

SAFETY ELEMENT



ALAMEDA COUNTY

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ALAMEDA COUNTY COMMUNITY DEVELOPMENT AGENCY



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SAFETY ELEMENT OF THE ALAMEDA COUNTY GENERAL PLAN

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INTRODUCTION

1.0 OVERVIEW

1.1. Planning Context

The County has determined that there is a need to conduct a comprehensive update of its Seismic Safety and Safety Elements (approved by the Board of Supervisors in 1982). Updating this document will provide an invaluable opportunity to create a consistent policy framework that can be applied throughout unincorporated Alameda County. This document presents the new and updated Safety Element of the Alameda County General Plan.

Alameda County's process to update the Safety Element occurred in three phases. During the first phase, staff compiled information regarding known seismic/geologic, flood, hazardous waste, and fire hazards. In addition, staff researched current, planned and ongoing disaster preparation efforts occurring within the County. Drafts of these reports were circulated internally and to the public for comment at various stages of development from May 2012 to November 2012.

In the second phase, existing County policies and implementation programs were evaluated to determine whether they adequately addressed the issues and needs identified in the inventory reports. The following documents were reviewed to identify existing policies that might be included in the new and updated elements and to assess gaps in the County's policies and programs.

- The Eden Area General Plan (March 2010)
- East County Area Plan as amended by Measure D (May 2002).
- The Castro Valley Plan (March 2012)

The final phase of the project was the public participation process which is documented below.

1.2. Citizen Participation

The inclusion of community stakeholders helps to ensure that appropriate disaster mitigation strategies are efficiently and effectively evaluated, developed, and implemented. The public outreach process consisted of the following strategies:

Public Meetings: The Planning Commission reviewed draft sections of the document. In total, the Commission hosted five meetings to discuss the Safety Element. In order to provide adequate opportunities for the public to provide input on the Safety Element text, the Commission agreed that staff would bring a working draft of each chapter for review. The Safety Element was also discussed at the Transportation and Planning Committee of the Board of Supervisors on December 3, 2012 and by the Unincorporated Services Committee of the Board on December 5, 2012.

Public Hearings: The Planning Commission held public hearings on May 21, 2012 to initiate the preparation of the Safety Element and on November 5 and November 19, 2012 to discuss the draft Safety Element in its entirety. In addition, the Board of Supervisors met on January 8, 2013 to discuss the adoption of the Safety Element. Public input was permitted at both of these meetings.

Outreach: Alameda County created a web page to keep the community informed about the preparation of the Safety Element. This web page provided links to the previous element, as well as documents from each of the meetