water supply

Mitigation Action No.	Project Name/Description	Population Affected
2022-2	Lake Cachuma Water Quality and Sediment Management Phase II	208,500 people with impacts to water quality and increased surface water treatment costs
2022-3	South Coast Conduit Creek Crossing and Slope Protection Measures	13,000 to 120,000 people with disruption in water supply depending on where a break occurs
2022-4	SCC Line Valves for Emergency Breaks and Repairs	13,000 to 208,500 people with disruption in water supply depending on where a break occurs
2022-5	North Portal Intake Tower Seismic Assessment and Project	208,500 people with disruption in water supply
2022-6	Sheffield Tunnel Evaluation and Repair	Montecito Water District and Carpinteria Valley Water District customers
2022-7	Reservoir Access Road Improvements	150,000 people with impact to water quality

The mitigation actions will be implemented by the COMB Operations Division. The Emergency Pumping Facility Project would be implemented if drought conditions continue. Several creek crossings which are shallow are being actively monitored and may require protection measures if the pipeline becomes exposed. In addition, COMB annually updates its five-year infrastructure improvement planning, which will incorporate components of this plan and provide additional projects which would be included in this COMB LHMP annex in a future update.

7.4 IMPLEMENTATION PLAN

2022-1. Lake Cachuma Emergency Pumping Facility Project

Lake Cachuma serves as the primary water supply for approximately 208,500 people in southern Santa Barbara County. The ability to gravity flow water through the Intake Tower is lost when the lake level falls below the inlet gates. Persistent drought conditions require the installation of an Emergency Pumping Facility Project (EPFP). The EPFP is needed to deliver water from a pumping barge to the Intake Tower until the lake elevation increases and gravity flow is reestablished. Since Bradbury Dam was constructed in the early 1950s, there have been three major multi-year dry periods requiring the installation of pumping facilities that delivered water to the Intake Tower. The first iteration occurred in 1957 when a multi-year dry period delayed lake filling after dam construction. More recently, emergency pumping facilities with a floating conveyance pipeline were utilized from 1990 to 1991 and from 2015 to 2017.

COMB has completed engineering designs for a water delivery pipeline secured to the bottom of Lake Cachuma, to provide access to lower reservoir levels during prolonged drought. The pipeline is designed to be connected to the lowest inlet gate on the existing intake tower and extend into deeper parts of the reservoir. The project will allow access to an additional ~18,000 acre-feet (as allocated per existing agreements) of water for delivery to 208,500 residents on the south coast of Santa Barbara County. Lake Cachuma was recently impacted by seven consecutive years of record drought, reaching a low of 7.2% reservoir capacity in October 2016. When reservoir levels drop below the inlet gates, the gravity system is rendered unusable without pumps and pipes. This

project provides either a temporary floating pipeline or a permanently secured pipeline that can be used when supplies are required from lower reservoir levels.

Mitigation Priority and Performance	
Priority	High
Hazards Mitigated	Drought / Water Shortage, Wildfire (Sedimentation)
Estimated Timeline	The project is dependent on the lake levels and drought conditions. The temporary emergency system has been designed and permitted and the key components are in storage. For the temporary floating pipeline option, pile driving would have to start before the lake reached 695 feet. It would remain on standby for approximately 1 year depending on hydrology before operations at 678 feet. For the permanent secured pipeline option, the pipeline would be installed one time in 2 to 3 months. Then, the facility can be installed and operational in 120 days as it would only involve the construction of the pumping barge and there would not need to start as early for the pile driving installation. The 695' trigger in 2014-2017 resulted in a long standby period between initial deployment and operations. The pipeline component of the system could be weighted to the bottom of the lake to provide long-term storage of the pipeline for the expected higher frequency need of the system. This would reduce the time needed to install the system and reduce the environmental impacts of moving, fusing, floating, and pile driving that is required to install the temporary pipeline.
Estimated Cost/Funding Source	The temporary system cost $8,600,000 to operate from 2014 to 2017. With the key components in storage, the system could be reinstalled and operated for $4,300,000 over ~1.5 years of operation. A one-time cost of ~$4,000,000 would be needed to purchase and install the pipe on the bottom of the lake (secured pipeline). This would reduce the future installation time, reduce environmental impacts, reduce future costs (by ~12,900,000 over 65 years), and mitigate against future impacts from sedimentation reducing operational capacity. COMB was awarded a Reclamation WaterSmart Grant (Drought Response Program: Drought Resiliency Projects for Fiscal Year 2019) for $750,000, and $2,250,000 through DWR's Urban and Multibenefit Drought Relief Program Phase II in 2022. Other funding will come from the COMB Operating Budget / Section 404 Funding or other sources.
Responsible Agency/Department	COMB
Relevant Objective	Objective 2.1: Facilitate the rehabilitation of current and development of new critical water infrastructure to make the South Coast Water System more resilient
Comments	This project was adapted from 2017-1 included as part of the former LHMP.

2022-2. Lake Cachuma Water Quality and Sediment Management Phase II

Lake Cachuma is the principal drinking water supply for the South Coast of Santa Barbara County providing surface water supply to the Goleta Water District, City of Santa Barbara, Montecito Water District, and Carpinteria Valley Water District. In addition, Lake Cachuma serves as the conduit for state water deliveries to the South Coast.

The Zaca Fire (2007), White Fire (2013), Rey Fire (2016), Whittier Fire (2017), and Thomas Fire (2017) have impacted the watershed and water quality in Lake Cachuma. Between the five fires listed approximately 180,000 acres of the watershed (two-thirds) burned. Wildfires are known to

have a direct impact on receiving surface water quality by increasing organic carbon, nutrient, and sediment loading. Raw water containing elevated organic carbon increases disinfection byproduct formation potential. Water treatment staff at Corona Del Mar Water Treatment Plant and William B. Cater Water Treatment Plant receiving raw Lake Cachuma have observed elevated disinfection byproducts following wildfire scarring within the watershed. COMB recently completed a two-year study (The Water Quality and Sediment Management Study Phase I) on behalf of, and in coordination with, the COMB Member Agencies for addressing raw surface water quality and sedimentation issues at Lake Cachuma. The report identified Total Organic Carbon (TOC) and algal blooms as priority issues. The consultant also recommended a suite of management actions designed to increase understanding of water quality challenges. Among the management actions were 1) determine predominant source of TOC (i.e. vascular/terrestrial vs. nonvascular/algal) and seasonal variability, and 2) measure mass of phosphorus (P) in sediments and rates of sediment P flux. Phase II management actions include special sediment depth sampling at key lake locations, additional tributary surface water sampling from burned and unburned subwatersheds, and advanced laboratory analysis in order to quantify the magnitude of organic carbon and nutrient contributing sources (Organic Carbon / Phosphorus Sampling and Source Investigation).

Also contained within the Water Quality and Sediment Management Study Phase I, was a recommendation to advocate for improved forest management in the Upper Santa Ynez Watershed. This could include issuing letters of support for watershed projects resulting in improved water quality at Lake Cachuma, such as road maintenance, fuelbreak maintenance, thinning, prescribed burning, and other techniques for fuel reduction. Strategic management of the forest will help prevent future large-scale wildfires like the Zaca Fire and Thomas Fire, and resultant water quality concerns. A large portion of the upper watershed land is located within the Los Padres National Forest, managed by the Forest Service. Part of Lake Cachuma Water Quality and Sediment Management Phase II is engagement and support of Forest Service actions within the watershed as applicable and with direction from the COMB Board of Directors. For example, a letter of support was issued to the Forest Service in August 2022 in support of the Los Padres National Forest's (LPNF) Proposed Ecological Restoration Project, to restore fire-adapted ecosystems, reduce fuels, and selectively reintroduce prescribed burning on Los Padres National Forest lands near Lake Cachuma.

Mitigation Priority and Performance	
Priority	High
Hazards Mitigated	Wildfire
Estimated Timeline	Organic Carbon / Phosphorus Sampling and Source Investigation is expected to be completed by June 2024.
Estimated Cost/Funding Source	$100,000 (environmental consultant)/ COMB Operating Budget/Section 404 Funding.
Responsible Agency/Department	COMB
Relevant Objective	Objective 1.2: Participate in initiatives that provide mutual hazard mitigation benefits for COMB and the Member Agencies
Comments	

2022-3. South Coast Conduit Creek Crossing and Slope Protection Measures

Over time the creek crossings for the South Coast conduit erode resulting in exposure of the pipeline in some locations. This project would involve mitigating the risks to the conduit by either protecting it in place (concrete encasement and/or channel stabilization) or lowering the conduit. In addition, the conduit has been exposed on hillslope requiring slope stabilization measures such as buried reinforced caisson walls and rock slope protection.

Mitigation Priority and Performance	
Priority	High
Hazards Mitigated	Flooding / Mud Flow / Debris Flow, Landslide / Other Earth Movements
Estimated Timeline	Creek crossing protection measures would typically be performed during the late summer when there is minimal to no flow in the creeks. These projects would require additional engineering and permitting (6 to 12 months). Construction of concrete encasement and channel stabilization measures would take 1 month. Pipeline relocation by lowering the conduit would take approximately 2 to 3 months. Slope stabilization measures would occur in the summertime period. Engineering and permitting may require 6 to 12 months and construction 2 to 3 months.
Estimated Cost/Funding Source	100,000 (in-stream protection in place) to $1,500,000 (pipeline relocation) for affected crossings/ COMB Operating Budget/Section 404 Funding.
Responsible Agency/Department	COMB
Relevant Objective	Objective 1.1: Mitigate the long-term vulnerability of structures and critical water infrastructure to reduce impacts from hazards
Comments	This project was adapted from 2017-3 included as part of the former LHMP.

2022-4. SCC Line Valves for Emergency Breaks and Repairs

A large earthquake near the South Coast Conduit (SCC) could be capable of damaging the existing buried pipeline network. Seismic failure for large diameter segmented pipelines typically occurs in distressed pipeline joints. With over 26 miles of segmented conduit within the water delivery system maintained by COMB, there exists the possibility of structural damage during a large earthquake.

Flooding and debris flows are also risks to buried pipelines. In the event of a storm, the SCC and laterals are at risk of being exposed and damaged. This project type would allow the installation of line valves within the SCC, to isolate smaller sections of the pipeline in the event of a main break. Overall, the installation of additional line valves would promote disaster resiliency and increase operational flexibility. A secondary benefit is that rehabilitation work would be easier to perform, and water would be conserved during future projects with additional line valves in place.

Line stops would be installed and the segment would be removed. Port plugs with a bypass line would be installed on either side of the removed segment to avoid the need for a service outage. A new segment with a valve would be inserted and the pipeline would be disinfected, tested, and put back in service.

Mitigation Priority and Performance	
Priority	Medium
Hazards Mitigated	Flooding / Mud Flow / Debris Flow, Landslide / Other Earth Movements, Earthquake, Terrorism

Mitigation Priority and Performance	
Estimated Timeline	This project could be completed in under a month
Estimated Cost/Funding Source	$500,000 (construction) /COMB Operating Budget/Section 404 Funding
Responsible Agency/Department	COMB
Relevant Objective	Objective 1.1: Mitigate the long-term vulnerability of structures and critical water infrastructure to reduce impacts from hazards
Comments	

2022-5. North Portal Intake Tower Seismic Assessment and Repair

Water diversions from Lake Cachuma occur at the North Portal Intake Tower, which flows into the Tecolote Tunnel and SCC for water delivery to the Cachuma Project Member Agencies. The vertical tower is located approximately mid-reservoir and has slide gates at varying levels to draw in water. This project would include the examination of structural elements on the Intake Tower to determine the reliability of the tower, and recommendations for upgrades and retrofit projects if appropriate. Of particular interest is how the tower would perform under various earthquake scenarios. A retrofit project of the North Portal Intake Tower may result from assessment recommendations.

Mitigation Priority and Performance	
Priority	Medium
Hazards Mitigated	Earthquake
Estimated Timeline	A condition assessment of the North Portal Intake Tower is ideally completed when the lake level is low and exposed for examination
Estimated Cost/Funding Source	$100,000 (assessment) plus the cost of a retrofit from assessment recommendations COMB Operating Budget/Section 404 Funding
Responsible Agency/Department	COMB
Relevant Objective	Objective 1.1: Mitigate the long-term vulnerability of structures and critical water infrastructure to reduce impacts from hazards
Comments	

2022-6. Sheffield Tunnel Evaluation and Repair

The Sheffield Tunnel is a concrete tunnel housing the 30" South Coast Conduit (SCC) that extends 6,100 feet between the Mission Creek area and Parma Park. Within the tunnel, sections of concrete pipe are connected and joined with steel bands and mortar joints to maintain the integrity of the pipe collar connections. This project would include the examination of structural elements of the tunnel to determine the reliability of the tunnel elements, and recommendations for upgrades and retrofit projects if appropriate. Of particular interest is how the tunnel would perform under various earthquake scenarios. A retrofit project of Sheffield Tunnel may result from assessment recommendations.

Mitigation Priority and Performance	
Priority	Medium
Hazards Mitigated	Earthquake

Mitigation Priority and Performance	
Estimated Timeline	This project would require engineering (~1 year). Total time including construction to complete this project (1 to 2 years).
Estimated Cost/Funding Source	$200,000 (engineering) and ~$200,000 (construction) COMB Operating Budget/Section 404 Funding
Responsible Agency/Department	COMB
Relevant Objective	Objective 1.1: Mitigate the long-term vulnerability of structures and critical water infrastructure to reduce impacts from hazards
Comments	

2022-7. Reservoir Access Road Improvements

Improvements to reservoir access roads to prevent impacts from landslides and from poor water quality entering the reservoir. Lauro Reservoir has had numerous landslides in the past and has been the reservoir access road has had partial improvements to prevent issues with landslides and poor water quality entering the reservoir. In addition, access roads at the North Portal to Lake Cachuma and at Glen Annie Reservoir have a history of landslides and damage in storm events. The project at Lauro Reservoir would include the completion of approximately 800 feet of road that acts as an access, retaining wall for landslides, and overflow spillway for the debris basin.

Mitigation Priority and Performance	
Priority	Medium
Hazards Mitigated	Flood and Landslides
Estimated Timeline	A condition assessment of the North Portal Intake Tower is ideally completed when the lake level is low and exposed for examination
Estimated Cost/Funding Source	$900,000 (construction) from assessment recommendations COMB Operating Budget/Section 404 Funding
Responsible Agency/Department	COMB
Relevant Objective	Objective 1.1: Mitigate the long-term vulnerability of structures and critical water infrastructure to reduce impacts from hazards
Comments	

8.0 PLAN MAINTENANCE

8.1 MONITORING, EVALUATING, AND UPDATING THE PLAN

Since the last LHMP in 2017, the LPT has monitored, evaluated, and updated the plan on a continuing and as-needed basis. COMB was very successful in implementing the 2017 mitigation actions as noted in Table 7-1. The remaining mitigation actions outlined in the 2017 LHMP are ongoing at the time of this 2022 update.

COMB will be responsible for ensuring that this LHMP annex is monitored on an ongoing basis. COMB 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 COMB's LHMP will be forwarded to the County Office of Emergency Management for inclusion in further updates to the MJHMP.

Major disasters affecting COMB, 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. COMB 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, COMB is committed to revising the plan a minimum of every five years. COMB'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

COMB 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 COMB and the existing institutions, plans, and policies that help to implement the LHMP (e.g., IIP, IRWM, RRA, ERP, WQ&SM). The LHMP annex complements these plans and programs, working together to achieve the goal of reducing risk exposure to COMB's customers and assets. An update to COMB'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 IIP and ERP to implement infrastructure improvements to reduce earthquake, drought, and flooding hazards.

The information contained within this LHMP, including results from the Vulnerability Assessment and the Mitigation Strategy, is used by COMB to help inform updates and the development of plans, programs, and policies. COMB 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, COMB 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, COMB 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 Janet Gingras, General Manager, using the following information:

Janet Gingras, General Manager
Cachuma Operation and Maintenance Board
3301 Laurel Canyon Road, Santa Barbara, CA 93110
JGingras@cachuma-board.org
805-687-4011

9.0 REFERENCES

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Carpinteria Valley Water 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.

In December 2017, the Carpinteria Valley community experienced one of the worst natural disasters in a lifetime – the Thomas Fire. This wildfire – the largest at the time in California's recorded history – burned areas of the Los Padres National Forest – including the Santa Ynez Front Range, an area of forty-plus-year-old chaparral woodland. The weeks of smoke, ash, and proximity to the fire itself forced many within the community to flee their homes and livelihoods. Within the Carpinteria Valley, several homes and outbuildings were destroyed.

As tragic and daunting as the fire was itself, that crisis soon manifested as something much worse. On January 9, 2018, heavy rain saturated the burn area in the Santa Ynez Mountains, resulting in debris flows through communities along the coast of Southern Santa Barbara and Ventura Counties. These flows resulted in the deaths of 21 people (and 2 missing) and caused widespread rail and road closures – isolating some communities. Subsequent rain events resulted in continued evacuation orders to tens of thousands of people – many within the Carpinteria community.

Although natural disasters cannot be prevented from occurring, their impact can be lessened by preparation and mitigation. Hazards that cannot be fully mitigated must be addressed by communities that are resilient and capable of moving quickly – through planning, preparation, and action – to provide an efficient and effective response and recovery from these disasters. Education, awareness, and preparation are key to these responses.

The Carpinteria Valley Water District (CVWD 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. The LHMP was last comprehensively updated as an annex to the 2017 MJHMP. Since then, the District has:

- Incorporated the LHMP goals, objectives, and mitigation actions into its operations, management, and infrastructure planning and processes, including the Capital Facilities Plan and Financial Plan.
- Used the LHMP's assessment of capabilities, hazards, and vulnerabilities to inform planning, infrastructure improvements, and programs, including outreach and engagement programs for water conservation.
- Implemented mitigation actions through the Capital Facilities Plan, maintenance programs, grant programming, community outreach, and budget process.

- Reviewed and evaluated mitigation actions before and after disasters, including the Thomas Fire and Montecito debris flow.

This update to the 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, *Planning Process* 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, *Mitigation Strategies*).

Approval of this LHMP by FEMA and CalOES will make the District eligible for federal funding assistance under the Local Hazard Mitigation Grant Program or the Pre-Disaster Mitigation program.

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.

2.1 PROMULGATION AUTHORITY

This LHMP was reviewed and approved by the elected members of the Carpinteria Valley Water District Board of Directors:

Mr. Case Van Wingerden, Board President

Mr. Ken Stendell, Vice President

Ms. Polly Holcombe, Board President

Ms. Shirley L. Johnson, Director

Mr. Matthew Roberts, Director

Mr. Robert McDonald, P.E, MPA, General Manager

2.2 ADOPTION BY BOARD OF DIRECTORS

This Local Hazard Mitigation Plan (LHMP) was presented to the District's Strategic Water Committee and Board of Directors for review. The LHMP is being sent to CalOES and FEMA for approval. Revisions or changes by CalOES or FEMA to any section of the document will be sent back to the Board for formal approval. Upon final approval, Board meeting minutes will be included in the LHMP.

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 updating the County's 2022 MJHMP Update, including CVWD'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 Mitigation Advisory Committee (MAC) and the second is the Local Planning Team (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 Santa Maria Valley Water Conservation District (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 Local Planning teams focused on these underlying 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

The MAC was guided through the planning process. As the material was shared and decisions were made, it was the MAC team's responsibility to bring these findings back to their LPT. A summary of the collaborative planning process of the MAC and LPT is provided in Sections 3.1 and 3.2 below.

Additionally, opportunities for public involvement were offered and encouraged throughout this process. Section 3.3 below provides a summary of the public outreach conducted to facilitate the preparation of the MJHMP and this LHMP.

3.2 MITIGATION ADVISORY COMMITTEE (MAC)

The District participated as a MAC member to prepare this LHMP as an annex to the 2022 MJHMP. The District was represented by Maso Motlow, Management Analyst 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	**MAC Meeting #1 (virtual)** 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	**MAC Meeting #2 (virtual)** 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	**MAC Meeting #3 (virtual)**

Date	Purpose
	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	**MAC Meeting #4 (virtual)** Collected feedback on 2017 mitigation strategies Conducted interactive exercise on mitigation strategies for key hazards unaddressed in previous MJHMP Discussed annex updates
January 2022	**MAC Meeting #5 (virtual)** Presented draft plan Discussed key MAC/LPT review needs and key issues Discussed annex updates to dovetail with plan update
March 2022	**MAC Meeting #6 (virtual)** Review and discuss public comments received on the draft plan Recommend a revised draft plan to decision-makers Review annex updates for review and approval

3.3 LOCAL PLANNING TEAM (LPT)

Table 3-2 lists the members of the CVWD LPT. These individuals collaborated to identify/validate 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. CVWD Local Planning Team 2022

Name	Title
Robert McDonald	General Manager
Norma Rosales	Assistant General Manager
Brian King	District Engineer
Maso Motlow	Management Analyst
Greg Stanford	Operations and Maintenance Manager

The District's LPT members worked directly with the Santa Barbara 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 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

Meeting Dates	Summary of Activity
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 (12/8/21) to discuss LHMP priorities and mitigation approaches.
January and March 2022	Reviewed new maps and local vulnerabilities. Provided input on the status of 2017 LHMP mitigation strategies. Reviewed draft mitigation strategies and provide feedback. 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 April 2022, the LHMP draft was completed. After review by FEMA and CalOES, the District Board of Directors reviewed and approved the final LHMP through monthly Board meetings in September and October.

4.0 CAPABILITY ASSESSMENT

The District (formerly known as the Carpinteria County Water District), incorporated on February 13, 1941, is an independent Special District within the State of California. The legal authority of this District is outlined in Division 12 of the Water Code, section 30000 et. seq. The District is governed by five elected members of the community as a Board of Directors (Board). The President and Vice-President of the Board are nominated by members of the Board. The Board appoints and employs a General Manager who oversees and administers the day-to-day operation of the District per the policies and procedures established by the Board. The General Manager employs an Assistant General Manager (Business Manager), District Engineer (Engineering Manager), and

Operations Manager. There are an additional 15 full-time non-management employees employed by the General Manager.

4.1 COMMUNITY PROFILE

The District is located on the coast of California 80 miles north of Los Angeles and 12 miles southeast of Santa Barbara (see Figure 4-1 for a vicinity map). The District's service area encompasses an area extending along the south coast of the County of Santa Barbara easterly from the Toro Canyon area to the Ventura County line. The Foothills of the Santa Ynez Mountains lay to the north and the Pacific Ocean to the south of the valley. The District's service area is approximately 11,098 acres (17.3 square miles). See Figure 4-2 for a map of the District boundary.

The District is located on a narrow, moderately to gently sloping alluvial plain that extends from the base of the Santa Ynez Mountains southward to the Pacific Ocean. The natural drainage of the plain is provided by Rincon Creek, Gobernador Creek, Carpinteria Creek, Franklin Creek, Santa Monica Creek, and Arroyo Paradon. Headwaters of each of these creeks are located in the Santa Ynez Mountains.

The climate within the District's service area is Mediterranean-like. Summers are usually dry with generally mild temperatures and the winters are cool and have light to moderate quantities of precipitation (predominantly in the form of rainfall). Annual variation in climate conditions is minimal within the District. However, unique topographic conditions in the Gobernador Canyon area of the District can lead to frost conditions for approximately 5 days per year.

The average daily maximum air temperature varies between 64.9 and 77.1 degrees Fahrenheit with an average of 70.8.[1] Annual rainfall for the area is 18.83 inches. The annual average evapotranspiration (ETo) for the area is 43.7 inches.[2]

The District comprises the City of Carpinteria and the surrounding agricultural lands that extend into the lower foothills of the Santa Ynez Mountains. The economy of the City of Carpinteria (incorporated 1965) is based on travel and tourism, commercial and retail, and some light industry and research. Financially, the majority of the City's annual budget comes from hotel occupancy taxes, sales taxes, and residential property taxes.[3] The agricultural economy is dominated by avocado orchards, container nurseries, and covered nurseries growing orchids, cut flowers, vegetables, and cannabis.

Public schools within the District include two elementary schools[4] (grades K - 5), a middle school (grades 6 - 8), and a high school (grades 9 – 12), as well as a multi-year family school and a continuing education high school.[4] There are several private day schools in the Valley, as well as a preparatory boarding school.

[1] Western Region Climate Center, Santa Barbara, Station No. 047902

[2] California Department of Water Resources (CADWR), Santa Barbara CIMIS, Station No. 107

[3] City of Carpinteria, Comprehensive Annual Financial Report

[4] The Carpinteria Unified School District also serves the neighboring community of Summerland

According to the 2019 U.S. Census, the City of Carpinteria is home to 13,811 residents. The population is projected to increase by 5.7 percent by 2050 to reach 14,602 residents by 2050 (U.S. Census 2019; SBCAG 2018). Carpinteria has an average household size of 2.74 and a median income of $79,291. Approximately 49.0 percent of City of Carpinteria residents identify as White, 45.0 percent identify as Hispanic, and 6.1 percent identify as Asian, Black, Mixed, or Other.

Figure 4-1. Regional Location of the Carpinteria Valley Water District

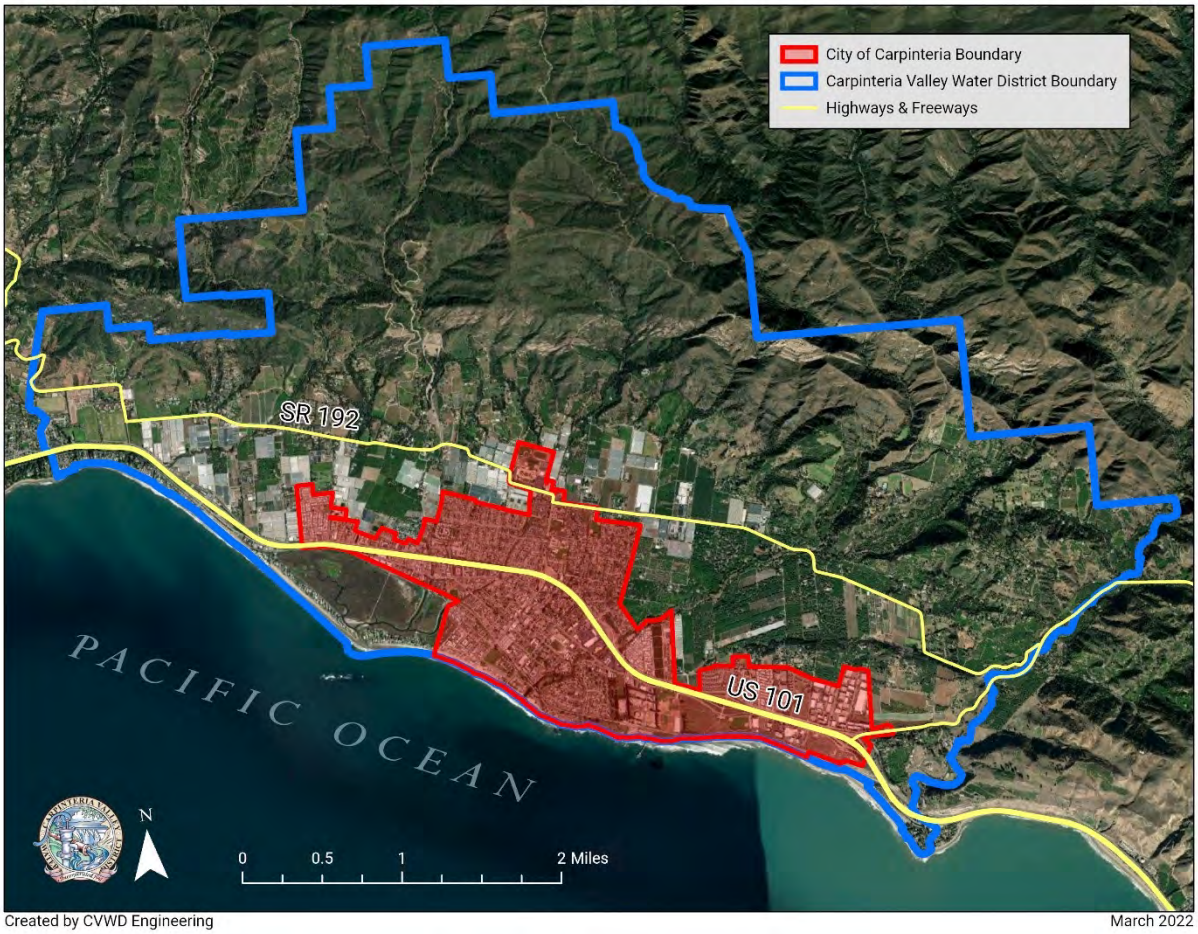
The District's service area is approximately 11,098 acres, of which 1,660 acres are within the City of Carpinteria. The City contains approximately 530 acres of residential development. There are approximately 875 mobile coach homes within the District, principally located in five mobile coach parks. Several of these parks restrict children and young adults. There is a single large (70 unit) assisted living / memory-care facility in the community. Agricultural activities dominate the developed area outside the City boundary. In 2020, there were approximately 1,987 acres of avocado, 146 acres of lemons, 174 acres of cherimoyas, and another 36 acres of passion fruit, olives, and stone fruits. Covered nurseries comprised 344 acres of productive land, growing primarily cannabis. Open and 'hoop house' nurseries (204 acres) predominantly grow containerized ornamental landscape plants and cut flowers. The District also contains 213 acres of field and row crops growing a variety of produce and berries. Almost 43% (4,730 acres) of the District is undeveloped or native vegetation, including extensive oak and chaparral wooded areas as well

as a large, protected saltwater estuary. The coastline forms a continuous southern boundary to the District. Figure 4-2 depicts the District's service area.

Although limited residential development occurs outside the City, much of the existing agricultural land is protected by County and State land use designations. The District has installed new water services in recent years, most notably Lavender Court (2006-08, 48 meters); Lagunitas (2012, 79 meters); Dahlia Court expansion (2013, 36 meters) and Casa De Las Flores (2013-15, 38 meters). All of these developments were within the City and were a result of land use change rather than greenfield development.

Since the last update of the District's LHMP in 2017, land use and population have not substantially changed within its service area. Modest development has occurred consistent with the adopted City of Carpinteria's General Plan/ Local Coastal Plan as well as the County of Santa Barbara's Housing Element Update and has primarily comprised infill development and redevelopment within jurisdictional limits. There has been no expansion of urban area boundaries and no comprehensive changes to land use plans that would result in substantial densification. Further, service area population has not substantially changed. As a result, the District's level of vulnerability to hazards analyzed in Section 6.0, *Vulnerability Assessment*, has not substantially changed due to land use, development, or population growth since the last update of the LHMP.

Figure 4-2. Carpinteria Valley Water District Service Area



4.2 SERVICES AND INFRASTRUCTURE

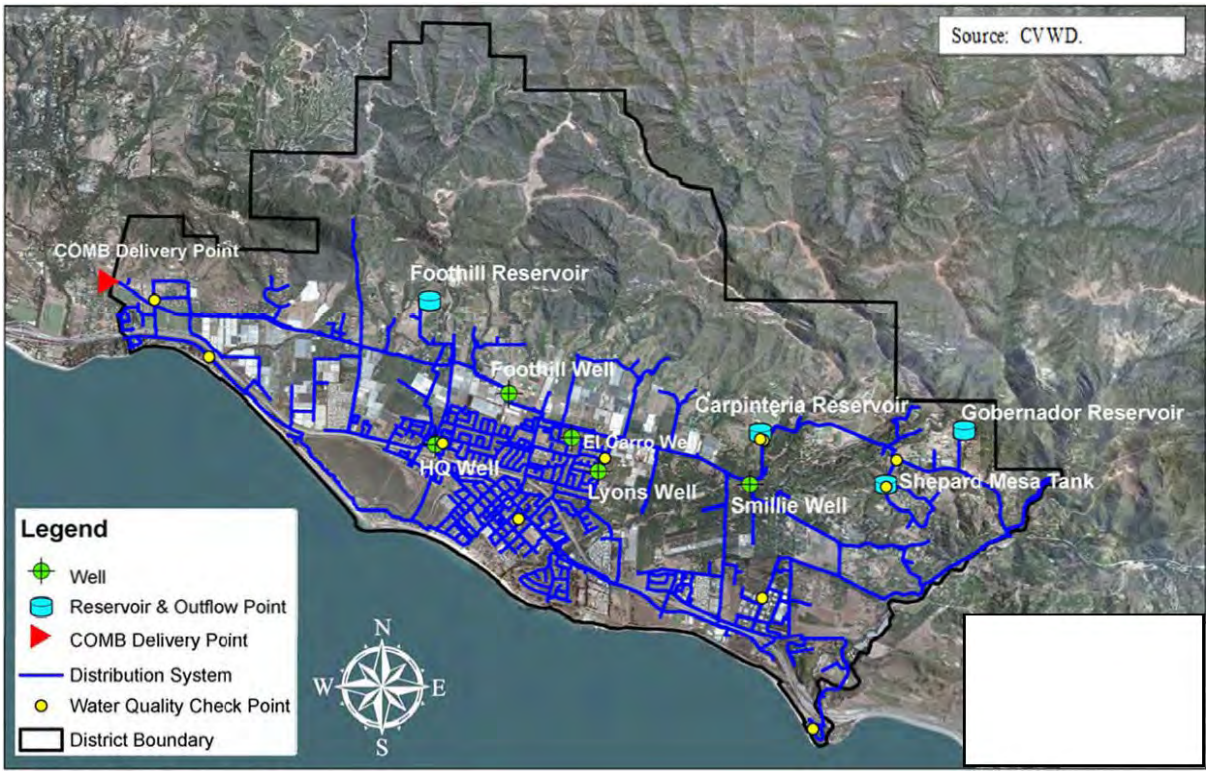
The District provides potable water to 4,524 customers and provides fire service standby water for 129 customers. The majority of water services are residential (3,265 single-family and 350 multi-family residences). Agricultural customers (386) and commercial accounts (283) are the next largest classes. There are also 68 Public Authority accounts, 58 Industrial accounts, and 50 dedicated landscape accounts. Water service meters range from 3/4" to 6", while fire services range from 2" to 10". The District also maintains 435 fire hydrants in the community.

The District owns and operates five (5) municipal wells with a combined capacity to produce approximately 3.98 MGD. These wells are located central to the suburban section of Carpinteria. Figure 4-3 displays the CVWD facilities including general locations of wells. The District constructed a new well, Headquarters Well, and a replacement well for El Carro in the last 18 years. Both of these wells can extract and inject water. These wells will help meet the peak demands and provide some redundancy in the groundwater supply reliability.

The District owns and operates three (3) potable water reservoirs with a combined storage capacity of approximately 10.68 AF. These reservoirs include Shepard Mesa (0.15 AF), Foothill (9 AF), and Gobernador (1.53 AF). Figure 4-3 displays the CVWD facilities including the general locations of the reservoirs. The United States Bureau of Reclamation (USBR) and Cachuma Operations and Maintenance Board (COMB) own and operate two additional potable water reservoirs in the area, namely Ortega Reservoir (60 AF) and Carpinteria Reservoir (44 AF).

The District owns and operates a total of 78.14 miles of distribution pipelines. These pipelines include concrete (51%), steel (36%), and other materials (13%). Figure 4-3 displays the general locations of the CVWD distribution facilities.

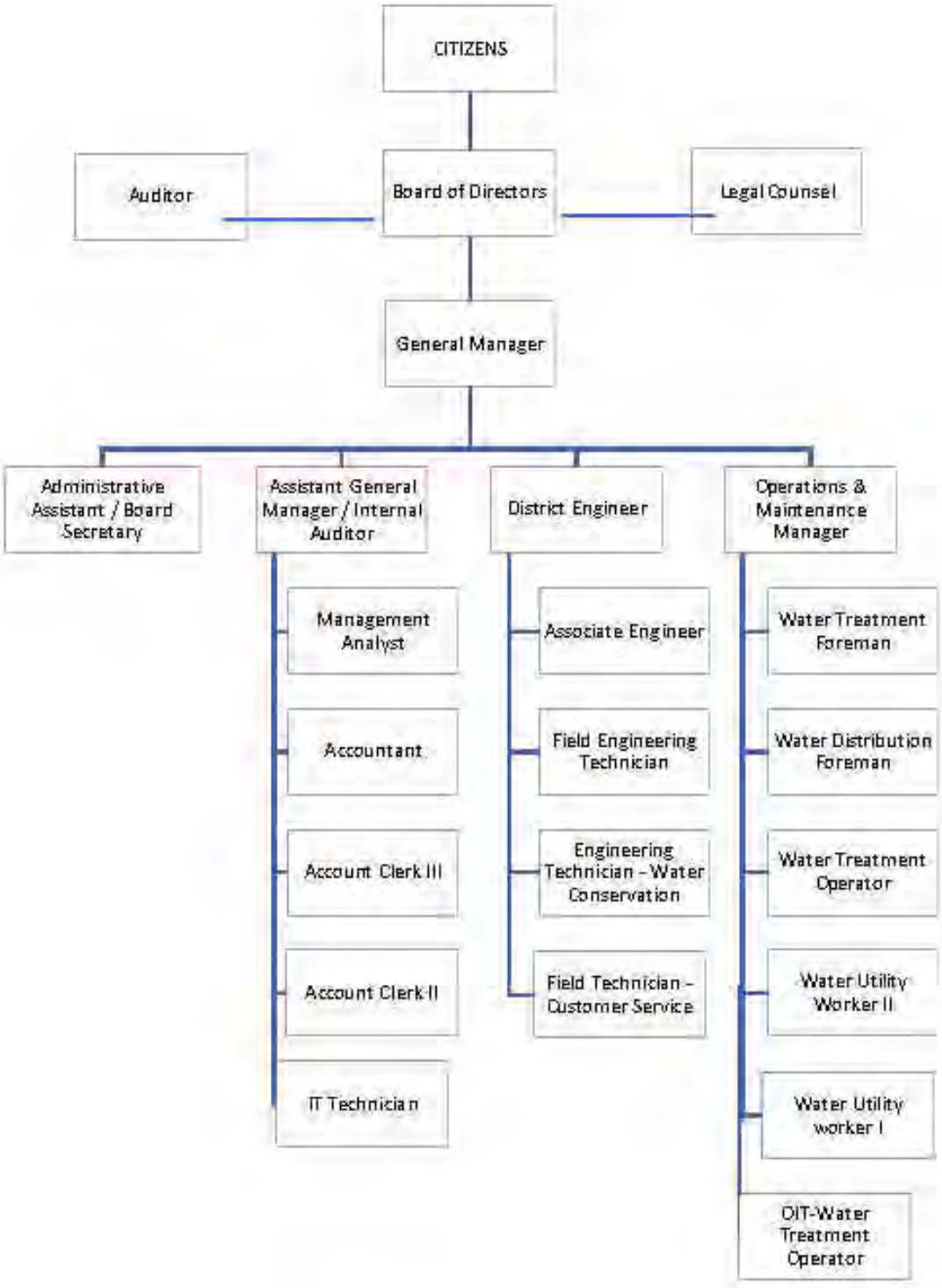
Figure 4-3. CVWD Facilities



4.3 ADMINISTRATIVE AND TECHNICAL CAPABILITIES

The District was incorporated on February 13, 1941, is an independent Special District within the State of California. The legal authority of this District is outlined in Division 12 of the Water Code, section 30000 et. seq. The District is governed by five elected members of the community as a Board of Directors (Board). The District's organization chart is depicted below.

Figure 4-4 CVWD Organizational Chart


CITIZENS
Auditor
Board of Directors
Legal Counsel
General Manager
Administrative Assistant / Board Secretary
Assistant General Manager / Internal Auditor
District Engineer
Operations & Maintenance Manager
Management Analyst
Accountant
Account Clerk III
Account Clerk II
IT Technician
Associate Engineer
Field Engineering Technician
Engineering Technician - Water Conservation
Field Technician - Customer Service
Water Treatment Foreman
Water Distribution Foreman
Water Treatment Operator
Water Utility Worker II
Water Utility worker I
OIT-Water Treatment Operator

In addition to the General Manager, the District employs 19 people. The General Manager, appointed by the Board of Directors, is the administrative head of the District, with the responsibility for planning, organizing, staffing, coordinating, budgeting, and directing all District operations. 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 Assistant General Manager, at the direction of the General Manager, assists in the planning and implementation of District policies, programs, and projects. The Assistant General Manager also assists the General Manager in the administration of District operations and the supervision of District Staff. The Assistant General Manager ensures compliance with District policy, timely completion on a variety of projects, and facilitates the implementation of District goals and objectives as established by the Board of Directors and the General Manager. The Assistant General Manager represents the District as assigned before professional organizations, elected officials, and community groups.

The District Engineer, reporting to the General Manager, 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 by staff. The District Engineer also oversees water conservation programs and Bureau of Reclamation activities related to agriculture.

The Operations and Maintenance Manager, reporting to the General Manager, is responsible for overseeing operations, repair, and maintenance of the District's system of wells, pumps, reservoirs, pipelines, valves, and other facilities. The Operations and Maintenance Manager is also responsible for general inventory, maintenance of the District's fleet of vehicles, building and grounds maintenance, and serves as the District's Safety Officer. This position is also responsible for water quality monitoring and reporting and ensures appropriate levels of California Department of Health Services certification of District employees.

4.4 LEGAL AND REGULATORY CAPABILITIES

The District recently developed a new Capital Facilities Plan. In addition, the District recently developed a 5-year Financial Plan to address infrastructure funding and debt restructuring. Water supply planning is undertaken annually and outlined in its Urban Water Management Plan (20202) and Agricultural Water Management Plan (2016). The District recently updated its Vulnerability Assessment as required by the Public Health Security and Bioterrorism Preparedness and Response Act (PL. 107-188 Section 1433(a)). The District also recently complete a Risk and Resilience Assessment and update of its Emergency Response Plan as required by America's Water Infrastructure Act (AWIA) Section 13. Finally, during the annual budget process, the Engineering and Operations Departments establish a list of critical annual and bi-annual projects for funding. Annually, the District spends between $800,000 and $1,100,000 on projects related to infrastructure and maintenance. This money is in addition to staff costs.

The District implements the LHMP through existing plans, programs, and procedures, as described in Section 8.0, *Plan Maintenance*. The LHMP annex complements these plans and programs, working together to achieve the goal of reducing risk exposure to the District's customers and assets.

Repetitive Loss Information and NFIP Participation

As a Special District, the CVWD 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.

4.5 FISCAL CAPABILITIES

The District's current FY 2021annual budget is $14,303,096, an increase of ~ $143,696 over FY 2020. Annual debt obligations are $5,462,614, the majority of which are costs associated with financing the District's portion of the State Water Project, and projects associated with the District's recently completed Capital Improvement Program. The District reviews and adjust rates on an annual basis.

4.6 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's education and outreach opportunities focus on mitigating drought through conservation and awareness.

- The District participates in the County WaterWise rebate program and advertises these rebates to customers.
- The District publishes information about current drought severity (i.e. drought stages) and conveys the rationale, impact, and rules around current drought conditions to the public through articles in local publications, bill inserts, and announcemnts on its website.
- The District has a dedicated conservation staff member who responds to calls from customers and conducts site visits with customers (when site visits are COVID-safe).
- The District is encouraging customers to sign up for EyeOnWater, an online portal showing real-time water use, through phone calls, door tags, bill inserts etc. Customer who sign up for EyeOnWater can better understand their consumption, and spot irregular use.

4.7 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 vulnerability and water source sustainability would improve the District's capabilities to ensure safe, reliable, and sustainable water sources to agencies. The District recently completed its AWIA Risk and Resilience Assessment and Emergency Response Plan. The process of developing these plans and the vulnerabilities they highlight help the District to target mitigation activities.
- **Administrative/Technical Opportunities**: As part of this update, the District aims to improve its resilience to ensure operations are sustained during a hazardous event, including energy reliability and back-up systems for core infrastructure and facilities. Existing plans, inclusive of the plans aforementioned and this LHMP, will be updated periodically with the best available information.
- **Outreach Opportunities**: Continued interagency efforts to support the sustainability of the South Coast Conduit would improve the District's capabilities to ensure safe, reliable, and sustainable water sources to District customers.
- **Fiscal Opportunities**: The District is pursuing grants to fund mitigation efforts aimed at water supply reliability and resiliency, extreme heat, energy efficiency, 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

The purpose of this section is to review, update, and/or validate the hazards identified for the 2022 CVWD 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 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 District refined the list of applicable hazards and confirmed the hazard prioritization. The following sections provide the results of this effort.

The Hazard Assessment presented here reflects the CVWD'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. Applicable hazard information from the CVWD's 2019 LHMP was incorporated during the development of this section. A comprehensive treatment of hazards and their descriptions may be found in Chapter 5.0 of the Santa Barbara County 2022 MJHMP.

5.1 HAZARD IDENTIFICATION AND PRIORITIZATION

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 Carpinteria Valley. The CVWD 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 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 LPT as their top priorities (Appendix A). A brief rationale for each hazard is included below. This assessment of key hazards is provided in addition to the 2022 MJHMP's comprehensive assessment of regional hazards that may affect the CVWD.

Table 5-1. CVWD Local Priority Hazards

Hazards Prioritization	Total Number of Points
Earthquake	12
Wildfire	12
Drought and Water Shortage	11
Energy Shortage	11
Landslide	11
Extreme Temperatures	9
Cyber Attack	8
Dam Failure	8
Sea Level Rise / Coastal Erosion	8
Flood / Debris Flow	7

The Hazard Assessment presented here reflects the District's 2022 refinements and expansions to the updated risk assessment presented in Chapter 5.0, *Hazard Assessment* of the MJHMP. Applicable hazard information from the District's previous plans was incorporated during the development of this section. The District's LPT reviewed the hazard assessment and review the plan before acceptance.

5.2 HAZARD PROFILES

5.2.1 Earthquake

Description of Hazard

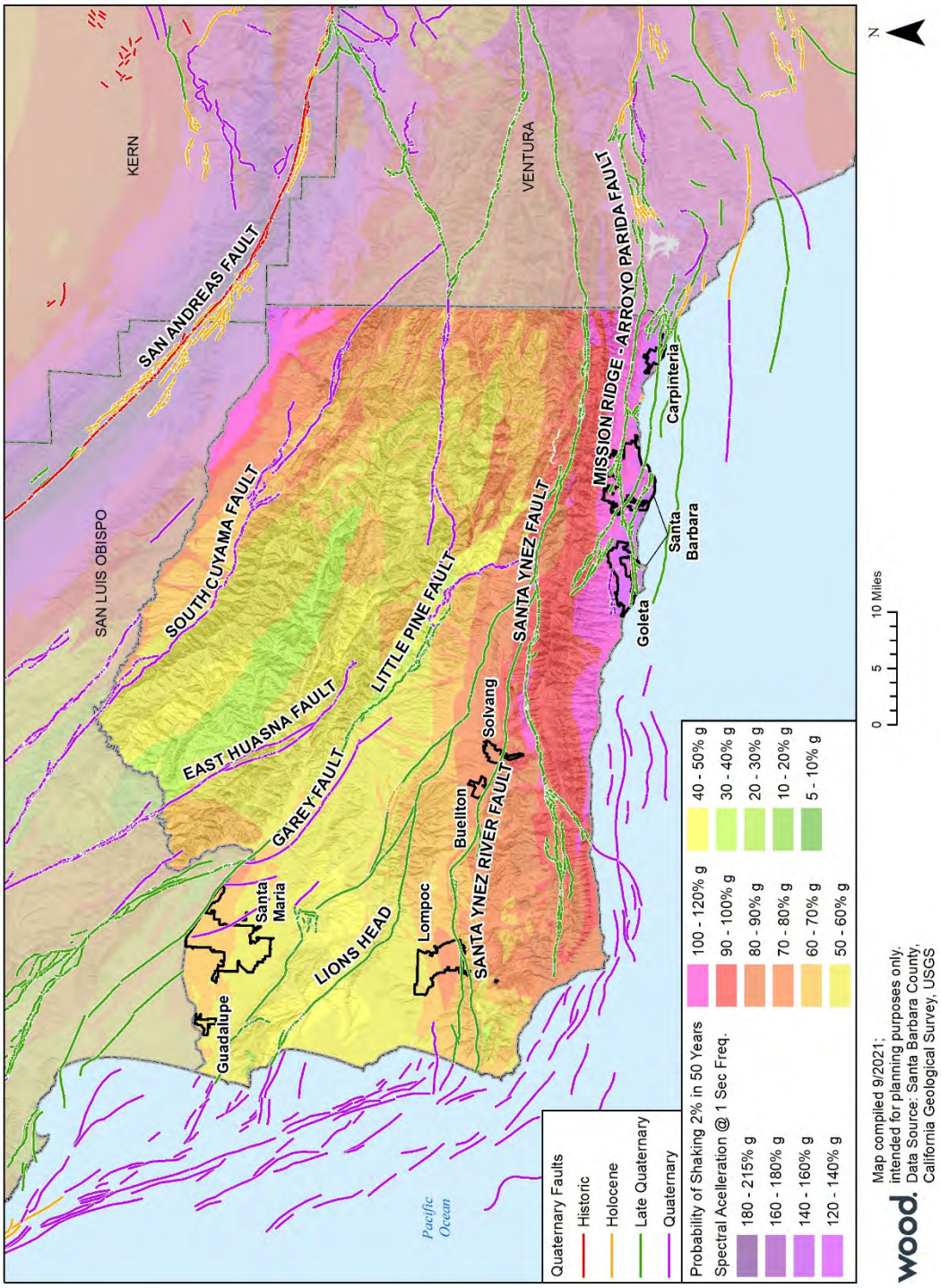
An earthquake is the release of strain that occurs along margin boundaries of plates and faults within the Earth's crust. This action produces ground motion and shaking, surface cracking and ruptures, and collapse. Earthquakes are severe, short-lived episodes that can result in widespread damage.

There are two general approaches to measuring the strength of an earthquake – the magnitude or size of the movement and the intensity of shaking or damage. The intensity of an earthquake is measured at the surface, where most damage to built infrastructure will occur. In the United States, a common measure of intensity is the Modified Mercalli Intensity (MMI) Scale, which designates the magnitude of visible effect (or impact) using 12 increasing steps designated using Roman numerals. At step II few people will notice the earthquake, while at step V almost everyone will feel it and some objects – dishes and windows – might break. At step IX, extensive damage will have occurred – even to the most well-constructed buildings and facilities.

In measuring magnitude, a seismograph is used to determine the maximum motion. On common measure – local magnitude (ML) - is similar to the Richter scale, a logarithmic scale of measurement from 1 to 9. Roughly speaking an earthquake of magnitude 3.5 or below is not widely felt or noticed. The March 11, 2011, earthquake off the coast of Japan had a moment magnitude (Mw) of 9.0 – 9.1, resulting in widespread damage to bridges, roadways, and buildings, as well as a dangerous tsunami.

Peak ground acceleration (PGA) is a measure of the strength of ground shaking. Larger peak ground accelerations result in greater damage to structures. PGA is used to depict the risk of damage from future earthquakes by showing earthquake ground motions that have a specified probability (10, 5, or 2 percent) of being exceeded in 50 years return period. Figure 5-1 shows faultlines in the county and the probability of areas of the county experiencing 2 percent shaking within the next 50 years. These values are often used for reference in construction design, and in assessing relative hazards when making economic and safety decisions.

Figure 5-1. Santa Barbara County Probability of Shaking 2% in 50 Years



Location and Extent of Hazard

Santa Barbara County – including the Carpinteria Valley – is an active earthquake area. There are numerous active faults associated with the San Andreas fault (located 7 miles northeast of the County). These faults can be seen in Figure 5-1.

The Santa Barbara County Comprehensive Plan Seismic Safety and Safety Element provide descriptions of all faults in Santa Barbara County, including historically active, active, potentially active, and inactive, as well as their location and fault length.

History of Hazard

Santa Barbara County is located in a high seismic activity zone and as such has a long history of earthquakes. Although most seismic activity in California occurs within the San Andreas Fault system, most historic seismic events in the region have been centered offshore on an east-west trending fault between the county and the Channel Islands. Several smaller earthquakes have taken place in the past years, including two magnitude 2.0 earthquakes in March 2021 in the Santa Ynez Valley and a magnitude 2.3 earthquake in April 2021 near the City of Lompoc (Earthquake Track 2021). These approximate magnitude 2.0 earthquakes are fairly common in the county. More extensive discussion of previous earthquakes in Santa Barbara County is available in Chapter 5.0 of the 2022 MJHMP and the Seismic and Safety Element of the Santa Barbara County Comprehensive Plan, Figure 5-10 of the MJHMP displays historical epicenters of earthquakes located in Santa Barbara County since 1700.

Probability of Occurrence

Likely – The USGS and their partners, as part of the latest Uniform California Earthquake Rupture Forecast Version 3 (USGS 2015), have estimated the chances of having large earthquakes throughout California over the next 30 years. Statewide, the rate of earthquakes around magnitude 6.7 (the size of the 1994 Northridge earthquake) has been estimated to be one per 6.3 years (more than 99 percent likelihood in the next 30 years); in southern California, the rate is one per 12 years (93 percent likelihood in the next 30 years). Southern California's detailed rates are provided in Table 5-10 of the MJHMP.

Climate Change Considerations

While climate change is not expected to directly affect earthquake frequency or intensity; it could exacerbate indirect or secondary impacts of earthquakes. For example, climate change could increase the frequency and intensity of extreme precipitation events, which in turn increases the probability of landslides and liquefaction events during an earthquake if the earthquake coincided with a wet cycle (California Natural Resources Agency 2018). Additionally, earthquakes often precipitate structure fires that can spread to adjacent orchards and wildlands. Climate change may amplify any fire effects associated with earthquakes.

5.2.2 Wildfire

Description of Hazard

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.

Although fires in nature have an ecologically restorative function, these become hazards to humans when people live in relative proximity to extensive native vegetation – in an area known as the wildland-urban interface (WUI). In the WUI the source of ignition is often human activity or accidents, but electrical power failure and lightning can cause wildfires. The fuel, initially, is small brush and grasses, which can quickly escalate to larger vegetation given driving winds and low humidity. The presence of housing and other structures in the WUI adds potential fuel to fires, helping to accelerate the fire. As the fire spreads, the ability of fire suppression systems becomes increasingly strained, resulting in further fire spread.

Location and Extent of Hazard

The Carpinteria Valley is very conducive to wildfire. The District is bordered to the north by the steep, south-facing slopes of the Santa Ynez Mountains within the Los Padres National Forest. The hillslopes are covered in woody chaparral and grasses. Towards the southern edge of the Forest, numerous residences are scattered in areas of oak and eucalyptus in the foothills and on several large mesas within the WUI. Further south – on the Valley floor – there are numerous irrigated avocado orchards. Carpinteria has been designated by the Federal Government as a 'community at risk' to fire given its proximity to the forest (refer to Section 5.3.1 of the MJHMP for a discussion of communities at risk within the county.

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 most current Fire Hazard Severity Zone maps were created in 2007. Figure 5-2 shows the Wildfire Threat Zones located in Santa Barbara County.

History of Hazard

Table 5-2 identifies major fires within Santa Barbara County since 1932. This list includes the 1985 Wheeler fire and 2017 Thomas fire – both of which burned areas within the current District boundaries.

Figure 5-2. Wildfire Threat in Santa Barbara County

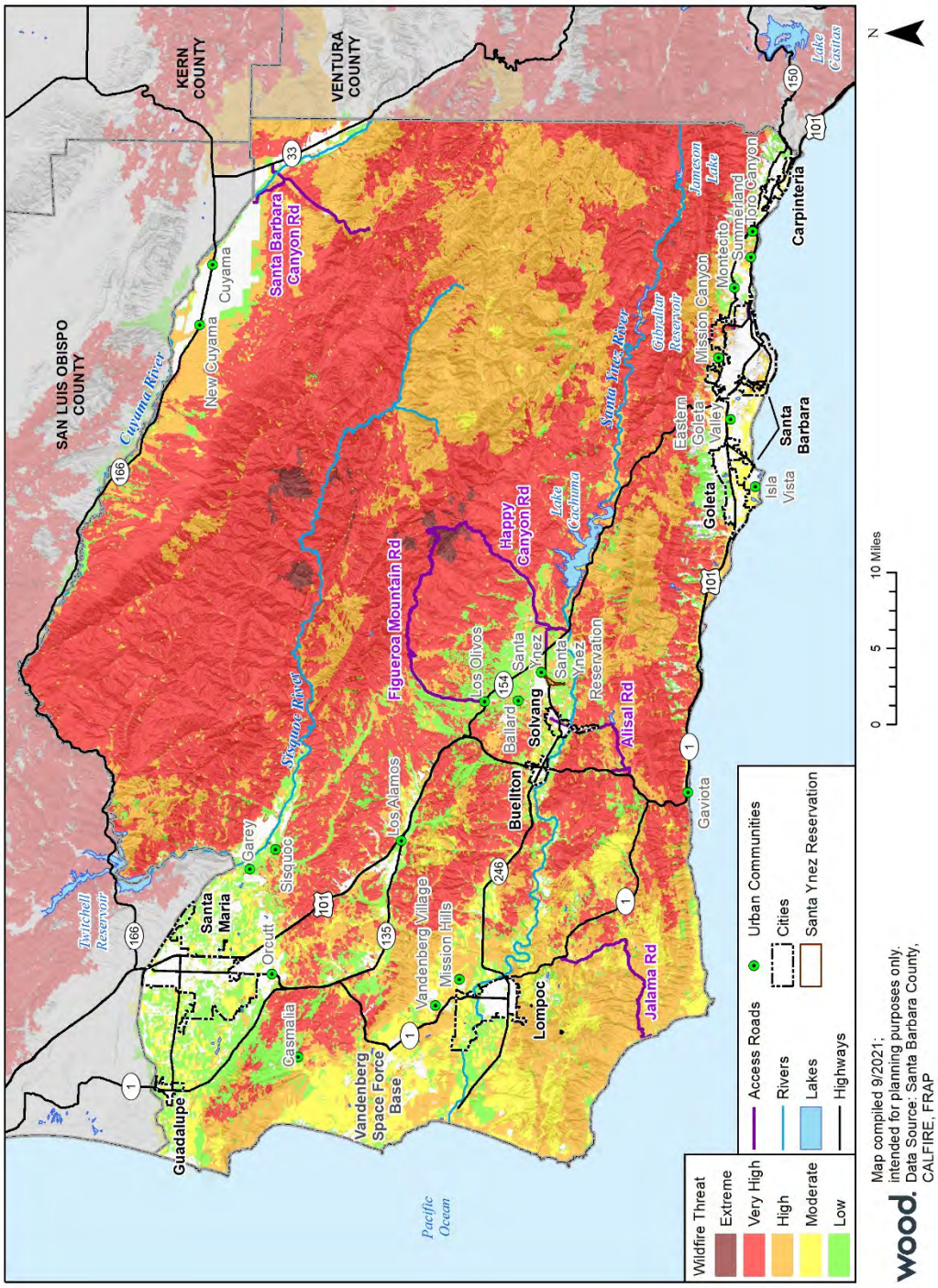


Table 5-2. Major Wildfires in Santa Barbara County

Year	Fire Name	Acres Burned		Year	Fire Name	Acres Burned
1932	North Shore	7,576		2002	Sudden	7,500
1971	Cielo	2,010		2004	Gaviota	7,197
1971	Romero	14,538		2004	Cachuma	1,115
1975	--	1,527		2006	Bald Fire	4,332
1977	Cachuma	2,250		2006	Perkins	14,923
1977	Hondo Canyon	8,526		2007	Zaca	240,807
1979	Wasioja	2,006		2008	Gap	9,443
1981	Rey	1,638		2008	Tea	1,940
1981	Oak Mountain	8,688		2009	Jesusita	8,733
1984	Minuteman	1,187		2009	La Brea	89,489
1985	Wheeler	122,687		2010	Bear Creek	1,252
1989	Cocheo	1,233		2013	White	1,984
1990	Paint	4,424		2016	Rey	32,606
1993	Marre	43,864		2016	Sherpa	7,474
1994	Aliso	3,244		2017	Alamo Fire	28,834
1996	Wasioja	2,812		2017	Whittier Fire	18,430
1996	Cuyama	1,400		2017	Thomas Fire	281,893
1997	Logan	49,490		2018	Front Fire	1,014
1997	Azaela	1,351		2019	Cave Fire	3,126
1997	Halloween	1,129		2020	Scorpion Fire	1,395
1998	Ogilvy	4,029		2021	Alisal Fire	16,970
2000	Harris	8,684				

1985 – The Wheeler Fire broke out on July 1, 1985, when an arsonist ignited bushes in Wheeler Gorge, located about 15 miles northwest of Ojai. At the time it began, several other severe fires were burning throughout California, and resources were stretched thin. Although the fire is reported immediately, logistical and communication issues delayed response, and by the time firefighters arrived, the fire had already spread wildly out of control. On the fire's western front, strong winds were pushing the blaze through Matilija Canyon and up over the San Ynez Mountains. The Wheeler Fire burned 118,000 acres, 19 homes, 37 outbuildings, and destroyed or damaged $3 million in agricultural resources.

2017 – Before even larger fires in recent years, the Thomas Fire in 2017 was the largest California wildfire in modern California history, engulfing more than 280,000 acres, destroying or damaging more than 1,000 structures, primarily within Ventura County, and resulting in two fatalities. The fire was ignited north of Santa Paula in Ventura County and burned into Santa Barbara County through the Santa Ynez Mountains and parts of the upper Santa Ynez River watershed. It was one of the first wildfires to burn from inland Ventura County into the Santa Barbara front country of the Santa Ynez Mountains (National Interagency Fire Center 2021; Santa Maria Times 2021).

The physical extent of fires within Santa Barbara County is depicted in Figure 5-4 of the MJHMP. Almost the entire forest has burned, much of it within the last two decades. Although most of the catastrophic fires occurred in the backcountry, there have been numerous fires within the WUI on the southern range of the Santa Ynez Mountains, including the 2008 Gap Fire, 2009 Tea and Jesusita Fires, and the 2017 Thomas Fire.

Probability of Occurrence

Highly Likely – 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. The Carpinteria Valley is set at the base of the Santa Ynez Mountains, which support 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 within the Las Padres for the foreseeable future. This means that fire hazards will continue, although with changing probability depending on the stage of the cycle. Given the impact of the Thomas Fire, the District faces a lower probability of wildfire damage than it did in 2016. As the forest recovers, with grasses and smaller shrubs, local fires may threaten facilities in the WUI, but with lesser intensity and damage.

Climate Change Considerations

Climate change will affect the probability and severity of wildfire in the Carpinteria area. Increased average temperature and a continued Mediterranean climate mean increased vegetation drying, thereby contributing to greater fuel volumes.

5.2.3 Drought and Water Shortage

Description of Hazard

Drought in California is typically associated with abnormally low precipitation over a 2-to-3-year period. Depending on location and infrastructure, even 4 years of low precipitation may not trigger water shortages for human use but will very likely result in shortages to natural systems.

Longer-term droughts can impact surface water reservoir storage levels in major reservoirs, such as Lake Cachuma, which provides about 41 percent of CVWD's total water supplies (CVWD 2021a). Longer-term droughts can also impact water levels in major groundwater basins that are key to both urban and agricultural water supply. Drought impacts increase with the length of a drought, as carry-over supplies in reservoirs are depleted and water levels in groundwater basins decline. In some instances, when large amounts of water are pumped, the subsoil compacts, thus reducing in size and number of the open pore spaces in the soil the previously held water. This can result in a permanent reduction in the total storage capacity of the aquifer system (USGS 2021a).

Location and Extent of Hazard

In 2020, the CVWD water demand was approximately 4,105 acre-feet (AF) of water (CVWD 2021a). Additional water supplies are pumped from the Carpinteria Groundwater Basin by private well owners primarily for irrigation purposes. During a normal water year with long-term sustainability considerations, the total water supply is estimated at 4,586 AF for 2025 and 5,586

AF for the period 2030 to 2045. During periods of prolonged drought, the CVWD water supply would be reduced compared to that of normal water-years. For instance, water supplies after four years of drought may be as low as 3,905 to 4,306 AFY for the period 2025 to 2045, or approximately 600 to 1,300 AFY less than during normal conditions.

CVWD has a balanced water supply portfolio with groundwater from the Carpinteria Groundwater Basin, surface water supplies from the Cachuma Project, and imported surface water from the State Water Project (SWP).

Groundwater

Following the state declaring a drought emergency in January 2014, the Governor signed a three-bill package (i.e., California Senate Bills 1168 and 1319, and Assembly Bill 1739), known as the Sustainable Groundwater Management Act of 2014 (SGMA). The SGMA provides for the establishment of local Groundwater Sustainability Agencies (GSAs) to manage groundwater sustainability within the groundwater subbasins defined by the DWR.

The DWR prioritized all groundwater basins in the state designating High and Medium priority basins. High or Medium priority basins subject to critical conditions of overdraft are required to submit a Groundwater Sustainability Plan (GSP) by January 31, 2020, to ensure a sustainable yield of groundwater, without causing undesirable results. Failure to comply with that requirement could result in the state asserting its power to manage local groundwater resources. The state has identified five high and medium priority groundwater basins within Santa Barbara County, including the Carpinteria Groundwater Basin, which underlies the CVWD district boundaries (refer also to Table 4-7 and Figure 5-6 of the MJHMP).

CVWD overlays the Carpinteria Groundwater Basin (DWR Basin No. 3-018), a relatively large groundwater aquifer, that extends beyond the Ventura County line on the east, to Toro Canyon on the west, from the foothills of Santa Ynez Mountains to the north, and extending offshore to the southwest for over a mile. The Basin includes approximately 16.6 square miles of surface area and multiple water-bearing zones. Total storage in the aquifer is estimated to be approximately 700,000 AF (CVWD 1986), while usable storage for the Basin recharge area was estimated to be nearly 38,926 AF (Marks 2015). The estimated sustainable yield of the Basin Unit No. 1 is approximately 4,000 acre-feet per year (AFY). From Water Year 2015 to Water Year 2019, CVWD pumped an average of 1,953 AFY from the groundwater basin, which represents approximately 46 percent of CVWD's total supplies over that period (CVWD 2021a).

Groundwater rights in the Basin have not been adjudicated. CVWD adopted a Groundwater Management Plan in 1996 to establish its role as groundwater manager for the Carpinteria Groundwater Basin. The Groundwater Management Plan will ultimately be superseded by a GSP in 2024, which is currently under development (CVWD 2021a).

In years with little rainfall, higher levels of groundwater pumping can exacerbate ongoing overdrafts in the Carpinteria Groundwater Basin, accelerating groundwater drawdown and potential water quality problems. Since groundwater level fluctuations are cyclical and sensitive to overdraft, groundwater withdrawal is closely monitored (Santa Barbara County IRWM Cooperating Partners 2019).

Surface Water

Surface water found in streams and reservoirs are an important part of the regional water supply for domestic use within the county. The development of reservoirs can reduce the threat of flooding and store stream runoff until it is needed, allowing society to use water from winter rains to meet our needs during the dry summer and fall months when streams cannot meet demand.

CVWD receives surface water supplies from the Cachuma Project and SWP. Over the period 2016 to 2020, CVWD has received an annual average of 2,448 AFY (62 percent of CVWD's water supplies) from these sources (CVWD 2021a).

The Cachuma Project includes Lake Cachuma, Bradbury Dam, Tecolote Tunnel, and South Coast Conduit (SCC) and related distribution systems, which were constructed in the early 1950s. Lake Cachuma, the county's largest reservoir, is located on the middle Santa Ynez River about 25 miles northwest of Santa Barbara. During the most recent drought, Lake Cachuma was down to approximately 6 percent of its overall water holding capacity and although it has recovered, it is now only at approximately 48.1 percent capacity. Moreover, over the past 11 years and through five large fires, the watershed areas surrounding Lake Cachuma have been denuded of extensive amounts of vegetation, which will result in abundant amounts of sediment and debris during stormflows, much of which will end up in Lake Cachuma. The resultant debris flows have introduced large amounts of organic material into surface waters, and possible impacts could include increased nutrient loading, dissolved organic carbon, major ions, firefighting compounds, turbidity, and general treatability challenges in the region's largest drinking water source (Santa Barbara County IRWM Cooperating Partners 2019). CVWD purchased an annual average of 1,594 AF from the Cachuma Project over the period 2016 to 2020. This amount represents 41 percent of CVWD's total water supplies (CVWD 2021a).

CVWD's water supply from the SWP is described below.

Imported Water (State Water Project)

The SWP is the largest state-built, multi-purpose water project in the country. CVWD is an SWP participant in Santa Barbara County, with a maximum allocation set at 2,200 AFY in a normal year (including a 200 AF buffer) (CVWD 2021a). SWP water has helped reduce the use of groundwater in the Carpinteria Groundwater Basin. SWP water also has improved water quality in areas that directly receive SWP water and has increased the overall water supply in Santa Barbara County (County of Santa Barbara 2017b). Since State Water is used primarily as a supplemental supply, the amount received by CVWD will vary each year. Actual SWP water deliveries to CVWD in 2020 were 0 AF. For the period 2016-2020, SWP water provided approximately 854 AFY, or 22 percent, of CVWD's water supplies (CVWD 2021a).

Recycled Water and Advanced Treatment

In addition to potable water supplies, several water purveyors in the county also use non-potable recycled wastewater to irrigate parks, schools, golf courses, and other large, landscaped areas. The CVWD is planning for future additional water supplies such as potable reuse via the Carpinteria Advanced Purification Project (CAPP). The CAPP will produce advanced treated recycled water that will be injected into the Carpinteria Groundwater Basin to be stored and later extracted to

meet potable demands. The CAPP is expected to begin delivering water in 2026, and produce approximately 1,000 AFY of reliable, drought-proof local supply.

Water Conservation

To use all available water supplies wisely and efficiently, CVWD implements numerous water conservation or water use efficiency measures, including conservation tips, surveys, conservation programs, and rebate programs for residents, commercial users, and agricultural users. These measures are directed at helping water users minimize unnecessary use of water during times of plentiful supply and help stretch limited water resources during water shortages (see also Section 6.2.3, *Drought and Water Shortage*). The CVWD administers several demand management programs for municipal customers, including the following:

- Water waste prevention ordinances
- Metering
- Conservation pricing
- Public education and outreach
- Water loss control
- Conservation program coordination and staffing
- Other demand management measures significantly impacting water use.

During declared water supply shortages, the CVWD uses a six-stage rationing plan that includes voluntary and mandatory rationing, depending on the causes, severity, and anticipated duration of the shortage. The criteria for triggering the CVWD's water rationing stages and water usage reduction goals are summarized in Table 5-3 below.

Table 5-3. Water Shortage Stages and Goals

Shortage Condition	Stage	Customer Reduction Goal	Type of Rationing Program
Less than 10 Percent	1	10%	Voluntary
10 to 20 Percent	2	20%	Mandatory
20 to 30 Percent	3	30%	Mandatory
30 to 40 Percent	4	40%	Mandatory
40 to 50 Percent	5	50%	Mandatory
More than 50 Percent	6	>50%	Mandatory

Source: CVWD 2021a.

History of Hazard

California is no stranger to drought; it is a recurring feature of our climate. Three 20th century droughts were of particular importance from a water supply standpoint—the droughts of 1929–1934, 1976–1977, and 1987–1992. More recent multiyear droughts occurred in 2007–2009 and 2012–2017 (DWR 2021). California's most recent multi-year drought occurred from 2012-2017. In January 2014, Santa Barbara County joined the State of California in declaring a local drought emergency, which was the first local emergency declaration of drought in the county's history (County of Santa Barbara 2014). This was the first time the state-imposed mandatory urban water

use reduction requirements on water suppliers, and all of California's 58 counties declared local emergencies. Refer to Section 5.3.2 of the MJHMP for a detailed discussion of multi-year droughts that were identified as having significant impacts on the county.

An iconic image of this drought was in 2017 when the temporary emergency pumping plant and pipeline at Lake Cachuma were used to move water for the Santa Barbara area across the lake's dry bottom to the distribution system intake that had been stranded by falling lake levels. Lake Cachuma, which supplies 41 percent of CVWD's total water supplies as previously mentioned, had water levels so low a special barge fitted with large pumps had to be employed to access remaining water. On April 7, 2017, the Governor lifted the statewide drought emergency; however, given ongoing low water levels in local reservoirs, the County kept the local drought emergency in place until 2019. Effects of this drought included wetland and stream drying, impacts to agricultural land, and tree mortality across the Carpinteria Valley. Additionally, CVWD's water storage capacity and water quality were impacted at Lake Cachuma from increased sedimentation from the Thomas Fire in 2017 (Santa Maria Times 2019).

Since August 2020, the period between 2012 and 2016 was one of the documented driest consecutive water years in the county with 50.83 inches in cumulative rainfall (County of Santa Barbara 2021a). Effects of the drought have lowered water storage at Lake Cachuma, one of the county's largest surface water reservoirs, with water storage at 48.4 percent of capacity in late 2021 (County Flood Control District 2021). Although the statewide drought of 2012–2016 was ended by a wet Water Year in 2017, localized drought conditions persisted in the Central Coast region and were not ended until a wet Water Year in 2019 (DWR 2021).

Probability of Occurrence

Highly Likely – Droughts are a regularly recurring feature of Santa Barbara County weather that can be affected by overall regional or worldwide climactic patterns. El Niño and La Niña events are natural climate patterns over the Pacific Ocean often with global effects, with influence over the weather of the U.S. southwest that on average occur every two to seven years. The state recently experienced the 5-year significant drought event of 2012-2017; other notable historical droughts included 2007-09, 1987-92, 1976-77, and off-and-on dry conditions spanning more than a decade in the 1920s and 1930s. In any given year, CVWD can be subject to drought conditions and water shortages. However, out of the last 10 years, the county has been under a locally declared drought emergency for five years; therefore, it is likely drought and associated water shortages will continue and may increase due to climate change considerations, as described further below.

Climate Change Considerations

Climate change has the potential to make drought increasingly common along the west coast, including in the Carpinteria Valley. DWR projects climate change will result in more variable weather patterns in California that may lead to more severe, frequent, and extended droughts, which will impact the City's water supply (DWR 2021). Extreme heat creates conditions more conducive for evaporation of moisture from the ground, thereby increasing the severity of drought as well as wildfires.

As described in the County's Climate Change Vulnerability Assessment (CCVA; Santa Barbara County Planning and Development Department 2021), "Two distinct metrics measure precipitation:

1) annual average precipitation and 2) seasonality. Although there will likely be a slight increase in precipitation throughout the 21st century, the seasonality may change (i.e., timing during a given year). There will likely be more rain during periods of precipitation (e.g., storms with higher rainfall totals), fewer total days with precipitation, and an increase in year-to-year variability. This means that more rain may fall during fewer storms throughout the year." Based on these projections, there will be a gradual increase in average annual precipitation in the South Coast (refer to Table 5-7 of the MJHMP; Santa Barbara County Planning and Development Department 2021).

Due to these changes in precipitation patterns, although episodic severe storm events may increase in severity, droughts will likely last longer and happen more frequently because of more variability in precipitation extremes. Average base flows in rivers and creeks in the county's coastal and inland areas are projected to decline significantly in the South Coast subregion, in an early- and late-century (e.g., post-2050) extended drought scenario. This reduction in average base flows will affect two key local water supply sources (i.e., surface water reservoirs and groundwater), impacting urban and agricultural uses and natural resources (Santa Barbara County Planning and Development Department 2021).

Snowpack is the amount of snow that accumulates during the winter and is a natural reservoir that stores water during the winter. As it slowly melts in the spring and summer, it feeds streams and rivers that provide water to regions hundreds of miles away along the Central Coast and Southern California. The Sierra Nevada snowpack is important in terms of providing water storage and ensuring adequate supply in the summer to the SWP when water is most needed. A warming planet could lead to earlier melting of winter snowpacks, leaving lower stream flows and drier conditions in the Sierra Nevada during late spring and summer. The southwest region of the U.S. relies on snowmelt to supply 50 to 80 percent of the lake, reservoir, river, and creek inflows for water supply. Snowpack levels dropped by 25 percent during the 2011 to 2016 drought, and the average springtime snowpack is expected to drop 64 percent by 2100. In 2021, the snowpack in the Northern Sierra was 70 percent of the average, but the rain was less than 50 percent of the annual average, making it the third driest year on record. Loss of snowpack will increase as temperatures increase because of less precipitation during droughts, more precipitation falling as rain, and snow melting earlier in the spring (Santa Barbara County Planning and Development Department 2021). Changing precipitation distribution and intensity is projected to lead to increased run-off rather than be captured and stored exacerbating the potential for drought. The result of these processes is an increased potential for more frequent, longer lasting, and more severe periods of drought (DWR 2021).

5.2.4 Energy Shortage

Description of Hazard

Energy shortages (or disruptions) are considered a form of lifeline system failure. Disruptions can be the consequence of another hazard or can be a primary hazard. Most power blackouts are not human-caused but are the result of situations involving unintended events, such as an overwhelming need for power due to weather conditions, equipment failure, or accidents. They may also fail due to natural hazards such as earthquakes, floods, and landslides. These outages can last anywhere from a few minutes to several weeks.

Southern California Edison (SCE) provides power to the southern parts of the county, including the CVWD. SCE is aware of the restrictions on its systems and is making planned systematic changes to address the shortcomings. SCE offers several programs to customers experiencing outages, such as hotel discounts, rebates for portable power devices, and providing customers who rely on medical equipment with portable backup batteries (SCE 2021). SCE also offers power outage alerts via phone and email to alert customers of outages.

Due to recent massive wildfires throughout California and their ignition originating from utility infrastructure and high winds, the electric utilities have initiated a program to conduct Public Safety Power Shutdowns to prevent wildfire ignitions. These are classified as intentional, unscheduled disruptions. The utilities are currently working with the County to minimize power delivery interruption while managing wildfire hazards.

Location and Extent of Hazard

The entire county is subject to energy shortages, which can vary in size and area of disruption for electrical services from a large area to a small number of service connections. Electricity service is also highly vulnerable because it is highly dependent on electrical transmission lines and substations functioning properly.

History of Hazard

Energy disruptions on a small scale have occurred regularly in Santa Barbara County. In the Carpinteria Valley, small-scale energy disruptions electrical outages are relatively frequent. One of the largest events affecting electric and natural gas services in the Carpinteria Valley in recent years was the 2017 Thomas Fire, during which the transmission system running from Ventura County to the City of Goleta was shut down, leaving more than 85,000 customers without power for an extended period during the emergency (SCE 2017). Similar service disruptions, though not quite as extensive, occur in areas affected by wildfires and other disasters or emergencies.

In fall 2018, SCE admitted that some of its equipment contributed to the December 2017 Thomas fire. This admission was accompanied by the announcement that the company would begin taking precautions against future liabilities by reducing or halting electrical service under certain environmental conditions including high winds and low humidity.

Probability of Occurrence

Likely – In any given year, Santa Barbara County can be subject to energy shortages. A large disruption due to a power failure or rotating brown-out is highly likely. As described above, SCE announced that the company would be reducing or halting electrical service under certain environmental conditions including high winds and low humidity to take precautions against future liabilities.

Climate Change Considerations

With increased changes in weather and climate, the energy demands will shift too. This shift in demand could have significant impacts on energy supply and demand.

5.2.5 Landslide

Description of Hazard

Landslides are rapid down-slope movements of earth, rock, and other debris caused by soil saturation, earthquakes, chemical weathering, and fracturing. The size and resultant out-flow are dependent on the source material, slope, and nature of precipitating event. In most cases, there is an increase in gravitational stresses on slope material (over-steepening) that makes the upslope material unstable. Over-steepening can be caused by human activity (road cuts) and naturally, by downslope failure like erosion.

Location and Extent of Hazard

Landslides and landslide-prone sedimentary formations are present throughout the coastal plain of western Santa Barbara County. Figure 5-18 of the MJHMP shows the location of soil types throughout the county. Generally, areas with soft soils are more prone to movement. Landslides also occur in the granitic mountains of East Santa Barbara County, although they are less prevalent. Many of these landslides are thought to have occurred under much wetter climatic conditions than at present. Recent landslides are those with fresh or sharp geomorphic expressions suggestive of active (ongoing) movement or movement within the past several decades. Reactivations of existing landslides can be triggered by disturbances such as heavy rainfall, seismic shaking, and/or grading. Many recent landslides are thought to be reactivations of ancient landslides.

Section 5.3.7 of the MJHMP lists the areas in Santa Barbara County where there are geologic formations that can lead to fairly severe landslides as identified by the Santa Barbara County Comprehensive Plan Seismic Safety and Safety Element (Santa Barbara County Planning and Development Department 2015). Within the Carpinteria Valley, the foothills to the north of the City of Carpinteria are subject to occasional landslides and earth movements. Some areas of the Carpinteria Valley are prone to more frequent rain-induced landslides, resulting in disruption to transportation and damage to roadways. The most common areas of recent historic landslides are Gobernador Canyon and all roads that are underlain by the Rincon Shale Formation. Parts of Gobernador Canyon has experienced earth movements in 1995, 1998 and is currently considered a moving slope. Foothill road in the western parts of the District also experiences landslides, particularly during wet winters. See Figure 5-3 for a map of landslide susceptibility in Santa Barbara County.

History of Hazard

Many previous landslide occurrences within the county were smaller and are not well documented. Locally, Gobernador Canyon Road in the Carpinteria Valley has experienced landslides that affected travel in 1995 and 1998. Three of the more significant recent landslides are discussed below:

- **1995** – In the spring of 1995, La Conchita, located at the western border of Ventura County and adjacent to Santa Barbara County, experienced a landslide that destroyed several houses in its path.

- **1998** – In 1998, a portion of the bank of the Cuyama River collapsed east of Santa Maria, affecting half a dozen cars and a tractor-trailer rig on Highway 166, which were caught in the slide. Two highway patrol officers were killed.
- **2005** – In January 2005, a powerful Pacific storm brought heavy rain, snow, flash flooding, high winds, and landslides to Central and Southern California. With such copious rainfall, flash flooding was a serious problem across Santa Barbara, Ventura, and Los Angeles counties. In Santa Barbara County, flash flooding and mudslides closed Gibraltar Road at Mt. Calvary Road, stranding several vehicles, while mudslides inundated 3 homes in Lake Casitas. Across Ventura County, flash flooding and mudslides closed down Creek Road at Hermosa Road. In addition, the Ventura Beach RV Resort was flooded and Highways 1 and 126 were closed due to flooding. In La Conchita, a devastating mudslide killed 10 people, destroyed 15 homes, and damaged 12 other homes.

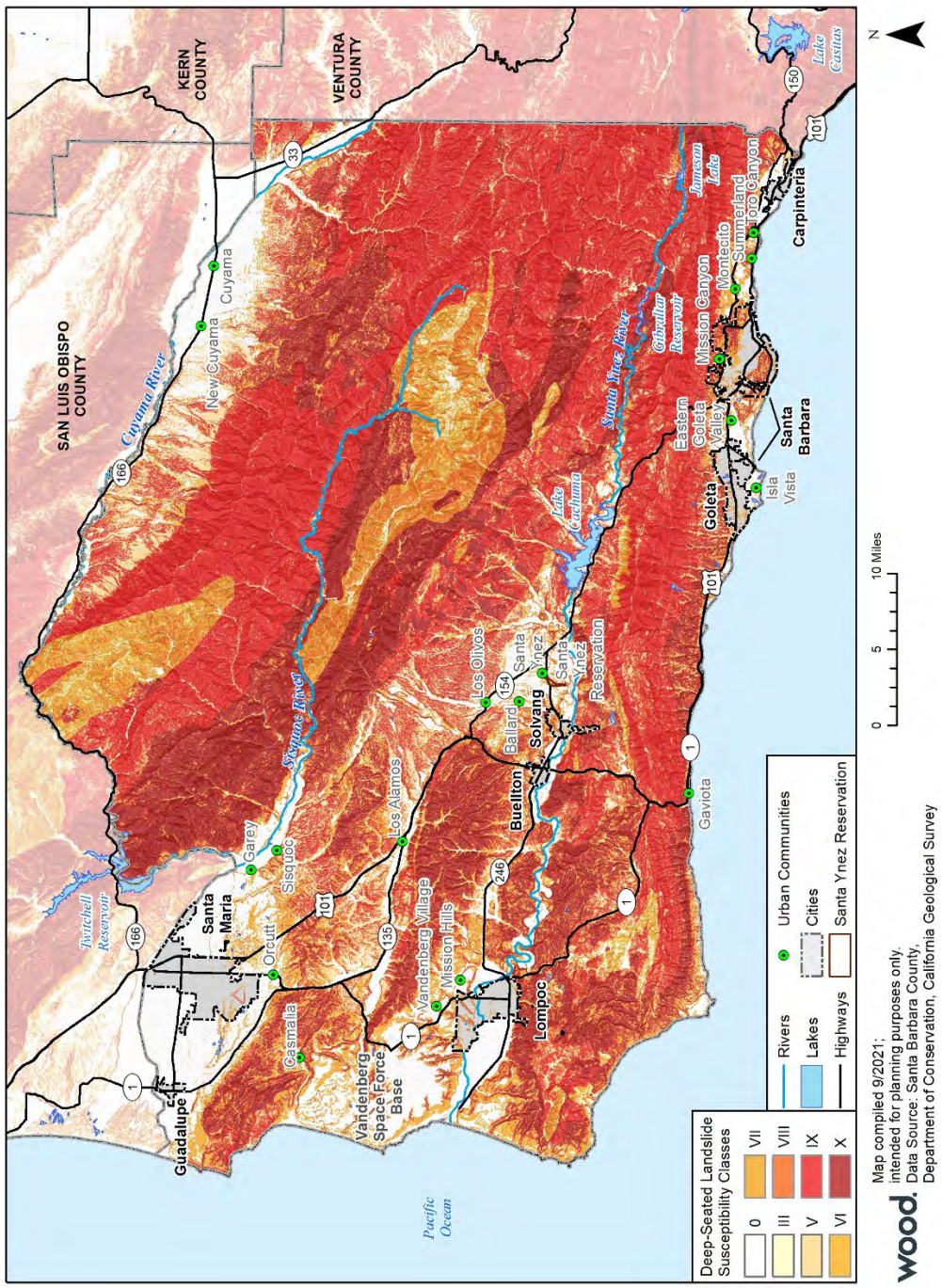
Probability of Occurrence

Occasional – Figure 5-3 shows the locations of deep-seated landslide susceptibility in the Carpinteria Valley. The areas shaded in darker red are considered to have a higher probability of landslide occurrence than the low landslide risk areas in the Carpinteria Valley. See Section 5.3.7, *Landslide* of the 2022 MJHMP for detailed information.

Climate Change Considerations

Climate change is expected to intensify weather events, thereby increasing the potential for landslides. Wildfires make the landscape more susceptible to landslides when rainstorms pass through as the water liquefies unstable, dry soil and burned vegetation. Geologists routinely conduct landslide hazard assessments after wildfires occur, but there is often not enough time between a fire and a rainstorm to implement an effective emergency response plan (USGS 2021). Wildfire frequency, higher temperatures, and increased droughts projected to occur under climate change can reduce soil absorption capacity and kill vegetation that holds soil in place, making it unable to absorb as much water, further destabilizing slopes. The results also suggest more intense rainfall events could make landslides much more frequent. Slope failure is expected to become more frequent as more precipitation falls during fewer storm events (see Section 5.2.10, *Flood and Debris Flow*). Also, the increased heavy precipitation events may cause instability in areas where landslides were not as likely before. Therefore, resulting landslides may be larger or more widespread.

Figure 5-3. Landslide Susceptibility Zones in Santa Barbara County



5.2.6 Extreme Heat

Description of Hazard

Extreme heat is defined by FEMA as temperatures that hover 10 degrees Fahrenheit (°F) or more above the regional average high temperature or over 100 °F in California and last for at least three days or even as long as several weeks (FEMA 2021). Extreme heat is a function of heat and relative humidity. A heat index describes how hot the heat-humidity combination makes the air feel. As relative humidity increases, the air seems warmer than it is because the body is less capable of cooling itself or regulating heat via evaporation of perspiration. As the heat index rises, so do health risks such as heat exhaustion, sunstroke, and heatstroke.

While the effects of extreme heat on human health can be severe, so too can its effects be on natural ecosystems, services, infrastructure, and various economic sectors (e.g., agricultural sector). During periods of extreme heat, transportation, gas, power, and other services may be disrupted, and critical infrastructure may be destroyed or damaged (FEMA 2021). The National Institute for Occupational Safety and Health (NIOSH), alongside OSHA, provides a Heat Safety Tool App that offers occupational safety and health recommendations based on the heat index (OSHA 2021). Each extreme heat day or heat wave can present additional risk of other hazards present within the County but is primarily a direct contributor to wildfire hazards and risks (refer to Section 5.2.2, *Wildfire*). As heat increases, the need for additional cooling systems to avoid mechanical failure increases as well. This can increase costs to consumers and may contribute to climate change if fossil fuels are used to generate the electricity needed to operate cooling systems.

Location and Extent of Hazard

All of Santa Barbara County can experience extreme heat. Coastal communities on average have lower temperatures compared to communities in the inland areas of the county and could be less at risk to extreme temperatures although potentially less acclimatized to high temperatures if they occur.

History of Hazard

Santa Barbara County has experienced several extreme heat events in the past; however, they are not well documented. One documented event reported as "simoon", occurred on June 17, 1859, where a record temperature of 133 °F was taken during an extreme heat and wind event that struck Santa Barbara in the early afternoon (Noozhawk 2020). This event set the world record for the hottest temperature ever recorded on Earth, which was held for 75 years until the record was broken by one degree in Death Valley on July 10, 1913 (Guinness World Records 2021). More recently, according to the NOAA Storm Events Database, a combination of high pressure and high humidity caused temperatures to spike to between 100 °F and 119 °F on July 22, 2006, throughout southern California, including the county (NOAA 2021). In 2020, heatwaves in the Santa Ynez Valley with temperatures reaching 118 °F caused early grape harvests at wineries (Jervis 2020).

Probability of Occurrence

Highly Likely – In any given year, Santa Barbara County, including the Carpinteria Valley, can be subject to extreme heat conditions.

Climate Change Considerations

As temperatures rise due to climate change, residents, employees, and visitors in the Carpinteria Valley will face a greater risk of death from dehydration, heatstroke/exhaustion, heart attack, stroke, and respiratory distress caused by extreme heat. By mid-century, extreme heat events in urban centers could cause two to three times more heat-related deaths than occurring today. Freezing spells are likely to become less frequent as climate temperatures increase (Climate Central 2019).

Historically, Santa Barbara County has experienced an average of four extreme heat days a year, however, this is expected to increase to 12 extreme heat events per year by 2030, 19 extreme heat events per year by 2060, and 34 extreme heat events per year by 2100 (Santa Barbara County Planning and Development Department 2021). Due to the rising temperatures, heat waves are likely to become more frequent, which will have direct impacts on human health in terms of heat-related illness. The Carpinteria Valley's large farming and viticulture production which employs hundreds of outdoor laborers will be vulnerable to the rising temperatures and most at risk for heat-related illnesses. Residents will also be vulnerable to rising temperatures, as many of the homes on the coast do not have air conditioning units, as there was less of a need in the past, and therefore may be less prepared compared to the inland region of the county to adapt to extreme heat events.

Cascading impacts include increased stress on water quantity and quality, degraded air quality, and increased potential for more severe or catastrophic natural events such as heavy rain, droughts, and wildfire. Another cascading impact includes increased duration and intensity of wildfires with warmer temperatures.

Extreme heat has also been shown to accelerate wear and tear on the natural gas system and electrical infrastructure. Projected increases in summer demand associated with rising temperatures may increase risks to energy infrastructure and may exceed the capacity of existing substations and distribution line infrastructure and systems.

5.2.7 Cyber Attack

Description of Hazard

The 2018 California State Hazard Mitigation Plan defines cyber-attacks as "attempts by cyber criminals to attack a government, organization, or private party by damaging or disrupting a computer or computer network, or by or stealing data from a computer or computer network for malicious use." Cyber-attacks use malicious code to alter computer operations or data. The vulnerability of computer systems to attacks is a growing concern as people and institutions become more dependent upon networked technologies. The Federal Bureau of Investigation (FBI) reports that "cyber intrusions are becoming more commonplace, more dangerous, and more sophisticated," with implications for private- and public-sector networks (refer to Section 5.5.2 of the MJHMP for a discussion of the types of cyberattacks).

In a recent attempt to combat this threat, the State of California adopted Senate Bill 327 in September of 2018. This bill seeks to improve information privacy, specifically on connected devices. Existing laws in California require businesses to take all reasonable steps to dispose of

customer records within their custody containing personal information and also require businesses that own, license, or maintain personal information about a California resident to implement and maintain reasonable security procedures. Senate Bill 327, which went into effect January 1, 2020, further requires the manufacturer of connected devices to equip the device with a reasonable security feature to protect user information.

Location and Extent of Hazard

Cyber-attacks can and have occurred in every location regardless of geography, demographics, and security posture. Incidents may involve a single location or multiple geographic areas. A disruption can have far-reaching effects beyond the location of the targeted system; disruptions that occur far outside the state can still impact people, businesses, and institutions within the county. The Santa Barbara County Grand Jury determined in 2020 that cyberattacks and related threats are an ongoing security issue for all public entities within the county, which requires prompt and aggressive actions to prevent significant disruption (Santa Barbara County Grand Jury 2020). This hazard can occur anywhere within the Carpinteria Valley; however, cyber threats are generally targeted towards larger corporations or the government.

History of Hazard

Between 2012 and 2015, 50 million records of Californians were breached, and the majority of these breaches resulted from security failures, with malware and hacking; physical breaches constituted three-quarters of all events. As the use of digital information expands, Californians will increasingly become more vulnerable to the slow-moving, potential technological hazard of cyber damage (Cal OES 2018).

The District was the victim of a CryptoWall cyber attack in September 2015. The attacker demanded payment through bitcoin before providing the key to decrypt CVWD's files. While most files were backed up and were able to be restored to a version prior to the attack's encryption, key imagery files were not able to be restored and so the ransom was paid.

Probability of Occurrence

Likely – As described above, cyber threats are on the rise globally, nationally, and locally. The probability of occurrence of cyber threats is rapidly increasing, especially with increased reliance on the Internet and cloud-based computing. Small-scale cyber-attacks occur daily, but most have negligible impacts at the local or regional level. Data breaches are also extremely common, but again most have only minor impacts on government services. Perhaps of greatest concern to the District are ransomware attacks, which are becoming increasingly common. It is difficult to predict the odds of the District being hit with a successful ransomware attack in any given year, but it is safe to say it is likely to be attacked in the coming years. The possibility of a larger disruption affecting systems within the District is a constant threat, but it is difficult to quantify the exact probability due to such highly variable factors as the type of attack and intent of the attacker. Major attacks specifically targeting CVWD systems or infrastructure cannot be ruled out.

Climate Change Considerations

While there is no evidence to link climate change to an increase in occurrences of cyber threats, the target could be related to issues with individuals or companies perceived to affect the climate (i.e., GHG producers).

5.2.8 Dam Failure

Description of Hazard

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.

Location and Extent of Hazard

In the context of the Carpinteria Valley Water District, 'dam failure' has two distinct meanings. The first is the failure of Bradbury Dam in the Santa Ynez Valley and Lauro Dam in Santa Barbara. Lake Cachuma is impounded by Bradbury Dam and is a major source of water to the District, while Lauro Dam provides a balancing reservoir for the City of Santa Barbara and the Montecito and Carpinteria communities. The second meaning is the failure of the structural integrity of the Districts reservoirs, which have earthen and concrete embankments that facilitate water storage. The District has three in-ground reservoirs that could be considered to have a dam – Carpinteria, Gobernador, and Foothill.

History of Hazard

While dam failures have occurred in many parts of the world, there is only one significant incident in Santa Barbara County. Built in 1917, the Sheffield Dam in Santa Barbara failed catastrophically during the 1925 earthquake. It was built on sandy soil which liquefied during the event. The center 300-feet of the 720-feet long dam broke off and was carried away on the liquefied soil, spilling 30 million gallons of water.

Probability of Occurrence

Unlikely – The complete failure of Bradbury or Lauro Dams is very remote. Both facilities are subject to the Dam Safety Program administered by the State of California and the federal government, and both dams have recently undergone extensive seismic retrofits to prevent possible failure associated with earthquakes. The District's reservoirs are periodically drained and inspected for cracks. Carpinteria reservoir was recently refurbished when the roof structure was installed in 2006. The Ortega reservoir in Montecito offers a cautionary lesson regarding maintenance and refurbishing, however. The concrete base of the reservoir was improperly sealed during reconstruction in the late 2000s and now has a persistent leak problem that threatens to undermine the foundation. The reservoir now operates at less than designed capacity to reduce the threat to failure.

Climate Change Considerations

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.

5.2.9 Sea Level Rise and Coastal Erosion

Description of Hazard

Sea level rise is defined as the rising of the mean sea level (MSL) as a result of the so-called greenhouse effect or global warming. Three processes contribute to sea level rise, the first of which is thermal expansion. Increases in atmospheric carbon dioxide increase air temperature which eventually will lead to increased water temperature. As water warms, it expands, and in a confined space this will lead to an increase in surface elevation. The second process is eustasy, which involves an increase in the volume of water residing in the ocean. This can be increased or decreased depending on the volume of water stored as ice on land. The third process is isostasy, which involves the relative gravitational equilibrium between the earth's crust and the mantle. Locally, forced uplift by plate tectonics can result in changes to MSL, as can rapid sedimentation. As sea level rise occurs, areas of land that were once outside the tidal inundation zone may be subjected to wave erosion and decay.

Location and Extent of Hazard

Given other factors associated with climate change including storm intensity, the potential for coastal hazards, such as sea level rise and coastal erosion, to occur along the approximately 7 miles of the coast within the District planning area is very possible. The South Coast has a long history of exposure to coastal hazards from bluff retreat to coastal erosion and flooding. Low-lying areas such as those within the Beach Neighborhood of Carpinteria have experienced coastal flooding due to storms surges and wave attacks. Bluff erosion is another serious local hazard with annual bluff erosion rates generally varying from 6 inches to one foot per year, depending upon location.

Coastal hazards modeling efforts show that the coastal dunes and bluffs in Carpinteria are vulnerable to coastal erosion caused by exposure to waves, weathering, and runoff (County of Santa Barbara 2017). In such areas, erosive processes slowly eat away at the beach and foundations of the bluffs, reducing beach widths, eroding dunes, and creating risk for bluff collapse. Bluff collapses threaten bluff-top property and create a safety risk to people visiting the lower beaches.

Shoreline changes (coastal erosion and accretion) result from a change in sediment supply, coastal processes including large storms, and human activities. When sediment supply exceeds the gross longshore sediment transport rates then the coast will accrete seaward; when more sediment is removed than supplied, the coast will erode. Long-term changes in the shoreline are caused by sediment supply and sea level rise, whereas short-term or event-based erosion is caused by large storm events (City of Carpinteria 2019). Sandy beach widths on Carpinteria City beach range between 65 and 200 feet, although width varies seasonally and along the coast. Carpinteria beaches experience seasonal cycles in which winter storms move significant amounts of sand offshore, creating steep, narrow beaches.

In response to coastal hazards, private property owners and local governments have erected rock revetments and seawalls to attempt to protect public and private improvements from coastal hazard damage. The UPRR has also installed both concrete seawalls and rock revetments to protect the railroad tracks along the South Coast from Carpinteria to Gaviota. The long-term effects of such

coastal protection structures are subject to debate, as well as their secondary impacts on natural coastal processes and sand supply.

In addition, higher MSL may result in seawater intrusion into local aquifers. Sea level rise can result in hazards along the coast through several mechanisms. The first is tidal inundation. Tidal induration can result in periodic nuisance flooding to severe property damage. Secondly, the combination of sea level rise with storm surges can make storm-related flooding worse, although along the west coast of the U.S. this is less of a problem. And finally, coastal erosion related to sea level rise can result in damage to public infrastructure and private property.

History of Hazard

Typically, coastal hazards increase during periods of major storms that can coincide with high tides, causing coastal flooding, coastal bluff erosion, and landslides such as those that were experienced during the 1983, 1998, and 2015/2016 El Niño storms. Segments of the South Coast have been subject to significant damage from coastal hazards. Historic coastal flooding has occurred along the county's South Coast, particularly in the City of Carpinteria, since the mid-1800s. Significant wave events in 1938, 1943, 1958, 1982–83, 1988, 1997–1998, 2002, 2007, and 2015-2016 demonstrate the dynamic and hazardous coastal environment. Homes along Sandyland Cove and Pardaro Lane in the City of Carpinteria suffered substantial damage during the 1983 and 2015/2016 El Niño events in particular. While many of these storm events and creek flooding hazards are associated with El Niño, other causes can threaten the environment including storm events post-wildfire. In such situations, due to an absence of vegetation and resultant soil erosion, large fluxes of sediment can be rapidly transported to the coast. For example, the January 2018 storms caused severe mudflows and debris flow in Montecito and Carpinteria (see Section 5.2.10, *Flood and Debris Flow*).

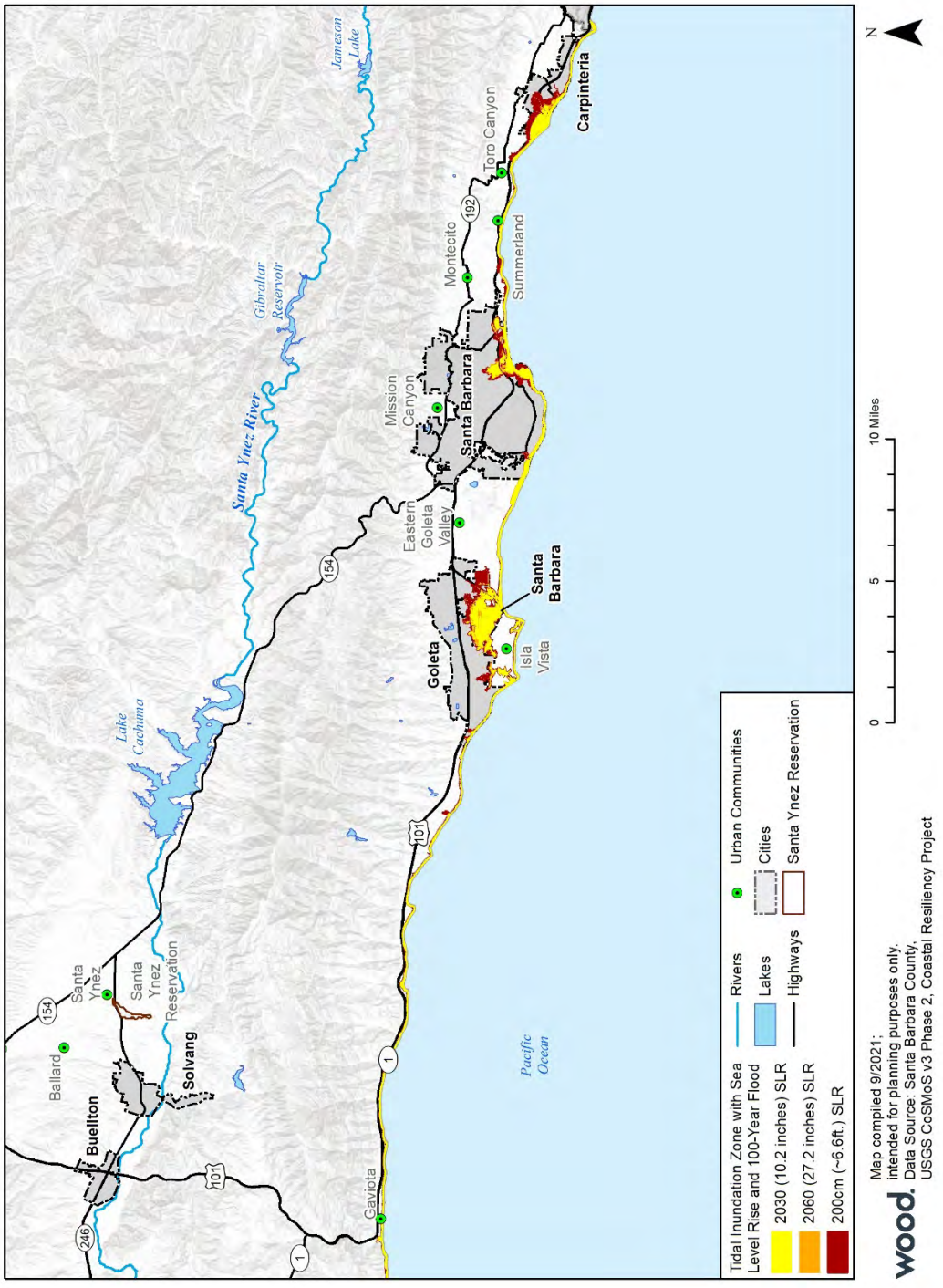
Probability of Occurrence

Highly Likely – Coastal flooding from tidal inundation and wave attack and associated erosion of coastal bluffs and beaches occurs during many winters but is most pronounced during past major El Niño events, which have return intervals of 2 to 7 years. Sea level rise is projected to incrementally increase the inland extent that is vulnerable to coastal hazards through 2100 (Figure 5-4). Although many private coastal properties and public facilities have been protected by rock revetments or seawalls, coastal flooding, beach, and bluff erosion continue in Carpinteria. While the existing probability of occurrence is typically confined to El Niño seasons or major storm events, as discussed below, climate change and sea level rise are projected to increase in frequency and severity of occurrence.

Climate Change Considerations

Sea level rise is fundamentally tied to climate change and occurs with known atmospheric and oceanic drivers such as carbon dioxide emissions. Given the build-out of properties at sea level within the District, it is unlikely that the District will need to relocate more than a few dozen services given the average projected sea level rise increases.

Figure 5-4. Santa Barbara County Sea Level Rise Tidal Inundation + 100-year Flood Conditions



5.2.10 Flood and Debris flow

Description of Hazard

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 storm-water facilities road culverts can all contribute to flooding. Under certain conditions of heavy precipitation, debris such as rocks and vegetation within a watershed can be mobilized. If this occurs a destructive debris flow may occur. During debris flow, anything within the path of the debris can be destroyed. This type of event can occur with little forewarning.

Location and Extent of Hazard

Floods usually occur during the rainy season, with the highest precipitation during December through March during heavy rainfall. Streamflow throughout the Carpinteria Valley 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.

History of Hazard

Flooding has been a major problem for communities and regions along rivers, creeks, and the shoreline throughout Santa Barbara County's history. Santa Barbara County has several hydrologic basins that have different types of flooding problems, including over bank riverine flooding, flash floods, tidal flooding/tsunamis, and dam failure. The most common flooding in Santa Barbara is due to riverine flooding and flash flood events.

Between 1906 and 2018, Santa Barbara County experienced 22 significant inland flood and debris flow events. Eight of these floods received Presidential Disaster Declarations. These historical flood events and years as well as information concerning the nature of the flooding/debris flows and the extent of the damages are described in Section 5.3.4 and Section 5.3.5, respectively, of the MJHMP.

The most recent flood and debris flow that occurred in the Carpinteria Valley were in 2018. Following the December 2017 Thomas Fire, heavy rains unleashed destructive rivers of water, mud, and debris in Santa Barbara County, particularly Montecito, leaving at least 23 people dead, destroying over 100 homes, and damaging over 300 homes (approximately $400 million in damages). Rain from the storm fell on hillsides and mountains stripped of trees and vegetation by the Thomas Fire. The National Weather Service, Los Angeles reported that 0.54 inches of rain had fallen in 5 minutes at Montecito and 0.86 inches in 15 minutes in the City of Carpinteria (FloodList 2021).

These flood flows triggered a chain of events in the City of Carpinteria due to flooding in Carpinteria Creek. The surge of water and debris that came down Carpinteria Creek undermined and destabilized the concrete rock wall embankment that borders the southeast side of the Wastewater Treatment Plant. At the time of the storm, Caltrans was in the process of building a new bridge over Carpinteria Creek. The intense storm dropped too much water too quickly and

caused a massive debris flow, which built up enormous head pressure at this new bridge before breaking free. The velocity of the debris flow moved so quickly and with such force that boulders could be heard rolling down the creek from 5 blocks away. After the floodwaters in the creek receded, the creek bed was scoured to a historical depth not previously seen and the wall embankment was noticeably impacted. Floodwaters surcharged the municipal storm drain system. The road to the Wastewater Treatment Plant, its administration office, a preschool, and employee housing for California State Park employees was impassable due to the flooding. Highway 101 was also cut off to the northwest of the City for 3 weeks and to the southeast to Ventura for about a week, leaving the Carpinteria Valley isolated for an extended amount of time. Both the supply chain (e.g., food, fuel) and staffing levels at the Treatment Plant as well as countless other businesses and offices in Carpinteria were compromised. Food from local grocery stores disappeared also immediately (California Water Environment Association 2022). Water, sewer, gas, and internet services were also temporarily disrupted in the Carpinteria Valley.

Probability of Occurrence

Highly Likely – The 100-year flood is a flood that has a one percent chance in any given year of being equaled or exceeded. The 500-year flood is the flood that has a 0.2 percent chance of being equaled or exceeded in any given year. Figure 5-5 shows the location of the 100-year flood hazard zones in the Carpinteria Valley as mapped by FEMA's Flood Insurance Rate Maps (FIRM). The floodplains shown delineate areas with potential exposure to flooding for 100-year storm flows.

Based on historical data and given the likelihood of wildfires and intense rainfall events, as well as steep slopes in the Carpinteria Valley, mudflow and debris flow hazards are likely to continue on an annual basis, with damaging mudflow and debris flow occurring less frequently. Mudflows and debris flows are usually a cascading effect of severe weather. The probability for more severe and damaging landslides increases during El Niño years or severe winter storms. The potential for debris flows dramatically increases following a wildfire (refer also to Section 5.2.2, *Wildfire* and Section 5.2.5, *Landslide*).

In response to the debris flow disaster in Montecito on January 9, 2018, the Santa Barbara County Office of Emergency Management has published a map showing high and extreme risk areas for debris flow. Figure 5-6 illustrates the areas at most risk for flooding and debris flows, including Carpinteria and Montecito.

Climate Change Considerations

As described in the County's CCVA, although climate change will increase the frequency and intensity of droughts (refer to Section 5.2.3, *Drought and Water Shortage*), scientists also project that it will increase the frequency and intensity of heavy rainstorms that cause inland flooding (Santa County Barbara Planning and Development Department 2021). 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. For example, what is currently a 200-year storm, or one that has a 1 in 200 chance of occurring in a given year, by 2100 would increase in frequency by 40 to 50 years (to a 1 in

150/160 chance in a given year). This means that the 100-year and 500-year floodplains may expand, and the current floodplains may become 40- to 50-year floodplains (Santa County Barbara Planning and Development Department 2021). The frequency and intensity of heavy rainstorms are projected to increase, causing fluvial flooding along creeks, although overall annual precipitation levels are expected to increase only slightly. For discussion regarding the impacts of climate change on coastal flooding and sea level rise, refer to Section 5.2.9, *Sea Level Rise and Coastal Erosion*.

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 (USDA and USGS 2009).

Research dating back to the 1930s and 1940s shows an association between debris-flow occurrence and recent wildfires in mountain watersheds, commonly referred to as the "fire and flood cycle." Much of the burned areas within and above the Carpinteria Valley are on steep, brush-covered slopes drained by equally steep, short channels which facilitate debris flow occurrence. As previously described, the increased potential of wildfire occurrence also escalates the risk of mudflows and debris flows in the period following a fire, when slopes lack vegetation to stabilize soils and burned soil surfaces create more rainfall runoff. Therefore, greater wildfire frequencies result in an increased likelihood of precipitation-induced debris-flow events in recently burned areas (USDA and USGS 2009).

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

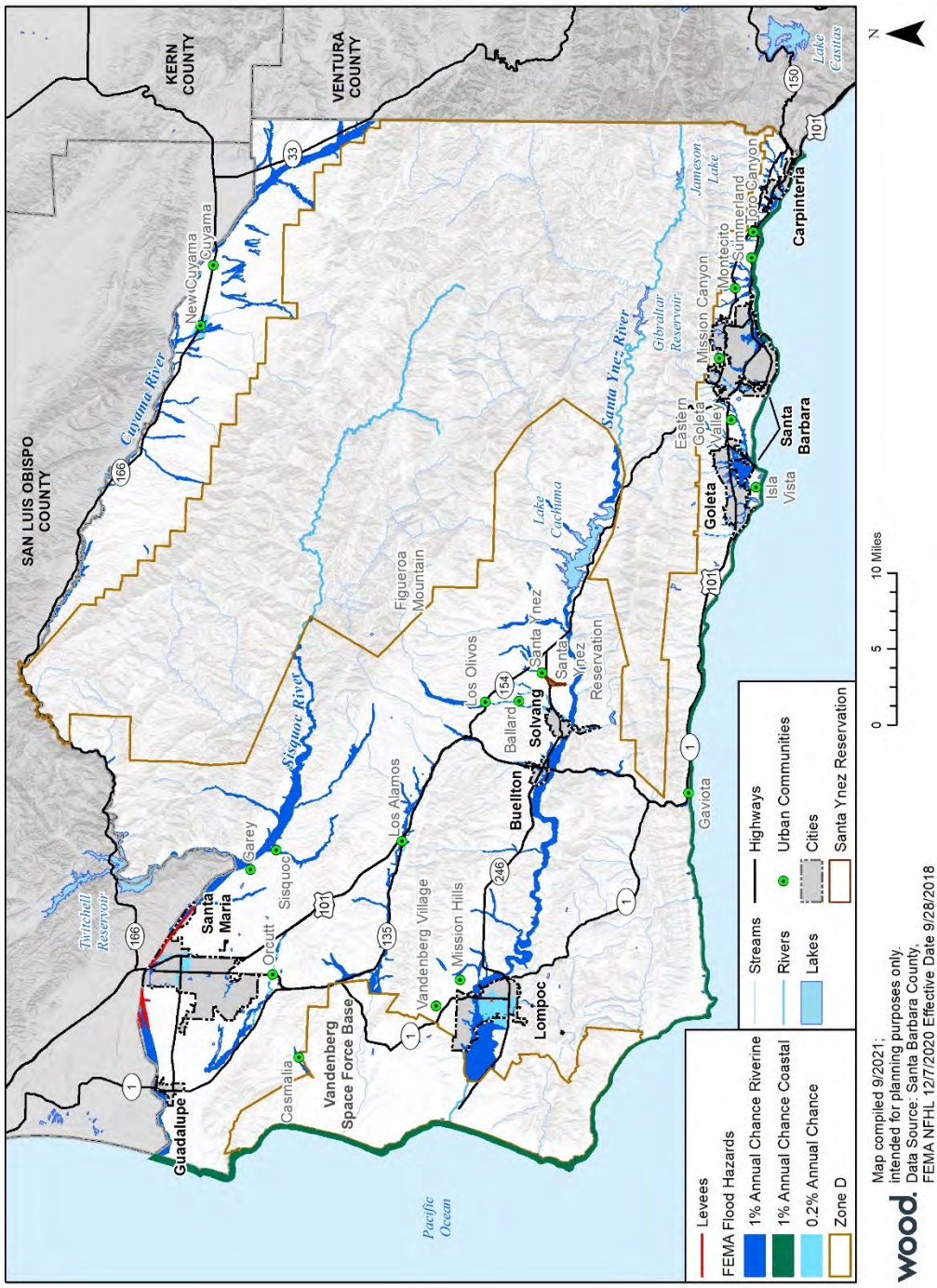
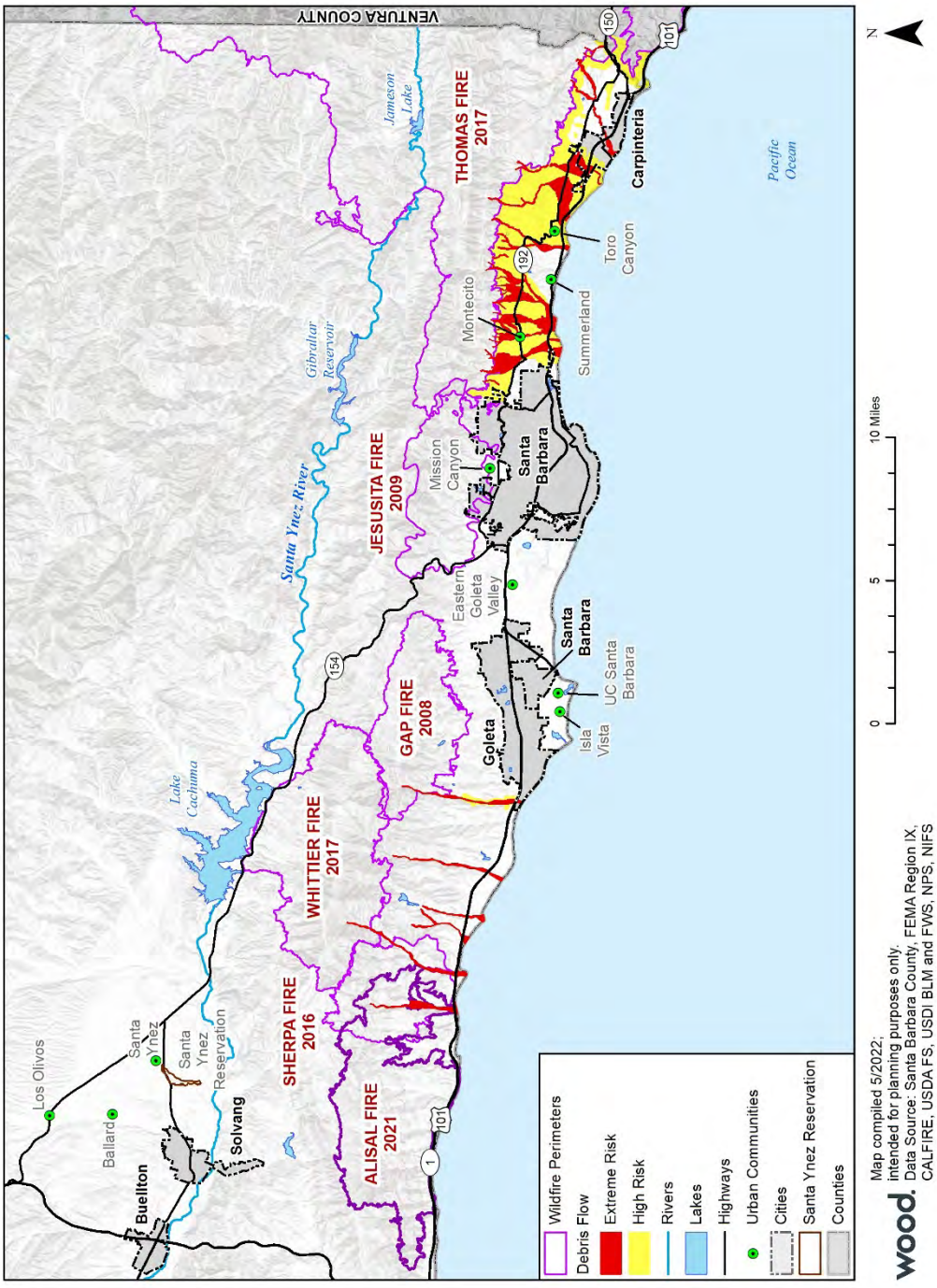


Figure 5-6. Santa Barbara County Known Debris Flow Hazard Areas



6.0 VULNERABILITY ASSESSMENT

The vulnerability assessment builds on the hazard assessment provided in Section 5.0, *Hazard Assessment* to estimate losses where data is available and consider a specific list of critical facilities identified by CVWD.

6.1 DISTRICT ASSETS / CRITICAL FACILITIES

The District operates a network of storage facilities, transmission and distribution lines, and several wells to provide water to its customers. In addition, there are several key facilities operated by the Cachuma Operations and Maintenance Board (COMB) that convey water from a regional water Source (Lake Cachuma) and State-wide water supplies (via California Department of Water Resources and the Central Coast Water Authority). This assessment only includes facilities with vital components owned by the District, or facilities that the District owns outright. The District identified 14 critical facilities to be included in the Vulnerability Assessment portion of the LHMP. Of the available data, it was shown that these facilities are worth approximately $174,900,000 (Table 6-1).

The LPT has identified the following key assets/facilities within the District:

Table 6-1. CVWD Facilities and Costs

Facility	Year	Construction Cost*	Replacement Cost**
Shepard Mesa Tank	1970 / 2006	244,867	~$1,000,000
Gobernador Reservoir	1954 / 2002	140,760	~$2,500,000
Carpinteria Reservoir	1954 / 2006	6,427,421	~$21,000,000
Foothill Reservoir	2008	11,810,936	~$15,000,000
Headquarters Well	2004	3,203,533	~$4,000,000
El Carro Well	1992 / 2013	3,795,778	~$4,000,000
Smillie Well	1976 / 2016	720,208	~$4,000,000
Lyons Well	1977 / 2007	595,922	~$4,000,000
Shepard Mesa Pump station	2013	85,672	~$500,000
Lateral 30 Pump station	1954 / 2007	32,220	~$1,000,000
District Office / Yard	1972 / 1988	529,802	~6,000,000
Distribution system	various	7,389,805	~81,000,000
Meters / AMI infrastructure	2017-22		
Water Supply	various	Varies	~$2000/AF
TOTAL			$174,900,000

* Constructed and improvement costs as shown on District records
** Replacement cost estimates

This plan does not address NFIP insured structures within the District's jurisdiction that have been repetitively damaged by floods. Please see Section 4.2.3 of the 2022 MJHMP.

6.2 DESCRIPTION OF DISTRICT VULNERABILITIES BY HAZARD

6.2.1 Earthquake

Population Served: 100% ~ 15,500 people

Critical Facilities: 100%

A large earthquake occurring in the Carpinteria area would leave most of the District's physical assets in jeopardy and could severely limit the District's ability to provide water for fire suppression and municipal needs. Repairs and restoration of water to all residents could take between 6 and 24 months, depending on earthquake severity. In addition to the loss of infrastructure, the District would lose significant revenue due to a lack of water sales, thereby restricting the District's ability to service debt, pay employees and conduct routine repairs.

6.2.2 Wildfire

Population Served: 3-5% ~ 500 to 800 people

Critical Facilities: Gobernador Reservoir; Shepard Mesa Tank; Shepard Mesa Pump Station; Foothill Reservoir (control building); Carpinteria Reservoir; Lateral 30 and 10 pump stations; meters and AMI equipment within the WUI.

The Thomas fire destroyed the electrical facilities at Gobernador Reservoir in December 2017. The roof of the reservoir is an asphalt shingle / wooden truss, making it vulnerable to fire. The Shepard Mesa pump station is located in an area of oaks and other mature trees. Shepard Mesa Tank – while elevated – could experience damage to control facilities at ground level and sustain damage to the metal supports. The control facility at Foothill Reservoir is located against a grassy slope but could experience heat damage to communications equipment and the backup diesel tank. The Carpinteria Reservoir was not damaged in the Thomas fire, however, there are structures and equipment that, given the right conditions, could have been burned. The District lost 2 new digital meters to the Thomas fire – at a cost of $1190.00.

6.2.3 Drought and Water Storage

Population served: 100% ~ 15,500 people

Critical Facilities: source of supply; HQ, Smillie, El Carro, and Lyons well.

During droughts conditions, the District relies on different mixes of available water than it would during normal operations. In the current drought, water available from the Cachuma project has been reduced and the District has relied heavily on groundwater extraction. This has contributed to a lowering of the water table throughout the Valley. If the drought persists, the District will reduce pumping capacity to avoid excessive drawdown and pump cavitation and begin relying on imported water through the Coastal Branch of the State Water Project.

6.2.4 Energy Shortage

Population Served: 100% ~ 15,500 people

Critical Infrastructure: System-wide

Presently, not all of the District's critical facilities have on-site backup generators to run wells and pumping equipment. The District has one portable generator that can be quickly pulled to the desired facility, most typically HQ well, however not all pumping facilities have required connectors or transfer switched.

6.2.5 Landslide

Population Served: 3-5% ~ 500 to 800 people

Critical Facilities: Shepard Mesa Tank; Carpinteria Reservoir; Foothill Reservoir; Lateral 10 pump-station; distribution system; meters and AMI infrastructure.

As noted above, the District has lost infrastructure due to landslides. With the Thomas Fire removing soil stabilizing vegetation in the foothills of the Valley, the District may expect to see additional landslide events, particularly during wet months.

6.2.6 Extreme Heat

Population Served: 100% ~ 15,500 people

Critical Facilities: water supply; HQ, Smillie, El Carro, and Lyons wells; Pumping Facilities; and communication infrastructure

During the summer months, the District already experiences days of very warm/hot temperatures. This leads to increased water use, primarily agricultural customers, and, in turn, can lead to decreases in stored water and the need to pump more groundwater or import water from the Cachuma project. More frequent extreme heat events will exacerbate this condition. In addition, the District currently does not use air conditioners to cool equipment at its well sites. The District currently has a heat issue at the El Carro well site, where a combination of enclosed space, southern exposure, and warm ambient air temperatures results in well motor temperatures and electrical equipment coming close to failure thresholds.

6.2.7 Cyber Attack

Population Served: 100% ~ 15,500 people

Critical Facilities: All

A cyberattack on District IT systems could have several adverse effects. Damage to computer systems could cause some facilities to malfunction, including District monitoring capabilities for critical facilities. Data stored for employees and customers could be breached and stolen. Additionally, remote access to the District's SCADA systems could result in manipulation of chemical levels at specific facilities. The District's financial security could also be damaged.

6.2.8 Dam Failure

Population Served: Bradbury Dam failure – 100% 15,500 people; Local reservoir failure – unknown

Critical Facilities: Carpinteria, Gobernador, and Foothill reservoirs

A failure at a local dam or debris basin could cause localized flooding that would occur with potentially little to no warning. Regional failures such as Bradbury or Lauro Dams could have the added impact of water supply loss for District customers.

6.2.9 Sea Level Rise and Coastal Erosion

Population Served: 1% - 3% ~150 – 500 people

Critical Facilities: distribution system; meters and AMI infrastructure, Local Groundwater Basin

In Carpinteria, development at sea level is located to the west of Linden Avenue. The District services numerous residences along Sandyland Road, Avenue Del Mar, Sand Point Road, and Padaro Lane. Many of these residences are vacation rentals. Sea level rise, along with storm surges could inundate meter boxes and damage infrastructure in the short term. In the long term, the District may have to alter the distribution system should seawater intrusion become an issue.

6.2.10 Flood and Debris Flow

Population Served: 30 - 40% 4,500 – 6,200 people

Critical Facilities: Gobernador Reservoir; Headquarters well; Smillie well; Lateral 10 pump-station; District Office and yard; distribution system; meters and AMI infrastructure

The District office and yard and HQ well border Santa Monica creek which passes beneath Via Real and Highway 101 via a channelized culvert. Debris blocking this culvert may back water up sufficiently to overflow the creek channel flooding the District yard and potentially disabling the HQ well. Smillie well is located adjacent to Carpinteria creek and the site could experience wash-out in a heavy rain event. The District has experienced one repetitive loss on a critical facility. The Lateral 10 pipeline extends over Arroyo Paradon and has been subject to two failures due to flooding. The most recent replacement cost the District $50,000.

7.0 MITIGATIONS STRATEGIES

In preparation for the 2022 LHMP update, the 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. This section contains the CVWD's updated and most current mitigation strategy as of 2022.

7.1 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.

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 STATUS OF PREVIOUS MITIGATION ACTIONS

The former LHMP was adopted in 2019 as an annex to the 2017 MJHMP. Since the 2017 MJHMP, the District has incorporated the LHMP goals, objectives, and mitigation actions into its local plans and processes, including its AWIA Risk and Resilience Assessment and Emergency Response Plan, budget planning, and capital improvement planning. Ongoing monitoring and evaluation of the LHMP by the District ensured mitigations are implemented and tracked. Key mitigation actions completed include the Sentry Well Project and the Shepard Mesa Tank Generator or Solar Power System Installation. The following projects from the 2019 LHMP Mitigation Implementation Plan are not started, in progress, or complete.

Not started

- El Carro Well Generator Installation
- Headquarters Well Generator Installation
- Smillie Well Generator Installation
- Gobernador Reservoir Generator Installation
- Gobernador Reservoir Wood Roof Fireproofing
- Shepard Mesa Pump Station Fireproof Control Building
- Emergency UHF Radio Communication System
- Critical Inventory for pumping equipment (pump motors, valves, electrical controls)
- Wood Meter Box Replacement

In progress

- Gobernador Reservoir Control Structure Fireproof Building

  - CVWD developed plans for this project but there was no further action.
- Ventura/ Santa Barbara Counties Intertie Project
  - Project development is in initial stages.
- Recycled Water Indirect Potable Reuse Project
  - Project is in design and permitting phase
- Fire Hydrant Modification
  - CVWD applied for a grant to complete this project but the grant was denied. There was no further action on this project.

Complete

- Sentry Well Project
  - Prolonged drought leading to depletion of the groundwater basin will lead to seawater intrusion. Once seawater advances into the basin, water can no longer be used or stored in that section of the basin. This project constructed monitoring wells along the coast to map seawater intrusion.
- Shepard Mesa Tank Generator or Solar Power System Installation
  - Shepard Mesa Tank provides potable water for firefighting, property protection, and consumption for ~300 customers in the remote area of the Shepherd Mesa. During the December 2017 Thomas Fire the District experienced major long term power loss to water production and distribution facilities restricting its ability to provide water for firefighting and protection. A solar power system would provide a reliable emergency backup power source for this critical water storage and distribution facility. This will reduce the risk of power outages during emergencies.

7.3 PRIORITIZATION PROCESS

A simplified Benefit-Cost Review was applied 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?

Table 7-1 provides a detailed benefit-cost review for each mitigation recommendation, as well as a relative priority rank (High, Medium, and Low) based upon the judgment of the Planning Team. 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

Table 7-1. Benefit-Cost Review Summary

Mitigation Activity	Benefits (Pros)	Costs (Cons)	Priority
2022-1 - El Carro Well Generator Installation	Backup power source for emergencies; provides water for consumption and firefighting	$230,000	High
2022-2 - HQ Well Generator Installation	Backup power source for emergencies; provides water for consumption and firefighting	$180,000	High
2022-3 – Smillie Well Generator Installation	Backup power source for emergencies; provides water for consumption and firefighting	$50,000	High
2022-4 - Gobernador Reservoir Generator Installation	Backup power source for emergencies; provides water for consumption and firefighting	$50,000	Medium
2022-5 – Gobernador Reservoir Wood Roof Fireproofing	Protects water supply during wildfire	$900,000	Medium
2022-6 – Gobernador Reservoir Control Structure Fireproof Building	Protects water supply during wildfire	$60,000	Medium
2022-7 - Shepard Mesa Pump Station Fireproof Control building	Protects water supply during wildfire	$155,000	Medium
2022-8 - Emergency UHF radio communication system	Enables staff to maintain communication and control of remote facilities during emergency	$25,000	Medium

Mitigation Activity	Benefits (Pros)	Costs (Cons)	Priority
2022-9 - Critical Inventory for pumping equipment (e.g., pumps Motors, valves, electrical controls)	Enables staff to maintain equipment functionality during emergencies by avoiding supply chain issues and procurement delays	$171,000	Low
2022-10 - Ventura/Santa Barbara Counties Intertie Project	Increase water supply reliability despite increasing prolonged drought by creating a new physical water supply connection	$15,000,000	High
2022-11 - Carpinteria Advanced Purification Project (CAPP)	Increase groundwater water supply reliability despite increasing prolonged drought by reclaiming and injecting water	$32,000,000	High
2022-13 - Wood Meter Box Replacement	Protect customer meters from wildfire	$300,000	Low
2022-14 - Groundwater Sustainability Agency Participation	Support future requests for grant funding to fund groundwater sustainability	$100,000	Medium

7.4 IMPLEMENTATION STRATEGY

The following projects have been identified by District staff as being critical to meeting hazard mitigation goals in the near term. District staff, including the Operations Manager, District Engineer, Assistant General Manager, and General Manager will prioritize the implementation of these projects based on needs assessments and a determination of financial resources. Financing will come from a mix of grants, financial-market lending, and rates and charges.

In addition, the District will work to coordinate the implementation of these projects with other local agencies, including the Cachuma Operations and Maintenance Board, Montecito Water District, Carpinteria Sanitary District, City of Carpinteria, and County of Santa Barbara where appropriate. The District regularly participates in planning and development processes with these various agencies and will continue to do so in the future to ensure compliance and implementation goals. The District is already participating in the County's Integrated Regional Water Management Program (IRWMP) to secure partnerships in implementing some projects.

Further, the District would continue to support and participate in countywide mitigation actions included in the 2022 MJHMP, including outreach to disadvantaged communities that lies within dam inundation and coastal hazards zones. The District would also support the City of Carpinteria's

mitigation actions to address coastal resiliency for vulnerable properties and infrastructure, including water supply. As described in Section 8.0, the District will continue to participate on the MAC and coordinate with the County on regional coordination and outreach for hazards associated with dam inundation and sea level rise/coastal erosion.

Sea level rise and coastal erosion affect a subset of properties within the District and a small subset of specific infrastructure in the immediate vicinity of these properties. The District's proposed mitigation efforts focus on drought, water supply, extreme heath, wildfire, and electrical mitigation measures because these threats apply to a larger portion of the District's customers (if not all customers) and infrastructure. Additionally, the measures to mitigate sea level rise and coastal erosion are largely outside the direct control of the District and better led by other agencies with support from the District, as appropriate.

2022-1. El Carro Well Generator Installation

During the December 2017 Thomas Fire, the CVWD experienced major long-term (5 days) power loss to this critical water production and treatment facility restricting the district's ability to provide water for firefighting, property protection, and consumption. El Carro well produces 45% of the district's groundwater production and serves ~6000 customers.

This project would provide a means to procure and install a 200kw emergency backup generator for the El Carro Well & Treatment Plant. Funding of this project will cover the costs associated with all permitting, engineering, procurement, and installation of a 200kw emergency backup power generator and automatic transfer switch. The district has received preliminary pricing quotes and is in the beginning stages of the permitting process with the Santa Barbara County Air Pollution Control District. Because of the proximity to a school special noise reduction and exhaust particulate filtration systems are required for this facility.

Mitigation Priority and Performance	
Priority	High
Hazards Mitigated	Wildfire, Energy Shortage, Extreme Heat
Estimated Timeline	18 months
Estimated Cost/Funding Source	$230,000/ FEMA & General Funds
Responsible Agency/Department	CVWD
Relevant Objectives	Goal 2: Protect people and existing community assets (e.g., critical facilities, infrastructure, water, and public facilities) from hazards. Objective 2.B: Enhance the ability of community assets, particularly critical facilities, to withstand hazards. Objective 2.D: Upgrade and replace aging critical facilities and infrastructure.
Comments	This project was adapted from 2018-CVWD 1 included as part of the 2018 LHMP.

2022-2. HQ Well Generator Installation

During the December 2017 Thomas Fire, the CVWD experienced major long-term (5 days) power loss to this critical water production and treatment facility restricting the district's ability to provide

water for firefighting, property protection, and consumption. Headquarters well produces 55% of the district's groundwater and serves ~8500 customers.

This project would provide a means to procure and install a 300kw emergency backup generator for the Headquarters Well & Treatment Plant. Funding of this project will cover the costs associated with all permitting, engineering, procurement, and installation of a 300kw emergency backup power generator and automatic transfer switch. The district has received preliminary pricing quotes and is in the beginning stages of the permitting process with the Santa Barbara County Air Pollution Control District.

Mitigation Priority and Performance	
Priority	High
Hazards Mitigated	Wildfire, Energy Shortage, Extreme Heat
Estimated Timeline	18 months
Estimated Cost/Funding Source	$180,000/ FEMA funding and General funding
Responsible Agency/Department	CVWD
Relevant Objectives	Goal 2: Protect people and existing community assets (e.g., critical facilities, infrastructure, water, and public facilities) from hazards. Objective 2.B: Enhance the ability of community assets, particularly critical facilities, to withstand hazards. Objective 2.D: Upgrade and replace aging critical facilities and infrastructure.
Comments	This project was adapted from 2018-CVWD 2 included as part of the 2018 LHMP.

2022-3. Smillie Well Generator Installation

During the December 2017 Thomas Fire, CVWD experienced major long-term power loss (about 5 days) to this critical water production and treatment facility restricting the district's ability to provide water for firefighting, property protection, and consumption. Smillie well produces 55% of the district's groundwater production and serves ~1500 customers.

This project would provide a means to procure and install a 100kw emergency backup generator for the Smillie Well & Treatment Plant. Funding of this project will cover the costs associated with all permitting, engineering, procurement, and installation of a 100kw emergency backup power generator and automatic transfer switch. The district has received preliminary pricing quotes and is in the beginning stages of the permitting process with the Santa Barbara County Air Pollution Control District.

Mitigation Priority and Performance	
Priority	High
Hazards Mitigated	Wildfire, Energy Shortage, Extreme Heat
Estimated Timeline	18 months
Estimated Cost/Funding Source	$50,000/ FEMA funding and General funding
Responsible Agency/Department	CVWD
Relevant Objectives	Goal 2: Protect people and existing community assets (e.g., critical facilities, infrastructure, water, and public facilities) from hazards.

Mitigation Priority and Performance	
	Objective 2.B: Enhance the ability of community assets, particularly critical facilities, to withstand hazards. Objective 2.D: Upgrade and replace aging critical facilities and infrastructure.
Comments	This project was adapted from 2018-CVWD 3 included as part of the 2018 LHMP.

2022-4. Gobernador Reservoir Generator Installation

During the December 2017 Thomas Fire, CVWD experienced major long-term power loss to Gobernador production and distribution facilities restricting the district's ability to provide water for firefighting and property protection. Gobernador reservoir is potable water storage and distribution facility which is the only source of storage for the remote area of Gobernador Canyon. This facility has a storage capacity of 500,000 gallons for firefighting, property protection, and consumption to 300 customers.

This project would reduce or eliminate power outages during wildfire and provide reliable emergency backup power for this critical water storage and distribution facility.

This project would provide fund procurement and installation of an emergency backup generator for this water production and treatment facility. Funding of this project will cover the costs associated with all permitting, engineering, procurement, and installation costs of an emergency backup power generator and automatic transfer switch. The District has received preliminary pricing quotes and is in the beginning stages of the permitting process with the Santa Barbara County Air Pollution Control District.

Mitigation Priority and Performance	
Priority	Medium
Hazards Mitigated	Wildfire, Energy Shortage, Extreme Heat
Estimated Timeline	18 months
Estimated Cost/Funding Source	$50,000/ FEMA funding and General funding
Responsible Agency/Department	CVWD
Relevant Objectives	Goal 2: Protect people and existing community assets (e.g., critical facilities, infrastructure, water, and public facilities) from hazards. Objective 2.B: Enhance the ability of community assets, particularly critical facilities, to withstand hazards. Objective 2.D: Upgrade and replace aging critical facilities and infrastructure.
Comments	This project was adapted from 2018-CVWD 4 included as part of the 2018 LHMP.

2022-5. Gobernador Reservoir Wood Roof Fireproofing

During the December 2017 Thomas Fire the Carpinteria Valley Water District experienced fire damage to Gobernador Reservoir which is instrumental for fire protection and daily water supply to Gobernador Canyon. Gobernador reservoir is 500,000-gallon water storage and distribution

facility serving ~500 customers. The fire melted all controls and communications to the reservoir. As a result, CVWD was unable to operate the reservoir.

This project would fund all necessary permits along with the necessary engineering and design procurement and installation of a fireproof roof for this reservoir to protect water quality and maintain a supply of water for firefighting needs.

Mitigation Priority and Performance	
Priority	Medium
Hazards Mitigated	Wildfire
Estimated Timeline	18 months
Estimated Cost/Funding Source	$900,000/ FEMA funding and General funding
Responsible Agency/Department	CVWD
Relevant Objectives	Goal 2: Protect people and existing community assets (e.g., critical facilities, infrastructure, water, and public facilities) from hazards. Objective 2.B: Enhance the ability of community assets, particularly critical facilities, to withstand hazards. Objective 2.D: Upgrade and replace aging critical facilities and infrastructure.
Comments	This project was adapted from 2018-CVWD 6 included as part of the 2018 LHMP.

2022-6. Gobernador Reservoir Control Structure Fireproof Building

During the December 2017 Thomas Fire the Carpinteria Valley Water District experienced fire damage to Gobernador Reservoir which is instrumental for fire protection and daily water supply to Gobernador Canyon. Gobernador reservoir is 500,000-gallon water storage and distribution facility serving ~500 customers. The fire melted all controls and communications to the reservoir. As a result, CVWD was unable to operate the reservoir.

This project would protect the communications and control equipment at Gobernador Reservoir from wildfire. This project would provide funding for all engineering, design, and installation costs for the construction of a fireproof cement block building to prevent repeated wildfire damage to the control system and water quality monitoring equipment located at this facility. Construction would consist of relocation of the main electrical service and relocation to a newly constructed cement block building which would house the main electrical panel, PLC and controls, SCADA communication equipment, and chlorine residual monitoring equipment. It would also protect a proposed new emergency backup generator.

Mitigation Priority and Performance	
Priority	Medium
Hazards Mitigated	Wildfire
Estimated Timeline	12 months
Estimated Cost/Funding Source	$60,000/ FEMA funding and General funding
Responsible Agency/Department	CVWD
Relevant Objectives	Goal 2: Protect people and existing community assets (e.g., critical facilities, infrastructure, water, and public facilities) from hazards.

Mitigation Priority and Performance	
	Objective 2.B: Enhance the ability of community assets, particularly critical facilities, to withstand hazards. Objective 2.D: Upgrade and replace aging critical facilities and infrastructure.
Comments	This project was adapted from 2018-CVWD 7 included as part of the 2018 LHMP.

2022-7. Shepard Mesa Pump Station Fireproof Control building

During the December 2017 Thomas Fire, CVWD experienced fire damage around the Shepard Mesa Pump Station. This pump station supplies water to a 50,000-gallon reservoir that provides fire protection and potable water for consumption to ~300 customers.

This project would protect this critical water supply from wildfire damage. This project would provide funding for all permitting fees, engineering & design requirements, and construction costs for the construction of a fireproof building to protect the pumping, controls, and emergency generator from wildfire damage.

Mitigation Priority and Performance	
Priority	Medium
Hazards Mitigated	Wildfire
Estimated Timeline	18 months
Estimated Cost/Funding Source	$155,000/ FEMA funding and General funding
Responsible Agency/Department	CVWD
Relevant Objectives	Goal 2: Protect people and existing community assets (e.g., critical facilities, infrastructure, water, and public facilities) from hazards. Objective 2.B: Enhance the ability of community assets, particularly critical facilities, to withstand hazards. Objective 2.D: Upgrade and replace aging critical facilities and infrastructure.
Comments	This project was adapted from 2018-CVWD 8 included as part of the 2018 LHMP.

2022-8. Emergency UHF radio communication system

During disaster events like earthquakes, floods, debris flows/landslides, wildfires, or dam failures, the cellular communication towers become overloaded and communication to CVWD field staff is lost because cell phones are their primary form of communication.

This project would provide funding for the procurement and installation of a UHF radio communication system for field communications during a natural disaster. This would create a redundant method of communication (between CVWD staff and with emergency services) during an emergency.

Mitigation Priority and Performance	
Priority	Medium

Mitigation Priority and Performance	
Hazards Mitigated	Wildfire, Earthquake, Flood/Debris Flow, Dam Failure, Landslide, Cyber Attack
Estimated Timeline	6 months
Estimated Cost/Funding Source	$25,000/ FEMA funding and General funding
Responsible Agency/Department	CVWD
Relevant Objectives	Goal 2: Protect people and existing community assets (e.g., critical facilities, infrastructure, water, and public facilities) from hazards Objective 2.C: Use best available science and technology to better protect life and property
Comments	This project was adapted from 2018-CVWD 9 included as part of the 2018 LHMP.

2022-9. Critical Inventory for pumping equipment (e.g., pumps Motors, valves, electrical controls)

When equipment fails and CVWD does not have replacement parts readily available, CVWD can experience extended equipment downtime which impacts CVWD's ability to serve customers. This is especially problematic during disasters.

This project proposes creating an inventory of critical spare parts for CVWD's wells, pump stations, and reservoirs. For some parts with limited warranties or other restrictions, CVWD will develop relationships with vendors to keep parts on hand so CVWD can quickly procure parts when necessary. These systems would enable rapid repair of critical infrastructure (during a disaster or otherwise) by creating quick access to necessary parts and avoiding long lead time and supply chain issues that delay the repair.

Mitigation Priority and Performance	
Priority	Low
Hazards Mitigated	Wildfire, Earthquake, Flood/Debris Flow, Sea Level Rise/Coastal Erosion, Landslide
Estimated Timeline	12 months
Estimated Cost/Funding Source	$171,000/ FEMA funding and General funding
Responsible Agency/Department	CVWD
Relevant Objectives	Goal 5: Prepare to adapt and recover from the impacts of climate change and ensure regional resiliency. Objective 5.B: Identify, assess, and prepare for impacts of climate change.
Comments	This project was adapted from 2018-CVWD 10 included as part of the 2018 LHMP.

2022-10. Ventura/Santa Barbara Counties Intertie Project

The South Coast Conduit (SCC) transports all surface water supplies for the South Coast of SB County. If the SCC were damaged by wildfire, flood, debris flow etc., CVWD would lose access to all imported water supplies. CVWD would only have access to limited groundwater supplies.

This project would connect two completely independent water conveyance systems through a two-mile-long 16-inch diameter intertie pipeline with a pump station and some minor water treatment. This would allow water to be moved into Santa Barbara County from the east if the South Coast Conduit were down and would allow water to move west into Ventura County if there were a water shortage there.

The Casitas Water District, Carpinteria Water District, Central Coast Water Authority, Cachuma Member units are working together on this project.

Preliminary design and CEQA are complete. The final design will be complete in 2022.

Mitigation Priority and Performance	
Priority	High
Hazards Mitigated	Wildfire, earthquake, flood/debris flow, landslide
Estimated Timeline	24 months
Estimated Cost/Funding Source	$15 million from ASADRA and FEMA funds
Responsible Agency/Department	CVWD
Relevant Objectives	Goal 2: Protect people and existing community assets (e.g., critical facilities, infrastructure, water, and public facilities) from hazards. Objective 2.B: Enhance the ability of community assets, particularly critical facilities, to withstand hazards. Objective 2.D: Upgrade and replace aging critical facilities and infrastructure.
Comments	This project was adapted from 2018-CVWD 11 included as part of the 2018 LHMP.

2022-11. Carpinteria Advanced Purification Project (CAPP)

Prolonged drought leads to water shortages and potentially supply interruptions causing widespread water shortages in Southern Santa Barbra County. Existing documents like the GWR (Recycled Water) Facility study and the Hazard Mitigation Plan provide additional detail about this hazard.

CVWD proposes to construct an Advanced Water Treatment Plant to create a local, drought-resistant water supply that can be used during prolonged droughts and water supply shortages. This project will provide a means to reclaim water that is being discharged to the ocean clean it to an ultra-pure level and store it in the local groundwater basin for use during extended dry periods or to replenish the groundwater basin, as necessary.

The Advanced Water Treatment Plant with (MFRO) would be located at the existing Carpinteria wastewater treatment plant and include 1.5 miles of 12-inch pipeline with 2 Injection well sites. The preliminary design is complete including facilities and feasibility studies, injection site analysis, CEQA report, and preliminary engineering.

Mitigation Priority and Performance	
Priority	High
Hazards Mitigated	Drought, Earthquake
Estimated Timeline	24 – 36 months

Mitigation Priority and Performance	
Estimated Cost/Funding Source	$32 Million from Clean Water SRF loans, Title 16, USBR grants, as well as other State grants and general funds
Responsible Agency/Department	CVWD
Relevant Objectives	Goal 5: Prepare to adapt and recover from the impacts of climate change and ensure regional resiliency. Objective 5.A: Use the latest climate science to implement hazard mitigation strategies in response to climate change.
Comments	This project was adapted from 2018-CVWD 12 included as part of the 2018 LHMP, formerly called the Recycled Water Indirect Potable Reuse Project

2022-12. Wood Meter Box Replacement

During the Thomas Fire, CVWD lost several meters due to wood meter boxes catching fire.

CVWD will replace existing wood meter boxes with fire-retardant boxes. This will protect meters from fire by preventing the meter box from igniting.

CVWD will identify the number and size of meter boxes to replace.

Mitigation Priority and Performance	
Priority	Low
Hazards Mitigated	Wildfire
Estimated Timeline	8 months
Estimated Cost/Funding Source	$300,000/ FEMA funding and General funding
Responsible Agency/Department	CVWD
Relevant Objectives	Goal 2: Protect people and existing community assets (e.g., critical facilities, infrastructure, water, and public facilities) from hazards. Objective 2.B: Enhance the ability of community assets, particularly critical facilities, to withstand hazards. Objective 2.D: Upgrade and replace aging critical facilities and infrastructure.
Comments	This project was adapted from 2018-CVWD 14 included as part of the 2018 LHMP

2022-13. Groundwater Sustainability Agency Participation

The Carpinteria Valley Water District is a member of the Carpinteria Groundwater Sustainability Agency (GSA). The Water District's Board of Directors is also the Regular Board of Directors for the GSA. Additionally, until the GSA has its own staff, Water District staff complete tasks for the GSA. Therefore, the ensure the GSA is able to develop and adopt a Groundwater Sustainability Plan, it is imperative that the Water District has the resources to support ongoing GSA activites.

This project would support future requests for grant funding to fund groundwater sustainability.

Mitigation Priority and Performance	
Priority	Medium
Hazards Mitigated	Drought and Water Shortage

Mitigation Priority and Performance	
Estimated Timeline	1-3 years
Estimated Cost/Funding Source	$100,000/ FEMA funding and General funding
Responsible Agency/Department	CVWD and Carpinteria GSA
Relevant Objectives	Goal 5: Prepare to adapt and recover from the impacts of climate change and ensure regional resiliency. Objective 5.A: Use the latest climate science to implement hazard mitigation strategies in response to climate change.
Comments	

8.0 PLAN MAINTENANCE

8.1 PROGRESS

The CVWD and its departments have been continually implementing mitigation actions and monitoring their effectiveness since the last update of the LHMP in 2019. Some projects from 2019 were completed successfully, while others are ongoing or still pending. This section sets forth the intended process for monitoring and maintaining the 2022 LHMP.

8.2 PLAN REVIEW, MAINTENANCE, AND UPDATES

The District's LHMP will be reviewed by District staff annually. This plan will be re-evaluated whenever a significant hazard-related event occurs within the District's service area or should critical facilities operated by partnering agencies be affected by hazards. In addition, the plan and projects identified will be incorporated into annual budgeting and capital expenditures planning.

LHMP updates will be undertaken in the following manner:

- Analysis and risk assessment of hazards;
- Review and revise plan goals and objectives;
- Review and revise mitigation strategies;
- Prepare and disseminate draft plan to the update committee and Board of Directors;
- Submit the plan to Cal OES / FEMA and local agencies for review and comment;
- Submit revised draft plan for review by the Board of Directors;
- Submit the final HMP to FEMA for approval.

The final approved LHMP will be posted on the District's website along with contact information. As part of the budget process, the District will take the opportunity to advance its preferred implementation strategies and invite public comment.

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 the District, 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 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.

8.3 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 District and the existing institutions, plans, policies and programs that help to implement the LHMP (e.g., capital infrastructure improvement plan, drought preparedness and water storage plan, conservation programs). The LHMP annex 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 its AWIA Risk and Resilience Assessment and Emergency Response Plan to implement infrastructure improvements to reduce earthquake, drought, and flooding hazards.

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.

8.4 ONGOING PUBLIC OUTREACH AND ENGAGEMENT

After initial adoption of the plan, 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 that the District undertakes separately from the County process, 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.

8.5 POINT OF CONTACT

Comments or suggestions regarding this plan may be submitted at any time to Maso Motlow, Management Analyst using the following information:

Maso Motlow, Management Analyst
Carpinteria Valley Water District
1301 Santa Ynez Avenue
Carpinteria, CA 93013
Maso@cvwd.net
805-684-2816 Ext. 108

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Goleta Water 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 Goleta Water District (GWD 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 Infrastructure Improvement Plan and Urban Water Management Plan.
- Use the LHMP's assessment of capabilities, hazards, and vulnerabilities to inform planning, infrastructure improvements, and programs, including outreach and engagement programs for water conservation.
- Implement mitigation actions through the Infrastructure Improvement Plan and Sustainability Plan, maintenance programs, grant programming, community outreach, and budget process.
- Review and evaluate mitigation actions before and after disasters, including wildfires and 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), Montecito Fire Protection District (MFPD), Montecito Water District (MWD), Santa Maria Valley Water Conservation District (SMVWCD), and GWD. 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. The District was represented by Daniel Brookes, Engineering and Infrastructure Manager, and KK Holland, Principal Policy Analyst, 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	**MAC Meeting #1 (virtual)** 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	**MAC Meeting #2 (virtual)** 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	**MAC Meeting #3 (virtual)** 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	**MAC Meeting #4 (virtual)**

Date	Purpose
	Collected feedback on 2017 mitigation strategies Conducted interactive exercise on mitigation strategies for key hazards unaddressed in previous MJHMP Discussed annex updates
January 2022	**MAC Meeting #5 (virtual)** Presented draft plan Discussed key MAC/LPT review needs and key issues Discussed annex updates to dovetail with plan update
February 2022	**MAC Meeting #6 (virtual)** Review and discuss public comments received on the draft plan Recommend a revised draft plan to decision-makers 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. Goleta Water District Local Planning Team 2022

Name	Title
Daniel Brooks	Engineering and Infrastructure Manager
KK Holland	Principal Policy Analyst
Kelly Bourque	Capital Projects Lead
Brooke Welch	Senior Water Resources Analyst

The GWD LPT members worked directly with the County 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 District 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 (1/10/22) to discuss LHMP priorities and mitigation approaches.
January and March 2022	Reviewed new maps and local vulnerabilities.

Meeting Dates	Summary of Activity
	Provided input on the status of LHMP mitigation strategies. Reviewed draft mitigation strategies and provided feedback. 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.

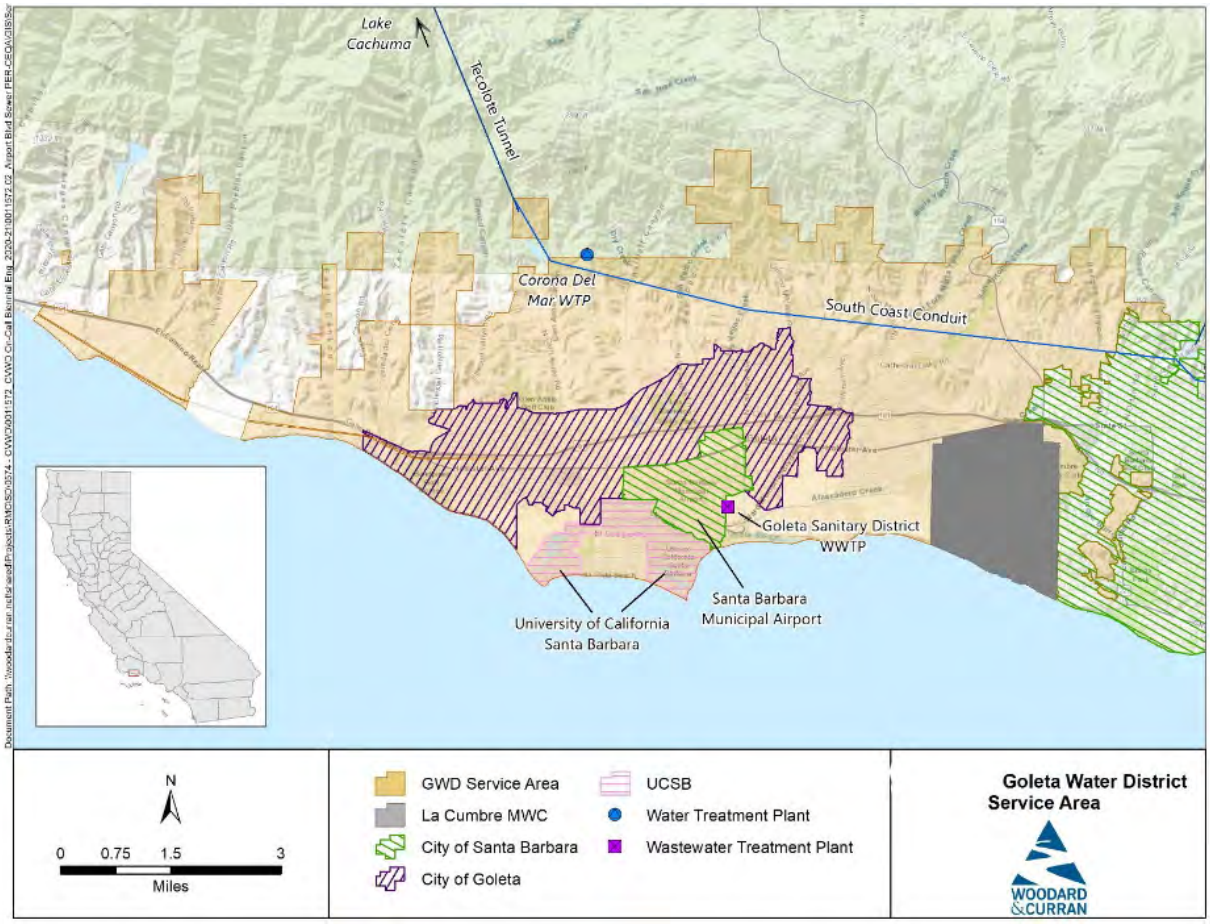
In April 2022, the LHMP was completed and made available for public review, concurrent with review by FEMA and CalOES. A copy of the document was posted to the District website with a copy available at the District office. The opportunity to review documents was announced on the District's website. The community was welcome to submit written or verbal comments to the Principal Policy Analyst. In addition, the opportunity for the community to be heard was permitted during the Water Management and Long Range Planning Committee Meeting and the District Board of Directors meeting before the adoption of this plan.

4.0 CAPABILITY ASSESSMENT

The District was established on November 17, 1944. The service territory extends along the south coast of Santa Barbara County west from the Santa Barbara city limits to El Capitan (Figure 4-1). The District is bounded to the south by the Pacific Ocean and the north by the foothills of the Santa Ynez Mountains, spanning approximately 29,000 acres. The District provides water to a population of approximately 87,000, including residential, commercial, agricultural, industrial, and institutional customers by drawing on a diverse water supply portfolio that includes local surface water supplies, groundwater, state water, and recycled water. The District's water system includes over 270 miles of pipelines, the Corona Del Mar Water Treatment Plant (CDMWTP), storage reservoirs, pumping facilities, nine wells, a recycled water system, and connections with Lake Cachuma, the Goleta Groundwater Basin (Basin), and the State Water Project (SWP).

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 with hazard mitigation planning, as well as codes, ordinances, and plans already in place associated with 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.

Figure 4-1. Goleta Water District Service Area



4.1 KEY DEPARTMENTS

The District operates under the general direction of an elected five-member Board of Directors (Board). The terms of office are four years, with elections held every two years and terms staggered to ensure continuity. The District is transitioning from at-large elections, in which residents may vote for multiple candidates, to district elections, in which voters elect a single board member to represent their specific district or area. The first district-based election will take place on November 1, 2022, with two seats contested. The Board holds public meetings on the second Tuesday of every month, and three additional public committees meet monthly. The Board employs a General Manager to manage approximately 65 staff members, who carry out a variety of District functions. These include water treatment and distribution, meter installation and repair, water quality testing, infrastructure

development and maintenance, customer support, accounting, conservation activities, and applications for new water services.

The Executive Management team is led by the General Manager, John McInnes, in close coordination with Assistant General Manager, David Matson, who also serves as Chief of Staff. The District features three distinct Departments – Administration, Engineering and Infrastructure, and Water Supply and Conservation.

As a Special District with a governing Board, the District can set policy, raise funds, issue debt, and set water rates. The District relies on an adopted yearly budget, a Five-Year Infrastructure Improvement Plan, and an adopted procurement policy to manage, plan for and maintain water service to customers. Management of the water supply portfolio is informed by The Water Supply Management Plan (WSMP), the Groundwater Management Plan (GMP), and the Urban Water Management Plan (UWMP), all of which are updated approximately every five years. A Drought Preparedness and Water Shortage Contingency Plan was adopted in 2014 and updated in 2021. The District also completed a Stormwater Resource Plan, and a Potable Reuse Facilities Plan (feasibility study) to explore options for developing alternative water supplies.

The District also runs a conservation program that includes significant customer education on water use restrictions, tips on saving water, and rebate programs, and is a member of the California Water Efficiency Partnership, and the Regional Water Efficiency Program. District rebate programs distribute water-saving devices such as hose nozzles and low flow shower heads and provide customers with financial assistance to implement water-saving irrigation upgrades and change out landscaping for water-wise plants.

District rates are informed by a Cost-of-Service Study to capture the cost to serve each customer class and are structured according to best practices in the industry to include tiered pricing.

4.1.1 Administration Department

The Administration Department includes Financial Management, Reporting, Information Technology, Customer Service, Human Resources, and Public Outreach. Accounting services ensure proper controls and processes are in place to accurately collect revenue and disburse expenditures. Routine transaction services include accounts payable, accounts receivable, investment and cash management, annual budget preparation, monthly budget tracking, cash flow analysis, payroll and benefits processing, rate analysis, and annual audit report preparation. Customer Service is the initial point of contact for the community, handling incoming calls, receiving visitors, and managing the billing and collection process for approximately 16,600 customer connections. Human Resources works closely with District management to recruit, train, and retain the most qualified personnel for the District. The Public Outreach program includes all District communications, media relations, press releases, special outreach initiatives, newsletters, and oversight of the website and internet presence. Public outreach staff identifies innovative and effective communication methods to engage with and understand the customer base, ensuring District services align with customer needs and values.

4.1.2 Engineering and Infrastructure Department

The Engineering and Infrastructure Department includes programs and functions related to capital infrastructure planning and implementation, including maintenance, and improvement of three water systems and associated facilities: the Potable Water System, the Goleta West Conduit System, and the Recycled Water System to ensure the water treatment and delivery systems are designed and installed to meet industry and regulatory standards as well as the community's water supply needs. The department also includes the review of new water services, engineering research and analysis, and management of the Geographic Information System (GIS), and is responsible for capital project management, including implementation of the District Five-Year Infrastructure Improvement Plan and Sustainability Plan (see Section 4.5, *Relevant Plans, Policies, and Programs*). Specific efforts include developing project budgets, cost estimates, and prioritization schedules to meet the needs of the District over the five-year planning horizon. To keep costs stable and prioritize investment, Engineering focuses on maintaining and replacing vital infrastructure needed to ensure long-term capital asset integrity.

4.1.3 Water Supply and Conservation Department

The Water Supply and Conservation Department includes the following categories: Water Resources, Conservation Programs, and New Water Services. Water conservation and efficient water use help preserve and extend water supplies for all District customers. New Water Services focus on establishing relationships with new customers through the water service application process. The Water Resources program supports the ongoing management of water supply agreements and coordinates the District's foundational resource plans, including the Groundwater Management Plan, WSMP, UWMP, and the Sustainability Plan (see Section 4.5, *Relevant Plans, Policies, and Programs*).

4.2 ADMINISTRATIVE AND TECHNICAL CAPACITY

The administrative and technical capabilities of the District, as shown in Table 4-1, include staff, personnel, and department resources available to implement the actions identified in Section 7.0, *Mitigation Strategy* of this LHMP. 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 personnel with GIS skills.

Table 4-1. Goleta Water District Administrative and Technical Capacity

Personnel Resources	Yes/No	Department/Position
Planner/engineer with knowledge of land development/land management practices	N/A	N/A
Engineer/professional trained in construction practices related to buildings and/or infrastructure	Yes	Engineering & Infrastructure (Department Manager, Operations Supervisor, Engineering Supervisor, Capital Project Lead, Associate Engineer)

Personnel Resources	Yes/No	Department/Position
Planner/engineer/scientist with an understanding of natural hazards	Yes	Engineering & Infrastructure (Department Manager, Engineering Supervisor)
Personnel skilled in GIS	Yes	Engineering & Infrastructure (GIS/Asset Management Specialist, Associate Engineer)
Full-time building official	No	N/A
Floodplain manager	No	N/A
Emergency manager	Yes	Engineering & Infrastructure (Operations Supervisor, Treatment Supervisor)
Grant writer	Yes	Engineering & Infrastructure (Capital Project Lead); Water Supply & Conservation (Senior Water Resources Analyst); Office of the General Manager (Principal Policy Analyst)
Other personnel	Yes	
GIS Data Resources (Hazard areas, critical facilities, land use, building footprints, etc.)	Yes	Engineering & Infrastructure (GIS/Asset Management Specialist, Associate Engineer)
Warning Systems/Services (Reverse 9-11, cable override, outdoor warning signals)	No	N/A
Other	No	

4.3 LEGAL AND REGULATORY CAPABILITIES

As a Special District with a governing Board, the District can set policy, raise funds, issue debt, and set water rates. The District relies on an adopted yearly budget (refer to Section 4.4 below), a Five-Year Infrastructure Improvement Plan, and an adopted procurement policy to manage, plan for and maintain water service to customers. Management of the water supply portfolio is informed by the Groundwater Management Plan, WSMP, and UWMP, all of which are updated approximately every five years. A Drought Preparedness and Water Shortage Contingency Plan was adopted in 2014 and updated in 2021. The District also completed a Stormwater Resource Plan, and a Potable Reuse Facilities Plan (feasibility study) to explore options for developing alternative local water supplies.

The legal and regulatory capabilities of GWD 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 ordnances, 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. Goleta Water District Regulatory Capability

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

4.4 FINANCIAL RESOURCES

Each year, the Board of Directors approves the District's Budget for the following fiscal year (FY), which runs from July 1 through June 30. The Budget blends advanced revenue forecasting and effective expenditure management with the infrastructure investment needed to deliver safe, cost-effective, and sustainable water supplies to the community. The FY 2021-22 Budget also represents a short-term financial plan consistent with the goals outlined in the 2020-2025 Expenditure Forecast and 2020 Cost of Service Study. FY 2020-21 saw estimated actual revenues and transfers of $42.9 million and expenditures of $41.6 million, with a reserve designation of $1.3 million.

In addition to an annual budget, the District also prepares an Annual Comprehensive Financial Report. The Report states that during FY 2021, the District's Net Position increased $36,856 (0.1 percent) to $34,366,479 from $34,299,623, the Net Position at the end of FY 2020. Operating Revenues increased by $8,472,844 and Operating Expenses decreased by $1,950,949.

The District's major economic drivers for its revenue base are monthly service charges, water sales, investment revenue, conveyance revenue, and miscellaneous fees. Expenditures include water supply agreements, personnel, and operations and maintenance such as water treatment and supplies.

Table 4-3. Goleta Water District Fiscal Capability

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

4.5 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 has a robust and expansive outreach program that connects with customers across a variety of communication channels and provides frequent communication with up to 15 or more direct contacts per year. The District maintains a website, updated regularly with feature articles on relevant topics of community concern, including drought and water supply conditions, and FAQs. Billing Statement messages reach approximately 16,000 customers a month with a customizable message, and billing inserts can be added as needed. A Newsletter is mailed twice a year to all households in the service territory, even if they do not receive a bill directly, and a postcard notification for the Consumer Confidence Report is mailed yearly. All mailings list the District phone number and website and contain links to additional information. Social media accounts on Facebook and Twitter regularly post about programs, special events the District participates in, and educational content, and are used during emergencies to provide updated information on emergency response activities, service interruptions, and links to Santa Barbara County emergency operations. Emergency preparedness and emergency response activities are typically featured several times per year on social media or in the Newsletter. During emergencies and service interruptions, the District coordinates with Santa Barbara County to send reverse 911 calls to affected households, and can physically tag doors for targeted outages. The District participates in several community festivals and events, including the Goleta Lemon Festival and Earth Day.

4.6 RELEVANT PLANS, POLICIES, AND ORDINANCES

The District has a range of guidance documents and plans for each of its departments. These include an Infrastructure Improvement Plan, Urban Water Management Plan, Drought Preparedness and Water Shortage Contingency Plan, Sustainability Plan, and Stormwater Resource Plan, as well as conservation programs, as detailed below.

The District periodically reviews and updates policy documents and procedures as new information becomes available and incorporates best management practices. The District reviews changes to existing policies and programs through both its Water Management and Long Range Planning Committee, and its Administration Committee before adoption by the Board of Directors. After a natural disaster or emergency incident, the District reviews protocols and updates policies and procedures when appropriate. For example, during the recent drought, several code amendments were made to clarify or strengthen water use restrictions and remain consistent with State guidelines.

4.6.1 2020 Infrastructure Improvement Plan

The 2020-2025 Infrastructure Improvement Plan (IIP) identifies the minimum level of investment needed to accomplish the District's top two priorities: maintaining water quality and maintaining operable infrastructure. This investment is balanced against the need to fulfill the District's mission of providing a reliable supply of quality water at the most reasonable cost to the District's present and future customers. The 2020-2025 IIP identifies 136 projects totaling $343 million in order of priority and recommends funding the 48 most critical projects for $50 million. All projects are described in summary with cost estimates. Projects proposed for funding also state the need for the project, the consequences of not funding the project, and a five-year cost schedule. Some of the top priority projects identified in the IIP include CDMWTP solids handling upgrades due to water quality changes at Lake Cachuma ($6,80,000), well treatment upgrades ($7,500,000), and a new replacement well ($5,100,000).

4.6.2 2020 Urban Water Management Plan

Preparation of a UWMP is required by the California Department of Water Resources (DWR) for all urban water suppliers within the State of California. Between 2020 and 2040, total potable demands are projected to increase by 1,035 acre-feet per year (AFY) from 10,000 AFY to 11,035 AFY (excluding water losses) due to population growth. The largest customer of District water is the University of California, Santa Barbara (UCSB). As students return to in-person learning post-pandemic, water demand is expected to increase to pre-pandemic levels. GWD's 2020 potable and raw water deliveries were comprised of 53 percent residential, 24 percent agricultural irrigation, 19 percent commercial and institutional, and 4 percent landscape irrigation (comprised of dedicated irrigation meters).

4.6.3 2021 Drought Preparedness and Water Shortage Contingency Plan

The objectives of this Plan are to describe the conditions which constitute a water shortage emergency, define and discuss the various stages of action, and provide guidance and procedures to undertake during a declared water shortage. The Plan is consistent with the California Department of Water Resources 2020 UWMP Guidebook, California Water Code §§350 – 359, Government Code §§8550-8551, and the Urban Water Management Planning Act. Broadly, this Plan allows the District to identify and quickly respond to a water shortage in a manner that provides for public health and safety while minimizing the impacts on customers. The Plan identifies and describes the factors affecting water supply, including the indicators of shortage conditions as well as the process and uncertainties inherent in the forecasting process. It also establishes five water shortage stages and outlines the "triggers" for each stage, reviews the general strategies the District will employ to mitigate the impacts of drought and water shortage on the community, and discusses water shortage response actions such as public outreach, demand reduction programs, enforcement actions, and other operational actions.

4.6.4 2012 Sustainability Plan and 2019-2021 Sustainability Plan Progress Report

The District developed the Sustainability Plan in 2012 to illustrate how sustainability has been and will continue to be built into the District's water service. The Plan establishes three guiding principles to define how the three sustainability categories (i.e., economic, environmental, and social) are interpreted by the District as they relate to public water utility service delivery and resource management strategy. District initiatives are divided into three distinct service delivery categories:

- Customer Service and Business Operations
- Administration Buildings and Fleet Management
- Water Supply, Treatment, and Distribution System Investment

The principles are implemented through everyday operations as well as initiatives identified annually in coordination with the District's Annual Budget and IIP. The Sustainability Plan was designed to be adaptable and capable of adjusting to changing conditions. As such, the Annual Progress Report provides an overview of sustainability initiatives and outlines the District's recent accomplishments toward the three guiding principles established in the 2012 Sustainability Plan. Achievements identified in the 2019-2021 Progress Report include the District receiving a grant to

install a renewable backup power system at six of its reservoirs, receiving a grant to install battery backup power facilities at the CDMWTP, and reducing operational energy consumption, saving the District $44,000 per year on electricity costs. The Report also outlines technological and communications upgrades with customers, provides an overview of drought planning, and highlights key District initiatives.

4.6.5 2017 Stormwater Resource Plan

Stormwater management in the District service territory is within the jurisdiction of the Santa Barbara County Department of Public Works Flood Control District (County Flood Control), as well as the City of Goleta and UCSB. The District manages stormwater runoff per the same state and federal regulations. While it does not have the jurisdiction or authority to implement stormwater capture projects, the Stormwater Resource Plan explores and promotes water supply augmentation and improved water quality within the District's service territory for recommendation to County Flood Control as the appropriate land use and flood control entity for carrying out such projects. Notably, implementation of the recommended projects would support and enhance the District's Aquifer Storage and Recovery (ASR) program, which utilizes a series of injection wells to recharge the groundwater basin with surface water (when available) for storage and later use in dry years. Such sustainable water management optimizes the use of water supplies, helping to ensure the continued balance of supplies with the diverse demands for water resources in southern Santa Barbara County. This Plan provides a watershed-based approach to stormwater management by identifying multi-benefit projects. One benefit, for example, involves reducing the volume of urban and/or agriculture runoff to receiving waters, thereby reducing pollutant loads while also augmenting or supplementing water supplies. The pollutant load reductions achieved by stormwater capture projects would also benefit receiving water quality, thus supporting Municipal Separate Storm Sewer System (MS4) permit compliance with total maximum daily load (TMDL) waste load allocations and agriculture waiver entities with specific waterbody load allocations.

4.6.6 Conservation Programs

The District is a member of the California Water Efficiency Partnership and the Regional Water Efficiency Program. GWD also runs a conservation program that includes significant customer education on water use restrictions. District rebate programs distribute water-saving devices such as hose nozzles and low-flow shower heads and provide customers with financial assistance to implement water-saving irrigation upgrades and change out landscaping for water-wise plants. District rates are informed by a Cost-of-Service Study to capture the cost to serve each customer class and are structured according to best practices in the industry to include tiered pricing.

4.7 OPPORTUNITIES FOR MITIGATION CAPABILITY IMPROVEMENTS

The District continuously strives to mitigate the adverse effects of potential hazards through its existing capabilities while also evaluating 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 flood vulnerability and water source sustainability (e.g., groundwater, recycled water) 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 a supply interruption at Lake Cachuma.
- **Administrative/Technical Opportunities**: As part of this update, the District aims to improve its resilience to ensure emergency response operations and water service can be sustained during a hazardous event. Potential mitigations include energy reliability projects and back-up power systems for core infrastructure and facilities to ensure that even if power supplies are disrupted the District can continue to deliver essential lifeline water service, but also seismic upgrades, vulnerability assessments, and additional treatment to address changing water quality conditions at Lake Cachuma in response to more frequent droughts and wildfires. Given the reality that climate change will likely increase the frequency and severity of natural disasters, identifying and preparing for the impacts of climate change is a critical priority in the District's capital planning. Additional considerations are also given to preparing for human caused hazards, with plans to either retrofit or incorporate design elements to new projects to reduce the risk of disease transmission and increase security at District 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 proactively educating customers on where their water comes from, how it is delivered through the system, and the ways in which planned capital spending can increase resiliency during a disaster 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 in the context of its Infrastructure Improvement Plan and Board adopted budget, and seeks to mitigate hazards by identifying and addressing vulnerabilities in existing facilities while incorporating hazard-resistant designs into future investments. This includes siting infrastructure outside of hazard zones and building and retrofitting critical facilities to withstand and mitigate hazards. District also considers the impacts to vulnerable and disadvantaged communities to promote social equity. These efforts seek to protect the District's investments, but also minimize the risk to life and property.

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 GWD 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 GWD 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 GWD 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 GWD 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. Goleta Water District Local Priority Hazards

Hazard Type and Ranking	Score	Planning Consideration Based on Hazard Level
Drought	13	Significant
Earthquake	12	Significant

Hazard Type and Ranking	Score	Planning Consideration Based on Hazard Level
Wildfire	12	Significant
Tsunami	8	Moderate
Flood	7	Moderate

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 GWD in subsections below. The GWD LPT acknowledged the following hazards are either not a threat, are highly unlikely within the District, or are adequately addressed by the 2022 MJHMP and do not require additional information to be relevant to the District's hazard setting; therefore, these hazards are not addressed further in the GWD LHMP: pandemic/epidemic, cyber threat, energy storage & resilience, extreme heat, erosion/coastal erosion, sea level rise, severe weather/storm, windstorm, hurricane, tornado, oil spill, natural gas pipeline rupture and storage facilities, hydraulic fracturing and well stimulation, radiological and nuclear accidents, levee failure, aircraft crashes, and train accidents, agricultural pests and invasive species, terrorism, and civil unrest. These additional hazards are addressed fully in the more comprehensive 2022 MJHMP.

5.3 DROUGHT & WATER SHORTAGE

5.3.1 Description of Hazard

A drought is defined as a period of below-average precipitation in a given region, resulting in prolonged shortages in the water supply. A drought is a gradual phenomenon and is generally not signified by one or two dry years but rather a prolonged period of abnormally low rainfall leading to a water shortage. Under the District's 2021 Drought Preparedness and Water Shortage Contingency Plan, a local water shortage emergency is triggered when the water supply is projected to be 85-90 percent of normal for the next 12 months or is insufficient to provide 80 percent of normal deliveries for the next 24 months (GWD 2021). In any given year, the District can be subject to drought conditions and water shortages. A drought can last for months or years; the most recent drought beginning in 2012 reached a record eighth year before ending in 2019.

Due to the unique geographical terrain and climate in Santa Barbara County, cyclic drought is common in the region. The climate in the District service area is generally characterized as Mediterranean coastal with mild, dry summers and cool winters. High temperatures average about 70 degrees Fahrenheit (°F) while low temperatures rarely fall below 40 °F. The area is semi-arid with an average rainfall of approximately 18 inches per year, primarily occurring between December and April (GWD 2021). Historic rainfall has fluctuated significantly, with just under 6 inches recorded in 1990 and more than 40 inches in 1983.

Droughts in Santa Barbara County do not always coincide with federal and state drought declarations. For example, when the Governor declared a statewide drought emergency on October 19, 2021, based on its local water supply outlook the District did not meet the criteria for a Water Shortage Emergency. In 2018, Santa Barbara County and the District remained in a water shortage emergency despite the statewide drought emergency declaration having been lifted on

April 7, 2017. The District has the authority to issue local declarations, including water use restrictions defined in the District's Code and Drought Preparedness and Water Shortage Contingency Plan (GWD 2021).

5.3.2 Location and Extent of Hazard

Drought and Surface Water

The District is subject to periodic drought conditions and water shortages. This is largely due to the heavy reliance on local surface water supplies, with Lake Cachuma traditionally serving as the primary source of water for the south coast of Santa Barbara County, including the District. Under normal conditions, up to 9,322 AFY (75 percent) of the District's normal planned annual demand can be met with supplies from Lake Cachuma, which provides the largest source of water supply at the lowest cost.

The availability of surface water from Lake Cachuma varies year to year as a result of weather and runoff. Lake Cachuma receives the bulk of its water supply through runoff from the Santa Ynez River during heavy precipitation in the winter months, with limited access to state water resources. Due to the Mediterranean climate and depending on the weather, stream flows throughout the Santa Ynez watershed are highly variable and directly affected by rainfall. A minimum of 15 inches of cumulative rainfall from winter storms is typically needed in the Santa Ynez River watershed for inflow to occur, as anything less than that is likely to infiltrate into the ground. Thus, the location and timing of storms are important factors that can affect lake levels.

Most streams in the District's jurisdiction are dry during the summer months since stream flows rise and fall in response to precipitation. The drainages in the southern part of the District's jurisdiction are characterized by high intensity, short duration runoff events due to the relatively short distance from the top of the Santa Ynez Mountains to the Pacific Ocean.

Drought and Imported Water Deliveries

In addition to Lake Cachuma's role as a primary water supply source, the lake serves as a water storage and conveyance system. State Water Project (SWP) water and all supplemental water purchases are delivered to and stored in the lake via a pipeline connected to the San Luis Reservoir in Merced County. The District's entitlement to SWP water is 7,450 AFY, of which a maximum of 4,500 AFY can be delivered due to capacity constraints of the incoming SWP pipeline and the need to share and coordinate deliveries with other South Coast water agencies. In a normal year, the District plans for the delivery of 3,800 acre-feet (AF) of SWP water, which is approximately 23 percent of the District's water supply portfolio. Carryover water from previous years is stored in Lake Cachuma and the San Luis Reservoir when the District's annual allocation is not fully used.

Drought and Groundwater

During emergencies and periods of extended drought, the groundwater basin serves as the lifeline for the Goleta Valley as it provides an alternative water supply capable of meeting the minimum public health and safety needs of the community (approximately 6,000 AFY). The District uses nine groundwater wells to access the Basin, to which it has an adjudicated right to pump up to 2,350 AFY. The District forgoes pumping and preserves water in the Basin during wet years to store for

future use as a critical drought buffer. The Basin and the stored drought buffer provide nearly half of the District's water supply during severe drought conditions.

It typically takes several years for the Basin to return to normal levels after drought periods. The majority of groundwater recharge in the Basin occurs naturally through winter rain and runoff that percolates into the soil, and water from rivers and streams that infiltrate below ground. During droughts, reduced winter storms and a lack of surplus water combine to reduce groundwater recharge at a time of increased groundwater extraction. While the Basin is adjudicated, further limiting groundwater extraction when possible is part of the District's overall Basin management strategy.

The District has also historically injected drinking water into the Basin under its ASR Program when surplus water was available. The District is one of seven agencies in California to hold a permit for ASR, with a new permit from the Central Coast Regional Water Quality Control Board (RWQCB) issued on December 18, 2020. Injection can accelerate the decades-long rate of recharge to restore the Basin, though recovery still takes years.

Drought and Water Quality

Besides water shortages, droughts also create water quality problems. This is emerging as a severe issue as record low water levels at Lake Cachuma increased lake temperatures and receding lake levels during the previous drought allowed vegetation to grow in the dry lakebed. During the winter, vegetation is submerged, and increased loads of vegetation accumulate in the lake as a result of winter runoff. Vegetation and debris decompose in the lake and thus increase the concentration of organic material in the water. During certain months of the year, lake water organic levels exceed the treatment capacity of the District's CDMWTP, and alternative water supplies, such as groundwater, must be used to meet state and federal drinking water regulations. The increase of organic material requires additional filtration and disinfection by the District. Increased use of chlorine for disinfection can lead to the creation of undesirable and regulated disinfection byproducts (DBPs).

Reduced rainfall and lower lake levels also lead to a higher evaporation-to-condensation ratio, which can increase salt and metal concentrations as well as water temperatures. These conditions have the potential to cause algae blooms that increase organic matter and further degrade water quality. This further accelerates the creation of DBPs and water treatment challenges.

5.3.3 History of Hazard within the District

Since 1950, Santa Barbara County has had five state and/or federally declared drought disasters; in 1990, 1991, and 2001, 2012-2019 (refer to Section 5.3.2, *Drought and Water Shortage* of the MJHMP), and 2021. The District suspended its most recent Water Shortage Emergency in August of 2019.

Droughts in the 1970s and 1980s drove the development of significant conservation programs by the District, adjudication of the Basin under the Wright Judgement, the ASR Program, as well as several voter initiatives to protect local groundwater resources in the Goleta Valley. The Wright Judgement, which was settled in 1989, allows the District to extract 2,350 AFY (approximately 15 percent of the District's water supply portfolio in normal years). This excludes water the District has

stored in the Basin, as well as the drought buffer available to the District when there are reduced deliveries of Cachuma Project water. Additionally, the voter-approved Safe Water Supplies (SAFE) Ordinance, originally approved in 1991 and amended thereafter, prohibits the District from allocating water to new or additional potable water service connections to properties not previously served by the District, unless the District: receives 100 percent of its annual Cachuma Project allocation; the District has met all of its Wright Judgment obligations; there is no water rationing; and, the District has met its obligation to make its annual storage contribution to the drought buffer. The 1985 to 1992 drought also resulted in the District developing recycled water as an alternative water supply source, with recycled water coming online in 1996.

The 2012 to 2019 drought surpassed the 1985 to1992 drought in both severity and length. On September 9, 2014, the District declared a Stage II Water Shortage, with a targeted 25-percent reduction and mandatory water use restrictions. As drought conditions worsened, the District declared a Stage III Water Shortage on May 12, 2015, raising the targeted reduction to 35 percent and further restricting outdoor irrigation. From 2012 to 2019, rainfall in the Goleta area was as low as 7 inches in a single year, and Lake Cachuma fell to 7 percent of capacity. Despite above-average rainfall of 25 inches in 2017, the South Coast remained in drought conditions even as the statewide drought was declared over.

5.3.4 Probability of Occurrence

Highly Likely – The region has experienced drought conditions for 7 of the past 10 years or more than half of the past two decades.

5.3.5 Climate Change Considerations

Climate change has the potential to increase the frequency, severity, and duration of droughts. Extreme heat and reduced rainfall create conditions more conducive to the evaporation of moisture from the ground and reduced or earlier melting of winter snowpacks can affect the amount of water the District receives from the SWP. Extreme heat and less rainfall reduce regional stream flows and introduce drier conditions. The result of these processes is an increased potential for more frequent and more severe periods of drought.

5.4 EARTHQUAKE & LIQUEFACTION

An earthquake is caused by a release of strain within or along the edge of the Earth's tectonic plates producing ground motion and shaking, surface fault rupture, and secondary hazards, such as ground failure. The severity of the motion increases with the amount of energy released, decreases with distance from the causative fault or epicenter, and is amplified by soft soils. Even short-duration earthquakes can cause massive damage to buildings and infrastructure.

The effect of an earthquake on the Earth's surface is called the “intensity.” The intensity scale consists of a series of certain key responses such as movement of furniture and facilities, and/or total failure and destruction. The Richter scale currently used in the United States is composed of 12 increasing levels of intensity that range from imperceptible shaking to catastrophic destruction. The Richter

scale is logarithmic; each one-point increase corresponds to a 10-fold increase in the amplitude of the seismic shock waves and a 32-fold increase in energy released.

Table 5-2. Richter Scale.

Richter Magnitudes	Earthquake Effects
Less than 3.5	Generally not felt but recorded.
3.5 - 5.9	Often felt, but rarely causes damage.
Under 6.0	Slight damage to well-designed buildings. Can cause major damage to poorly constructed buildings over small regions.
6.1-6.9	Can be destructive in areas up to about 100 kilometers across residential areas.
7.0-7.9	Can cause serious damage to larger areas.
8 or greater	Can cause serious damage in areas several hundred kilometers across.

Peak ground acceleration (PGA) is a measure of the strength of ground shaking. Larger peak ground accelerations result in greater damage to structures. PGA is used to depict the risk of damage from future earthquakes by showing earthquake ground motions that have a specified probability (10, 5, or 2 percent) of being exceeded in a 50-year return period. Figure 5-1 shows fault lines in the county and the probability of areas of the county experiencing 2 percent shaking within the next 50 years. These values are often used for reference in construction design, and in assessing relative hazards when making economic and safety decisions.

After earthquakes, some regions may be prone to liquefaction. Liquefaction is the phenomenon that occurs when ground shaking causes loose, saturated soils to lose strength and act as a viscous fluid. Liquefaction causes two types of ground failure: (1) lateral spread and (2) loss of bearing strength. Lateral spreads develop on gentle slopes and entail the sidelong movement of large masses of soil as an underlying layer liquefies. Loss of bearing strength occurs when the soil supporting structures liquefy, causing the structures to settle; resulting in damage and, in some cases, collapse.

On level ground, liquefaction results in water rising to the ground surface. On sloping ground, liquefaction can result in slope failure, such as the Sheffield Dam failure in the aftermath of the 1925 Santa Barbara earthquake (refer to Section 5.3.3, *Earthquake & Liquefaction* of the MJHMP). The National Earthquake Hazards Reduction Program (NEHRP) rates soils from hard to soft and gives the soils ratings from Type A through Type E (NEHRP 2000). The hardest soils are rated Type A, and the softest soils are rated Type E. Liquefaction risk is considered high if there are soft soils (Types D or E) present. The majority of the soils within the District territory are types A-C, with some areas having type D. There have been no Type E soils identified. Liquefaction risk is also determined by depth-to-groundwater. Most of the low coastal plain and valley bottoms are underlain by alluvium and given a moderate rating with respect to liquefaction potential.

5.4.1 Location and Extent of Hazard

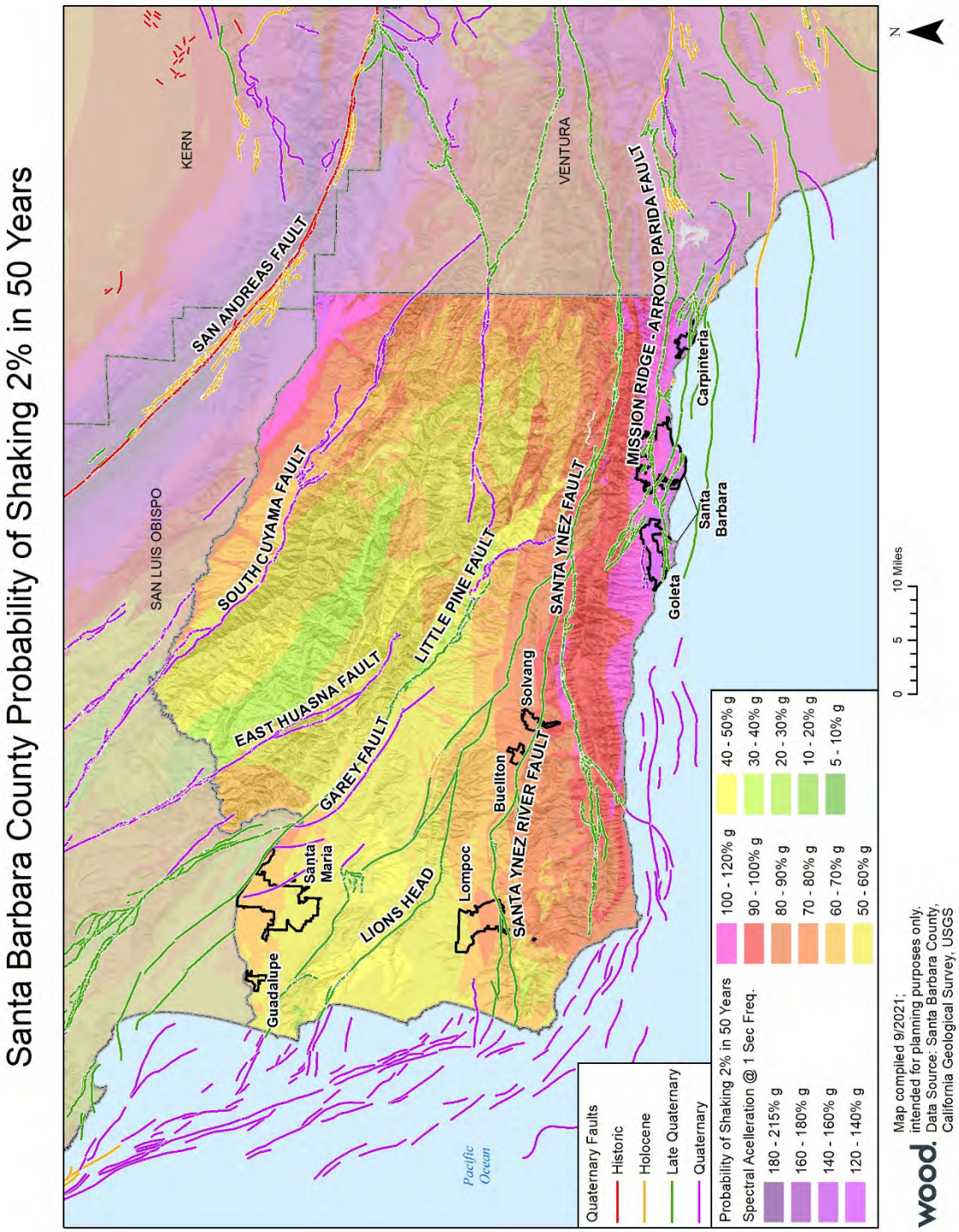
The District's service area is located in a high seismic activity zone in the Transverse Range geologic province. The movement of continental plates manifests primarily along the San Andreas Fault system. The closest area of the San Andreas Fault is situated approximately 44 miles northeast of the Goleta Valley. Active faults in the San Andreas Fault system that fall within District include the Nacimiento, Ozena, Suey, and Little Pine faults. Other active faults in the region include the Big Pine, Mesa, Santa Ynez, Graveyard-Turkey Trap, More Ranch, Pacifico, Santa Ynez, and Santa Rosa Island faults (Santa Barbara County Planning and Development Department 2015). The Goleta Valley is also potentially susceptible to earthquakes from the offshore and onshore fault system of the Ventura-Pitas Point Fault, which is capable of producing 8.0 earthquakes as strong as the San Andreas Fault. The Ventura-Pitas Point Fault runs westward 60 miles from Ventura, through the Santa Barbara Channel, and beneath the cities of Santa Barbara and Goleta.

5.4.2 History of Hazard within the District

Santa Barbara County is subject to frequent earthquakes of varying intensity. Some of the larger earthquakes in the Goleta Valley in recent years have included a 4.1 magnitude earthquake in 2017 and a 3.8 magnitude earthquake in 2018 in Isla Vista. No injuries or damages to District infrastructure were reported (Santa Barbara County Planning and Development Department 2015).

There is no historic evidence of liquefaction in the Goleta Valley (Santa Barbara County Planning and Development Department 2015).

Figure 5-1. Santa Barbara County Probability of Shaking 2% in 50 Years



5.4.3 Probability of Occurrence

Occasional – The U.S. Geological Survey (USGS) and their partners, as part of the latest Uniform California Earthquake Rupture Forecast Version 3 (USGS 2013), have estimated the chances of having large earthquakes throughout California over the next 30 years. Statewide, the rate of earthquakes around magnitude 6.7 (the size of the 1994 Northridge earthquake) has been estimated to be one per 6.3 years (more than 99 percent likelihood in the next 30 years); in southern California, the rate is one per 12 years (93 percent likelihood in the next 30 years) (refer to Table 5-10 of the MJHMP).

5.4.4 Climate Change Considerations

While climate change is not expected to directly affect earthquake frequency or intensity; it could exacerbate indirect or secondary impacts of earthquakes. For example, climate change could increase the frequency and intensity of extreme precipitation events, which in turn increases the probability of landslides and liquefaction events during an earthquake if the earthquake coincided with a wet cycle (California Natural Resources Agency 2018). Additionally, earthquakes often precipitate structure fires that can spread to adjacent orchards and wildlands. Climate change may amplify any fire effects associated with earthquakes.

5.5 WILDFIRE

5.5.1 Description of Hazard

Wildfire can be classified as either a wildland fire or a wildland-urban interface (WUI) fire. Wildland fires occur in an area relatively undeveloped except for the possible existence of basic infrastructure, such as roads and power lines. A WUI fire includes situations where a wildfire enters a developed area with structures and other human developments. In WUI fires, the fire is fueled by both naturally occurring vegetation and urban structural elements. According to the National Fire Plan issued by the U.S. Departments of Agriculture and Interior, the WUI is defined as "the line, area, or zone where structures and other human development meet or intermingle with undeveloped wildland or vegetative fuels."

Large wildfires also have several indirect effects beyond those of a smaller, local fire. These may include impacts on air and water quality, health issues, erosion, road closures, business closures, and other forms of losses. Furthermore, large wildfires increase the threat of other disasters, such as landslides and flooding.

Certain conditions heighten wildfire hazards: a large source of fuel, conducive weather (generally hot, dry, and windy), and the inability of fire suppression sources to easily suppress and control the fire.

The majority of wildfires are human-induced or caused by lightning. Once burning, wildfire behavior is based on several 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 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. Weather, as manifested in temperature, humidity, and wind (both short and long-term) affect the probability, severity, and duration of wildfires. The majority of the most destructive fires locally are wind-driven and influenced by Santa Ana events. Santa Ana winds are strong, extremely dry down-slope winds that originate inland and affect coastal Southern California. These hot, dry weather patterns are typically observed in the fall, but can also occur throughout the year. Santa Ana winds often bring the lowest relative humidity of the year to coastal Southern California. Low humidity, combined with the warm, compressional-heated air mass, and high wind speeds create critical fire weather conditions.

5.5.2 Location and Extent of Hazard

Fire threat is a combination of two factors: (1) fire frequency or the likelihood of a given area burning, and (2) potential fire behavior. These two factors are combined to create four threat classes ranging from moderate to extreme. Vegetation and topography were significant elements in the identification of the fire threat zones. A substantial amount of the vegetation in Santa Barbara County is commonly chaparral, which is dense and scrubby vegetation that has evolved to persist in a fire-prone habitat. Chamise, manzanita, and ceanothus are all examples of chaparral plants common in Santa Barbara County. See Figure 5-2 for a depiction of Wildfire Threat within the county as mapped by the California Department of Forestry and Fire (CAL FIRE). As shown therein, the majority of the District is located within low to moderate Fire Threat areas. Areas within the District boundaries that have a higher Fire Threat are along the foothills of the Santa Ynez Mountains in the WUI.

5.5.3 History of Hazard within the District

Wildfires have become more frequent, with 21 major wildfires burning a range of 1,000 to 240,807 acres since 2000 (refer to Table 5-4 of the MJHMP). Of these fires, three (i.e., Sherpa and Gap, and Holiday) burned in the District service territory, and five (i.e., Zaca, White, Rey, Whittier, and Thomas) burned within the Lake Cachuma watershed (refer to Section 5.3.1 of the MJHMP for a description of these fires). In July 2018, the Holiday Hill fire burned 28 structures within a neighborhood of the District's service area, threatening nearby District infrastructure and damaging a reservoir. Approximately 70 percent of the watersheds in Lake Cachuma have burned since 2007.

In 2017, the Whittier fire occurred next to Lake Cachuma, burning a total of 18,430 acres. The Whittier fire burned close to the intake tower leaving critical facilities at risk of flood and erosion as well as water quality. In 2017, the Thomas Fire burned in Santa Barbara County, including portions of the District territory and the Santa Ynez River watershed. The Thomas Fire was one of the most destructive wildfires in history, and one of the largest in California, burning approximately 281,893 acres of land and sending ash into the lake through the air and subsequent winter storms. Sedimentation associated with ash and soil erosion in the watershed significantly worsened water quality in Lake Cachuma.

Figure 5-2. Wildfire Threat in Santa Barbara County

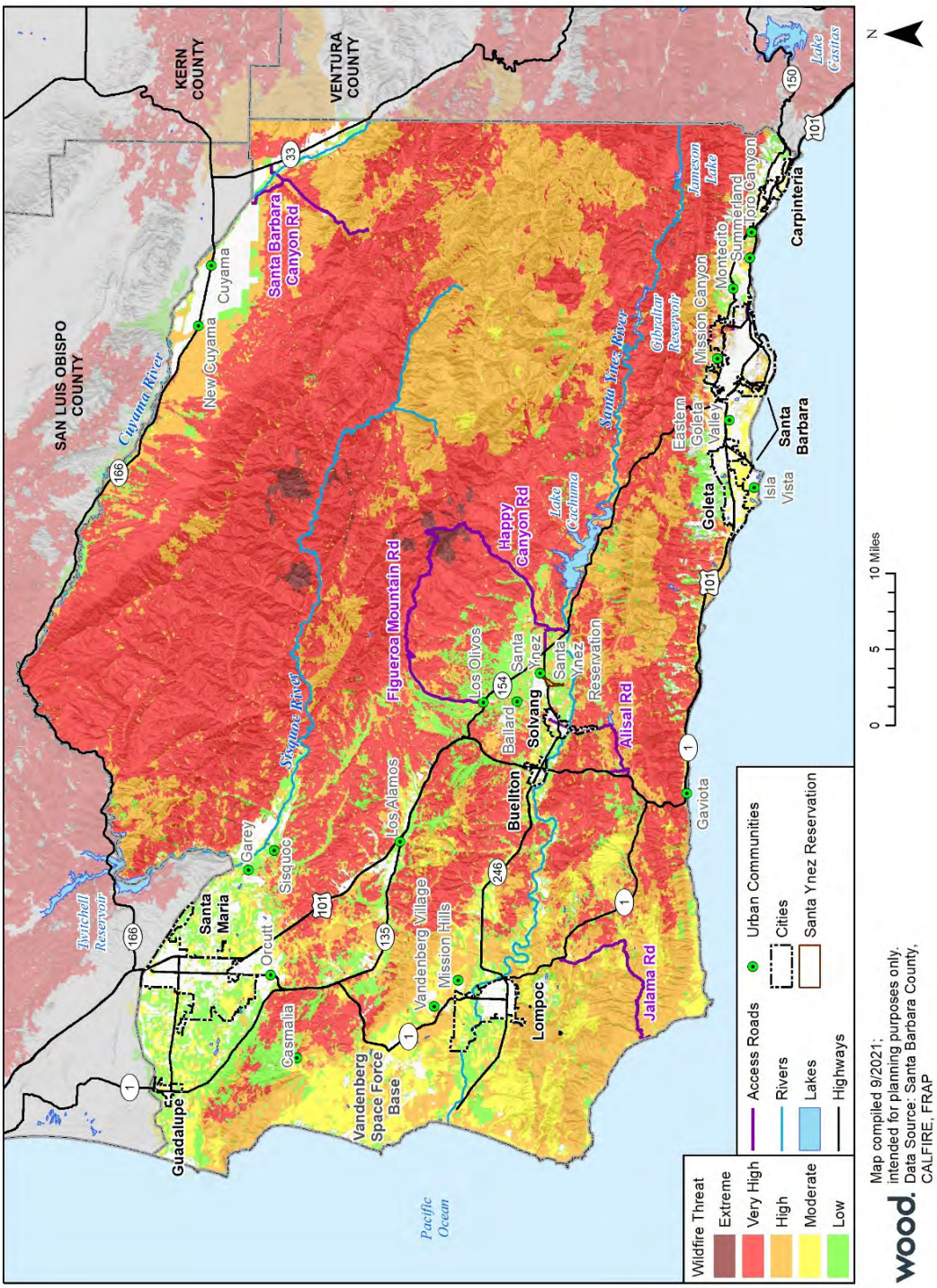
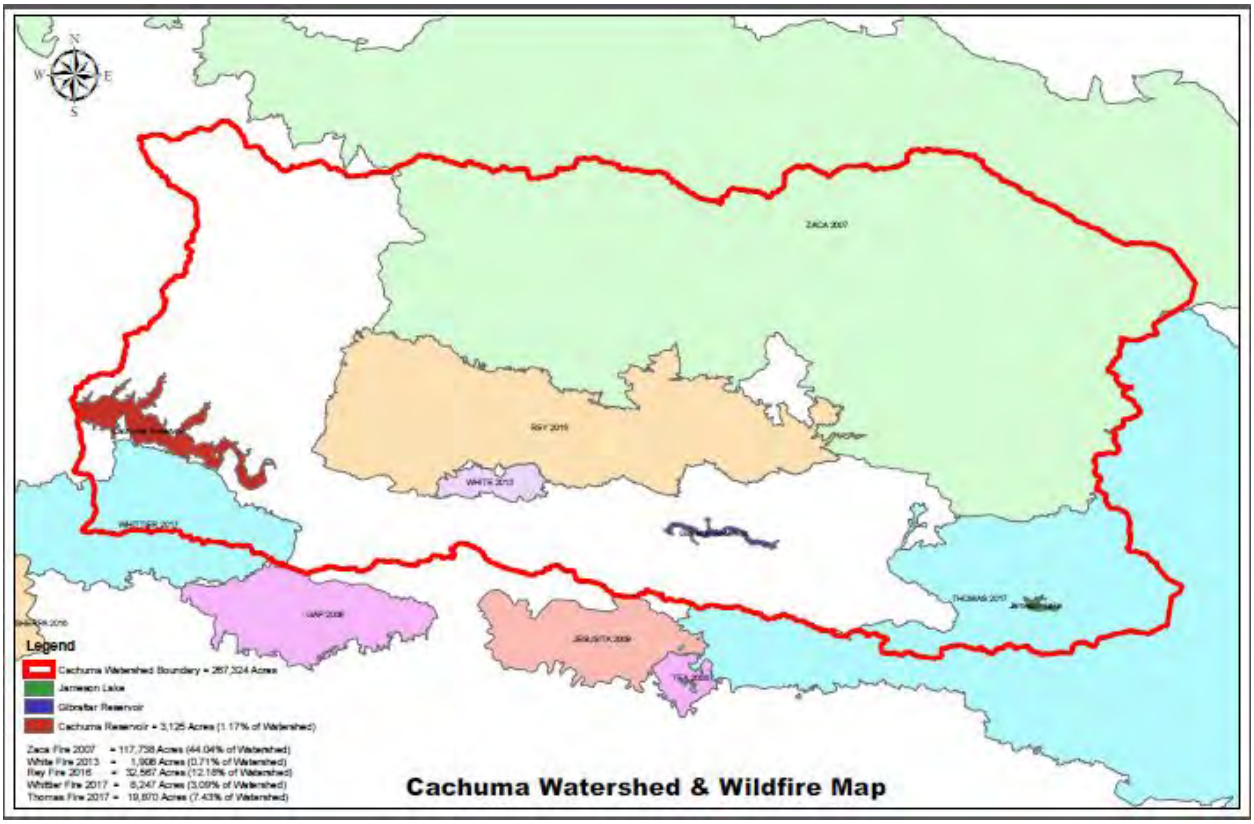


Figure 5-3. Recent Wildfires in or near the Lake Cachuma Watershed



5.5.4 Probability of Occurrence

Highly Likely – Santa Barbara County was subject to 42 major wildfires over 88 years, resulting in a 48 percent chance of occurrence in any given year. In addition, Figure 5-2 shows the threat of fire to Santa Barbara County as mapped by CAL FIRE.

5.5.5 Climate Change Considerations

Climate change increases the risk of wildfire hazards by increasing the likelihood of extreme weather events. Rising temperatures and more frequent, prolonged drought conditions dry out vegetation and create more fuel. This, combined with increased Santa Ana wind events, can further hinder the ability of firefighters to contain fires.

5.6 TSUNAMI

5.6.1 Description of Hazard

A tsunami is a series of long waves generated in the ocean by the sudden displacement of a large volume of water. Underwater earthquakes, landslides, volcanic eruptions, meteor impacts, or onshore slope failures can also cause tsunamis. Tsunami waves travel at speeds averaging 450 to 600 miles per hour. As a tsunami nears the coastline, its speed and wavelength decrease, and its height increases. Depending on the type of event that creates the tsunami, as well as the remoteness

of the event, the tsunami could reach land within a few minutes or after several hours. Low-lying areas could experience severe inland inundation of water and deposition of debris more than 3,000 feet inland.

5.6.2 Location and Extent of Hazard

Major faults of the San Andreas zone, although capable of strong earthquakes, cannot generate any significant tsunamis. Only earthquakes in the Transverse Ranges, specifically the seaward extensions in the Santa Barbara Channel and offshore area from Point Arguello can generate local tsunamis of any significance. The reason for this may be that earthquakes occurring in these regions result in a significant vertical displacement of the crust along these faults. Such tectonic displacements are necessary for tsunami generation.

The District is susceptible to tsunami hazards from several offshore geological faults, the more prominent faults being the Mesa Fault, the Santa Ynez Fault in the mountains, and the Santa Rosa Fault. Other unnamed faults in the offshore area of the Channel Islands may present tsunami hazards. These faults have been active in the past and can subject the entire county coastal area to seismic action at any time.

5.6.3 History of Hazard within the District

Thirteen possible tsunamis have been observed or recorded from local earthquakes between 1812 and 1988 in the Santa Barbara region. There have been no recorded tsunamis on Goleta shores since 1988.

On February 27, 2010, a magnitude 8.8 earthquake occurred along the central coast of Chile and produced a tsunami. For the coast of Southern California, it was one of the largest tsunami episodes since 1964. Numerous reports of dock damage and beach erosion were reported in southern Santa Barbara County, but not specifically in Goleta.

On March 11, 2011, a magnitude 9.0 earthquake occurred off the Pacific coast of Tohoku, Japan. This earthquake devastated many communities in Japan and caused tsunami effects across the ocean in Santa Barbara County. The tsunami in the county only had a trace amount of surge and tidal fluctuations up to seven feet (Noozhawk 2011). The only significant impact in Santa Barbara County was on the dredging contractor for the Santa Barbara harbor. There were no notable tsunami effects in the Goleta area.

5.6.4 Probability of Occurrence

Occasional – Based on the tsunami inundation map above, several areas along the coast of the county have the potential to be inundated by a tsunami. While there is a medium probability of an earthquake that could result in potential tsunami events in the county, the history or risk within the service territory is low.

5.6.5 Climate Change Considerations

As previously described, tsunamis are created by earthquakes or other earth movements. To date, no direct relationship has been made between climate change and the occurrences of earthquakes or other earth movements (refer to Section 5.3, *Earthquake & Liquefaction*).

5.7 FLOOD

5.7.1 Description of Hazard

A flood is a general and temporary condition of partial or complete inundation on land that is normally dry. Several factors determine the severity of floods, including rainfall intensity and duration. Other causes of flooding can include a ruptured dam or levee, rapid ice or snow melting in mountains, or under-engineered infrastructure. A large amount of rainfall in a short time can result in flash flood conditions. The National Weather Service's definition of a flash flood is a flood occurring in a watershed where the time of travel of the peak of flow from one end of the watershed to the other is less than six hours.

Another form of flooding occurs when coastal storms produce large ocean waves that sweep across coastlines making landfall. Storm surges can inundate coastal areas and cause flooding. If a storm surge coincides with high tide, the water height will be even greater. The Goleta Valley historically has been vulnerable to storm surge inundation associated with tropical storms and El Niño weather events.

Repetitive Loss Information and NFIP Participation

As a Special District, the GWD 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.

5.7.2 Location and Extent of Hazard

The geographical location, climate, and topography of Goleta Valley make the District's service area prone to flooding. Regional floods typically occur during the rainy season or heavy rainfalls after long dry spells. Due to the Mediterranean climate and the variability of rainfall, streamflow in Goleta is highly variable and directly related to rainfall.

The drainages in the Goleta Valley and South Coast region are characterized by high intensity, short duration runoff events resulting from the relatively steep decline from the top of the Santa Ynez Mountains to the Pacific Ocean. Runoff from high intensity, short-duration storm events can cause inundation of over stream banks and adjacent areas. Flood water carries debris, such as sediments, rocks, and downed trees, potentially damaging District facilities. Debris also plugs culverts and bridges, creates erosion and sloughing of banks, and can decrease channel capacity due to sedimentation.

The Goleta Valley is traversed by the floodplains of several creeks that drain the Santa Ynez Mountains, with the degree of flood hazard varying substantially by creek. Some creeks such as Las Vegas Creek have been channelized, reducing but not eliminating flood hazards. Other Creeks,

such as Maria Ygnacia Creek, remain in a more natural condition with the corresponding potential for flood hazards. Flood control debris basins have been constructed on some of these creeks to intercept sediment and debris, reducing the potential for plugging of downstream creek channels and associated flood hazards.

5.7.3 History of Hazard within the District

Flooding has been a major problem for communities and regions along rivers, creeks, and the shoreline throughout Santa Barbara County's history. Santa Barbara County has several hydrologic basins that have different types of flooding problems, including overbank riverine flooding, flash floods, tidal flooding/tsunamis, and dam failure. The most common flooding in Santa Barbara is due to riverine flooding and flash flood events.

Between 1906 and 2018, Santa Barbara County experienced 22 significant inland flood events. Eight of these floods received Presidential Disaster Declarations. The historical flood events in the Goleta Valley and years as well as information concerning the nature of the flooding and the extent of the damages are described below.

- **1995 Floods –** Two major storm-related flooding events occurred in the winter of 1995 — on January 10 and March 10. The floods of 1995 brought widespread flooding to Santa Barbara County, with the most severe flooding of creeks along on the South Coast while the rest of the county was largely spared from serious damages. Flooding occurred on most major streams in the cities of Goleta, Santa Barbara, and Carpinteria as well as the community of Montecito. Both floods caused closures of road and rail transportation for several hours and received Presidential Disaster Declarations. Estimated public and private damages were around $100 million (County Flood Control 1995).
- **January 1995 –** The January 10th flood affected approximately 510 properties along the South Coast and caused roughly $50 million of damage. Flooding occurred on most major creek channels in Goleta, Santa Barbara, Montecito, and Carpinteria. All modes of transportation in and out of the South Coast, including the Santa Barbara Airport, Highway 101, the Union Pacific Railroad (UPRR), the harbor, and other major roads on the South Coast were cut off for several hours as a result of this flood. Highway 101 reopened to the north later that day; however, southbound roads, the airport, UPRR, and the harbor were not restored for several days (County Flood Control 1995).

  In Goleta, major flooding occurred on Carneros and San Pedro Creeks from Calle Real to the Goleta Slough. On Carneros Creek, the culvert under Los Carneros Road was completely plugged with trees and debris. In addition, the culvert under Highway 101 was partially plugged. Flows overtopped Calle Real and Highway 101. On San Pedro Creek, several homes were flooded when the culvert under Calle Real (and continuing under Highway 101) became almost completely plugged. Several homes on and around Carlo Drive and Valdez Drive at the intersection of Calle Real were flooded with up to 3 feet of water and mud. San Jose Creek jumped out of its banks at the Twin Screens Outdoor Theater at the end of Kellogg Avenue, causing flooding in portions of downtown Goleta. A major disaster was averted on Atascadero

Creek due to the creek clearing project completed by Flood Control maintenance crews just ten days before the storm (County Flood Control 1995).

The Santa Barbara Airport remained closed for three days due to extensive flooding, except for helicopter service, while maintenance crews cleaned mud and debris from the runways.

- **March 1995 –** The storm event on March 10 caused flooding of most major channels in Goleta, Santa Barbara, Montecito, and Carpinteria. More than 300 structures were reported flooded and/or damaged, with many of the same structures flooded in January flooded again. Approximately $30 million of public and private property were damaged during the storm. Flows over 5,000 cubic feet per second were recorded at San Jose Creek, causing flooding in Old Town Goleta. Once again, the airport, Highway 101, and UPRR in and out of the South Coast were cut off for several hours. This flood received a Presidential Disaster Declaration (County Flood Control 1995).
- **1998 –** The storm events of 1998 arrived on a strong El Niño and brought several record-breaking rainfalls with 50-year storm event intensities throughout February. The City of Santa Barbara recorded its wettest month in history, 21.36-inches of rainfall. By the end of the month, many areas in the county had received 600 percent of normal February rainfall. Flood-related damages within Santa Barbara occurred during three major storm periods: February 1-4, February 6-9, and February 22-24. The cost to repair extensive flood damage to public and private property was estimated at $15 million. Just like in 1995, transportation throughout the county was disrupted through closures of roads, the Santa Barbara Airport, and train service. Flood damage was spread throughout the county and the county was declared a Federal Disaster Area on February 9. The floods received a Presidential Disaster Declaration (County Flood Control 1998).
- **February 2, 1998 –** During the first storm on February 2, winds with gusts as high as 63 mph knocked over hundreds of trees and caused loss of power to thousands of homes across Goleta and Santa Barbara. A large eucalyptus tree crushed an Isla Vista apartment complex and forced the evacuation of its residents. The next day, 15-foot-high waves damaged pilings under Stearns Wharf and a broken sewer line near Arroyo Burro Beach, closing several nearby beaches due to high levels of bacteria buildup (County Flood Control 1998).

  Transportation throughout the county was disrupted due to flooding and mudflows: the Santa Barbara Airport was closed due to flooded runways, train service was halted due to mud slides over the tracks, and numerous South Coast roads were closed. Highway 101 was closed south of Ventura by a mudslide and reduced to one lane at Gaviota because of rockslides. Highway 154 was closed due to rockslides. Highway 1 between Lompoc and Gaviota was closed to erosion. On February 3, the Cachuma Reservoir spilled, and farmland west of Lompoc was inundated (County Flood Control 1998).
- **February 6, 1998 –** With little time to recuperate, the South Coast was hit by a second major storm on February 6, causing severe damage in the Goleta area, including flooding at Las Vegas, Encina, and San Pedro creeks. UCSB was closed due to inundated classrooms. Street flooding was widespread throughout Isla Vista and Old Town Goleta. Disruptions of

transportation were widespread throughout the South Coast – a downed tree resulted in an accident that closed Highway 101 (County Flood Control 1998).

- **February 22-24, 1998 –** Intense rain again hit the County on February 23 and 24 after several days of moderate rainfall. This time, it was the creeks of Montecito and Carpinteria that were most heavily affected. Transportation was again interrupted with the closure of Highway 101 near Ventura, Sycamore Canyon Road, and Gaviota Road. Long-distance telephone service was disrupted due to a broken cable and power went out in parts of Goleta. In addition, a ruptured water line in Goleta resulted in limited deliveries to some customers. Several major mud slides threatened and destroyed homes throughout the South Coast.
- **2005 –** In January 2005, a powerful Pacific storm tapped into a subtropical moisture source to produce heavy rain, snow, flash flooding, high winds, and landslides to Central and Southern California. Rainfall totals ranged from 4 to 8 inches over coastal areas to between 10 and 20 inches in the mountains. In Santa Barbara County, flash flooding and mudslides closed Highway 101 at Bates Road in Carpinteria and Gibraltar Road at Mt. Calvary Road, stranding several vehicles, while mudslides inundated 3 homes in Lake Casitas. With such heavy rainfall, the Santa Ynez Rivers exceeded its flood stages. Overall, damage estimates for the entire series of storms that started December 27th, 2004, and ended on January 11th, 2005, were easily over $200 million with the most damage incurred by agricultural interests in Santa Barbara County and Ventura County (NOAA 2005).

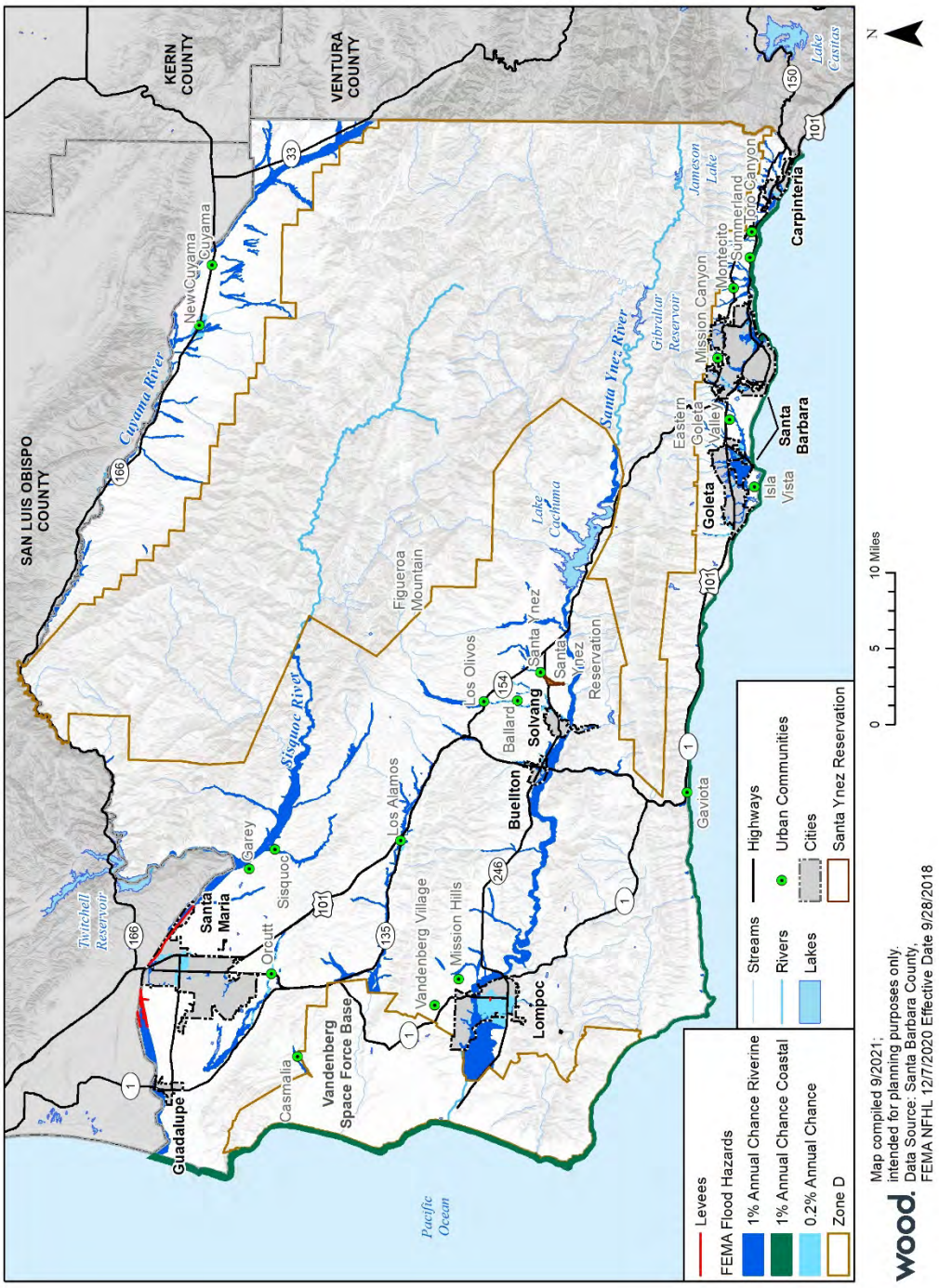
5.7.4 Probability of Occurrence

Occasional – The 100-year flood is a flood that has a one percent chance in any given year of being equaled or exceeded. The 500-year flood is the flood that has a 0.2 percent chance of being equaled or exceeded in any given year. Figure 5-4 shows the location of the 100-year flood hazard zones in the county as mapped by FEMA's Flood Insurance Rate Maps (FIRM) and the location of 100-year flood awareness zones, based on DWR's Best Available Maps (BAM). The BAM floodplains identify potential flood risks that may warrant further studies or analyses for land use decision-making. The floodplains shown delineate areas with potential exposure to flooding for 100-year storm flows. These flows and resulting flooded areas are based on the best available floodplain information and may not identify all areas subject to flooding (DWR 2021).

5.7.5 Climate Change Considerations

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 creeks, although overall annual precipitation levels are expected to increase only slightly (Santa County Barbara Planning and Development Department 2021).

Figure 5-4. Santa Barbara County FEMA Flood Hazard Areas



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 (residential, non-residential, critical facilities, 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 four main hazards to the District is outlined below. A further description of the threats and methodologies used in this analysis is provided in Chapter 6.0, *Vulnerability Assessment* of the MJHMP.

6.1 DROUGHT & WATER SHORTAGE

The District provides essential lifeline water service to 87,000 people. Droughts significantly reduce water levels across all seasons, disrupting the average amounts of water available to customers. Water is essential for drinking, sanitation, and cooking. The inability to serve customers, either temporarily or for prolonged periods, puts the health and safety needs of the community at risk. Critical activities like fire suppression, and facilities serving the health and safety needs of the community such as hospitals and health facilities, schools, daycares, and the Santa Barbara County Jail, all depend on sufficient water being available.

Water is also critical to the economic health of the community, and shortages or rationing can produce significant economic challenges. The region depends heavily on agriculture, tourism, and technology, all of which are adversely affected by drought. Agricultural impacts can extend for years as losses associated with perennial agriculture, such as orchards, sometimes require a minimum of five years to recover production. Water is also heavily relied upon in the commercial sector for tourism, technology, manufacturing, and research at UCSB, as well as meeting the minimum health and safety needs for employees and tourists.

Given the vulnerability of the Goleta Valley to drought, the District has invested heavily in water supply development and infrastructure to create a diverse water supply portfolio from four distinct water sources – Lake Cachuma, the Basin, imported water from the SWP, and recycled water. The amount of water the community uses can vary annually due to exchange agreements, availability of other supplies, and customer demand, but over the last ten years surface water availability has typically ranged as high as 14,000 AFY to just below 10,000 AFY. Public health and safety, which represents the minimum amount necessary to meet indoor water use needs and provide water for essential services (e.g., fire suppression and hospitals, but excluding outdoor irrigation and agriculture) is approximately 6,000 AFY. The vulnerability of each of these water supply sources to drought is articulated below.

6.1.1 Surface Water Vulnerabilities

The availability of surface water from Lake Cachuma varies from year to year as a result of weather and runoff. To illustrate the extent to which the semi-arid climate can give rise to drought, consider that Lake Cachuma last spilled in 2011. Within three years, dry conditions reduced the lake to 30 percent of capacity and resulted in local water shortage declarations. During periods of severe droughts, such as Water Years (WY) 2015-16, and 2016-17, the District received a 0-percent allocation from Lake Cachuma, meaning no additional water was available from the lake.

6.1.2 Vulnerabilities to Imported Water Deliveries

As described in Section 5.3, *Drought & Water Shortage*, Lake Cachuma also serves as a water storage and conveyance system. Water delivered from Lake Cachuma to the South Coast depends on a gravity-fed intake tower that delivers water to the Tecolote Tunnel, a six-mile-long tunnel conveying water from Lake Cachuma to the District's CDMWTP and the City of Santa Barbara, which serves treated water to other agencies such as Montecito Water District and Carpinteria Valley Water District. The gravity-fed system that serves the Tecolote Tunnel cannot operate if lake elevations drop below the level of the lowest gate at the intake structure. When this occurs, water is stranded in the lake unless a pumping barge is placed into service to pump water up to the lowest gate of the intake tower. Prolonged drought conditions not only reduce available water supplies but can also strand SWP deliveries and purchased water by shutting down the conveyance system at the lake.

6.1.3 Groundwater Vulnerabilities

Groundwater recharge occurs naturally through rain and runoff that percolates into the soil, and water from rivers and streams that infiltrate below ground. It typically takes several years for the Basin to return to normal levels after drought periods. The District has also historically injected water into the Basin under its ASR Program when surplus water was available. During droughts, reduced winter storms and a lack of surplus water combine to reduce groundwater recharge at a time of increased extraction. While the Basin is adjudicated, limiting groundwater recharge when possible is part of the District's overall Basin management strategy.

6.1.4 Water Quality Vulnerabilities

Water quality can further exacerbate water shortages during a drought because SWP deliveries and supplemental water purchases are delivered through Lake Cachuma, and thus present the same challenging water quality conditions and treatment issues as local surface water supplies. These issues have been exacerbated by the increased duration and severity of recent droughts and are likely to occur with increasing frequency due to climate change. Water quality challenges are further compounded by wildfires, which occur with increased frequency during droughts (see Section 6.3, *Wildfire*).

6.1.5 Current Mitigation Strategies

While it is not possible to eliminate the threat of drought, the District engages in several proactive mitigation strategies. These include:

- Maintaining a diverse water supply portfolio with surface water, groundwater, State Water, and recycled water.
- Careful management of the Basin, which includes drawing on other supply sources to leave groundwater in the basin to preserve a drought buffer for use during critical dry periods.
- Investing in the well and distribution infrastructure necessary to access stored groundwater.
- The purchase of supplemental water when necessary to augment local supplies.

- Adoption of a Drought Preparedness and Water Shortage Contingency Plan with water use restrictions.
- Use of an advanced forecasting model to manage water supply and customer demand.
- A robust conservation program, including rebates to help customers save water, and educational outreach on water-wise practices. This has led to District residential customers achieving among the lowest per-capita water use in the State. Combined indoor and outdoor residential water use during the drought consistently outperformed the State's target of 55 gallons per person per day for indoor use.
- The provision of recycled water, considered a drought-proof water supply, for non-potable uses, such as landscape irrigation and restroom facilities.
- Use of a tiered rate structure for residential users.

6.2 EARTHQUAKE & LIQUEFACTION

The District's ability to serve water is at risk if an earthquake were to collapse the Tecolote Tunnel, the only pipeline connecting Lake Cachuma to the District's South Coast water distribution system. If the Tecolote Tunnel failed, water from Lake Cachuma (including SWP deliveries) could not be delivered to the South Coast. Under this scenario, the District would only be able to serve water already in storage throughout the District's reservoirs until groundwater wells could come online. However, groundwater well facilities and well shafts may also fail during a severe earthquake. Until the Tecolote Tunnel could be repaired, the health and safety of District customers would be at risk as the District would depend on water resources within its reservoir storage capacity, which is limited to only a few days of drinking water supply, or groundwater within the Basin (which requires electricity) to supply water for its customers.

Besides the Tecolote Tunnel, the District's transmission mains and facilities are at risk of collapse and damage. Water quality could also be affected. Depending on the condition and location of the pipeline, an event could result in an overall system shut down or potential contamination from dirt and debris being introduced into the pipe. The District would need to isolate areas of pipe collapse with critical valves to repair the damage.

Expected ramifications of an earthquake also include damage to U.S. Highway 101, State Route-154, Highway 150, and other critical access routes for deliveries. Disruption of transportation routes would affect chemical delivery to the CDMWTP, fuel deliveries to backup generators, as well as the ability of staff and District contractors (e.g., well repair specialists, welders, etc.) who live out of the area to perform repairs and move in equipment. Some District employees commute from outside of Goleta along highways vulnerable to shutdowns. Many of the District's facilities are accessed by unpaved roads and are susceptible to cracks, potholes, and landslides which could make the facilities inaccessible by car. With roads damaged, the District would face restrictions in transporting chemicals, fuel, staff, and contractors for water treatment at various facilities. Another major concern is earthquake-related power outages (see Chapter 6.0, *Vulnerability Assessment* of the 2022 MJHMP).

6.2.1 Current Mitigation Strategies (Element C1.a)

Although the timing of earthquakes cannot be predicted, the District employs several proactive mitigation strategies:

- Equipment bracing for employee safety.
- Pipe support installation on header pipes, wells, pump stations, and other facilities.
- Installing, maintaining, and exercising isolation valves and interconnections with the neighboring water utility for access to backup water supplies.
- Building in and designing "backup" and redundant infrastructure, such as backup pumps and motors.
- Completing geotechnical analysis of soil stability at the Transmission Main at Van Horne Reservoir and identifying susceptibility to future landslides and failure.
- Visual inspections of critical main transmission lines, including sections of the District's 42-inch Bishop Transmission Main conveying water from the plant to a majority of the District's distribution system.
- Completion of a Pipeline Creek Crossing Vulnerability Study, which identified and surveyed all pipeline creek crossings in the District's service area.
- Designing the replacement of a critical, vulnerable segment of the Goleta West Conduit to prevent failure and extended shutdown of water service to 25+ large customers.
- Purchasing and maintaining equipment and inventory needed for emergency replacements of pipeline ruptures, valve breaks, and other failures of all sizes.
- Proactively managing chemical deliveries to the treatment plant and well sites to minimize potential disruptions.
- Checking facilities after small earthquakes for noticeable damage.

6.3 WILDFIRE

6.3.1 Threat to District Infrastructure

Wildfires threaten District infrastructure, particularly facilities located in the WUI. In the past few years, fires have burned up to the conveyance facilities used to deliver water from Lake Cachuma to the District's CDMWTP, and various District storage reservoirs. Previous wildfires have also threatened the distribution system and other critical assets, such as pumps, motors, treatment chemical feeds, and analyzers. In July 2018, the Holiday Hill Fire burned and melted water treatment aeration equipment at the District's one-million-gallon Fairview Reservoir. While the District has been fortunate that no critical facilities have been lost, the potential consequences would be devastating. Vital facilities threatened by wildfires are detailed here.

Distribution System

Fires that burn through parts of the distribution system can disrupt the District's ability to deliver water to customers by disconnecting parts of the system. Fires can melt above-ground infrastructure,

water meters, and can consequently introduce contaminants into the water system. Contamination caused by fire and back suction due to loss of pressure could cause a widespread water quality emergency, as observed with California's Paradise Fire and Santa Rosa fires. After the Paradise Fire, benzene and other volatile organic compounds (VOCs) were detected as burned plastic pipes, meters or toxic waste flushed into the water system during the fire. More importantly, breakdowns in the distribution system can cause a loss of system pressure that limits firefighting ability.

Pumps and Motors

The District has pumps and motors located throughout the system to move water at various facilities and to residences at higher elevations. Many of these installations are located in the WUI and susceptible to fire loss. Loss of this equipment could make delivery of groundwater to certain zones impossible and limit fire-fighting ability.

Lake Cachuma Intake Tower

Burning of the intake tower at Lake Cachuma would result in loss of water conveyance to 250,000 people on the South Coast and prevent the District from taking deliveries of surface water, SWP water, and supplemental water purchases. Such a loss would cause the District to rely solely on groundwater, which is a limited resource and requires energy for pumping that may also be interrupted by red flag warnings or PSPS initiated by SCE when weather conditions create a high risk for fire danger (see Chapter 6.0, *Vulnerability Assessment* of the 2022 MJHMP).

District Corona Del Mar Water Treatment Plant (CDMWTP)

Located in the WUI, the CDMWTP has been threatened by fires in the past. Brush clearance and proactive staging of engines during fire incidents have been critical to structure protection. The loss of CDMWTP would leave the District entirely dependent on groundwater, which can only meet the minimum public health and safety needs of the community (approximately 6,000 AFY) on a limited basis if all wells are online. As mentioned above, groundwater wells also require energy which may be limited during a wildfire as electricity grids may be shut down for PSPS (see Chapter 6.0, *Vulnerability Assessment* of the 2022 MJHMP). Further, fuel deliveries for backup generators may be limited if highways are shut down due to proximity to fires and evacuation areas.

District Reservoirs

A number of the District's reservoirs and storage tanks are located in the WUI. The District's reservoirs are located at higher elevations in the District's system within chaparral brush areas more vulnerable to fires. The District has limited storage capacity, and the loss of a reservoir impacts the ability to balance the system and hold water for emergency use in the event Lake Cachuma deliveries are interrupted.

6.3.2 Wildfire-Related Water Treatment Issues

In addition to structure loss, the risk of fire in the Cachuma Watershed presents a challenge to water treatment. Fires in the watershed are particularly destructive as fires increase carbon particles released into the atmosphere. Carbon and burned organic material deposited in the watershed and surface waters create treatment challenges downstream. Wind, water runoff from winter storms, and erosion carry ash and precipitation into the lake, increasing organic matter. This

increased organic loading creates variable water quality conditions, and the additional treatment necessary to address these challenges can result in increased concentrations of DBPs, particularly trihalomethanes (THMs), that form when chlorine is used to disinfect the water reacts with natural organic matter. THMs are regulated under a maximum concentration limit set by the U.S. Environmental Protection Agency (EPA) for drinking water quality, which is the legal threshold limit on the amount of a substance that is allowed in public water systems. During extreme storm events, or after particularly bad fires surface water conditions may exceed the District's treatment capacity.

6.3.3 Threats to Power Grid and Water Delivery

Wildfires can cause power outages by destroying an electric grid or a transmission tower. In the event of a power outage, the District's ability to use pumps and distribute groundwater to meet the health and safety needs of its customers would be adversely affected as described further in Section 6.4, *Energy Shortage & Resilience* below.

6.3.4 Current Mitigation Strategies

While it is not possible to eliminate the threat of wildfire, the District engages in several proactive mitigation strategies. These include:

- Active brush clearance and maintenance around facilities located in the WUI. This has protected structures and minimized losses at facilities located in burn areas.
- Coordinate actively with local Emergency Operations Command to monitor threats to District facilities and protect critical public infrastructure.
- Filling District reservoirs and CDMWTP settling pools in advance of hot weather and Santa Ana events to ensure water is available for fire suppression and community need.
- Researching, modeling, testing, and piloting several technologies to address water quality issues associated with wildfire.
- Operating in-reservoir technologies to remove increasing levels of disinfection byproducts, including reservoir mixers, blowers, and aeration, observed after wildfire events at Lake Cachuma.
- Flushing the distribution system of sediment and mineral deposits periodically to improve water quality.
- Reducing pre-chlorination levels to the minimum possible while still preventing algae growth in the basins at the CDMWTP.
- The use of powder-activated carbon (PAC) and granular activated carbon (GAC) filters at CDMWTP.
- Optimizing storage in distribution reservoirs during periods of normal operations to decrease the time water spends in the system to improve water quality and reduce THM formation.

6.4 TSUNAMI

The relative threat for local tsunamis in the District service area can be considered moderate due to low recurrence frequencies. Earthquakes occurring along submarine faults off Goleta could generate large destructive local tsunamis. Research performed by the County provides some documentation that two tsunamis were generated from two major earthquakes in the Santa Barbara region in December of 1812. The size of these tsunamis may never be known with certainty, but there are unconfirmed estimates of 15 feet waves along the Gaviota Coast (within the District's service territory), 30-35 feet waves in Santa Barbara, and waves of 15 feet or more in Ventura. These estimates are found in various literature and based on anecdotal history only.

Santa Barbara County evaluated critical facilities within the extreme tsunami inundation zone overlay to determine which falls within the geographic extent of a tsunami hazard. Only one location in the District service territory (the Goleta Pier at Goleta Beach State Park) falls within the risk area. The District maintains several critical facilities in and around the pier, including the Goleta Sanitary District Recycled Water Booster Pump Station, recycled water transmission main pipes, distribution pipes, and service lines, as well as a nearby groundwater well (Airport Well) at a similar elevation near the Goleta Slough. It is anticipated that a tsunami could adversely affect these District facilities.

6.4.1 Current Mitigation Strategies

The District is proactively performing research on alternatives to prevent damage from tsunami and flooding at its facilities near Goleta Beach:

- The District's existing recycled waterline at Goleta Beach (800 feet of an 18-inch pipeline) is vulnerable to damage from ongoing beach erosion and/or significant erosion from storm surge or tsunami events. The District is in process of conducting a design alternatives study to determine the best relocation strategy for the recycled water line.

6.5 FLOODING

While all of the District's reservoirs are either enclosed with a roof or located below ground, vents and hatches near the top of water storage reservoirs may be susceptible to overland flood events if reservoir sites are not well designed for proper drainage. The District's CDMWTP has several ponds and basins that may also be vulnerable to flash flooding.

The District's main vulnerability to flooding is inundation to facilities and assets where water can cause damage to electrical equipment, such as pumps, motors, telemetry, machinery, etc. District assets, such as wells, motors, and generators located close to creeks or at creek crossings are most susceptible to flooding damages. Facility operations must halt until the damaged devices are replaced or repaired. Water damage can be severe and almost always causes electrical equipment to short circuit. Irreparable devices further delay operations because the equipment needs to be replaced, and specialized parts can have long lead times.

Flooding can also prevent access to critical facilities. Floods inundate roads, leaving debris carried by the flood on the road and forming a blockade, and/or damaging the road itself. In the event

roads are impassable, key personnel cannot access remote District facilities. For example, Glen Annie Road is the only access road to the District's CDMWTP and is susceptible to damage from flooding as it crosses McCoy Creek. The CDMWTP requires weekly chemical resupply and shift rotations by highly trained operational staff. If necessary treatment chemicals cannot be delivered, or operators are unable to reach the plant, the District cannot treat and provide surface water to customers.

Another major concern is that floods can cause power outages by inundating an electric grid. As described in Section 6.4, *Energy Shortage & Resilience*, the District's groundwater wells and various pump stations currently require electricity to pump water. In the event of a power outage, the District would be unable to use the groundwater wells or pump stations in the distribution system to deliver water to customers.

6.5.1 Current Mitigation Strategies

The District employs several mitigation strategies to prevent damage from flooding at its facilities:

- Creek crossing retrofits where the CDMWTP access road crosses McCoy Creek.
- Flood prevention design best practices for electrical equipment at motor control centers (MCCs), variable frequency drives (VFDs), and other electrical equipment.
- Groundwater wellhead protection to prevent outside water sources and contaminants from contaminating groundwater wells.
- The design and installation of a sheet-pile wall to prevent Creekside undercutting at the CDMWTP Access Road.

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. Booster Pump Station upgrades at Edison and Van Horne

This project would:

- Convert temporary pump stations into permanent facilities to move back-up water supplies to isolated pressure zones in the system and distribute water when surface water supplies are interrupted from Lake Cachuma (during drought, pipeline breaks, etc.).
- Upgrade aging pumps and equipment to increase pumping capacity, reliability, and operational flexibility.

Enhanced pressure pumps will improve the movement of water throughout the distribution system since the majority of existing District pipelines were designed to deliver surface water through a gravity feed system. This would ensure pump stations will meet new code design standards, will be fire and earthquake-resistant, and enhance fire-fighting capabilities at higher elevations in the system. This project is consistent with the goals of the United States Bureau of Reclamation (USBR) under the Drought Response Program.

Mitigation Priority and Performance	
Priority	HIGH
Hazards Mitigated	Drought & Water Shortage, Wildfire, Earthquake
Estimated Timeline	Depends on funding
Estimated Cost/Funding Source	$2,772000/ District 2020-2025 IIP, USBR Water Smart Drought Response Program, DWR Prop 1E Disaster Preparedness
Responsible Agency/Department	GWD
Cost-Benefit Consideration	HIGH
Comments	A 100-percent engineering design has been prepared and the project is ready for construction. The project is included as an unfunded project in the 2020-2025 IIP, reviewed annually to reevaluate and reprioritize critical projects as conditions change.

2022-2. CDMWTP Upgrade for Disinfection Byproduct Control

The District studied treatment alternatives and identified the most cost-effective options for treating and removing organic matter and reducing THMs. Small-scale treatment testing has been completed and additional testing is currently underway to determine the feasibility of these plant upgrades. The treatment project has the dual benefit of also removing and treating for other chemical parameters and yet-to-be regulated contaminants of emerging concern. The project is phased and will depend on changing water quality conditions and funding.

Mitigation Priority and Performance	
Priority	LOW
Hazards Mitigated	Drought & Water Shortage, Wildfire
Estimated Timeline	2025
Estimated Cost/Funding Source	$56,000,000/ District 2020-2025 IIP

Mitigation Priority and Performance	
Responsible Agency/Department	GWD
Cost-Benefit Consideration	LOW
Comments	Funding for this project is included in the 2020-2025 IIP, but the project is conditioned on being necessary for water quality.

2022-3. Reservoir Aeration Treatment Systems

In-tank aerations systems are industry-accepted, cost-effective ways to treat for disinfection byproducts within the water distribution system that result from increased organic matter resulting from wildfire runoff and drought-related impacts to Lake Cachuma. The District conducted a study to inform the most cost-beneficial solutions to address disinfection byproduct treatment and tank aeration was a recommended option.

In-tank or fixed-spray nozzle aeration volatilizes DBPs, like THMs, created during the reaction of chlorine with organic matter and helps the District meet THM drinking water standards.

The District has implemented successful aeration systems at three reservoirs, but additional aeration in the more remote areas of the system would improve water quality.

Mitigation Priority and Performance	
Priority	MED
Hazards Mitigated	Drought & Water Shortage, Wildfire
Estimated Timeline	Depends on funding
Estimated Cost/Funding Source	$616,000 District 2020-2025 IIP
Responsible Agency/Department	GWD
Cost-Benefit Consideration	MED
Comments	Funding for preliminary designs for aeration and associated electrical infrastructure is included in the 2020-2025 Infrastructure Improvement Plan and is in progress.

2022-4. Emergency Back-up Power at District Well Sites

During recent wildfire events when electrical power was disrupted, the wells were turned off to avoid equipment failure. The District instead relied on surface water using a backup generator at the CDMWTP. Back-up emergency power is needed at District wells to provide water in the event water cannot be treated or delivered from Lake Cachuma or CDMWTP. Back-up emergency power at District well sites will ensure that these facilities continue to operate even during power outages.

Mitigation Priority and Performance	
Priority	HIGH
Hazards Mitigated	Wildfire, Earthquake, Flood, Tsunami
Estimated Timeline	Depends on funding
Estimated Cost/Funding Source	$3,010,000 DWR Prop 1E Disaster Preparedness, Federal grants, including Hazard Mitigation Assistance Grant Program
Responsible Agency/Department	GWD

Mitigation Priority and Performance	
Cost-Benefit Consideration	HIGH
Comments	The project is included as an unfunded project in the 2020-2025 IIP, reviewed annually to reevaluate and reprioritize critical projects as conditions change.

2022-5. Hollister Booster Pump Station Replacement

This project includes the design, construction, and management of a pit-less recycled water booster pump station to replace the existing Hollister Booster Pump station, which delivers water to recycled water customers for landscape irrigation. The pumping station is located in an underground vault at Hollister Avenue and South Glen Annie Road along the recycled water main and is vulnerable to flooding. The use of a pit-less submersible pump would mitigate the effects of future flooding and prevent service interruptions.

Preliminary designs will be completed between 2020-2025.

Mitigation Priority and Performance	
Priority	HIGH
Hazards Mitigated	Flood
Estimated Timeline	2030 / Depends on City of Goleta construction schedule
Estimated Cost/Funding Source	$4,200,000/ District 2020-2025 IIP
Responsible Agency/Department	GWD
Cost-Benefit Consideration	LOW
Comments	The District has evaluated potential relocation sites and conducted a long-term economic analysis on the pit-less pump option. Funding for initial preliminary design analysis is included in the 2020-2025 IIP.

2022-6. Emergency Back-up Power at District Pump Stations

The District operates six pumping stations that power pumps and motors used to lift water to higher elevations in the distribution system. These pump stations cannot operate during electrical shutdowns. Failure of the pump station would result in a lack of pressure to higher elevation residences and fire hydrants necessary for firefighting. Emergency backup power to pump stations can include onsite or mobile diesel generators for use during power outages.

Mitigation Priority and Performance	
Priority	MED
Hazards Mitigated	Wildfire, Earthquake, Flood, Tsunami
Estimated Timeline	Depends on funding
Estimated Cost/Funding Source	$700,000 DWR Prop 1E Disaster Preparedness, Federal grants, including Hazard Mitigation Assistance Grant Program
Responsible Agency/Department	GWD
Cost-Benefit Consideration	MED
Comments	The project is included as an unfunded project in the 2020-2025 IIP, reviewed annually to reevaluate and reprioritize critical projects as conditions change.

2022-7. Seismic Upgrades at Reservoirs

Many of the District's reservoirs were constructed before new seismic building requirements were in place and may be vulnerable to failure during significant earthquake events. Failure of reservoirs could result in flooding, loss of water storage, and damage to facilities and property downstream.

Seismic upgrades at the District reservoirs will bring facilities in line with new code requirements and reduce the likelihood of failure. These upgrades can include upgrading the freeboard and roof to handle potential water waves generated from an earthquake; reservoir anchorage or evaluation of the reservoir foundation to mitigate horizontal seismic forces; installing bracing rods; or reinforcing pipe connections with flexible couplings.

Mitigation Priority and Performance	
Priority	MED
Hazards Mitigated	Earthquake, Flood
Estimated Timeline	Depends on funding
Estimated Cost/Funding Source	$1,050,000/ Federal grants, including Hazard Mitigation Assistance Grant Program
Responsible Agency/Department	GWD
Cost-Benefit Consideration	MED
Comments	

2022-8. Solar Power Generation and Battery Storage at CDMWTP, Offices, and Remote Facilities

Solar generation at the District Headquarters will provide energy for operations and the District's electric vehicle chargers, with long-term cost savings to the District. Increased energy generation and battery storage will decrease dependence on the grid and allow some District operations to continue in the event of a power outage.

The District has conducted brief feasibility and cost-benefit analysis of various solar options at the District Headquarters and CDMWTP. Solar power and battery storage at remote facilities may eliminate the need for new power connections to maintain the operations of treatment infrastructure, analyzers, and other transmitters at remote sites. Solar generation for CDMWTP may also provide coverage for sedimentation basins, decreasing temperatures, and algae growth, while also generating energy for the CDMWTP. Alternatively, solar generation can be installed on surrounding hillslopes.

Mitigation Priority and Performance	
Priority	MED
Hazards Mitigated	Wildfire, Earthquake, Flood, Tsunami
Estimated Timeline	Depends on funding
Estimated Cost/Funding Source	$3,150,000/ Solar grants, District 2020-2025 IIP, USBR Water Smart WEEG
Responsible Agency/Department	GWD
Cost-Benefit Consideration	LOW

Mitigation Priority and Performance	
Comments	The District solicited proposals for the installation of solar panels and battery storage system-wide via a power purchase agreement, which will be considered by the Board of Directors in Spring 2022.

2022-9. City of Santa Barbara Interconnection

The District and the City of Santa Barbara currently have three interconnections to supply or transfer water from one system to another in the event of an emergency. The current delivery capacity from the City of Santa Barbara is 2 million gallons per day, less than the District's minimum public health and safety need, and to operate the District's groundwater wells must be shut down. The District can deliver only 1 million gallons per day to the City of Santa Barbara.

The project involves the construction of a new, larger connection (interconnect) between the water distribution systems of the District and the City of Santa Barbara. Potential capacity could increase by an additional 3 to 4 million gallons per day if constructed with a pump station based on an analysis of system hydraulic pressures. This project allows mutual assistance to agencies in the event of an emergency, such as a transmission line failure, earthquake, wildfire, or a planned system shut down. Santa Barbara is also connected to Montecito and Carpinteria, and therefore a regional benefit would extend to the entire South Coast.

Mitigation Priority and Performance	
Priority	MED
Hazards Mitigated	Drought & Water Shortage, Wildfire, Earthquake, Flood
Estimated Timeline	Depends on funding.
Estimated Cost/Funding Source	$2,100,000/ Federal, including Hazard Mitigation Assistance Grant Program
Responsible Agency/Department	GWD
Cost-Benefit Consideration	HIGH
Comments	The project is included as an unfunded project in the 2020-2025 IIP, reviewed annually to reprioritize critical projects as conditions change.

2022-10. Covers on CDMWTP Sedimentation Basins

During droughts and flood events, debris, nutrients, and high organic levels produce changing water quality conditions at Lake Cachuma and present treatment challenges. This project involves installing covers on the District's CDMWTP sedimentation basins to decrease water temperatures and improve water quality. Covers lessen the potential for algal blooms and disinfection byproduct formation within the treatment process.

Sedimentation basin covers are a solution used by many water treatment plants to cool water temperatures and mitigate the effect of organics on algal growth. Covers may be a more cost-effective solution than drilling additional groundwater production capacity, which provides an alternative source of water when surface water quality deteriorates.

Mitigation Priority and Performance	
Priority	LOW

Mitigation Priority and Performance	
Hazards Mitigated	Drought & Water Shortage, Flood
Estimated Timeline	Depends on funding.
Estimated Cost/Funding Source	$5,600,000/ Solar grants
Responsible Agency/Department	GWD
Cost-Benefit Consideration	LOW
Comments	

2022-11. Seismic Vulnerability Study

This study would identify facilities with inadequate anchorage or high risk of failure during varying levels of seismic events and recommend short- and long-term projects for lessening earthquake vulnerabilities. It could also include seismic modeling, earthquake resiliency planning, identification of vulnerable assets based on risk analysis, etc.

Facilities for inspection and review include CDMWTP, reservoirs, wells, pressure relief valves, and booster pump stations.

The study can also identify personnel who can perform post-earthquake building inspections for safety, inform an earthquake response plan, and additional earthquake modeling.

Mitigation Priority and Performance	
Priority	MED
Hazards Mitigated	Earthquake
Estimated Timeline	Depends on funding
Estimated Cost/Funding Source	$490,000/ DWR Prop 1E Disaster Preparedness, Federal grants, including Hazard Mitigation Assistance Program
Responsible Agency/Department	GWD
Cost-Benefit Consideration	HIGH
Comments	

2022-17. Seismic Building and Pipe Improvements

Seismic bracing of the ceiling and floor of the District's headquarters, CDMWTP buildings, remote facility buildings, and storage tanks would mitigate service disruptions to customers and protect critical systems, such as the Supervisory Control and Data Acquisition system (SCADA), which monitors the treatment and distribution systems.

Small improvements include bracing, pipe supports, joint supports, anchoring, and the replacement of inflexible joints with flexible or ball joints. For reservoirs and chemical storage tanks, automatic shutoff valves can be installed to prevent large leaks. Prioritization of seismic improvements at critical pipelines and wells near hospitals and community facilities can also help post-earthquake response.

Mitigation Priority and Performance	
Priority	MED

Mitigation Priority and Performance	
Hazards Mitigated	Earthquake
Estimated Timeline	Depends on funding
Estimated Cost/Funding Source	$750,000/ DWR Prop 1E Disaster Preparedness, Federal grants, including Hazard Mitigation Assistance Program
Responsible Agency/Department	GWD
Cost-Benefit Consideration	MED
Comments	

2022-13. Cathedral Oaks 20" Bypass Waterline

This project maintains adequate potable water and fire service to approximately 4,000 District customers in the event of a failure of an upper portion of either the Glen Annie Lateral or the 42-inch Transmission Main that runs along Cathedral Oaks Road. Should either line fail, alternative water service would need to be provided to maintain service to the District's customers.

The project consists of installing approximately 8,500 feet of 20-inch waterline in Cathedral Oaks Road between Glen Annie Road and Camino Laguna Vista. At Glen Annie Road, the proposed waterline will connect to the District's Glen Annie Lateral. At Camino Laguna Vista, the proposed waterline will connect to the District's 42-inch Transmission Main. The construction of the proposed waterline would loop the two transmission mains.

Mitigation Priority and Performance	
Priority	HIGH
Hazards Mitigated	Earthquake, Flood
Estimated Timeline	Depends on funding
Estimated Cost/Funding Source	$6,860,000/ District 2020-2025 IIP
Responsible Agency/Department	GWD
Cost-Benefit Consideration	HIGH
Comments	2020-2025 IIP funding is limited to preliminary design analysis. Construction of this project is included as an unfunded project in the 2020-2025 IIP, reviewed annually to reevaluate and reprioritize critical projects as conditions change.

2022-14. Seismic Pipe Retrofits

Many of the District's pipes do not meet updated Seismic Guidelines for Water Pipelines as they were primarily installed before 1960 and are vulnerable to failure during earthquakes.

The buried pipes can be retrofitted with seismic-resistant pipes with restrained and flexible joints. Certain pipes can be renewed with High-Density Polyethylene (HDPE) material to the extent of the pipe's service life and durability during an earthquake. Pipes can be prioritized based on age, location in high liquefaction areas, or areas that traverse active faults.

Installing seismic retrofits and upgrades will increase the resiliency of existing infrastructure to hazards, while also reducing the risk of pipeline failure and inability to provide water.

Mitigation Priority and Performance	
Priority	MED
Hazards Mitigated	Earthquake
Estimated Timeline	Depends on funding
Estimated Cost/Funding Source	$750,000/ DWR Prop 1E Disaster Preparedness, Federal grants, including Hazard Mitigation Assistance Program
Responsible Agency/Department	GWD
Cost-Benefit Consideration	MED
Comments	The District has identified estimated service life, known installation dates, and performed some pipe conditions assessments to classify vulnerable pipes for asset management. This data can also inform the prioritization of pipe retrofits.

2022-15. Risk Assessment of Critical Transmission Mains

Transmission main pipelines convey high volumes of water to customers from the District's wells and treatment plant. A failure on the transmission mainline may cause the system to drop pressure significantly, lessening pressure at hydrants for firefighting and potentially interrupting water service to customers.

Transmission mains require routine risk assessments to identify vulnerabilities in the pipe where failures might occur due to earth movement and interrupt water deliveries.

In 2018, the District began an inspection of 10,000 ft of the 45-year-old 42-inch transmission main with the latest industry technologies. This project will continue assessment efforts on the remaining fourteen miles of transmission main pipe using remotely controlled robots and high-resolution imagery to identify major problems for repair, lessening the risk of failure during an earthquake.

Mitigation Priority and Performance	
Priority	HIGH
Hazards Mitigated	Earthquake
Estimated Timeline	Depends on funding
Estimated Cost/Funding Source	$3,150,000 2020-2025 IIP, Federal grants, including Hazard Mitigation Assistance Program
Responsible Agency/Department	GWD
Cost-Benefit Consideration	HIGH
Comments	The project is included as an unfunded project in the 2020-2025 IIP, reviewed annually to reevaluate and reprioritize critical projects as conditions change.

2022-16. Vulnerable Creek Crossing Repairs

This project will continue the District's maintenance program to inspect, identify and repair exposed distribution piping at creek crossings. There are approximately 100 known locations where District water mains span either over or under creek crossings and 10 known locations where District water mains are exposed and vulnerable to failure from flash flooding or debris flow events. These

crossings require periodic inspection to identify erosion and the need to either repair or relocate the pipe to prevent waterline failure or emergency events in the future.

The District has prepared a design for the repair of the most vulnerable exposed crossing and anticipates constructing the repair in fall 2022.

Mitigation Priority and Performance	
Priority	HIGH
Hazards Mitigated	Earthquake, Flood
Estimated Timeline	Ongoing
Estimated Cost/Funding Source	$3,000,000/ District 2020-2025 IIP, DWR Proposition 68
Responsible Agency/Department	GWD
Cost-Benefit Consideration	MED
Comments	Creek crossing inspections have been performed in-house by staff. This information has been gathered for emergency response purposes. As funding is available, the District will develop designs for the construction of needed repairs as identified through periodic inspections.

2022-17. Risk Assessment of Recycled Water Mains

Risk assessments are an essential component of hazard mitigation and infrastructure replacement planning. Risk assessments help reduce the risk of pipe failure by identifying problems early, extending pipe useful life by relying on empirical data, and providing baseline data for future assessments.

The District maintains 10 miles of recycled water main pipelines that convey up to 1,000 AFY of recycled water, offsetting the District's potable water demand. Due to the age of these pipes and the aggressive nature of recycled water, this main has been prioritized for review.

The project will include using video cameras in the transmission mains to gather visual and electromagnetic data about pipeline corrosion, separation, leaks, or other potentially problematic conditions. The results of the assessment will be used to recommend localized pipeline repairs and/or replacements and establish a baseline for future conditions assessments.

Mitigation Priority and Performance	
Priority	Low
Hazards Mitigated	Earthquake, Tsunami
Estimated Timeline	Depends on funding
Estimated Cost/Funding Source	$2,450,000/ CWSRF Water Recycling Programs, Federal grants, including Hazard Mitigation Assistance Program
Responsible Agency/Department	GWD
Cost-Benefit Consideration	LOW
Comments	The project is included as an unfunded project in the 2020-2025 IIP, reviewed annually to reevaluate and reprioritize critical projects as conditions change.

2022-18. Flooding Vulnerability Study

The District currently lacks comprehensive knowledge of which specific assets, including critical electrical equipment, chemical storage, pumps and motors, water storage reservoirs, and treatment ponds may be vulnerable to flood events. A Flooding Vulnerability Study would help identify assets below various flooding marks (1-percent flood events or 5-year flood events), and recommend retrofits and replacements needed to avoid damage from flooding and inundation. This can also include well head protection, outlet relocations, updated drainage design, and implementation, or green infrastructure projects.

Mitigation Priority and Performance	
Priority	LOW
Hazards Mitigated	Flood
Estimated Timeline	Depends on funding
Estimated Cost/Funding Source	$200,000/ DWR Proposition 68, Federal grants, including Hazard Mitigation Assistance Program
Responsible Agency/Department	GWD
Cost-Benefit Consideration	MED
Comments	

2022-19. Flooding Barriers around Key Assets

This project will implement small, cost-effective projects to protect critical assets from flooding inundation based on facility evaluation. These can include identifying critical outlets that are below potential flood inundation levels or potential water damage to automatic transfer switches; elevating other electrical equipment vulnerable to flood events; and building flood control methods to modify runoff and manage stormwater through infrastructure or green infrastructure. Electrical equipment is vital to operate pumps and motors, treatment systems, water quality analyzers, and monitors.

Mitigation Priority and Performance	
Priority	LOW
Hazards Mitigated	Flood
Estimated Timeline	Depends on funding
Estimated Cost/Funding Source	$3,500,000/ DWR Proposition 68
Responsible Agency/Department	GWD
Cost-Benefit Consideration	MED
Comments	

2022-80. CDMWTP Access Road Improvements

The access road to the CDMWTP is 1.25 miles long, with an average width of approximately 18 feet (about 119,000 square feet of pavement), and has been damaged over time through normal wear, weather, and other factors. Structural assessment of the main access road indicates that it has significant cracking. The access road also crosses McCoy Creek, which becomes impassable during flash floods and debris flow events.

This project would modify and raise the McCoy Creek crossing on the access road and include other repairs. The access road is a short, low fair-weather creek crossing that can become flooded during heavy winter storm events and ensure that the road to CDMWTP remains accessible.

Mitigation Priority and Performance	
Priority	LOW
Hazards Mitigated	Flood
Estimated Timeline	Depends on funding.
Estimated Cost/Funding Source	$1,400,000/ DWR Proposition 68
Responsible Agency/Department	GWD
Cost-Benefit Consideration	MED
Comments	

2022-91. Recycled Waterline Relocation at Goleta Beach State Park

The District is in the process of an alternatives design study to recommend strategies for relocating critical recycled water infrastructure to prevent damage from beach erosion as a result of storm surge or tsunami events.

The recycled water mainline delivers 1,000 AFY of recycled water for the benefit of landscape irrigation and toilet flushing to customers including the University of California Santa Barbara, large golf courses, and other commercial landscaped areas. Without recycled water, drinking water must be used, limiting the District's available potable water supply.

Mitigation Priority and Performance	
Priority	LOW
Hazards Mitigated	Tsunami
Estimated Timeline	On hold
Estimated Cost/Funding Source	$2,380,000 DWR Proposition 68
Responsible Agency/Department	GWD
Cost-Benefit Consideration	HIGH
Comments	The District is in the process of conducting a relocation design alternatives study to recommend the most cost-effective, feasible solution for relocating the waterline. The estimated total cost is $1.7 million.

2022-102. Backflow Prevention Program to Prevent Water Contamination

Installing additional backflow prevention assemblies in high fire risk areas reduces the chance of backflow contamination during emergencies. Backflow prevention assemblies are designed to prevent backflow of contaminants or pollutants from entering the distribution system from homes or commercial properties at the meter, where unsafe substances preside. Back siphonage occurs when the pressure drops and creates a vacuum that may pull unsafe substances into the distribution system. Proactive backflow assembly installation could also be installed at critical customer connections, such as dialysis centers, daycares, hospitals, and health care facilities.

Mitigation Priority and Performance	
Priority	LOW
Hazards Mitigated	Wildfire
Estimated Timeline	Depends on funding
Estimated Cost/Funding Source	$350,000/ Federal or state grant programs
Responsible Agency/Department	GWD
Cost-Benefit Consideration	LOW
Comments	

2022-113. Remote Water Quality Sensors in the Distribution System

The District is required to monitor water quality downstream of the treatment plant at designated sampling locations, including for pH, temperature, chlorine residual, and conductivity. This project expands the District's water quality monitoring for remote areas of the distribution system, including areas where access is limited, where pipe or facilities failures may go unnoticed, or where increased monitoring of water quality would allow the District to respond quickly to changing water quality conditions.

Currently, manual monitoring is performed by operator staff at 28 sites. Remote water quality monitoring allows for early detection of pipe failures, cross-connection contamination, and other unpredictable events in the distribution system.

Post-emergency, remote water quality monitoring will also allow for targeted restoration to affected areas of the distribution system without the need to send operators to sample across the system. This significantly reduces response times after an emergency.

Mitigation Priority and Performance	
Priority	LOW
Hazards Mitigated	Wildfire, Earthquake, Flood, Tsunami
Estimated Timeline	Depends on funding
Estimated Cost/Funding Source	$400,000/ District 2020-2025 IIP
Responsible Agency/Department	GWD
Cost-Benefit Consideration	MED
Comments	The project is included as an unfunded project in the 2020-2025 IIP, reviewed annually to reevaluate and reprioritize critical projects as conditions change.

2022-124. Groundwater Well Chemical Storage Tank Upsizing

The District's groundwater wells each have on-site chemical storage tanks for water treatment chlorination. The current sizing of chemical storage tanks allows for approximately two weeks of groundwater production.

This project increases chemical storage at the wells to allow for increased groundwater production and treatment should there be an interruption in chemical deliveries caused by an emergency. Historical natural disasters in the community have closed area highways, delaying chemical

deliveries and fuel deliveries and disrupting access by District staff. This project will help maintain groundwater as a backup supply to serve customers for extended periods during emergencies.

Mitigation Priority and Performance	
Priority	LOW
Hazards Mitigated	Wildfire, Earthquake, Flood, Tsunami
Estimated Timeline	Depends on funding
Estimated Cost/Funding Source	$2,000,000/ Funding Source?
Responsible Agency/Department	GWD
Cost-Benefit Consideration	MED
Comments	Professional groundwater analysis recommended upsizing chemical storage tanks at the District's nine groundwater well sites.

2022-135. Implementation of Stormwater Capture Projects

The District's 2017 Stormwater Resources Plan identifies several stormwater capture and infiltration projects that could be implemented in the District service area. These projects would collect water from the large drainage areas of Goleta watersheds, utilizing existing stormwater conveyance infrastructure constructed by the County of Santa Barbara. The 12 infiltration basins, dry wells and capture reuse projects studied in the plan would provide for an estimated 24-660 Acre Feet (AF) each of new supply per year, with construction costs ranging depending on the project from $400k-$12m. While these are multi-benefit projects, the amortized cost per acre-foot (AF) is calculated at between $800-$27,000 per AF.

Mitigation Priority and Performance	
Priority	LOW
Hazards Mitigated	Drought, Flood
Estimated Timeline	Depends on funding
Estimated Cost/Funding Selectource	$3,500,000
Responsible Agency/Department	County Flood Control, GWD, City of Goleta
Cost-Benefit Consideration	LOW
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 GWD, 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 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 annex 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 Improvement Plan and Sustainability Plan to implement infrastructure improvements to reduce 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 KK Holland, Principal Policy Analyst, using the following information:

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Goleta Water District
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Santa Barbara, CA 93110
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MONTECITO FIRE PROTECTION 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 PLANNING PROCESS

§201.6(b): In order to develop a more comprehensive approach to reducing the effects of natural disasters, the planning process **shall** include:

(1) An opportunity for the public to comment on the plan during the drafting stage and prior to plan approval;

(2) An opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, and agencies that have the authority to regulate development, as well as businesses, academia and other private and non-profit interests to be involved in the planning process; and

(3) Review and incorporation, if appropriate, of existing plans, studies, reports, and technical information.

§201.6(c)(1): [The plan **shall** document] the planning process used to develop the plan, including how it was prepared, who was involved in the process, and how the public was involved.

1.1. 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.

Hazard mitigation planning is a dynamic process built on realistic assessments of past and present information that engages Montecito Fire Protection District (District) personnel to

anticipate future hazards and develop meaningful strategies to address possible impacts and identified needs. The hazard mitigation planning process involves the following tasks:

- Organizing resources
- Assessing risks
- Developing mitigation strategies, goals, and priorities
- Adopting a plan
- Implementing the plan
- Monitoring progress
- Revising the plan as necessary

The 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. The LHMP was last comprehensively updated as an annex to the 2017 MJHMP. Since then, the District has:

- Incorporated the LHMP goals, objectives, and mitigation actions into its operations, management, and infrastructure planning and processes.
- Used the LHMP's assessment of capabilities, hazards, and vulnerabilities to inform planning, infrastructure improvements, and programs, including outreach and engagement programs for fire safety and preparedness.
- Implemented mitigation actions through the facility and staff planning, maintenance programs, grant programming, community outreach, and budget process.
- Reviewed and evaluated mitigation actions before and after disasters, including the Thomas Fire and Montecito debris flow.

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 service area, 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 1.3 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 Chapter 4).

1.2. Planning Process

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 Mitigation Advisory Committee (MAC) and the second is the Local Planning Team (LPT).

All eight incorporated cities and the six special districts joined the County Office of Emergency Management (OEM) 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 Santa Maria Valley Water Conservation District (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 the 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 whether 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

LPT meetings were conducted to review the existing Hazard Mitigation Plan, update the capabilities and hazard assessments, and discuss existing, recurring, or new mitigation strategies.

The *Hazard Assessment* (Section 3) presents the methodology in which the LPT reviewed the

previously identified hazards and discussed revisions to their prioritization. A profile for each hazard is included which summarizes the type of hazard, location and extent, history of past occurrences, and probability of future occurrences. The hazard identification and ranking documented in this section form the foundation for prioritizing mitigation actions.

The LPT reviewed the previous Mitigation Strategies to assess progress made in implementing the listed actions. In addition, based on updates to the hazard identification, profiles, vulnerability assessments, and capability assessment, the need for new mitigation actions was considered. The progress report and any new mitigation actions are presented in the updated *Mitigation Strategy* (Section 4).

The LPT held regular meetings and continually worked on the Plan. The LPT coordinated and consulted with other entities and stakeholders to identify and delineate natural hazards within the District to assess the risks and vulnerable property in identified hazard areas. From the start, every attempt was made to establish an open public process to provide an opportunity for all sectors of the overall community to be involved in the planning process.

Each participating member of the LPT had the opportunity to impact all aspects of the planning process. In addition, District staff participated in community involvement through the public outreach campaigns used in the County's 2022 MJHMP Update process, which included engaging the public through open planning meeting invitations and online review opportunities.

§201.6(b): In order to develop a more comprehensive approach to reducing the effects of natural disasters, the planning process **shall** include:

(1) An opportunity for the public to comment on the plan during the drafting stage and prior to plan approval;

(2) An opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, and agencies that have the authority to regulate development, as well as businesses, academia, and other private and non-profit interests to be involved in the planning process; and

§201.6(c)(1): [The plan **shall** document] the planning process used to develop the plan, including how it was prepared, who was involved in the process, and how the public was involved.

1.3. Mitigation Advisory Committee (MAC)

The District participated as a MAC member to prepare this LHMP as an annex to the 2022

MJHMP. The District was represented by Aaron Briner, Battalion Chief, Fire Marshal, and David Neels, Division Chief of Operations on the MAC.

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

Table 1.1: Mitigation Advisory Committee (MAC) Meetings Summary

Meeting Dates	Summary of Discussions
March 2021	**MAC Meeting #1 (virtual)** 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	**MAC Meeting #2 (virtual)** 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	**MAC Meeting #3 (virtual)** 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	**MAC Meeting #4 (virtual)** Collected feedback on 2017 mitigation strategies Conducted interactive exercise on mitigation strategies for key hazards unaddressed in previous MJHMP Discussed annex updates
January 2022	**MAC Meeting #5 (virtual)** Presented draft plan Discussed key MAC/LPT review needs and key issues Discussed annex updates to dovetail with plan update
March 2022	**MAC Meeting #6 (virtual)** 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

1.4. Local Planning Team (LPT)

The members below participated on 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 1.2: Montecito Fire Protection District Local Planning Team 2022

Name	Title
Aaron Briner	Battalion Chief, Fire Marshal
Alex Broumand	Captain, Assistant Fire Marshal

The District's LPT members worked directly with the County 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 District's LPT met virtually as needed during the planning process to discuss data needs and organize data collection. The table below outlines a timeline of the LPT's activities throughout the planning process.

Table 1.3: Local Planning Team Activity Summary

Meeting Dates	Summary of Discussions
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 (12/20/21) to discuss LHMP priorities and mitigation approaches.
January and March 2022	Reviewed new maps and local vulnerabilities. Provided input on the status of 2017 LHMP mitigation strategies. Reviewed draft mitigation strategies and provide feedback. Reviewed and finalized 2022 LHMP

1.5. Public Involvement

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 April 2022, the LHMP was completed and made available for public review for forty-five days, concurrent with review by FEMA and CalOES. Hard copies of the document were available at Fire Station 1 located at 595 San Ysidro Road, Santa Barbara, CA 93108. The opportunity to review documents was announced through social media and the District's website. The community was welcome to submit written or verbal comments to the District.

1.6. Review and Incorporation of Existing Plans

§201.6(b): In order to develop a more comprehensive approach to reducing the effects of natural disasters, the planning process **shall** include:

(3) Review and incorporation, if appropriate, of existing plans, studies, reports, and technical information.

While updating the District's LHMP, the LPT reviewed existing plans (detailed below) and incorporated relevant information into the planning efforts.

2018 State of California Multi-Hazard Mitigation Plan

The State of California Multi-Hazard Mitigation Plan was reviewed to ensure consistency between the State and District plan concerning identified hazards and vulnerability, goals and objectives, and mitigation actions. The State goals served as the basis for developing the goals at the District level. District goals and objectives are outlined in Section 4.

Santa Barbara County Multi-Jurisdictional Hazard Mitigation Plan

Like the California Multi-Hazard Mitigation Plan, the County MJHMP was reviewed to ensure consistency between the County Plan and the District LHMP. County Plan goals were adopted as the District's goals in addition to utilizing hazard profile information as the basis for determining the hazards which impact the District.

2012 California Adaptation Planning Guide

FEMA, Cal OES, and the California Natural Resources Agency developed the California Adaptation Planning Guide to assist municipalities in recognizing local climate change and to provide guidance in addressing potential vulnerabilities. The information was used to develop potential hazards and to provide background information that allowed the LPT to make educated decisions regarding mitigation actions designed to alleviate the effects of climate change.

1.7. 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. 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 vulnerability and firefighting capacity would improve the District's capabilities to ensure adequate response and management of fire hazards.
- **Administrative/Technical Opportunities**: As part of this update, the District aims to improve its resilience to ensure operations are sustained during a hazardous event, including constructing protective structures around critical facilities. Existing plans, inclusive of the plans aforementioned and this LHMP, will be updated periodically with the best available information.
- **Outreach Opportunities**: The District could enhance Public Outreach regarding the impacts of a seismic event and wildfire to reduce the risks of fire hazard throughout the community.
- **Fiscal Opportunities**: The District can pursue grants to fund mitigation efforts aimed at fire protection and resilience. Additionally, the District can update its capital improvement/ facilities plan to reflect the information gathered for this Hazard Mitigation Plan.

2.0 PLANNING AREA PROFILE

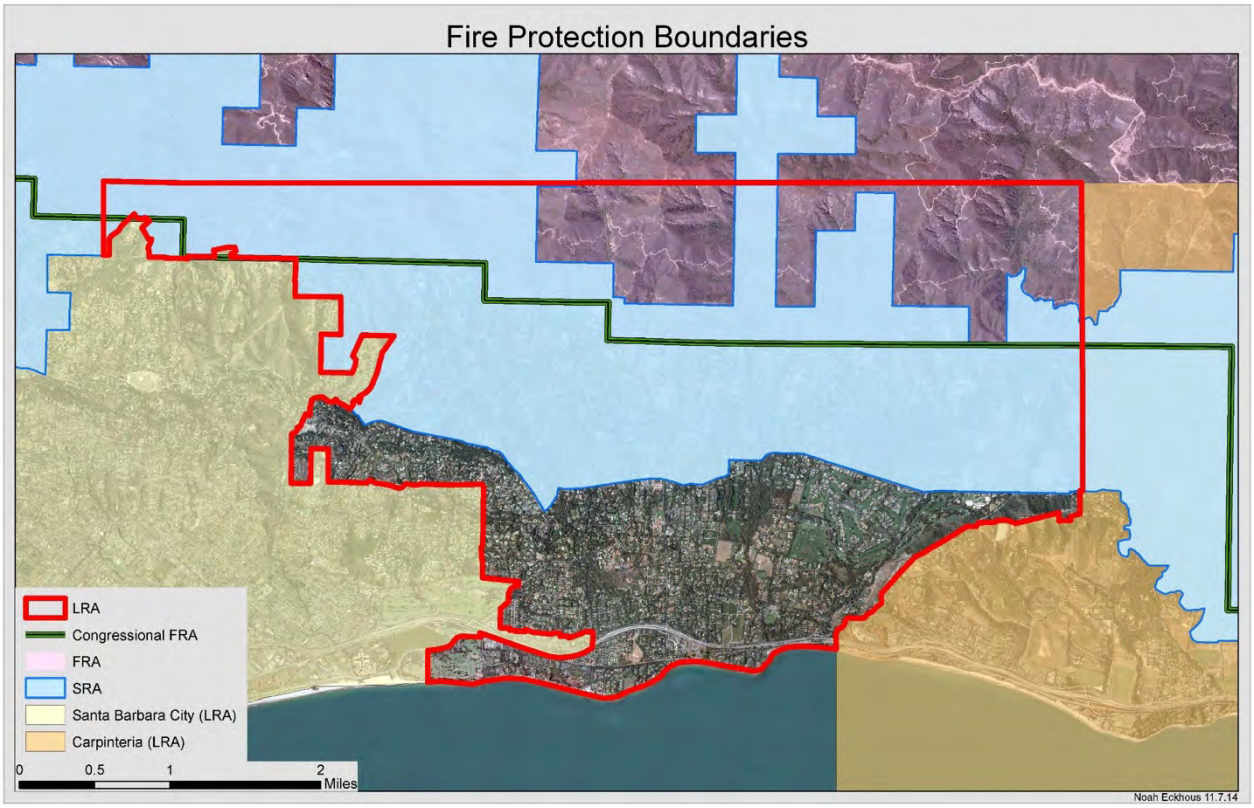
The District, located in the southern coastal portion of Santa Barbara County California, was formed on June 20, 1917, under the name Montecito Fire Protection District, to protect the people, property, and the environment in the Montecito area. The District is approximately 21.7 square miles in size and serves the unincorporated community of Montecito with an estimated population of about 8,965. The District is funded by a portion of general property tax revenue collected within district boundaries, which covers the costs of all services.

The District provides Paramedic level Advanced Life Support services to its constituents and those in the surrounding area. District personnel is trained and equipped to respond to all fires, medical emergencies, vehicle accidents, alarm ringing, technical rescue, hazardous materials, public service assists, and unknown types of emergencies. The District also provides overhead personnel to the USDA Forest Service and other agencies when responses to large incidents need additional resources.

The Montecito Fire Protection District is governed by the Fire Board of Directors. The District is organized under sections 13800 to 13970 inclusive of the Health and Safety Code of the State of California, Fire Protection District Law of 1987.

The District's climate is a temperate Mediterranean style that generally consists of cool wet winters and mild dry summers with coastal fog in some of the summer months. As such, temperatures in the winter rarely fall below freezing. Spring conditions remain mild with light amounts of rain and fog. During the summer and fall, the climate is usually dry and warm, with moderate conditions; however, the area often experiences the hot dry Santa Ana winds during the late summer and early fall periods.

The map on the next page provides an overview of the District's service area.



2.1. Development Trends

§201.6(c)(2)(ii)(C): [The plan **should** describe vulnerability in terms of] providing a general description of land uses and development trends within the community so that mitigation options can be considered in future land use decisions.

The areas within the District's service area boundary are generally built out, so sharp increases in population and the need for additional infrastructure development are unlikely. Currently, there are no plans to expand the District.

3.0 HAZARD ASSESSMENT

§201.6(c)(2)(i): [The risk assessment **shall** include a] description of the type, location, and extent of all-natural hazards that can affect the jurisdiction. The plan shall include information on previous occurrences of hazard events and on the probability of future hazard events.

§201.6(c)(2)(ii): [The risk assessment **shall** include a] description of the jurisdiction's vulnerability to the hazards described in `paragraph (c)(2)(i) of this section. This description **shall** include an overall summary of each hazard and its impact on the community.

§201.6(c)(2)(ii): [The risk assessment] **must** also address National Flood Insurance Program (NFIP) insured structures that have been repetitively damaged floods.

§201.6(c)(2)(iii): For multi-jurisdictional plans, the risk assessment **must** assess each jurisdiction's risks where they vary from the risks facing the entire planning area.

The purpose of this section is to review, update, and/or validate the identified and profiled hazards in the 2018 Montecito Fire Protection District LHMP. The intent is to confirm the list of hazards facing the District and determine if the current information and material are accurate. The importance of this is to ensure that all hazards are being considered and decisions are based on the most up-to-date information. Another purpose of this section is to screen the hazards. It will provide an understanding of the significance of ranking hazards by their priority in the community.

The Risk Assessment consists of three steps: Hazard Identification, Hazard Profiling, and Loss Estimates. This section includes the Hazard Identification and Hazard Profiling steps to evaluate the hazards of primary concern to local decision-makers to provide a basis for loss estimates which are also included within this chapter. Additionally, the Risk Assessment provides a foundation for the evaluation of mitigation measures that can help reduce the impacts of a potential hazard event. As an annex to the County's MJHMP, the LPT used the information found in the County's Plan as a basis for elements of the Risk Assessment.

Step 1: Identify Hazards: This step identified the natural and man-made hazards that might affect the District and then narrowed the list to the hazards that are most likely to occur. These hazards included natural, technical, and human-caused events, with an emphasis on the effect disasters may have on critical facilities. The LPT participated in a Hazard Identification exercise to identify and rank the potential hazards within the District.

Step 2: Profile Hazard Events: The hazard event profiles are mostly products of the County's multi-jurisdictional Plan. The LPT utilized the basic understanding of each hazard from the

County Plan and then considered how that hazard would impact the District specifically.

Step 3: Loss Estimates: The loss estimate step relied on detailed information regarding the hazard probability and maps that were completed as part of the hazard profiles. This information was utilized to apply the hazard probabilities and recurrence intervals to the assets and inventory (buildings and infrastructure) of the District. This step was critical in determining which assets were subject to the greatest potential damages and which hazard event was likely to produce the greatest potential losses.

The conclusion of this step precipitated a comprehensive loss estimate (vulnerability assessment) for each identified hazard for each specific asset in terms of damages, economic loss, and the associated consequences for the District.

The hazard identification and ranking were obtained primarily from a Hazard Identification Exercise completed during the LPT meeting. Each hazard profile includes a summary of the Hazard Identification Exercise identified risk factors and overall rank for each hazard, in addition to the detailed hazard description, historical occurrences, and projected future probability, magnitude, and frequency.

The LPT determined the initial hazard profile ranking through a facilitated exercise using an automated interactive spreadsheet that asked specific questions regarding potential hazards and then assigned a relative value to each potential hazard, accordingly, including numerical rankings (1-5) for the following criteria:

- Consequence/Severity – How widespread is the impact area?
- Secondary Effects – Could the event trigger another event and separate response?
- Probability/Frequency – Historical view of how often this type of event occurs locally and projected recurrence intervals.
- Warning/Onset – Advance warning of the event, or none.
- Duration – Length of elapsed time where response resources are active.
- Recovery – Length of time until lives and property return to normal.

Each member of the LPT reviewed the previously identified hazards and discussed the need for revisions to their prioritization. Table 3.1 summarizes the Hazard Identification risk factors, lists the descriptions of each factor, provides the specific descriptor choices for each risk factor and description, and summarizes the risk ranking associated with each hazard:

As a Special District, the Montecito Fire Protection District 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.

Table 3.1: Hazard Identification Risk Factors

Risk Factor	Description	Descriptors	Value
Probability/ Frequency	Prediction of how often a hazard will occur in the future	Infeasible event - not applicable due to geographic location characteristics	0
		A rare event - occurs less than once every 50 years	1
		Infrequent event - occurs between once every 8 years and once every 50 years (inclusive)	2
		Regular event - occurs between once a year and once every 7 years	3
		Frequent event - occurs more than once a year	4
Consequence/ Severity	Physical Damage - structures and lifelines Economic Impact – loss of function for power, water, sanitation, roads, etc.	No damage	1
		Minor/slight damage to buildings and structures, no loss of lifelines	2
		Moderate building damage, minor loss of lifelines (less than 12 hours)	3
		Moderate building damage, lifeline loss (less than 24 hours)	4
		Extensive building damage, widespread loss of lifelines (water, gas, electricity, sanitation, roads), loss of life	5
Vulnerability	Impact Area - area impacted by a hazard event Secondary Impacts - Capability of triggering additional hazards Onset - Period between initial recognition of an approaching hazard and when the hazard begins to impact the community	No physical damage, no secondary impacts	1
		Localized damage area	2
		Localized damage area, minor secondary impacts, delayed hazard onset	3
		Moderate damage area, moderate secondary impacts, moderate warning time	4
		Widespread damage area, significant secondary impacts, no warning time	5

Each hazard was assigned a risk rank (ranging from no/low hazard to severe/high hazard) based on the risk factors determined during the Hazard Identification Workshop. The risk score is calculated by Risk = Probability x Consequence x Vulnerability. Table 3.2 provides the risk ranking matrix used to calculate the risk score.

Table 3.2: Risk Ranking Matrix

Probability/Frequency Description	Risk Ranking Matrix

Rare Event: Occurs less than once every 50 years

Probability/Frequency Value: 1	Consequence/ Severity				
	1	2	3	4	5
Vulnerability 1	1	2	3	4	5
2	2	4	6	8	10
3	3	6	9	12	15
4	4	8	12	16	20
5	5	10	15	20	25

Infrequent Event: Occurs between once every 8 years and once every 50 years (inclusive)

Probability/Frequency Value: 2	Consequence/ Severity				
	1	2	3	4	5
Vulnerability 1	2	4	6	8	10
2	4	8	12	16	20
3	6	12	18	24	30
4	8	16	24	32	40
5	10	20	30	40	50

Regular Event: Occurs between once a year and once every 7 years

Probability/Frequency Value: 3	Consequence/ Severity				
	1	2	3	4	5
Vulnerability 1	3	6	9	12	15
2	6	12	18	24	30
3	9	18	27	36	45
4	12	24	36	48	60
5	15	30	45	60	75

Frequent Event: Occurs more than once a year

Probability/Frequency Value: 4	Consequence/ Severity				
	1	2	3	4	5
Vulnerability 1	4	8	12	16	20
2	8	16	24	32	40
3	12	24	36	48	60
4	16	32	48	64	80
5	20	40	60	80	100

The final risk score yields a profile ranking of each hazard, as illustrated in Table 3.3.

Table 3.3: Risk Rank Categorization

Risk Rank Categorization	
High Hazard	**50 to 100**
Moderately High Hazard	**25 to 49**
Moderate Hazard	**15 to 24**
Moderately Low Hazard	**5 to 14**
Low Hazard	**1 to 4**

The following illustrates the final hazard ranking developed by the LPT to rank each of the identified hazards in order of the highest perceived vulnerability to the lowest. The Hazard Profiles presented in Sections 3.1 through 3.8 are organized as shown in Table 3.4 with "higher priority" hazards listed at the top and the "lower priority" hazards at the bottom.

Table 3.4: Hazard Ranking Summary

Hazard Rank	Score
High	
Earthquake	50
Moderately High	
Wildfire	48
Moderate	
Landslide or Earth Movement	24
Public Health Pandemic	20
Energy Shortage & Resiliency	18
Flood	18
Terrorism	16
Moderately Low	
Low	

3.1. Earthquake Hazard Profile

Earthquake Risk Assessment Summary	
Risk Rank: High	
Probability/ Frequency:	Infrequent event - occurs between once every 8 years and once every 50 years (inclusive)
Consequence/ Severity:	Extensive building damage, widespread loss of lifelines (water, gas, electricity, sanitation, roads), loss of life
Vulnerability:	Widespread damage area, significant secondary impacts, no warning time
Hazard Risk Rank Score:	50

Earthquake vulnerability for the region is described in Section 5.3.3 of the County's MJHMP. According to the California Geological Survey, the Montecito area has minor fault lines running through the District's service area, with some areas being subject to moderate severity liquefaction (refer to Figure 5-8 and Figure 5-9, respectively, of the MJHMP). When considered by the LPT, it was decided that District assets might sustain some damage, but the biggest impact would be the need for the District's emergency services throughout the District. To date, an earthquake has not overwhelmed District resources, but the District is cognizant of the possible damage during a large seismic event.

3.2. Wildfire Hazard Profile

Wildfire Risk Assessment Summary	
Risk Rank: Moderately High	
Probability/ Frequency:	Regular event – occurs between once a year and once every 7 years
Consequence/ Severity:	Moderate building damage, lifeline loss (less than 24 hours), severe injury or disability
Vulnerability:	Moderate damage area, moderate secondary impacts, moderate warning time
Hazard Risk Rank Score:	48

Wildfire vulnerability for the region is described in Section 5.3.1 of the County's MJHMP. The areas north and east of the District's service area are identified as Very High Fire Hazard Severity Zones by the California Department of Forestry and Fire (CALFIRE) (refer to Figure 5-1 of the MJHMP). In the aftermath of the Thomas Fire, there was an amendment to the 2016 Community Wildfire Protection Plan (CWPP). The amendment identified, based on observed fire behavior during the recent fire, that there was a greater need for increased operational space necessary for life safety and structure defense. This resulted in a recommendation to expand the District's defensible space requirement in the identified "very high fire severity zone" to 200 feet based on the current risk modeling and prescriptive guidelines in the CWPP.

During the recent Thomas Fire in 2017/2018, the District only sustained minimal damage. However, the fire was followed by rain and extensive debris flows which caused severe damage to the areas throughout the service area. Earth Movement, including debris flow, is discussed in Section 3.5 of the LHMP and is detailed further in Section 5.3.5 of the MJHMP.

Additionally, the LPT discussed how the impacts of climate change may increase fire hazards. 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.

3.3. Earth Movement Hazard Profile

Earth Movement Risk Assessment Summary	
Risk Rank: Moderate	
Probability/ Frequency:	Infrequent event - occurs between once every 8 years and once every 50 years (inclusive)
Consequence/ Severity:	Extensive building damage, widespread loss of lifelines (water, gas, electricity, sanitation, roads), loss of life
Vulnerability:	Moderate damage area, moderate secondary impacts, moderate warning time
Hazard Risk Rank Score:	24

Landslide susceptibility and debris flows are described in Section 5.3.7 and 5.3.5, respectively, in the County's MJHMP. The LPT discussed its specific vulnerabilities and determined that debris flows, although not specifically outlined in the County's Plan, 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. Some debris flows are very fast. In areas of steep slopes, geology.com states that some debris flows can reach speeds of over 100 miles an hour.

Debris flows can be triggered in several different ways including the following.

Addition of Moisture	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 lubricates the debris, adds weight, and triggers a flow
Removal of Support:	Streams often erode materials along their banks. This erosion can cut into thick deposits of saturated materials stacked up the valley walls. This stacked high up the valley walls. This erosion removes support from the base of the slope and can trigger a sudden flow of debris.
Failure of Landslide Deposits:	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. Either of these can trigger a debris flow.
Wildfires or Timbering:	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 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

On January 9th, 2018, the areas of Montecito and Carpinteria experienced a debris flow event as a secondary impact of the 2017 Thomas Fire and subsequent rainfall. According to the event's After-Action Report, millions of tons of mud and rocks flowed out of the mountains toward the ocean creating destruction along the way. There were multiple significant incidents including natural gas.

pipeline explosions, structure fires, flooded structures with structural damage, swimming pools filled with mud and rocks, and persons trapped in structures, attics, and roofs that required rescuing. Access was limited and helicopters were used to transport multiple burn victims, individuals stranded, and people with traumatic injuries. The debris flows ultimately led to numerous injuries, and 23 deaths, including one missing person.

Debris flows, landslides and other earth movement events are a geologic hazard common to every U.S. State, including California's central coast area. According to a US Geological Survey report, landslides cause more than $1 billion in damages and 25 to 50 deaths in the U.S. each year. Earth movement in California is caused mainly due to increased precipitation and earthquakes. Large winter storms and earthquakes are usually accompanied by landslides that result in fatalities and property damage. The LPT reviewed its vulnerability and estimated two of its residential care facilities are most likely to be impacted by a landslide due to location and topography (refer to Figures 5-13 and 5-19 of the MJHMP).

3.4. Public Health Pandemic

Public Health Pandemic Risk Assessment Summary	
Risk Rank: Moderate	
Probability/ Frequency:	Rare - occurs once every 50 years (inclusive)
Consequence/ Severity:	Moderate, possible loss of mission essential functions due to staffing limitations, no loss of lifelines, first aid injury, and no disability
Vulnerability:	Moderate, with moderate secondary impacts, moderate warning time
Hazard Risk Rank Score:	20

Pandemic vulnerability for the region is described in Section 5.5.1 of the County's MJHMP. There is currently no system to anticipate the probability of a public health pandemic.

The District has adopted a Continuity of Operations Plan (COOP) which establishes guidelines to ensure the execution of the mission essential functions for the Montecito Fire Protection District in the event of a public health pandemic incapacitates administration and traditional service delivery. The COOP incorporates operations and recovery options for the continued governance of the District, Administration of the Fire Department, Operations of the two Fire Stations, and South Coast Dispatch Services. The COOP outlines actions to be taken by the District and the Fire Department in the event the Sana Barbara County Public Health Department declares a Local Health Emergency in the Santa Barbara County Operational Area.

3.5. Energy Shortage & Resiliency Hazard Profile

Energy Shortage & Resiliency Risk Assessment Summary	
Risk Rank: Moderate	
Probability/ Frequency:	Regular event - occurs between once a year and once every 7 years
Consequence/ Severity:	Minor/slight damage to buildings and structures, no loss of lifelines, first aid injury, and no disability
Vulnerability:	Localized damage area, minor secondary impacts, delayed hazard onset
Hazard Risk Rank Score:	18

Energy Shortage & Resiliency vulnerability for the region is described in Section 5.6.1 of the County's MJHMP. Due to recent massive wildfires throughout California and their ignition originating from utility infrastructure and high winds, the electric utilities have initiated a program to conduct Public Safety Power Shutdowns to prevent wildfire ignitions. The utilities are currently working with the County to minimize power delivery interruption while managing wildfire hazards. There is currently no system to anticipate the probability of energy shortage without evaluating the failure as a cascade effect from natural hazards (i.e., earthquakes). However, California has implemented numerous conservation measures to ensure an adequate power supply. The LPT noted that all parts of the District's service area are vulnerable to power shortages.

3.6. Flood Hazard Profile

Flood Risk Assessment Summary	
Risk Rank: Moderate	
Probability/ Frequency:	Infrequent event - occurs between once every 8 years and once every 50 years (inclusive)
Consequence/ Severity:	Moderate building damage, minor loss of lifelines (less than 12 hours), lost time injury but no disability
Vulnerability:	Localized damage area, minor secondary impacts, delayed hazard onset
Hazard Risk Rank Score:	18

Flood vulnerability for the region is described in Section 5.3.4 of the County's MJHMP. As demonstrated in the FEMA Flood Rate Insurance Maps (FIRM), the District's service area is not prone to flooding (refer to Figure 5-11 of the MJHMP). The area is built on a natural slope which allows rain waters to flow toward the coast and into the ocean. Only local riverine flooding is expected along creeks in the area (e.g., Cold Springs Creek, San Ysidro Creek, Montecito Creek, etc.) but will likely not severely affect the District. The LPT identified its two residential care facilities as specific points of vulnerability.

3.7. Terrorism Hazard Profile

Terrorism Risk Assessment Summary	
Risk Rank: Moderate	
Probability/ Frequency:	A rare event - occurs less than once every 50 years
Consequence/ Severity:	Moderate building damage, lifeline loss (less than 24 hours), severe injury or disability
Vulnerability:	Moderate damage area, moderate secondary impacts, moderate warning time
Hazard Risk Rank Score:	16

Terrorism vulnerability for the region is described in Section 5.5.6 of the County's MJHMP. In 2004, the District completed a Security Vulnerability Assessment which determined the different avenues by which the District could be impacted by acts of Terrorism. For security purposes, a discussion of those vulnerabilities is not included in this LHMP. However, the LPT reviewed the safeguards that have been utilized to prevent a malevolent attack and discussed the areas of vulnerability that remain. For this LHMP, it should be noted that the LPT is conscious of the specific areas that are vulnerable to an act of terrorism.

3.8. Climate Change

With the release of the California Adaptation Planning Guide (APG) in March 2015, the District aimed to include the effects of climate change into the LHMP. As identified in the "Understanding Regional Characteristics" portion of the APG, the District is located in the Central Coast Region of California. As a result, the LPT considered the following climate change impacts as recommended by the APG:

- Increased Temperatures
- Reduced Precipitation
- Reduced Agricultural Productivity

- Sea Level Rise

The LPT engaged in a discussion to determine which impacts posed a viable threat to the District. While some impacts clearly applied, others required additional research. Studies were conducted to look at recorded trends for sea level rise, wildfire, and regional temperature increases. The result of the study was the following list of perceived, feasible impacts that might affect the District over the next 5 to 10 years:

- Increased Temperatures
- Reduced Precipitation

After reviewing the results of each of these impacts, the LPT decided to include hazards in the Plan update that represented how the impacts would be felt by the District. For example, increased temperatures and reduced precipitation might result in a wildfire. Therefore, the LPT identified Wildfire as a perceived hazard connected with climate change. Any information regarding the effects of these impacts on the District will be found under the hazard profiles listed above. Additionally, mitigation strategies that apply to these impacts will be classified under Wildfire in the mitigation actions identified in Section 4.

3.9. Loss Estimates

The loss estimate began with a review of the District's asset inventory. The Asset Inventory Summary Tables are presented in the following tables.

Table 3.5: Asset Inventory Summary

Type	Name	TOTAL
Station	Fire Station 91	$6,842,824
Station	Fire Station 92	$4,021,004
Rental	1255 Rental Property	$491,996
Rental	1257 Rental Property	$309,604
Rental	1259 Rental Property	$298,450
Total		**$11,963,878**

The LPT reviewed each asset category and assigned a potential percentage of damage expected due to each identified hazard. In addition, if there were identified water service interruptions the loss of function values were also included. The tables of the following pages identify 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 3.6: Vulnerability Assessment Calculations

Montecito Fire Protection District Vulnerability Assessment Calculations			Earthquake		Wildfire		Landslide or Earth Movement		Energy Shortage & Resiliency		Flood		Terrorism	
Type	Name	TOTAL	% Damage	Loss Estimate	% Damage	Loss Estimate	% Damage	Loss Estimate	% Damage	Loss Estimate	% Damage	Loss Estimate	% Damage	Loss Estimate
Station	Fire Station 91	$6,842,824	20%	$1,368,565	10%	$684,282	5%	$342,141	1%	$68,428	0%	$0	25%	$1,710,706
Station	Fire Station 92	$4,021,004	15%	$603,151	10%	$402,100	5%	$201,050	1%	$40,210	0%	$0	25%	$1,005,251
Rental	1255 Residential Property	$491,996	50%	$245,998	10%	$49,200	100%	$491,996	0%	$0	30%	$147,599	5%	$24,600
Rental	1257 Residential Property	$309,604	50%	$154,802	10%	$30,960	100%	$309,604	0%	$0	30%	$92,881	5%	$15,480
Rental	1259 Residential Property	$298,450	50%	$149,225	10%	$29,845	100%	$298,450	0%	$0	30%	$89,535	5%	$14,923
Fire Service		$182,500	100%	$182,500	100%	$182,500	100%	$182,500	100%	$182,500	100%	$182,500	100%	$182,500

Earthquake	$2,704,240	Wildfire	$1,378,888	Landslide or Earth Movement	$1,825,741	Energy Shortage & Resiliency	$291,138	Flood	$512,515	Terrorism	$2,953,460			

Table 3.7 summarizes the loss estimates for each hazard.

Table 3.7: Loss Estimate Summary

Hazard	Total Losses
Terrorism	$2,953,000
Earthquake	$2,704,000
Landslide or Earth Movement	$1,826,000
Wildfire	$1,379,000
Flood	$512,515
Energy Shortage & Resiliency	$291,000

Note: Values are rounded to the nearest thousand.

4.0 MITIGATION STRATEGIES

§201.6(c)(3)(i): [The hazard mitigation strategy **shall** include a] description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards.

As an extension of the County's Multi-jurisdictional Hazard Mitigation Plan, the LPT felt it was important to continue with the goals and objectives laid out in the County's plan. The goals listed below guided the LPT in the development of mitigation activities that align with the objectives being upheld throughout the region.

Table 4.1: Hazard Mitigation Planning Goals

Goal 1	Ensure future development is resilient to known hazards.
Goal 2	Protect people and existing community assets (e.g., critical facilities, infrastructure, water, and public facilities) from hazards.
Goal 3	Actively promote understanding, support, and funding for hazard mitigation by participating agencies and the public.
Goal 4	Minimize the risks to life and property associated with urban and human-caused hazards.
Goal 5	Prepare to adapt and recover from the impacts of climate change and ensure regional resiliency.

Note: Goals are taken from the Santa Barbara County Multi-Jurisdictional Hazard Mitigation Plan

4.1. Identification of Mitigation Recommendations

§201.6(c)(3)(ii): [The mitigation strategy **shall** include a] section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effects of each hazard, with particular emphasis on new and existing buildings and infrastructure.

§201.6(c)(3)(iv): For multi-jurisdictional plans, there **must** be identifiable action items specific to the jurisdiction requesting FEMA approval or credit of the plan.

The former LHMP was adopted as an annex to the 2017 MJHMP. Since the 2017 MJHMP, the District has incorporated the LHMP goals, objectives, and mitigation actions into its local plans and processes, budget planning, and capital improvement planning. Ongoing monitoring and evaluation of the LHMP by the District ensured mitigations are implemented and tracked. Key

mitigation actions underway include expanding defensible space from 100 feet to 200 in vulnerable areas of the community and conducting an SVA to determine vulnerability.

Mitigation actions are project recommendations to reduce the District's vulnerability to the identified hazards. The LPT brainstormed potential mitigation activities and then performed a high-level Benefit-Cost Review on each of the identified mitigation actions. The review consisted of identifying all benefits and costs associated with implementing a mitigation action. Typical benefits include:

- Avoided physical damages (e.g., to buildings, infrastructure, and equipment)
- Avoided Loss of Function Costs (e.g., loss of utilities and lifeline)
- Avoided Causalities
- Avoided emergency management costs (e.g., emergency operations center costs, evacuations/rescue costs, and other management costs)

Once the benefits and costs were calculated, a relative priority was assigned for each action based on the evaluation.

Table 4.2 provides an overview of the mitigation actions, and other relevant information, in no specific order. Following the identification of the mitigation action, a Cost-Benefit Review was conducted to determine the prioritization of the items.

Table 4.2: Mitigation Activity Worksheet

Mitigation Activity	Hazards Mitigated	Plan Goal	Responsible Personnel	Resources	Estimated Project Cost	Timeframe	Protects New Buildings	Protects Existing Buildings	Status	Comments
2018.01 - Enhance Public Outreach regarding the impacts of a seismic event and wildfire	Earthquake Wildfire	Goal 3 Goal 5	Fire Marshal Battalion Chief	Staff Time/ General Fund	$10,000 in Material Costs	Short	Y	Y	2017 Plan Action: In Progress	Created and hired a Public Information Officer position to oversee public outreach
2018.02 - Implement structural integrity projects to protect power and communication systems	Earthquake Energy Shortage & Resiliency	Goal 2	Facilities Battalion Chief	CIP/GF	$100,000 per project	Medium	N	N	2017 Plan Action: Not Started – Considered for future	
2018.03 – Construct protective structures around critical facilities	Earth Movement Flood	Goal 2	Facilities Battalion Chief	CIP/GF	$200,000 per project	Medium	N	N	2017 Plan Action: Not Started – Considered for future	
2018.04 - Conduct an SVA to determine vulnerability	Terrorism	Goal 2 Goal 4	Division Chief Operations	Staff Time	Free through Ca Highway Patrol	Short	N	Y	2017 Plan Action: In Progress	
2018.05 – Expand defensible space from 100 feet to 200 in vulnerable areas of the community	Wildfire	Goal 1 Goal 2 Goal 5	Fire Marshal Battalion Chief	Staff Time	$10,000-$40,000 per project	Medium	Y	Y	2017 Plan Action: In Progress	Incorporating expansion of defensible space to 200'where feasible.
2020.01 – Ensure essential functions are maintained in the event a public health pandemic incapacitates administration and traditional service delivery	Public Health Pandemic	Goal 1 Goal 3 Goal 4	Division Chief Operations	Staff Time	$10,000 in Material Costs	Short	N	N	2020 Plan Review Action: In Progress	Adopted a Continuity of Operations Plan (COOP) which establishes guidelines to ensure the execution of the mission's essential functions
2022.01 – Obtain an evacuation analysis performed by an independent third party utilizing current scientific modeling	Wildfire Earthquake Terrorism Flood Earth Movement	Goal 1 Goal 3 Goal 4	Fire Marshal Battalion Chief	Staff Time & Consultant	$100,000 per project	Short	N	N	2022 Plan Action: In Progress	Invitation to Bid for evacuation analysis is in process with anticipated completion by end of FY

4.2. Prioritization of Mitigation Recommendations

§201.6(c)(3)(iii): [The mitigation strategy section **shall** include] an action plan describing how the actions identified in section (c)(3)(ii) will be prioritized, implemented, and administered by the local jurisdiction. Prioritization **shall** include a special emphasis on the extent to which benefits are maximized according to a cost benefit review of the proposed projects and their associated costs.

A simplified Benefit-Cost Review was applied 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?

Table 4.3 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 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

It should be noted that values for costs are estimates only.

Table 4.3: Benefit-Cost Review Summary

Mitigation Activity	Benefits (Pros)	Costs (Cons)	Priority
2018.01 - Enhance Public Outreach with regard to the impacts of a seismic event and wildfire	• Avoiding EM Costs • Avoided Casualties	• Difficulty reaching the public$10,000 in material Costs and additional staff needed	High
2018.02 - Implement structural integrity projects to protect power and communication systems	• Avoided Casualties • Avoided Physical Damages	• $100,000/project in construction costs	Medium
2018.03 – Construct protective structures around critical facilities	• Avoided Physical Damages • Reduce EM Cost	• $200,000/project in construction costs	Medium
2018.04 - Conduct an SVA to determine vulnerability	• Reduced EM Costs • Improved Security • Improved Vulnerability Awareness	• Staff Time	High
2018.05 - Expand defensible space from 100 feet to 200 in vulnerable areas of the community	• Avoiding EM Costs • Avoided Casualties	• Staff Time$10,000 - $40,000/project	High
2020.01 - Ensure essential functions are maintained in the event a public health pandemic incapacitates administration and traditional service delivery	• Avoided Casualties • Improved Vulnerability Awareness	• Staff Time$10,000 in project costs	High
2022.01 - Obtain an evacuation analysis performed by an independent third party utilizing current scientific modeling	• Avoiding EM Costs • Avoided Casualties	• Staff Time$100,000 in project costs	High

5.0 PLAN MAINTENANCE

Section 4.0, *Mitigation Strategies* identifies mitigation actions that have been prioritized based on the loss estimates and the probability of each hazard, which will typically be implemented according to the priority rank. To track hazard mitigation status, the District must continuously monitor and document the progress of the implementation of the mitigation actions. Though mitigation actions may be delegated to different departments within the District, the Fire Chief or designee will have the responsibility of monitoring overall progress.

5.1. Planning Mechanisms

§201.6(c)(4)(ii): [The plan **shall** include a] process by which local governments incorporate the requirements of the mitigation plan into other planning mechanisms such as comprehensive or capital improvement plans, when appropriate.

The District maintains the following processes to incorporate mitigation strategies into planning mechanisms. The following resources were identified by the LPT as being most inherent to District operations and most likely to be avenues for the first steps in hazard mitigation implementation. Also, lists of identified resources are described in Tables 5.1 through 5.5 later in this section.

District Board of Directors

The Board of Directors is responsible for approving projects and programs on a District-wide level. By providing mitigation planning concepts to the Board of Directors, mitigation actions and concepts will be incorporated into relevant planning efforts.

Chief Officers

The District is organized into groups of responding personnel under the oversight of a chief officer. Chief Officers can direct these groups in ways that encourage intentionality during response and training activities to implement mitigation measures throughout the community and encourage the public to do the same. When it comes to promoting a "mitigation mindset", Chief Officers can ensure mitigation concepts become precepts during normal daily operations.

Resource Tables

This section serves as a high-level capability assessment of the District's resources through which hazard mitigation objectives may be achieved. The following subsections attempt to document the Regulatory, Administrative/Technical, Fiscal, Grant funding, and Outreach/Partnerships resources available to the District.

Table 5.1: Regulatory Tools Table

Regulatory Tool	Comments
Fire Code	The Fire Code dictates established best practices for private and residential buildings within the District's service area. This code can be modified to require local homes and businesses to be modified to become less vulnerable to identified hazards.
Capital Improvement Plan	The plan outlines proposed efforts for capital projects and programs needed to carry out the goals and objectives of the District; including those regarding hazard mitigation.

Table 5.2: Administrative/Technical Tools Table

Administrative/Technical Tool	Personnel/Resources
Board of Directors	The Board of Directors can review and approve mitigation proposals for implementations
Emergency Responders	The District staff is comprised mainly of trained emergency responders with varied specialties. District staff can provide one-on-one suggestions to victims of local emergencies about how to implement mitigation strategies of their own.

Table 5.3: Fiscal Tools Table

Fiscal Tool	Available
General Fund	Yes, with Board approval
Capital Improvement Plan	Yes, with Board approval
Land & Building Fund	Yes, with Board approval

Table 5.4: Grant Funding Tools Table

Grant Funding Tool	Agency	Purpose	Contact
Pre-Disaster Mitigation Program(PDM)	U.S. Department of Homeland Security, Federal Emergency Management Agency	To provide funding for States, and communities for cost-effective hazard mitigation activities which complement a comprehensive hazard mitigation program and reduce injuries, loss of life, and damage and deconstruction of property.	FEMA500 C. Street, SW Washington, DC 20472Phone: (202) 646-4621www.fema.gov
Hazard Mitigation Grant Program	U.S. Department of Homeland Security, Federal Emergency Management Agency	To prevent future losses of lives property due to disasters; to implement State local hazard mitigation plans; to enable mitigation	FEMA500 C Street S.W. Washington, DC 20472

Grant Funding Tool	Agency	Purpose	Contact
		measures to be implemented during the immediate recovery from a disaster; and to provide funding for previously identified mitigation measures to benefit the disaster area.	Phone (202) 646-4621www.fema.gov
Flood Mitigation Assistance (FMA)	U.S. Department of Homeland Security, Federal Emergency Management Agency	To help States and communities plan and carry out activities designed to reduce the risk of flood damage to structures insurable under the NFIP.	FEMA500 C Street S.W. Washington, DC 20472Phone (202) 646-4621www.fema.gov
Emergency Management Performance Grants (EMPG)	U. S. Department of Homeland Security; Federal Emergency Management Agency	To encourage the development of comprehensive emergency management at the State and local level and to improve emergency management planning, preparedness, mitigation, response, and recovery capabilities.	FEMA500 C Street S.W. Washington, DC 20472Phone (202) 646-4621www.fema.gov
Community	U.S. Department of Housing	To develop viable urban	HUD451 7th Street, S. W. Washington, DC 20410-

Grant Funding Tool	Agency	Purpose	Contact
Development Grant Program (CDBG)	and Urban Development	communities by providing decent housing and a suitable living environment. Principally for low-to-moderate-income individuals.	7000Phone: (202) 708-3587www.hud.gov
Public Assistance Program (PA)	U.S. Department of Homeland Security, Federal Emergency Management Agency	To provide supplemental assistance to States, local governments, and certain private nonprofit organizations to alleviate suffering and hardship resulting from major disasters or emergencies declared by the President. Under Section 406, Public Assistance funds may be used to mitigate the impact of future disasters.	FEMA500 C Street S.W. Washington, DC 20472Phone (202) 646-4621www.fema.gov
Emergency Watershed Protection	U.S. Department of Agriculture, Natural Resource Conservation Service	To provide emergency technical and financial assistance to install or repair structures that reduce runoff and prevent soil erosion to safeguard life and property.	NRCSPO BOX 2890Washington, DC 20013Phone: (202) 720-3527 www.nrcs.usda.gov
Disaster Mitigation and Technical Assistance	U.S. Department of Commerce, Economic	To help States and localities to develop and /or implement	EDAHerbert C. Hoover Building Washington, DC 20230Phone: (800) 345-1222www.eda.gov

Grant Funding Tool	Agency	Purpose	Contact
Grants	Development Administration	a variety of disaster mitigation strategies.	
Watershed Surveys and Planning	U.S. Department of Agriculture, Natural Resource Conservation Service	To provide planning assistance to Federal, State, and local agencies for the development of coordination water and related land resources programs in watersheds and river basins	NRCSPO Box 2890Washington, DC 20013Phone: (202) 720-3527www.nrcs.usda.gov
National Earthquake Hazards Reduction Program (NEHRP)	U.S. Department of Homeland Security, Federal Emergency Management Agency	To mitigate earthquake losses that can occur in many parts of the nation providing earth science data and assessments essential for warning of imminent damaging earthquakes, land-use planning, engineering design, and emergency preparedness decisions.	FEMA500 C Street S.W. Washington, DC 20472Phone (202) 646-4621www.fema.gov
Engineering for Natural Hazards	National Science Foundation	Supports fundamental research that advances knowledge for understanding and mitigating the impact of natural hazards on constructed civil infrastructure	National Science Foundation Phone: (703) 292-7024https://www.nsf.gov

Grant Funding Tool	Agency	Purpose	Contact
Pre-Disaster Mitigation Program(PDM)	U.S. Department of Homeland Security, Federal Emergency Management Agency	To provide funding for States, and communities for cost-effective hazard mitigation activities which complement a comprehensive hazard mitigation program and reduce injuries, loss of life, and damage and deconstruction of property.	FEMA500 C. Street, SW Washington, DC 20472Phone: (202) 646-4621www.fema.gov

Table 5.5: Outreach and Partnerships Tools Table

Outreach/Partnership Tools	Comments
District Website	The District website is an open forum for providing hazard information and for accepting ongoing comments from the public. The website will likely be the main avenue for maintaining an open dialogue with the public for hazard mitigation throughout the planning period.
Public Outreach	The District hired a full-time Public Information Officer to oversee community outreach. Additionally, the District holds several educational opportunities throughout the year. Public outreach will be able to be expanded to include a broader spectrum of hazard-specific information to improve. hazard awareness.
Social Media	The District has a presence on several social media platforms. These platforms allow the District to reach a wide audience quickly and can be utilized to provide information about hazard mitigation or direct readers to the City website for in-depth mitigation input.
"Ready, Set, Go!" Defensible Space Action Plan	The District provides guidance documents to the public on their website with tips on how to make their property more resistant to the impacts of a wildfire. This document can be expanded to include more mitigation ideas and include information on multiple hazard types.
Mutual Aid Agreements	As part of expanding its resilience to the impacts of hazard events, the District intends to review its current mutual aid agreements, identify gaps, and secure new agreements to expand its available mutual resources.

5.2. Periodic Assessment Requirements

§201.6(c)(4)(i): [The plan maintenance process **shall** include a] section describing the method and schedule of monitoring, **evaluating**, and updating the mitigation plan within a five-year cycle.

Since the last LHMP, the LPT has monitored, evaluated, and updated the plan on a continuing and as-needed basis. The District was very successful in implementing the mitigation actions as noted in Table 4-2. The remaining mitigation actions are ongoing at the time of this update.

Planning is an ongoing process and, as such, this LHMP should be treated as a living document that must grow and adapt to keep pace with changes within the District. An annual assessment will be completed to document the changes in site hazards (e.g., updated FIRM maps, contemporary seismic studies, etc.) or the installation and purchase of new equipment (e.g., backup generators, emergency response equipment, etc.), to ensure they do not have any major effects on the District's hazard vulnerabilities that would impact the conclusions or actions associated with the Plan. Before the fifth year of the revision cycle, these annual observations will be reviewed to determine what changes should be implemented in the required Plan update. The results of the annual evaluations will be folded back into each phase of the planning process and should yield decisions on how to update each section of the Plan.

The Fire Chief or designee has the responsibility of implementing these annual and five-year requirements. During the annual review, if major updates are required, then the LPT will be reconvened to discuss the effects on the Plan. For the fifth-year revision, the entire LPT will reconvene to use their expertise to update the Plan in its entirety. Each of the annual assessments will be utilized as an opportunity to evaluate the progress of hazard mitigation action implementation. The Fire Chief or designee will be responsible for reviewing the mitigation actions annually, determining which have the potential to be accomplished over the next year, and encouraging implementation with the proper departments. If the Plan is not meeting its goals, the reviewer will document the shortcomings, suggest modifications, and implement changes to the plan as appropriate.

In addition to these periodic requirements, any significant modification to the District's facilities should be considered concerning a possible impact on the Plan. All LPT members are responsible for providing updates as necessary. As noted in the following section, the completed Plan will be available on the District's website to allow the public to continue to be involved during these periodic reviews.

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.

5.3. Evaluation and Update Requirements

§201.6(c)(4)(i): [The plan maintenance process **shall** include a] section describing the method and schedule of monitoring, evaluating, and **updating** the mitigation plan within a five-year cycle.

§201.6(c)(4)(iii): [The plan maintenance process **shall** include a] discussion on how the community will continue public participation in the plan maintenance process.

The Emergency Management and Assistance Regulations (44 CFR Part 201) state that it is the responsibility of local agencies (i.e., the District) to "at a minimum, review and, update the local mitigation plan every five years from the date of plan approval to continue program eligibility". The evaluation procedures listed below will provide insight into the major changes that need to be included in the five-year update and resubmission to FEMA:

- Annual HMP review concerning changes in hazard vulnerability (e.g., additional hazards identified, natural hazard events, etc.)
- Annual HMP review concerning the development of new facilities
- A five-year comprehensive update to address the findings of the annual reviews
- Re-submittal of the updated HMP to the California Governor's Office of Emergency Services (Cal OES)/FEMA

Additionally, the risk assessment portion of the plan will be reviewed to determine if the information should be updated or modified. Each department responsible for the various implementation actions will report on:

- Status of their projects
- Implementation processes
- Any difficulties encountered
- How coordination efforts are proceeding
- Which strategies should be revised

5.4. Implementation through Existing Plans and Programs

The District implements the LHMP through existing plans, programs, and procedures, as detailed in Section 1.6, *Review and Incorporation of Existing Plans* and Section 5.1, *Planning Mechanisms*. This LHMP provides a baseline of information on the hazards impacting the District and the existing institutions, plans, policies and programs that help to implement the LHMP (e.g., capital improvement plan, fire code). 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 information contained within this LHMP, including results from the Hazard 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.

5.5. 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 1.5, *Public Involvement*, 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.

2023 LOCAL HAZARD MITIGATION PLAN

An annex to the Santa Barbara County Multi-Jurisdictional Hazard Mitigation Plan 2023 Update

Montecito Water District
583 San Ysidro Road
Santa Barbara, CA 93108

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1.0 PLANNING PROCESS

§201.6(b): In order to develop a more comprehensive approach to reducing the effects of natural disasters, the planning process **shall** include:

(1) An opportunity for the public to comment on the plan during the drafting stage and prior to plan approval;

(2) An opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, and agencies that have the authority to regulate development, as well as businesses, academia and other private and non-profit interests to be involved in the planning process; and

(3) Review and incorporation, if appropriate, of existing plans, studies, reports, and technical information.

§201.6(c)(1): [The plan **shall** document] the planning process used to develop the plan, including how it was prepared, who was involved in the process, and how the public was involved.

1.1 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.

Hazard mitigation planning is a dynamic process built on realistic assessments of past and present information that engages Montecito Water District (District) personnel to anticipate future hazards and develop meaningful strategies to address possible impacts and identified needs. The hazard mitigation planning process involves the following tasks:

- Organizing resources
- Assessing risks
- Developing mitigation strategies, goals, and priorities
- Adopting a plan
- Implementing the plan
- Monitoring progress
- Revising the plan as necessary

The 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 and finalized in 2023 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. The LHMP was last comprehensively updated as an annex to the 2017 MJHMP. Since then, the District has:

- Incorporated the LHMP goals, objectives, and mitigation actions into its operations, management, and infrastructure planning and processes.
- Used the LHMP's assessment of capabilities, hazards, and vulnerabilities to inform planning, infrastructure improvements, and programs, including outreach and engagement programs for water conservation.
- Implemented mitigation actions through infrastructure planning, maintenance programs, grant programming, community outreach, and budget process.
- Reviewed and evaluated mitigation actions before and after disasters, including the Thomas Fire and Montecito debris flow.

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 service area 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 2023 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 1.3 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 Chapter 4).

1.2 Planning Process

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 Mitigation Advisory Committee (MAC) and the second is the Local Planning Team (LPT).

All eight incorporated cities and the six special districts joined the County Office of Emergency Management (OEM) 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 Santa Maria Valley Water Conservation District (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 the

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

§201.6(b): In order to develop a more comprehensive approach to reducing the effects of natural disasters, the planning process **shall** include:

(1) An opportunity for the public to comment on the plan during the drafting stage and prior to plan approval;

(2) An opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, and agencies that have the authority to regulate development, as well as businesses, academia, and other private and non-profit interests to be involved in the planning process; and

§201.6(c)(1): [The plan **shall** document] the planning process used to develop the plan, including how it was prepared, who was involved in the process, and how the public was involved.

The District engaged internal stakeholders, including members of the various District departments, to discuss hazards and mitigation strategies. External stakeholders, comprised of representatives from local agencies and the public, were consulted during the County's MJHMP Update process.

An online survey and three public workshops were held to engage the public. Six MAC meetings were held with participating agencies to assess hazards and discuss potential mitigation actions. The meetings held by District staff are detailed over the subsequent pages.

1.3 Mitigation Advisory Committee (MAC)

The District participated as a MAC member to prepare this LHMP as an annex to the 2022 MJHMP. The District was represented by Adam Kanold, Engineering Manager, and David Wong, Engineering Assistant on the MAC.

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

Table 1.1: Mitigation Advisory Committee (MAC) Meetings Summary

Meeting Dates	Summary of Discussions
March 2021	**MAC Meeting #1 (virtual)** 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

Meeting Dates	Summary of Discussions
September 2021	**MAC Meeting #2 (virtual)** 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	**MAC Meeting #3 (virtual)** 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	**MAC Meeting #4 (virtual)** Collected feedback on 2017 mitigation strategies Conducted interactive exercise on mitigation strategies for key hazards unaddressed in previous MJHMP Discussed annex updates
January 2022	**MAC Meeting #5 (virtual)** Presented draft plan Discussed key MAC/LPT review needs and key issues Discussed annex updates to dovetail with plan update
April 2022	**MAC Meeting #6 (virtual)** Review and discuss public comments received on the draft plan Recommend a revised draft plan to decision-makers

1.4 Local Planning Team (LPT)

The members below participated in 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 1.2: Montecito Water District Local Planning Team 2022

Name	Title
Adam Kanold	Assistant General Manager / Engineering Manager
David Wong	Assistant Engineer

The District's LPT members worked directly with the County 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 District's LPT met virtually as needed during the planning process to discuss data needs and organize data collection. The table below outlines a timeline of the LPT's activities throughout the planning process.

Table 1.3: Local Planning Team Activity Summary

Meeting Dates	Summary of Discussions
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 (12/13/21) to discuss LHMP priorities and mitigation approaches.
January and March 2022	Reviewed new maps and local vulnerabilities. Provided input on the status of 2017 LHMP mitigation strategies. Reviewed draft mitigation strategies and provide feedback. Reviewed and finalized 2022 LHMP

1.5 Public Involvement

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.

The draft LHMP was completed in April 2022 and presented to the public and District Board of Directors at a regular Board meeting. The document is available on the District website and in hard copy format at the District office at 583 San Ysidro Road. The opportunity to review documents was announced through the District's e-news and on the District website. The community was welcome to submit written or verbal comments to the District and make public comment during the Board Meeting.

1.6 Review and Incorporation of Existing Plans

§201.6(b): In order to develop a more comprehensive approach to reducing the effects of natural disasters, the planning process **shall** include:

(3) Review and incorporation, if appropriate, of existing plans, studies, reports, and technical information.

While developing the District's LHMP, District staff reviewed existing plans (detailed below) and incorporated relevant information into the planning efforts.

2018 State of California Multi-Hazard Mitigation Plan

The State of California Multi-Hazard Mitigation Plan was reviewed to ensure consistency between the State and District plan concerning identified hazards and vulnerability, goals and objectives, and mitigation actions. The State goals served as the basis for developing the goals at the District level. District goals and objectives are outlined in Section 4.

Santa Barbara County Multi-Jurisdictional Hazard Mitigation Plan

Like the California Multi-Hazard Mitigation Plan, the County MJHMP was reviewed to ensure consistency between the County Plan and the District's LHMP. County Plan goals were adopted as the District's goals in addition to utilizing hazard profile information as the basis for determining the hazards which impact the District.

2012 California Adaptation Planning Guide

FEMA, Cal OES, and the California Natural Resources Agency developed the California Adaptation Planning Guide to assist municipalities in recognizing local climate change and to provide guidance addressing potential vulnerabilities. The information was used to develop potential hazards and to provide background information that allowed District staff to make educated decisions regarding mitigation actions designed to alleviate the effects of climate change.

2020 Juncal Dam Emergency Action Plan

The District completed the Emergency Action Plan (EAP) for the Juncal Dam in May 2022. The EAP defines responsibilities and provides procedures designed to identify conditions that may endanger Juncal Dam and mitigating actions such as notifying the appropriate emergency management authorities of a possible failure of the dam.

1.7 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. 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 vulnerability and water source sustainability would improve the District's capabilities to ensure safe, reliable, and sustainable water sources to agencies.
- **Administrative/Technical Opportunities**: As part of this update, the District aims to improve its resilience to ensure operations are sustained during a hazardous event, including establishing an Emergency Operations Center for preparing for, responding to, and coordinating disaster response at the District headquarters. Existing plans, inclusive of the plans aforementioned and this LHMP, will be updated periodically with the best available information.
- **Outreach Opportunities**: Continued interagency efforts to support the sustainability of the South Coast Conduit would improve the District's capabilities to ensure safe, reliable, and sustainable water sources to District customers.
- **Fiscal Opportunities**: The District can pursue grants to fund mitigation efforts aimed at water reliability and resilience. Additionally, the District can update its capital improvement/ facilities plan to reflect the information gathered for this Hazard Mitigation Plan.

2.0 PLANNING AREA PROFILE

The District, located in the southern coastal portion of Santa Barbara County California, was formed in 1921, under the name Montecito County Water District, to provide potable water. The District serves the unincorporated communities of Montecito and Summerland with a total service area of approximately 9,910 acres and provides retail water supply to about 11,750 customers.

The District is supplied by multiple water sources: Lake Cachuma, the State Water Project, desalinated water purchased from the City of Santa Barbara, and local sources including Jameson Lake, Doulton Tunnel, and groundwater basin.

A five-member Board of Directors governs the District. Each director is elected by the District's registered voters for staggered four-year terms.

The District's climate is a temperate Mediterranean style that generally consists of cool wet winters and mild dry summers with coastal fog in some of the summer months. Temperatures in the winter rarely fall below freezing. Spring conditions remain mild with light amounts of rain and fog. During the summer and fall, the climate is usually dry and warm, with moderate conditions; however, the area often experiences the warm dry Sundowner winds during Fall, Winter, and Spring with peak windy season during the Spring.

The map on the following page provides an overview of the District's service area.

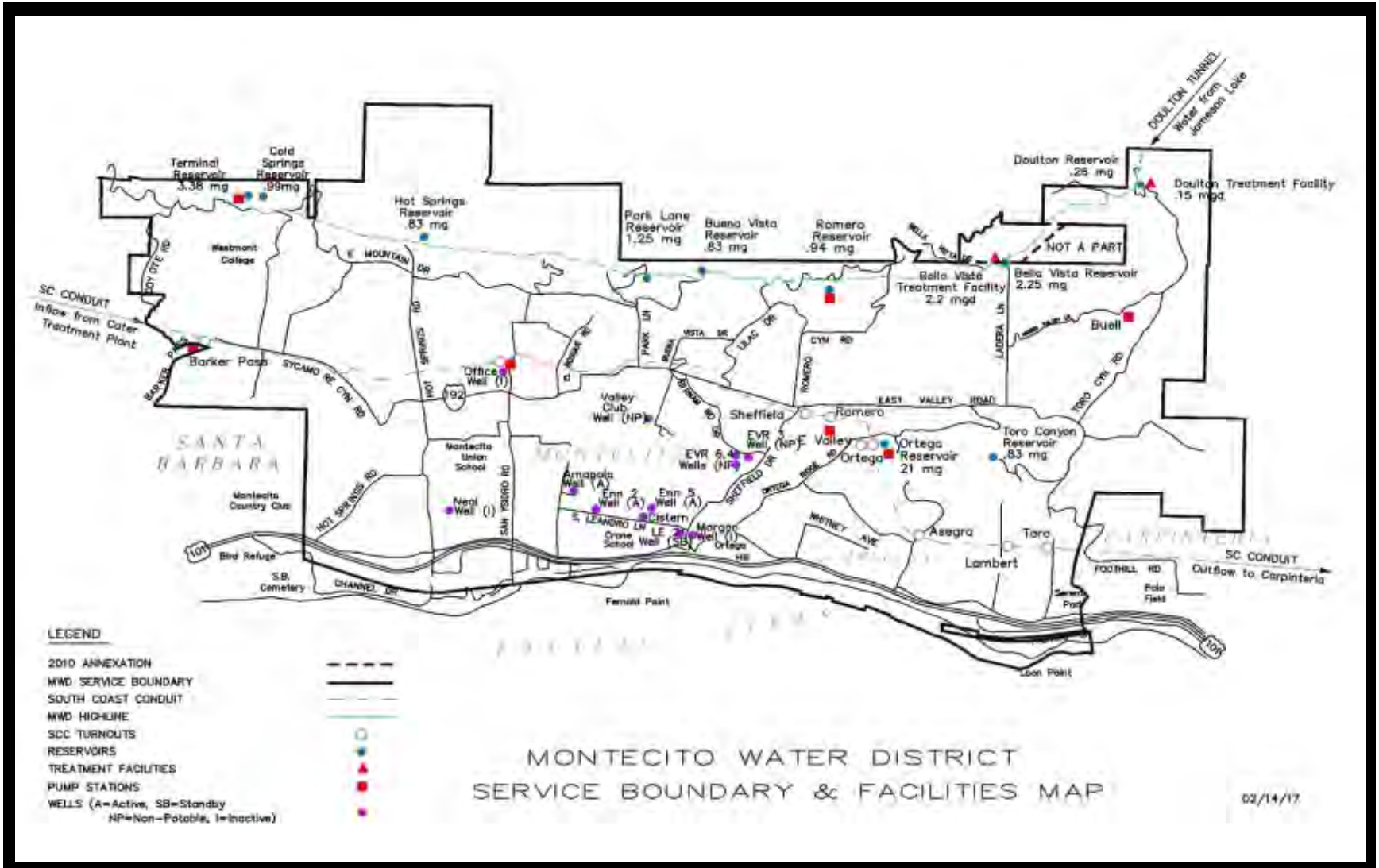

Figure 2.1: Montecito Water District Service Area Map

2.1 Development Trends

§201.6(c)(2)(ii)(C): [The plan **should** describe vulnerability in terms of] providing a general description of land uses and development trends within the community so that mitigation options can be considered in future land use decisions.

Since the formation of the District in 1921, the service area population has seen slow growth with the largest increase coming with the annexation of the Summerland County Water District in 1995. The service area is nearly fully built out with a small number of remaining vacant parcels that could be developed. Land use within the service area is primarily residential with small areas of commercial, institutional, and agricultural land use. In accordance with the District's Urban Water Management Plan 2020 update and Montecito Community Plan, new development is not expected to create a vulnerability to the District. There are no plans for new water system infrastructure within the service area. Table 2.1 below shows the 2020 customer use by class which reflects the breakdown of land use types in the service area.

Table 2.1: Water Use By Customer Classification 2020

Customer Type	Percent of Total Service Connections	Percent of Total Water Use
Single-Family Residential	91.1%	76.2%
Multi-Family Residential	1.4%	2.4%
Commercial	3.1%	5.6%
Institutional	3.3%	5.3%
Agricultural	0.9%	7.0%
Non-Potable	0.2%	3.5%

3.0 RISK ASSESSMENT

The Risk Assessment consists of three steps: Hazard Identification, Hazard Profiling, and Loss Estimates. This section includes the Hazard Identification and Hazard Profiling steps to evaluate the hazards of primary concern to local decision-makers to provide a basis for loss estimates which is also included within this chapter. Additionally, the Risk Assessment provides a foundation for the evaluation of mitigation measures that can help reduce the impacts of a potential hazard event. As an annex to the County's MJHMP, District staff used the information found in the County's Plan as a basis for elements of the Risk Assessment.

Step 1: Identify Hazards: This step identified the natural and man-made hazards that might affect the District and then narrowed the list to the hazards that are most likely to occur. These hazards included natural, technical, and human-caused events, with an emphasis on the effect disasters may have on critical facilities. District staff participated in a Hazard Identification exercise to identify and rank the potential hazards within the District.

Step 2: Profile Hazard Events: The hazard event profiles are mostly products of the County's multi-jurisdictional Plan. District staff utilized the basic understanding of each hazard from the County Plan and then considered how that hazard would impact the District specifically.

Step 3: Loss Estimates: The loss estimate step relied on detailed information regarding the hazard probability and maps that were completed as part of the hazard profiles. This information was utilized to apply the hazard probabilities and recurrence intervals to the assets and inventory (buildings and infrastructure) of the District. This step was critical in determining which assets were subject to the greatest potential damages and which hazard event was likely to produce the greatest potential losses.

The conclusion of this step precipitated a comprehensive loss estimate (vulnerability assessment) for each identified hazard for each specific asset in terms of damages, economic loss, and the associated consequences for the District.

3.1 Hazard Identification

§201.6(c)(2)(i): [The risk assessment **shall** include a] description of the type, location, and extent of all-natural hazards that can affect the jurisdiction. The plan shall include information on previous occurrences of hazard events and on the probability of future hazard events.

§201.6(c)(2)(ii): [The risk assessment **shall** include a] description of the jurisdiction's vulnerability to the hazards described in paragraph (c)(2)(i) of this section. This description **shall** include an overall summary of each hazard and its impact on the community.

§201.6(c)(2)(ii): [The risk assessment] **must** also address National Flood Insurance Program (NFIP) insured structures that have been repetitively damaged by floods.

§201.6(c)(2)(iii): For multi-jurisdictional plans, the risk assessment **must** assess each jurisdiction's risks where they vary from the risks facing the entire planning area.

The hazard identification and ranking were obtained primarily from a Hazard Identification Exercise completed during the MAC meetings for the County's MJHMP. Each hazard profile includes a summary of the Hazard Identification Exercise identified risk factors and overall rank for each hazard, in addition to the detailed hazard description, historical occurrences, and projected future probability, magnitude, and frequency.

The District does not have any NFIP repetitive loss properties. Instead, please refer to the 2022 MJHMP.

District staff participated in the Hazard Identification Exercise to identify the potential hazards within the District's service area. The Hazard Identification Workshop was facilitated using an interactive spreadsheet program that asks specific questions on potential hazards and then rates them accordingly. These questions guided District staff in the correct facilitation and application of the program. Table 3.1 summarizes the Hazard Identification Workshop risk factors, lists the descriptions of each factor, provides the specific descriptor choices for each risk factor and description, and summarizes the risk ranking associated with each hazard:

Table 3.1: Hazard Identification Risk Factors

Risk Factor	Description	Descriptors	Value
Probability/ Frequency	Prediction of how often a hazard will occur in the future	Infeasible event - not applicable due to geographic location characteristics	0
		A rare event - occurs less than once every 50 years	1
		Infrequent event - occurs between once every 8 years and once every 50 years (inclusive)	2
		Regular event - occurs between once a year and once every 7 years	3
		Frequent event - occurs more than once a year	4
Consequence/ Severity	Physical Damage - structures and lifelines Economic Impact – loss of function for power, water, sanitation, roads, etc.	No damage	1
		Minor/slight damage to buildings and structures, no loss of lifelines, first aid injuries	2
		Moderate building damage, minor loss of lifelines (less than 12 hours), minor injury	3
		Moderate building damage, lifeline loss (less than 24 hours), severe injury or disability	4
		Extensive building damage, widespread loss of lifelines (water, gas, electricity, sanitation, roads), loss of life	5
Vulnerability	Impact Area - area impacted by a hazard event Secondary Impacts - Capability of triggering additional hazards Onset - Period between initial recognition of an approaching hazard and when the hazard begins to impact the community	No physical damage, no secondary impacts	1
		Localized damage area	2
		Localized damage area, minor secondary impacts, delayed hazard onset	3
		Moderate damage area, moderate secondary impacts, moderate warning time	4
		Widespread damage area, significant secondary impacts, no warning time	5

Each hazard was assigned a risk rank (ranging from no/low hazard to severe/high hazard) based on the risk factors determined during the Hazard Identification Workshop. The risk score is calculated by Risk = Probability x Consequence x Vulnerability. Table 3.2 provides the risk ranking matrix used to calculate the risk score.

Table 3.2: Risk Ranking Matrix

Probability/Frequency Description	Risk Ranking Matrix						
Rare Event: Occurs less than once every 50 years	Probability/Frequency		Consequence/ Severity				
	Value	1	1	2	3	4	5
	Vulnerability		1	2	3	4	5
		2	2	4	6	8	10
		3	3	6	9	12	15
		4	4	8	12	16	20
		5	5	10	15	20	25
Infrequent Event: Occurs between once every 8 years and once every 50 years (inclusive)	Probability/Frequency		Consequence/ Severity				
	Value	2	1	2	3	4	5
	Vulnerability	1	2	4	6	8	10
		2	4	8	12	16	20
		3	6	12	18	24	30
		4	8	16	24	32	40
		5	10	20	30	40	50
Regular Event: Occurs between once a year and once every 7 years	Probability/Frequency		Consequence/ Severity				
	Value	3	1	2	3	4	5
	Vulnerability	1	3	6	9	12	15
		2	6	12	18	24	30
		3	9	18	27	36	45
		4	12	24	36	48	60
		5	15	30	45	60	75
Frequent Event: Occurs more than once a year	Probability/Frequency		Consequence/ Severity				
	Value	4	1	2	3	4	5
	Vulnerability	1	4	8	12	16	20
		2	8	16	24	32	40
		3	12	24	36	48	60
		4	16	32	48	64	80
		5	20	40	60	80	100

The final risk score yields a profile ranking of each hazard, as illustrated in Table 3.3.

Table 3.3: Risk Rank Categorization

Risk Rank Categorization	
High Hazard	**50 to 100**
Moderately High Hazard	**25 to 49**
Moderate Hazard	**15 to 24**
Moderately Low Hazard	**5 to 14**
Low Hazard	**1 to 4**

The following illustrates the final hazard ranking developed by the LPT to rank each of the identified hazards in order of the highest perceived vulnerability to lowest.

Table 3.4: Hazard Ranking Summary

Hazard Rank	Score
High	
Earthquake	50
Earth Movement/Debris Flow	50
Moderately High	
Wildfire	48
Pandemic/Public Health Emergency	45
Moderate	
Cyber Threat	24
Dam Failure	20
Drought	18
Terrorism	16
Moderately Low	
Flood	12
Low	
HazMat Release	4
Energy Shortage & Resiliency	4

3.2 Wildfire Hazard Profile

Wildfire		
Risk Rank: Moderately High		**Rank**
Probability/ Frequency:	Regular event – occurs between once a year and once every 7 years	3
Consequence/ Severity:	Moderate building damage, lifeline loss (less than 24 hours), severe injury or disability	4
Vulnerability:	Moderate damage area, moderate secondary impacts, moderate warning time	4
Hazard Risk Rank Score:	48	

Wildfire vulnerability for the region is described in Section 5.3.1 of the County's MJHMP. The areas north and east of the District's service area are identified as Very High Fire Hazard Severity Zones by the California Department of Forestry and Fire (CALFIRE) (refer to Figure 5-1 of the MJHMP).

The District frequently experiences a wildfire that affects District assets (Thomas Fire, Tea Fire, Jesusita Fire, Rey Fire, Coyote Fire, etc). During the recent Thomas Fire in 2017/2018, the District sustained moderate damage to Juncal Dam structures and secondary damages to Jameson Lake water quality. The fire was followed by a 400-year storm event and extensive debris flows which caused severe damage. Earth Movement, including debris flow, is discussed in Section 3.7 of the LHMP and is detailed further in Section 5.3.5 of the MJHMP.

District staff considered the impacts of climate change may increase wildfires. 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.

3.3 Energy Shortage & Resiliency Hazard Profile

Energy Shortage & Resiliency		
Risk Rank: Low		**Rank**
Probability/ Frequency:	Frequent event – occurs more than once a year	4
Consequence/ Severity:	No Damage	1
Vulnerability:	No Physical Damage, no secondary impacts	1
Hazard Risk Rank Score:	4	

Energy Shortage & Resiliency vulnerability for the region is described in Section 5.6.1 of the County's MJHMP. Due to recent massive wildfires throughout California and their ignition originating from utility infrastructure and high winds, the electric utilities have initiated a program to conduct Public Safety Power Shutdowns (PSPS) to prevent wildfire ignitions. The utilities are currently working with the County to minimize power delivery interruption while managing wildfire hazards.

While the District is subject to the PSPS events, all critical facilities have backup power supplies. The District does not experience damages during power outages nor secondary impacts of power outages. As shown during the 2018 debris flow, the District can effectively operate during longer duration power outages using its backup generators and refueling contracts with third party vendors.

Note: the County MJHMP ranked this hazard higher due to the larger purview of the County of Santa Barbara and impacted communities and infrastructure that may not have backup power generation.

3.4 Drought & Water Shortages Hazard Profile

Drought		
Risk Rank: Moderate		**Rank**
Probability/ Frequency:	Regular event - occurs between once a year and once every 7 years	3
Consequence/ Severity:	Minor/slight damage to facilities, no loss of lifelines	2
Vulnerability:	Minor damage to facilities, secondary impacts to water quality	3
Hazard Risk Rank Score:	18	

Drought and water shortages are described in Section 5.3.2 of the MJHMP including the history or droughts in the region and current status of regional water supplies.

The District has experienced numerous drought periods during its 100 year existence and expects to experience more frequent and prolonged droughts in the future due to climate change. Historically, droughts have required the District to continually diversify water supplies such as the addition of Bradbury Dam (Lake Cachuma) in the 1960s and State Water Project Water in the 1990s. As outlined in the 2020 Ubran Water Management Plan, the District has diversified its water supply portfolio to include more drought resilient water supplies and become less relient on rainfall dependent supplies. In 2018, the District acquired groundwater banking capabilities with Semitropic in the Central Valley and in 2020, the District acquired desalinated water supply from the City of Santa Barbara as part of a 50-year water supply agreement.

While droughts are expected to continue and to worsen, the District is less vulnerable to damages and consequences of droughts due to effective water supply planning. Some secondary impacts to water quality may occur during droughts when surface water and groundwater supplies are low.

Note: the District's ranking for this hazard is lower than the County of Santa Barbara MJHMP considering some communities in the County do not have drought resilient water supplies and are therefore more vulnerable to droughts.

3.5 Pandemic/Public Health Emergency Hazard Profile

Pandemic/Public Health Emergency		
Risk Rank: Moderately High		**Rank**
Probability/ Frequency:	Regular event - occurs between once a year and once every 7 years	3
Consequence/ Severity:	Possible loss of life, loss of operational continuity	5
Vulnerability:	Localized damage area, minor secondary impacts, moderate warning time	3
Hazard Risk Rank Score:	45	

Pandemic vulnerability for the region is described in Section 5.5.1 of the County's MJHMP. The COVID-19 Pandemic has affected all aspects of life and has demonstrated that everyone is vulnerable to the effects of a public health crisis. Although the COVID-19 pandemic did not directly affect water service to District's customers, it lowered productivity at the District due to staff quarantines and split shift working schedule for several months during the event.

Public health emergencies are becoming more frequent. In the past 20 years, there has been the SARS outbreak in 2002-2004, 2009 swine flu, 2012 MERS, 2013-2016 Ebola outbreaks, and the 2015-2016 Zika Virus epidemic. The District is describing this hazard as a "Regular event" that could result in severe injury or illness of staff, and have secondary impacts such as low staff moral and long term health issues.

3.6 Earthquake Hazard Profile

Earthquake		
Risk Rank: High		**Rank**
Probability/ Frequency:	Infrequent event - occurs between once every 8 years and once every 50 years (inclusive)	2
Consequence/ Severity:	Extensive building damage, widespread loss of lifelines (water, gas, sewer, roads), possible loss of life	5
Vulnerability:	Widespread damage area, significant secondary impacts, no warning time	5
Hazard Risk Rank Score:	50	

Earthquake vulnerability for the region is described in Section 5.3.3 of the County's MJHMP.

The District service area has multiple geologic faults with some areas being subject to moderate severity liquefaction (refer to Figure 5-8 and Figure 5-9, respectively, of the MJHMP). Historically, the District has not been negatively impacted by an earthquake. The 1925 Santa Barbara earthquake occurred when the District was just beginning to construct infrastructure. The 1994 Northridge Earthquake could be felt in the District service area but no damage was done to District facilities.

District pipelines and Juncal Dam are most vulnerable to earthquakes, given the dam was constructed in 1930 and underground pipelines cannot be protected from earthquakes.

3.7 Earth Movement Hazard Profile

Earth Movement / Debris Flow		
Risk Rank: High		**Rank**
Probability/ Frequency:	Infrequent event - occurs between once every 8 years and once every 50 years (inclusive)	2
Consequence/ Severity:	Extensive building damage, widespread loss of lifelines (water, gas, electricity, sanitation, roads), loss of life	5
Vulnerability:	Widespread damage area, significant secondary impacts, no warning time	5
Hazard Risk Rank Score:	50	

Landslide susceptibility and debris flows are described in Section 5.3.7 and 5.3.5, respectively, in the County's MJHMP.

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. Some debris flows are very fast. In areas of steep slopes, some debris flows can reach speeds of over 100 miles per hour.

On January 9th, 2018, the areas of Montecito and Carpinteria experienced a debris flow event as a secondary impact of the 2017 Thomas Fire and subsequent rainfall. According to the event's After-Action Report, millions of tons of mud and rocks flowed out of the mountains toward the ocean creating destruction along the way. There were multiple significant incidents including natural gas pipeline explosions, structure fires in Montecito, flooded structures, and persons trapped in structures, attics, and roofs that required rescuing. Helicopters transported multiple burn victims, individuals stranded, and people with

traumatic injuries. The debris flows ultimately led to 23 deaths, including two missing persons and numerous injuries. The District sustained significant widespread damages as a result of the 2018 debris flow.

While the frequency of a debris flow is low, they have occurred multiple times in the District's history (1969 and 2018) with both events causing significant damage. The consequences to District staff and infrastructure from a derbis flow are extremely high and the District remains vulnerable to debris flow in the future.

Note: this hazard has been ranked slightly higher than in the Countywide MJHMP document considering the local conditions (steep terrain and high wildfire risk) that may not apply to other areas of the County.

3.8 Terrorism Hazard Profile

Terrorism		
Risk Rank: Moderate		**Rank**
Probability/ Frequency:	A rare event - occurs less than once every 50 years	1
Consequence/ Severity:	Moderate building damage, lifeline loss (less than 24 hours), severe injury or disability	4
Vulnerability:	Moderate damage area, moderate secondary impacts, moderate warning time	4
Hazard Risk Rank Score:	16	

Terrorism vulnerability for the region is described in Section 5.5.6 of the County's MJHMP.

In accordiacnw with the American Water Infrastructure Act (AWIA), the District completed a Risk and Resilience Assessment and Emergency Response Plan in 2021 which assessed the Districts vulnerability to acts of Terrorism, among other risks. For security purposes, a discussion of those vulnerabilities is not included in this LHMP. However, District staff are aware of threats and risk related to Terrorism and are working to miigate those risks. The likelihood of this hazard occurring is low but the consequences could be significant. An act of terrorism could result in discontinuity of operations, loss of water service to a portion of the community, and injury to staff.

3.9 Flood Hazard Profile

Flood		
Risk Rank: Moderately Low		**Rank**
Probability/ Frequency:	Infrequent event - occurs between once every 8 years and once every 50 years	2
Consequence/ Severity:	Minor/slight damage to buildings and structures, no loss of lifelines, first aid injuries	2
Vulnerability:	Localized damage area, minor secondary impacts	3
Hazard Risk Rank Score:	12	

Flood vulnerability for the region is described in Section 5.3.4 of the County's MJHMP.

As demonstrated in the FEMA Flood Rate Insurance Maps (FIRM), the District's service area is not prone to flooding (refer to Figure 5-11 of the MJHMP). The service area generally consists of steep slopes which allow rain waters to flow quicky toward the coast and into the ocean. Only local riverine flooding is expected along creeks in the area (e.g., Cold Springs Creek, San Ysidro Creek, Montecito Creek, etc.) but will likely not severely affect the District infrastructure or staff.

Flooding may impact several District assets that are near to the creek high water elevations. This includes the Morgan Well, Las Entradas Well, and East Valley Pump Station. The loss of these infrastructure would not result in customer outages. Secondary impacts of expenses and time to reconstruct the facilities could occur.

Note: this hazard has been ranked slightly lower than in the Countywide MJHMP document considering the local conditions (steep terrain and lack of flat areas) better manage heavy rainfall whereas other areas of the County may be more prone to flooding where these conditions do not exist.

3.10 Dam Failure Hazard Profile

Dam Failure		
Risk Rank: Moderate		**Rank**
Probability/ Frequency:	A rare event - occurs less than once every 50 years	1
Consequence/ Severity:	Extensive building damage, loss of lifelines (water, gas, electricity, sanitation, roads), loss of life	5
Vulnerability:	Moderate damage area, moderate secondary impacts, minimal warning time	4
Hazard Risk Rank Score:	20	

Dam Failure vulnerability for the region is described in Section 5.3.6 of the County's MJHMP.

While the District service area is not within any inundation zones for dam failure (refer to Figure 5-25 of the MJHMP), the District operates the Juncal Dam, which could fail due to an earthquake or other event. The District owns and operates the Juncal Dam including a full time staff member that lives on site below the dam. The caretakers facilities could be damaged and the caretaker could be injured or lose their life depending on the severity of the dam failure. There are minor forest service facilities and campgrounds downstream of the dam that would also be destroyed.

This event is very unlikely but the consequences could be significant.

3.11 Cyber Threat Hazard Profile

Cyber Threat		
Risk Rank: Moderate		**Rank**
Probability/ Frequency:	Frequent event – occurs more than once a year	4
Consequence/ Severity:	Possible compromised data, personal information, productivity of staff	3
Vulnerability:	Localized damage area	2
Hazard Risk Rank Score:	24	

Cyber threat throughout the County is described in Section 5.5.2 of the MJHMP.

Cyber attacks are a fast-growing crime with an increase of 69% in complaints and a reported loss of $4.2 Billion in 2020 according to the FBI Internet Crime Report. Cybercrimes can be perpetuated from anywhere, are low cost and low risk to the criminal actors, and can cripple the daily operations of an organization by corrupting the computer systems.

The probability of this event occurring is high given the number of attacks, especially on small government agencies in recent years. However, the District has taken specific actions in recent years to ensure resilience to cybersecurity attacks. An actual breach could result in loss of data or information and reduce productivity of staff.

3.12 HazMat Release Hazard Profile

HazMat Release		
Risk Rank: Low		**Rank**
Probability/ Frequency:	A rare event - occurs less than once every 50 years	1
Consequence/ Severity:	Minor damage to buildings, no loss of lifelines, first aid injuries	2
Vulnerability:	Localized damage area	2
Hazard Risk Rank Score:	4	

HazMat Release vulnerability for the region is described in Section 5.6.2 of the County's MJHMP. The MJHMP outlines how hazardous materials traverse the County via roadways and railways daily exposing communities to risk.

The District's vulnerability to roadway/railway hazards is very low. An accident would need to be so severe that it damaged underground water infrastructure, to impact the District. This scenario is very unlikely. Instead, the District's vulnerability focused on the District's small chlorination system at Ortgea Reservoir and Doulton and Bella Vista Treatment Plants. While hazard assessments have determined that it is unlikely for a chlorine release will impact offsite areas, staff still have a small exposure risk at each location.

3.13 Climate Change

With the release of the California Adaptation Planning Guide (APG) in July 2012, the District has attempted to include the effects of climate change into the LHMP. As identified in the "Understanding Regional Characteristics" portion of the APG, the District is located in the Central Coast Region of California. As a result, District staff considered the following climate change impacts as recommended by the APG:

- Increased Temperatures
- Reduced Precipitation
- Reduced Agricultural Productivity
- Sea Level Rise

- Biodiversity Threat
- Public Health Threats
- Reduced Tourism

District staff engaged in a discussion to determine which impacts posed a viable threat to the District. While some impacts applied, others required additional research. Studies were conducted to look at recorded trends for sea level rise, wildfire, and regional temperature increases. The result of the study was the following list of perceived, feasible impacts that might affect the District over the next 5 to 10 years:

- Increased Temperatures
- Reduced Precipitation

After reviewing the results of each of these impacts, District staff decided to include hazards in the Plan update that represented how the impacts would be felt by the District. For example, increased temperatures and reduced precipitation would be recognized as a drought. Additionally, increased temperatures and reduced precipitation might result in a wildfire. Therefore, District staff identified Drought and Wildfire as perceived hazards. Any information regarding the effects of these impacts on the District will be found under the hazard profiles listed above. Additionally, mitigation strategies that apply to these impacts will be classified under Drought and Wildfire in the mitigation actions identified in Section 4.

3.14 Loss Estimates

The loss estimate began with a review of the District's asset inventory. The Asset Inventory Summary Tables are presented on the following tables.

Table 3.5: Asset Inventory Summary

Asset Inventory Summary – Montecito Water District		
Type	**Name**	**TOTAL**
Water Sources	Various MWD Wells	$3,795,754.00
Structures	MWD Administration Property	$319,582.00
Infastructure	Transmission and Distribution Systems	$17,890,212.00
Water Facility	Bella Vista Treatment Facility	$322,551.00
Water Facility	Doulton Treatment Plant	$24,908.00
Dam	Juncal Dam	$675,369.00
Water Storage	10 Reservoirs and 1 cistern	$6,388,866.00
Equipment	Machinery and Equipment	$512,016.00
	Total	**$29,929,258**

Loss of Function / Continuity Premium (1 day)		
Population:	**11,750**	
Category		**Total**
Water Service		$1,621,500.00
	Subtotal	**$1,621,500.00**

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 water service interruptions the loss of function values was also included. The tables of the following pages identify 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 3.6: Vulnerability Assessment Calculations

Montecito Water District Vulnerability Assessment Calculations			**Wildfire**		**Energy Shortage & Resiliency**		**Drought**		**Pandemic/Public Health Crisis**		**Earthquake**	
Type	**Name**	**TOTAL**	**% Damage**	**Loss Estimate**	**% Damage**	**Loss Estimate**	**% Damage**	**Loss Estimate**	**% Damage**	**Loss Estimate**	**% Damage**	**Loss Estimate**
Water Sources	Various Groundwater Wells	$3,795,754.00	10%	$379,575	5%	$189,788	0%	$0	0%	$0	80%	$3,036,603
Structures	District Administration Property	$319,582.00	10%	$31,958	0%	$0	0%	$0	0%	$0	80%	$255,666
Infastructure	Transmission and Distribution Systems	$17,890,212.00	5%	$894,511	0%	$0	0%	$0	0%	$0	40%	$7,156,085
Water Facility	Bella Vista Treatment Facility	$322,551.00	80%	$258,041	0%	$0	0%	$0	0%	$0	30%	$96,765
Water Facility	Doulton Treatment Plant	$24,908.00	100%	$24,908	0%	$0	0%	$0	0%	$0	30%	$7,472
Dam	Juncal Dam	$675,369.00	10%	$67,537	0%	$0	0%	$0	0%	$0	100%	$675,369
Water Storage	Storage Tanks (Reservoirs)	$6,388,866.00	5%	$319,443	0%	$0	0%	$0	0%	$0	25%	$1,597,217
Equipment	Machinery and Equipment	$512,016.00	50%	$256,008	0%	$0	0%	$0	0%	$0	10%	$51,202
Water Service		$1,621,500.00	10%	$162,150	0%	$0	25%	$405,375	5%	$81,075	50%	$810,750

			Wildfire	$2,394,131	Energy Shortage & Resiliency	$189,788	Drought	$405,375	Pandemic/Public Health Crisis	$81,075	Earthquake	$13,687,128

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Table 3.7: Vulnerability Assessment Calculations Continued

Montecito Water District Vulnerability Assessment Calculations			Earth Movement/ Debris Flow		Terrorism		Flood		Dam Failure		Cyber Threat		HazMat Release	
Type	**Name**	**TOTAL**	**% Damage**	**Loss Estimate**	**% Damage**	**Loss Estimate**	**% Damage**	**Loss Estimate**	**% Damage**	**Loss Estimate**	**% Damage**	**Loss Estimate**	**% Damage**	**Loss Estimate**
Water Sources	Various Groundwater Wells	$3,795,754.00	5%	$189,788	2%	$75,915	10%	$379,575	0%	$0	0%	$0	0%	$0
Structures	District Administration Property	$319,582.00	2%	$6,392	2%	$6,392	1%	$3,196	0%	$0	10%	$31,958	0%	$0
Infastructure	Transmission and Distribution Systems	$17,890,212.00	10%	$1,789,021	2%	$357,804	1%	$178,902	0%	$0	0%	$0	0%	$0
Water Facility	Bella Vista Treatment Facility	$322,551.00	10%	$32,255	2%	$6,451	1%	$3,226	0%	$0	0%	$0	0%	$0
Water Facility	Doulton Treatment Plant	$24,908.00	20%	$4,982	2%	$498	1%	$249	0%	$0	0%	$0	0%	$0
Dam	Juncal Dam	$675,369.00	0%	$0	2%	$13,507	100%	$675,369	100%	$675,369	0%	$0	0%	$0
Water Storage	Storage Tanks (Reservoirs)	$6,388,866.00	0%	$0	2%	$127,777	1%	$63,889	0%	$0	0%	$0	0%	$0
Equipment	Machinery and Equipment	$512,016.00	5%	$25,601	2%	$10,240	10%	$51,202	0%	$0	0%	$0	0%	$0
Water Service		$1,621,500.00	40%	$648,600	2%	$32,430	15%	$243,225	15%	$243,225	10%	$162,150	40%	$648,600
			Earth Movement	$2,696,638	Terrorism	$631,015	Flood	$1,598,832	Dam Failure	$918,594	Cyber Threat	$194,108	HazMat Release	$648,600

Table 3.8 summarizes the loss estimates for each hazard.

Table 3.8: Loss Estimate Summary

Loss Estimate Summary Table	
Hazard	Jurisdiction
	Montecito Water District
Earthquake	$13,687,128
Earth Movement	$2,696,638
Wildfire	$2,394,131
Flood	$1,598,832
Dam Failure	$918,594
HazMat Release	$648,600
Terrorism	$631,015
Drought	$405,375
Cyber Threat	$194,108
Energy Shortage & Resiliency	$189,788
Pandemic/Public Health Crisis	$81,075

4.0 MITIGATION STRATEGIES

§201.6(c)(3)(i): [The hazard mitigation strategy **shall** include a] description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards.

As an extension of the County's MJHMP, District staff developed District specific goals and objectives using guidance from the County's plan. The goals listed below guided District staff in the development of mitigation activities that align with the objectives being upheld throughout the region.

Table 4.1: Hazard Mitigation Planning Goals

Goal 1: Development	Ensure future development is resilient to known hazards.
Goal 2: Critical Facilities	Protect people and existing community assets (e.g. critical facilities, infrastructure, water, and public facilities) from hazards.
Goal 3: Outreach	Actively promote understanding, support, and funding for hazard mitigation by participating agencies and the public.
Goal 4: Human-Caused Hazards	Minimize the risks to life and property associated with urban and human-caused hazards.
Goal 5: Climate Change	Prepare to adapt and recover from the impacts of climate change and ensure regional resiliency.

Note: Goals are taken from the Santa Barbara County MJHMP

4.1 Identification of Mitigation Recommendations

§201.6(c)(3)(ii): [The mitigation strategy **shall** include a] section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effects of each hazard, with particular emphasis on new and existing buildings and infrastructure.

§201.6(c)(3)(iv): For multi-jurisdictional plans, there **must** be identifiable action items specific to the jurisdiction requesting FEMA approval or credit of the plan.

The former LHMP was adopted as an annex to the 2017 MJHMP. Since the 2017 MJHMP, the District has incorporated the LHMP goals, objectives, and mitigation actions into its local plans and processes, budget planning, and capital improvement planning. Ongoing monitoring and evaluation of the LHMP by the District ensured mitigations are implemented and tracked. Key mitigation actions completed include installing the Barker Pass Backup Generator, the Bella Vista Automatic Transfer Switch, and the Office Automatic transfer Switch (Table 4.4).

Mitigation actions are administrative and/or engineering project recommendations to reduce the District's vulnerability to the identified hazards. District staff developed mitigation projects based on the identified hazards and associated loss. In addition, the Federal Emergency Management Agency's (FEMA) Local Mitigation Planning Handbook and the California Adaptation Planning Guide were used to identify actions to mitigate the effects of climate change.

Tables 4.2, 4.3, and 4.4 show the proposed mitigation actions, removed mitigation actions since the 2018 update, and completed mitigation actions since 2018.

Table 4.2: Mitigation Activity Summary

New and Ongoing Mitigation Activity	Hazards Mitigated	Goal	Responsible Departments	Resources	Estimated Project Cost	Timeframe	Status	Comments
2022HMP.01 - Establish an Emergency Operations Center for Preparing for, Responding to, and Coordinating Disaster Response at the District Headquarters	All	Goals 2 and 4	Engineering	Capital Improvement, General Fund/Grant Funding	$4,000,000	Medium	Planning Stage	New Project. District does not currently have an area where emergency operations can be coordinated. This mitigation action was highlighted in the recent 2018 debris flow disaster in Montecito.
2022HMP.02 - establish site security at District administrative building.	Terrorism	Goal 2	Engineering	General Fund/Grant Funding	$100,000	Short	Planning Stage	New Project. Would establish automated entry doors, video surveillance, and other security measures to mitigate malicious attacks and terrorism at a critical District facility.
2022HMP.03 - establish site security at Bella Vista Treatment Plant	Terrorism	Goal 2	Engineering	General Fund/Grant Funding	$60,000	Short	Planning Stage	New Project. Would establish automated entry doors, video surveillance, and other security measures to mitigate malicious attacks and terrorism at a critical District facility.
2022HMP.04 - establish site security at Doulton Treatment Plant	Terrorism	Goal 2	Engineering	General Fund/Grant Funding	$50,000	Short	Planning Stage	New Project. Would establish automated entry doors, video surveillance, and other security measures to mitigate malicious attacks and terrorism at a critical District facility.
2022HMP.05 - establish site security at Juncal Dam at Jameson Lake	Terrorism/Dam Failure	Goal 2	Engineering	General Fund/Grant Funding	$90,000	Short	Planning Stage	New Project. Would establish automated entry gates, remote video surveillance, and other security measures to mitigate malicious attacks and terrorism at a critical District facility.

New and Ongoing Mitigation Activity	Hazards Mitigated	Goal	Responsible Departments	Resources	Estimated Project Cost	Timeframe	Status	Comments
2022HMP.06 - design and implement a remote water quality monitoring network as part of the SCADA system to monitor for malicious attacks on water quality.	Terrorism	Goals 2 and 5	Engineering	General Fund/Grant Funding	$200,000	Medium	Planning Stage	New Project. Would establish automated entry gates, remote video surveillance, and other security measures to mitigate malicious attacks and terrorism at a critical District facility.
2022HMP.07 - implement solar photovoltaic systems and battery backup at 8 storage tank sites as a backup for SCADA communications during power outages.	Energy Shortage & Resilience	Goals 2 and 5	Engineering	CIP/General Fund/Grant Funding	$500,000	Medium	Pending	New Project. Would install solar power backup systems at District storage tanks to provide backup power generation for on-site SCADA communications and critical pumping facilities.
2022HMP.08 - replace 100-year old transmission main "highline" at the boundary between Montecito residential area and US Forest Service land to ensure adequate fire protection during frequent and intensifying wildfires.	Wildfire/ Drought/ Earthquake	Goal 2	Engineering	CIP/General Fund/Grant Funding	$13,000,000	Long	Design	New Project. Would replace a 100-year old water main "highline" traversing the mountains above Montecito and ensure adequate water flows to fire fighting efforts along the forest/housing boundary.
2022HMP.09 - install new emergency release valves and improved intake to restore full functionality of the Juncal Dam Emergency Release Valves.	Drought & Dam Failure	Goal 2	Engineering	CIP/General Fund/Grant Funding	$2,400,000	Long	Design	New Project. Would install new emergency release valves and improved intake to restore full functionality of the Juncal Dam Emergency Release Valves.

New and Ongoing Mitigation Activity	Hazards Mitigated	Goal	Responsible Departments	Resources	Estimated Project Cost	Timeframe	Status	Comments
2018HMP.01 - Cistern Tank Retaining Wall - Construct a 3-5-foot-high retaining wall within the existing fenced area approximately 80 feet long surrounding the existing cistern	Flood/ Earth Movement/Debris Flows	Goal 2	Engineering	Grant Funding	$25,000	Short	Removed	Asset is at risk of debris flow entering this potable water storage tank.
2018HMP.06 - Implement structural integrity project at critical facilities	Earthquakes	Goal 2	Engineering	Capital Improvement/Grant Funding	$30,000,000	Medium	Ongoing	Ongoing. Seismic resilience study conducted on all reservoirs. Currently pursuing ASADRA funding for $21M to seismically retrofit 8 of 9 District reservoirs. Some buildings remain not retrofit to current seismic design code.
2018HMP.07 - Ensure new structures are built with considerations for seismic activity and earth movement	Earthquake/ Earth Movement	Goal 1	Engineering	Insurance Coverage/ Capital Improvement	$10,000,000 per project $750,000 in project planning/ consultant fees	Short	Ongoing	All new structures are designed with considerations to seismic stability and resilience to potential earth movements.
2018HMP.10 - Enhance protective structures surrounding critical facilities.	Earth Movement/Debris Flows	Goal 2	Engineering	Capital Improvements/ Grant Funding	$200,000 per project	Short	Ongoing	Projects needed at several locations to prevent creek flows and debris flows from entering District property, including East Valley Pump Station and Doulton Treatment Plant.
2018HMP.14 - Install pressure management system to monitor the water system for malevolent disturbance.	Terrorism	Goal 2	Engineering	Capital Improvements/ Grant Funding	$1,000,000	Long	Pending	Not yet started
2018HMP.15 - Conduct physical threat & awareness training to prepare staff to appropriately react to in-person attacks.	Terrorism	Goal 3	Administration	General Fund	$10,000	Medium	Pending	Not yet started

Table 4.3: Removed Mitigation Activity

Removed Mitigation Activity	Hazards Mitigated	Goal	Responsible Departments	Resources	Estimated Project Cost	Timeframe	Status	Comments
2018HMP.02 - Jameson Lake Sedimentation Prevention – Install erosion control within the Jameson Lake watershed to prevent sedimentation in the lake and water quality issues.	Fire/ Earth Movement	Goal 2	Engineering	Grant Funding	$200,000	Short	Removed	Removed from HMP. Negligible project benefits.

Table 4.4: Completed Mitigation Activity

Completed Mitigation Activity	Hazards Mitigated	Goal	Responsible Departments	Resources	Project Cost	Timeframe	Status	Comments
2018HMP.03 - Bella Vista Automatic Transfer Switch – Install an automatic transfer switch at BVPT that would automatically transfer power from Edison to the existing backup generator in the event of power loss.	Fire/ Energy Shortage and Resiliency	Goal 2	Engineering	Grant Funding	$25,000	Short	Complete	Completed April 2021.
2018HMP.04 - Office Automatic transfer Switch - Install an automatic transfer switch at MWD Office that would automatically transfer power from Edison to the existing backup generator in the event of power loss.	Fire/ Energy Shortage and Resiliency	Goal 2	Engineering	Grant Funding	$9,000	Short	Complete	Completed May 2020.
2018HMP.05 - Barker Pass Backup Generator – Install a backup generator at the Barker Pass Pump Station	Fire/ Energy Shortage and Resiliency	Goal 2	Engineering	FEMA Grant Funding	$130,000	Short	Complete	Completed January 2022.

Completed Mitigation Activity	Hazards Mitigated	Goal	Responsible Departments	Resources	Project Cost	Timeframe	Status	Comments
2018HMP.08 - Develop a policy for purchasing and distributing emergency water supply when water service is interrupted	Earthquake/Fire/ Drought/Terrorism	Goal 3	General Manager	Staff Time	Staff Time	Short	Completed	The District has retained a vendor for bottled water distribution.
2018HMP.09 - Update Emergency Plan and train critical in ICS Emergency Management	All-Hazard	Goal 3	General Manager	General Fund	$25,000	Short	Complete	Completed December 2021. Update required in 2026.
2018HMP.11 - Update Water Shortage Contingency Plan implementing lessons learned from the 2013 CA drought.	Drought	Goal 3	Finance/ Engineering	General Fund	$95,000	Short	Complete	Incorporated into the District's 2020 Urban Water Management Plan
2018HMP.12 - Develop evacuation Plan and acquire backup communication for the District's Dam caretaker staff to provide safe egress in a Dam failure scenario	Dam Failure	Goal 3	Engineering	General Fund/ Grant Funding	$150,000	Medium	Complete	Dam Caretaker has been provided a satellite phone and has a subscription to Emergency Helicopter Evacuation Services
2018HMP.13 - Upgrade technology (including SCADA) and security systems to withstand the impacts of a cyber-attack. Improve protection of sensitive customer data on servers.	Terrorism/Cyber Threat	Goal 3	IT Department	General/ Grant Funding	$75,000	Medium	Complete	Comprehensive cyber security review and penetration testing were completed in 2020.
2018HMP.16 - Install Backup power supply for critical facilities	Energy Shortage	Goal 2	Engineering	Capital Improvements/ Grant Funding	$100,000 per facility	Medium	Complete	Backup power has been installed for all critical infrastructure, including treatment plants, pumps, and offices.
2018HMP.17 - Update all critical facilities with surge protection equipment	Energy Shortage	Goal 2	Engineering	Capital Improvement Project	$10,000 per unit	Medium	Complete	Critical IT assets have surge protection on electrical plugs

4.2 Prioritization of Mitigation Recommendations

§201.6(c)(3)(iii): [The mitigation strategy section **shall** include] an action plan describing how the actions identified in section (c)(3)(ii) will be prioritized, implemented, and administered by the local jurisdiction. Prioritization **shall** include a special emphasis on the extent to which benefits are maximized according to a cost-benefit review of the proposed projects and their associated costs.

A simplified Benefit-Cost Review was applied 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?

Table 4.3 provides a detailed benefit-cost review for each mitigation recommendation, as well as a relative priority rank (High, Medium, and Low) based upon the judgment of District staff. 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

It should be noted that values for costs are estimates only

Table 4.3: Benefit-Cost Review Summary

Mitigation Activity	Benefits (Pros)	Costs (Cons)	Priority
2022HMP.01 - Establish an Emergency Operations Center for Preparing for, Responding to, and Coordinating Disaster Response at the District Headquarters	• Avoided Property Damage • Avoided Injury/Fatality • Avoided Emergency Management Costs	• $4,000,000	High
2022HMP.02 - establish site security at District administrative building.	• Avoided Property Damage • Avoided Injury/Fatality	• $60,000	Medium
2022HMP.03 - establish site security at Bella Vista Treatment Plant	• Avoided Property Damage • Avoided Injury/Fatality • Improved Water Supply reliability	• $60,000	Medium
2022HMP.04 - establish site security at Doulton Treatment Plant	• Avoided Property Damage • Avoided Injury/Fatality • Improved Water Supply reliability	• $50,000	Medium
2022HMP.05 - establish site security at Juncal Dam at Jameson Lake	• Avoided Property Damage • Avoided Injury/Fatality • Improved Water Supply reliability	• $90,000	Medium

Table 4.3: Benefit-Cost Review Summary

Mitigation Activity	Benefits (Pros)	Costs (Cons)	Priority
2022HMP.06 - design and implement a remote water quality monitoring network as part of the SCADA system to monitor for malicious attacks on water quality.	• Improved Water Supply reliability	• $200,000	Low
2022HMP.07 - implement solar photovoltaic systems and battery backup at 8 storage tank sites as a backup for SCADA communications during power outages.	• Improved Water Supply reliability	• $500,000	Medium
2022HMP.08 - replace 100-year old transmission main "highline" at the boundary between Montecito residential area and US Forest Service land to ensure adequate fire protection during frequent and intensifying wildfires.	• Avoided Property Damage • Avoided Emergency Management Costs • Improved Water Supply reliability	• $13,000,000	Medium
2022HMP.09 - install new emergency release valves and improved intake to restore full functionality of the Juncal Dam Emergency Release Valves.	• Avoided Property Damage • Avoided Emergency Management Costs • Improved Water Supply reliability	• $2,400,000	High

Table 4.3: Benefit-Cost Review Summary

Mitigation Activity	Benefits (Pros)	Costs (Cons)	Priority
2018HMP.06 - Implement structural integrity project at critical facilities	• Avoided Property Damage • Avoided Injury/Fatality • Avoided Emergency Management Costs	• $2,000,000 per project	High
2018HMP.07 - Ensure new structures are built with considerations for seismic activity and earth movement	• Avoided Property Damage • Avoided Injury/Fatality • Avoided Emergency Management Costs	• $10,000,000 per project $750,000 in project planning/consultant fees	Low
2018HMP.9 - Update Emergency Plan and train critical staff in ICS Emergency Management	• Avoided Emergency Management Costs	• $20,000 in planning and training costs	High
2018HMP.11 - Update Water Shortage Contingency Plan implementing lessons learned from the 2013 CA drought.	• Avoided Service Interruptions • Improved Water Supply reliability	• $50,000 in planning costs	Medium
2018HMP.14 – Install pressure management system to monitor the water system for malevolent disturbance.	• Avoided Property Damage • Avoided Service Interruptions	• $1,000,000 in construction costs	Low

Table 4.3: Benefit-Cost Review Summary

Mitigation Activity	Benefits (Pros)	Costs (Cons)	Priority
2018HMP.15 – Conduct security & Awareness training to prepare staff to appropriately react to cyber and in-person attacks.	• Avoided injury/fatality • Avoided Emergency Management Costs	• $10,000 in training costs	High

5.0 PLAN MAINTENANCE

The Mitigation Strategies section of this LHMP identifies mitigation actions that have been prioritized based on the loss estimates and the probability of each hazard, which will typically be implemented according to the priority rank. To thoroughly track hazard mitigation status, the District must continuously monitor and document the progress of the implementation of the mitigation actions.

5.1 Planning Mechanisms

§201.6(c)(4)(ii): [The plan **shall** include a] process by which local governments incorporate the requirements of the mitigation plan into other planning mechanisms such as comprehensive or capital improvement plans, when appropriate.

The District maintains the following processes to incorporate mitigation strategies into planning mechanisms. The following resources were identified by District staff as being most inherent to District operations and most likely to be avenues for the first steps in hazard mitigation implementation. Also, lists of identified resources are described in Tables 5.1 through 5.5 later in this section.

District Board of Directors

The Board of Directors is responsible for approving projects and programs on a District-wide level. By providing mitigation planning concepts to the Board of Directors, mitigation actions and concepts will be incorporated into relevant planning efforts.

General Manager

The General Manager provides leadership in the management of the District and execution of District policies. The General Manager serves as the District's chief executive officer and oversees the day-to-day operations of the District's departments. General Manager can expand the integration of hazard mitigation with the planning, direction, and management of District operations.

Engineering Department

The Engineering Departments oversee the Capital Improvement Program, New and Re-Development Services, Property Management, and Geographic Information System. Through these programs, the District can incorporate key mitigation actions.

Operations Department

This department operates and maintains the District's treatment and distribution systems. The Operations Department can expand implementation of hazard mitigation projects on an ongoing basis into the District’s infrastructure.

Resource Tables

This section serves as a high-level capability assessment of the District’s resources through which hazard mitigation objectives may be achieved. The following subsections attempt to document the Regulatory, Administrative/Technical, Fiscal, Grant funding, and Outreach/Partnerships resources available to the District.

Table 5.1: Regulatory Tools Table

Regulatory Tool	Comments
Urban Water Management Plan 2020	The Plan outlines forecasts for drought probability and magnitude while expanding upon awareness of drought hazard vulnerability.
Capital Improvement Plan 2020	The plan outlines proposed efforts for capital projects and programs needed to carry out the goals and objectives of the District; including those regarding hazard mitigation.
Juncal Dam Inundation Mapping and Emergency Action Plan 2019	The inundation flood maps identify flooding downstream of the District-owned Juncal Dam and the Emergency Response Plan identifies mitigation efforts in the event of a dam breach.
Emergency Response Plan 2021	The plan outlines the procedures for responding to fire, flood, earthquakes, and other disasters that could occur in the District.
AWIA Risk and Resilience Assessment 2021	The plan identifies man-made and natural threats to District assets and prioritizes asset-threat pairs based on a detailed ranking system.
Strategic Plan 2022	The plan outlines the District's strategic vision and mission and includes specific action items to meet core objectives.

Table 5.2: Administrative/Technical Tools Table

Administrative/Technical Tool	Personnel/Resources
Board of Directors	The Board of Directors can review and approve mitigation proposals for implementations
Administration	Administration is a multi-faceted resource. The District may utilize experts in its many departments for mitigation activity implementation

Table 5.3: Fiscal Tools Table

Fiscal Tool	Available
General Fund	Yes, with Board approval.
Capital Improvement Plan	Yes, with Board approval.
Emergency Reserves	Yes, with Board approval.

Table 5.4: Grant Funding Tools Table

Grant Funding Tool	Agency	Purpose	Contact
Pre-Disaster Mitigation Program (PDM)	U.S. Department of Homeland Security, Federal Emergency Management Agency	To provide funding for States, and communities for cost-effective hazard mitigation activities which complement a comprehensive hazard mitigation program and reduce injuries, loss of life, and damage and deconstruction of property.	FEMA 500 C. Street, SW Washington, DC 20472 Phone: (202) 646-4621 www.fema.gov
Hazard Mitigation Grant Program	U.S. Department of Homeland Security, Federal Emergency Management Agency	To prevent future losses of lives property due to disasters; to implement State of local hazard mitigation plans; to enable mitigation measures to be implemented during the immediate recovery from a disaster; and to provide funding for previously identified mitigation measures to benefit the disaster area.	FEMA 500 C Street S.W. Washington, DC 20472 Phone (202) 646-4621 www.fema.gov
Flood Mitigation Assistance (FMA)	U.S. Department of Homeland Security,	To help States and communities plan and carry out activities designed to reduce the risk of flood	FEMA 500 C Street S.W.

Grant Funding Tool	Agency	Purpose	Contact
	Federal Emergency Management Agency	damage to structures insurable under the NFIP.	Washington, DC 20472 Phone (202) 646-4621 www.fema.gov
Emergency Management Performance Grants (EMPG)	U. S. Department of Homeland Security; Federal Emergency Management Agency	To encourage the development of comprehensive emergency management at the State and local level and to improve emergency management planning, preparedness, mitigation, response, and recovery capabilities.	FEMA 500 C Street S.W. Washington, DC 20472 Phone (202) 646-4621 www.fema.gov
Community Development Grant Program (CDBG)	U.S. Department of Housing and Urban Development	To develop viable urban communities by providing decent housing and a suitable living environment. Principally for low-to-moderate-income individuals.	HUD 451 7th Street, S. W. Washington, DC 20410-7000 Phone: (202) 708-3587 www.hud.gov
Public Assistance Program (PA)	U.S. Department of Homeland Security, Federal Emergency Management Agency	To provide supplemental assistance to States, local governments, and certain private nonprofit organizations to alleviate suffering	FEMA 500 C Street S.W. Washington, DC 20472

Grant Funding Tool	Agency	Purpose	Contact
		and hardship resulting from major disasters or emergencies declared by the President. Under Section 406, Public Assistance funds may be used to mitigate the impact of future disasters.	Phone (202) 646-4621 www.fema.gov
Emergency Watershed Protection	U.S. Department of Agriculture, Natural Resource Conservation Service	To provide emergency technical and financial assistance to install or repair structures that reduce runoff and prevent soil erosion to safeguard life and property.	NRCS PO BOX 2890 Washington, DC 20013 Phone: (202) 720-3527 www.nrcs.usda.gov
Disaster Mitigation and Technical Assistance Grants	U.S. Department of Commerce, Economic Development Administration	To help States and localities to develop and /or implement a variety of disaster mitigation strategies.	EDA Herbert C. Hoover Building Washington, DC 20230 Phone: (800) 345-1222 www.eda.gov
Watershed Surveys and Planning	U.S. Department of Agriculture, Natural	To provide planning assistance to Federal, State, and local agencies for the development of coordination	NRCS PO Box 2890

Grant Funding Tool	Agency	Purpose	Contact
	Resource Conservation Service	water and related land resources programs in watersheds and river basins	Washington, DC 20013 Phone: (202) 720-3527 www.nrcs.usda.gov
National Earthquake Hazards Reduction Program (NEHRP)	U.S. Department of Homeland Security, Federal Emergency Management Agency	To mitigate earthquake losses that can occur in many parts of the nation providing earth science data and assessments essential for warning of imminent damaging earthquakes, land-use planning, engineering design, and emergency preparedness decisions.	FEMA 500 C Street S.W. Washington, DC 20472 Phone (202) 646-4621 www.fema.gov
Engineering for Natural Hazards	National Science Foundation	Supports fundamental research that advances knowledge for understanding and mitigating the impact of natural hazards on constructed civil infrastructure	National Science Foundation Phone: (703) 292-7024 https://www.nsf.gov

Table 5.5: Outreach and Partnerships Tools Table

Outreach/Partnership Tools	Comments
District Website	The District website is an open forum for providing hazard information and for accepting ongoing comments from the public. The website will likely be the main avenue for maintaining an open dialogue with the public for hazard mitigation throughout the planning period.
Public Outreach	The District holds several outreach opportunities throughout the year. Public outreach includes a broad spectrum of hazard-specific information to improve hazard awareness of the community related to water.
Mutual Aid Agreements	As part of expanding its resilience to the impacts of hazard events, the District intends to review its current mutual aid agreements, identify gaps, and secure new agreements to expand its available mutual resources if required.

5.2 Periodic Assessment Requirements

§201.6(c)(4)(i): [The plan maintenance process **shall** include a] section describing the method and schedule of monitoring, **evaluating**, and updating the mitigation plan within a five-year cycle.

Since the last LHMP, the LPT has monitored, evaluated, and updated the plan on a continuing and as-needed basis. The District was very successful in implementing the mitigation actions as noted in Table 4.4. The remaining mitigation actions are ongoing at the time of this update.

Planning is an ongoing process and, as such, this LHMP should be treated as a living document that must grow and adapt to keep pace with changes within the District. An annual assessment will be completed to document the changes in site hazards (e.g., updated FIRM maps, contemporary seismic studies, etc.) or the installation and purchase of new equipment (e.g., back-up generators, emergency response equipment, etc.), to ensure they do not have any major effects on the District's hazard vulnerabilities that would impact the conclusions or actions associated with the Plan. Before the fifth year of the revision cycle, these annual observations will be reviewed to determine what changes should be implemented in the required Plan update. The results of the annual evaluations will be folded back into each phase of the planning process and should yield decisions on how to update each section of the Plan.

The District Engineer has the responsibility of implementing these annual and five-year requirements. During the annual review, if any updates are deemed minor, then the District Engineer will perform the updates. However, if more major updates are required, then the District Staff will be reconvened to discuss the effects on the Plan. For the fifth-year revision, the staff will reconvene to use their expertise to update the Plan in its entirety. Each of the annual assessments will be utilized as an opportunity to evaluate the progress of hazard mitigation action implementation. The District Engineer will be responsible for reviewing the mitigation actions annually, determining which have the potential to be accomplished over the next year and encouraging implementation with the proper departments. If the Plan is not meeting its goals, the District Engineer will document the shortcomings, suggest modifications, and implement changes to the plan as appropriate.

In addition to these periodic requirements, any significant modification to the District's facilities should be considered concerning a possible impact on the Plan. All LPT members are responsible for providing updates for the District Engineer as necessary. As noted in the following section, the completed Plan will be available on the District's website to allow the public to continue to be involved during these periodic reviews.

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.

5.3 Evaluation and Update Requirements

§201.6(c)(4)(i): [The plan maintenance process **shall** include a] section describing the method and schedule of monitoring, evaluating, and **updating** the mitigation plan within a five-year cycle.

§201.6(c)(4)(iii): [The plan maintenance process **shall** include a] discussion on how the community will continue public participation in the plan maintenance process.

The Emergency Management and Assistance Regulations (44 CFR Part 201) state that it is the responsibility of local agencies (i.e., the District) to "at a minimum, review and, update the local mitigation plan every five years from the date of plan approval to continue program eligibility". The evaluation procedures listed below will provide insight into the major changes that need to be included in the five-year update and resubmission to FEMA:

- Annual LHMP review concerning changes in hazard vulnerability (e.g., additional hazards identified, natural hazard events, etc.)
- Annual LHMP review concerning the development of new facilities
- A five-year comprehensive update to address the findings of the annual reviews
- Re-submittal of the updated LHMP to California Governor's Office of Emergency Services (Cal OES)/FEMA

Additionally, the risk assessment portion of the plan will be reviewed to determine if the information should be updated or modified. Each department responsible for the various implementation actions will report on:

- Status of their projects
- Implementation processes
- Any difficulties encountered
- How coordination efforts are proceeding
- Which strategies should be revised

5.4 Implementation through Existing Plans and Programs

The District implements the LHMP through existing plans, programs, and procedures, as detailed in Section 1.6, *Review and Incorporation of Existing Plans* and Section 5.1, *Planning Mechanisms*. This LHMP provides a baseline of information on the hazards impacting the District and the existing institutions, plans, policies and programs that help to implement the LHMP (e.g., capital 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 its Juncal Dam Emergency Response Plan to reduce earthquake, drought, and flooding hazards.

The information contained within this LHMP, including results from the Hazard 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.

5.5 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 1.5, *Public Involvement*, 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.

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 managent 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 Resrevoir 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	**MAC Meeting #1 (virtual)** 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	**MAC Meeting #2 (virtual)** 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	**MAC Meeting #3 (virtual)** 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	**MAC Meeting #4 (virtual)** 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	**MAC Meeting #5 (virtual)** Presented draft plan Discussed key MAC/LPT review needs and key issues Discussed annex updates to dovetail with plan update
March 2022	**MAC Meeting #6 (virtual)** 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

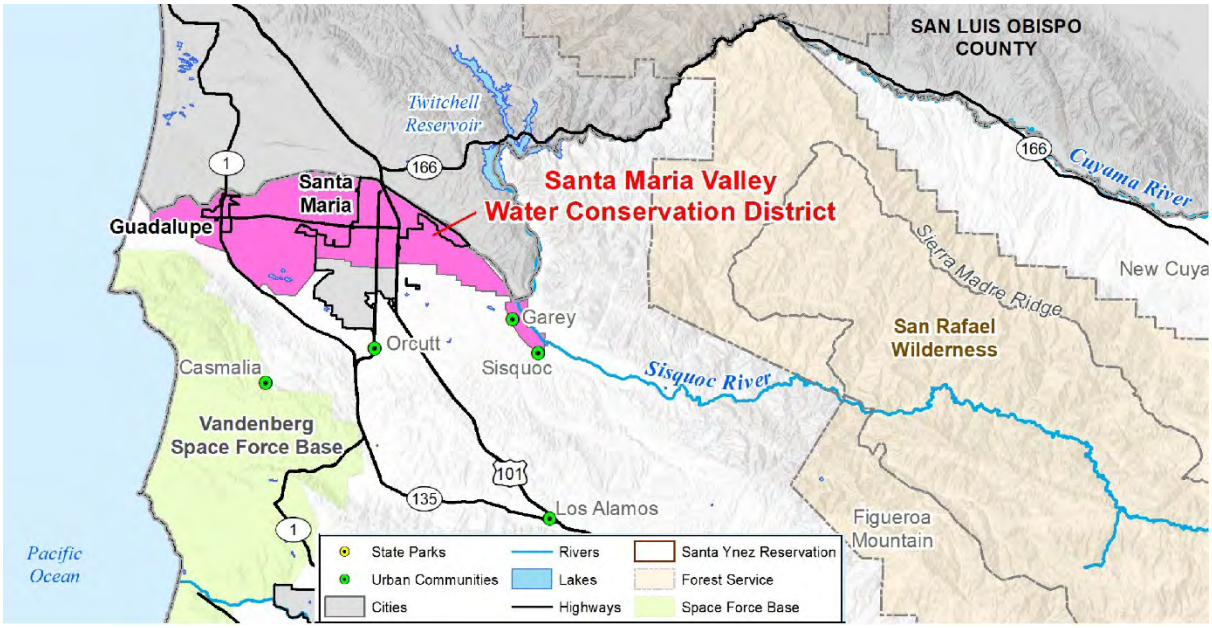
As a participating agency in the 2022 MJHMP update, the District was directly involved in the outreach program undertaken by the County for the 2022 MJHMP update, which involved extensive outreach during 2021 and early 2022. The District's MAC and LPT members participated in public outreach efforts for 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

Regulatory Tool (ordinances, codes, plans)	Yes/No
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

Financial Resources	Accessible or Eligible to Use (Yes/No)	Has This Been Used for Mitigation in the Past?	Comments
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 maintans 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-commities 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 ¾ 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

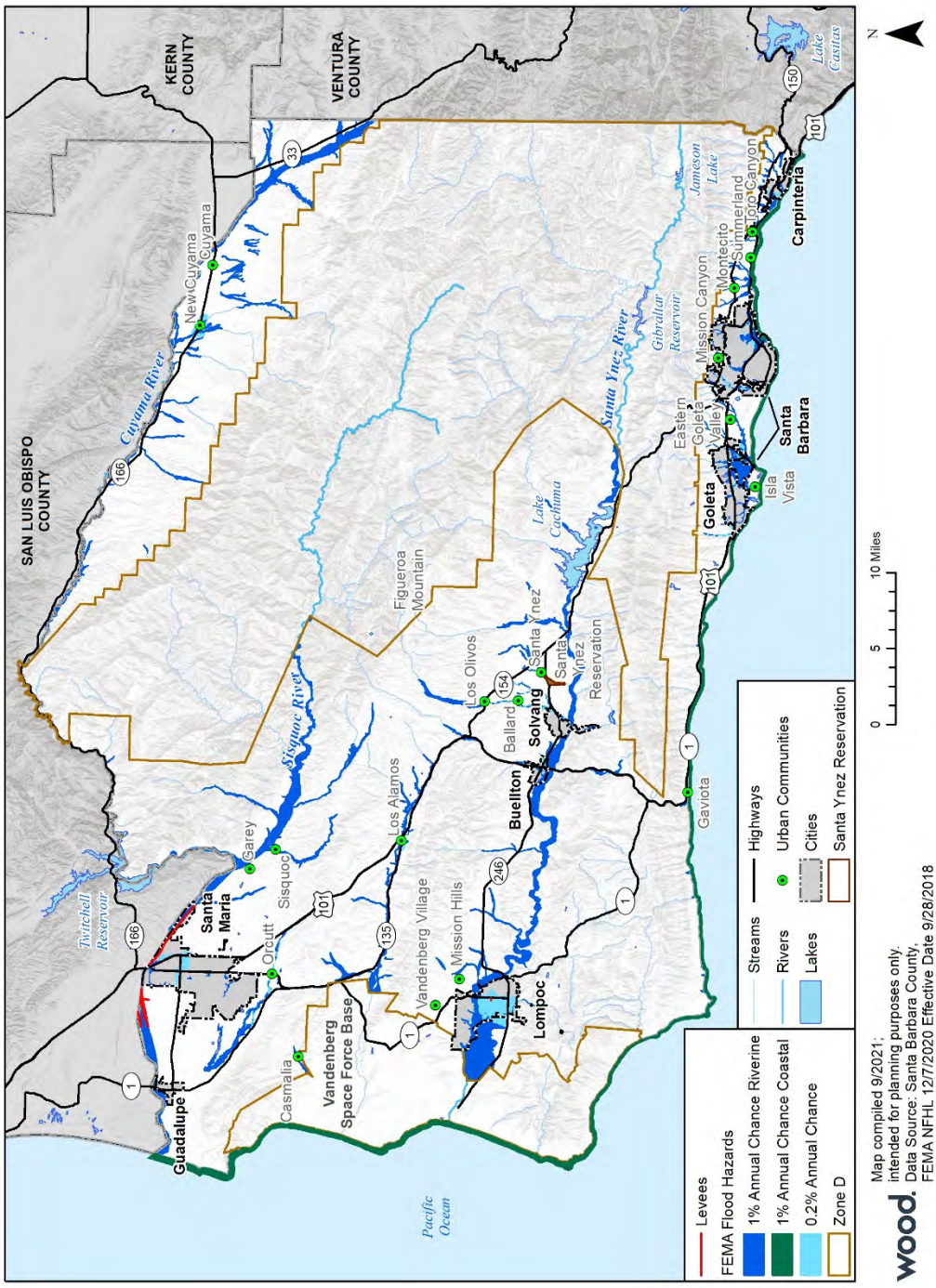
Year	Name of Disaster	Details
1998	Cuyama River Basin flooding	Flooding of the Cuyama River resulted in a washout of State Route (SR) 166
2010	North County Severe Storm	Severe storms caused flooding, mudflows, and debris flows.
2017	FEMA-4301-DR Severe Winter Storms, Flooding, and Mudslides	President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

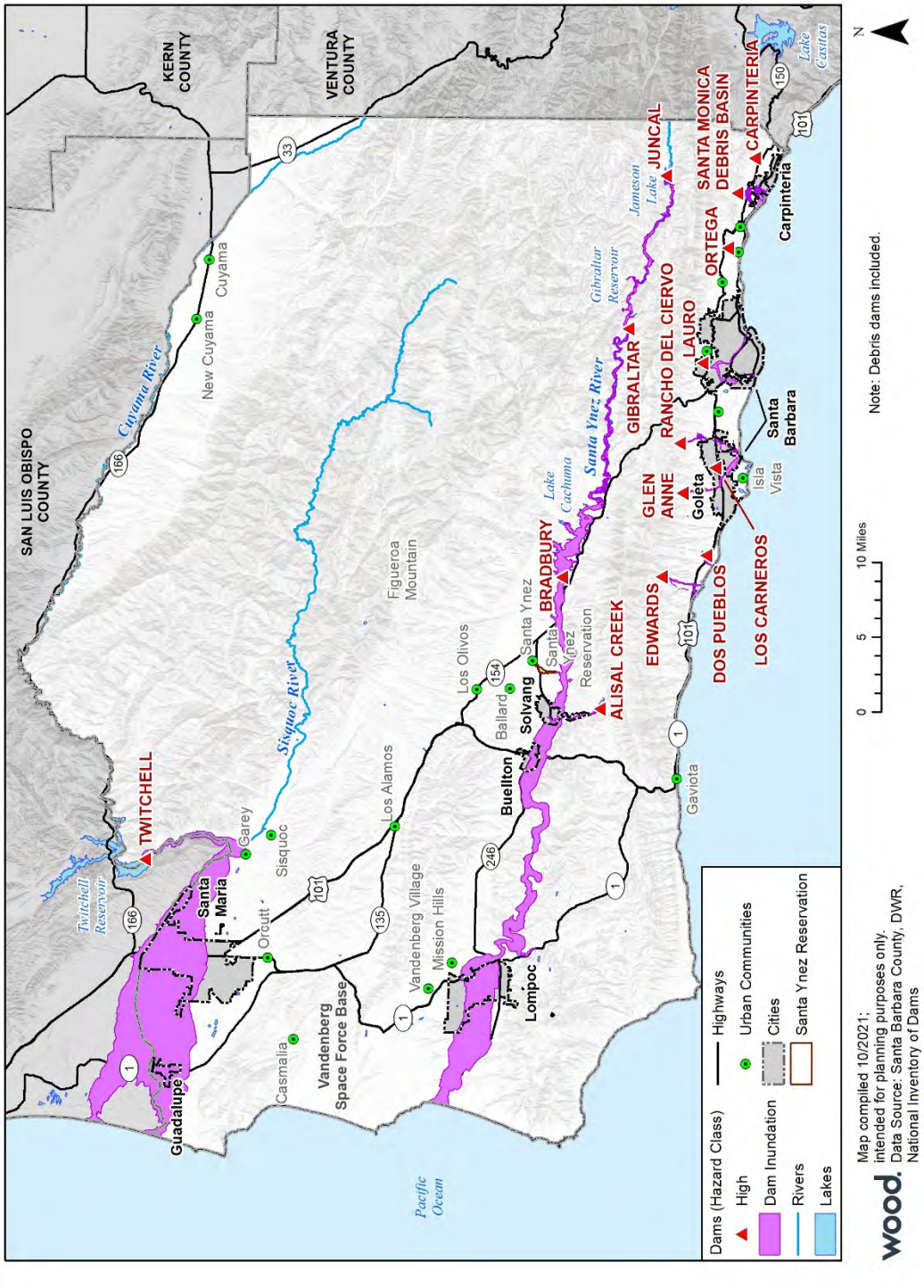
Dam failure can result from several natural or manmade causes. Structural failure caused by seismic activity can cause inundation by the action of a seismically induced wave, which overtops the dam without causing dam failure. This action is referred to as a seiche. Flooding as a result of a dam or levee 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.

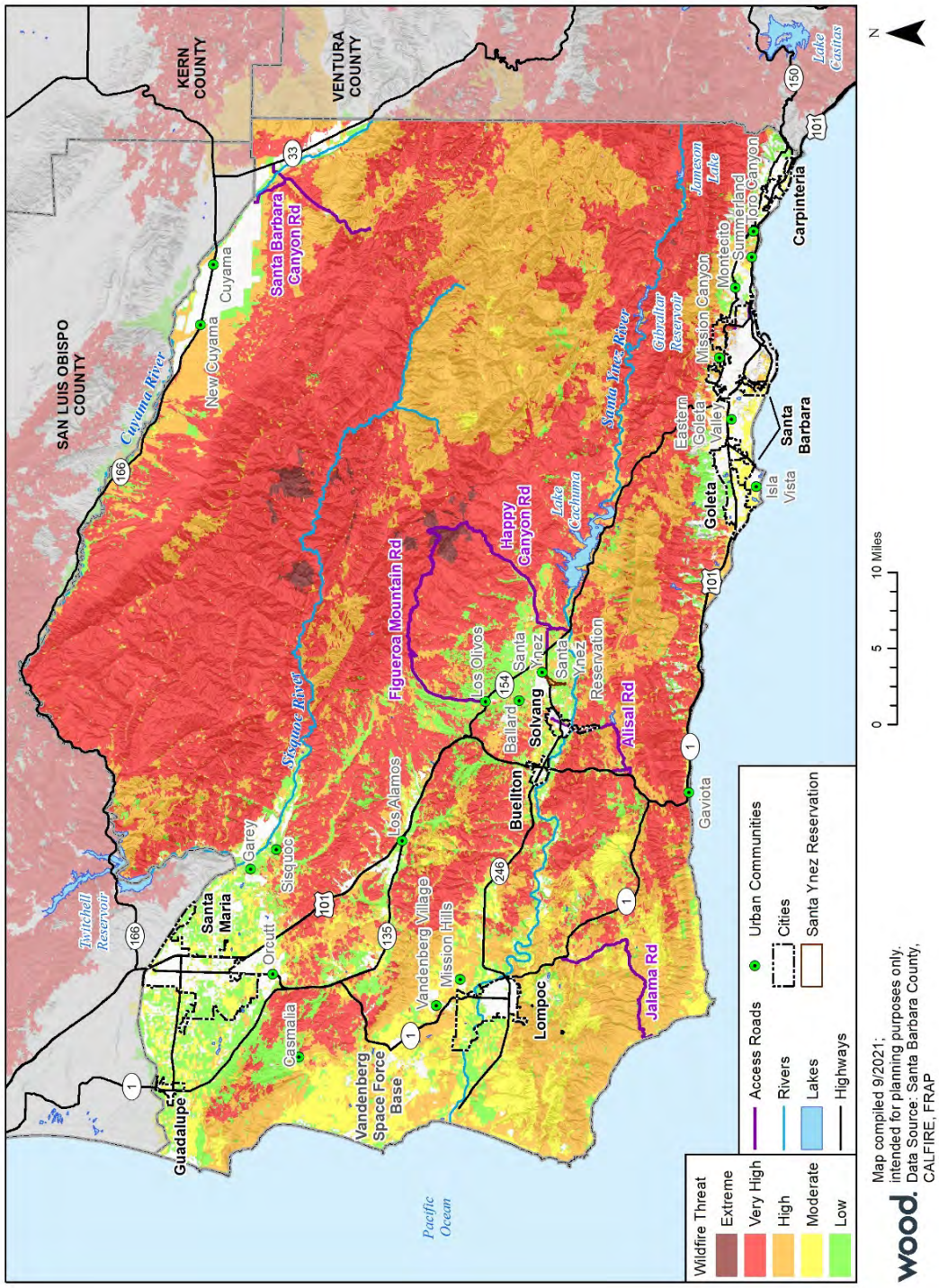
Table 5-4. SMVWCD Historic Wildfires

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
City of Guadalupe		
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	-
City of Santa Maria		
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	-

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	-
Unincorporated Area		
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
Total Asset Value		**$850,950,000**

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
Total		**$850,950**		**$25,560**		**$850,950**		**$1,415**

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 o 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 basisns.
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 Auquifer. 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.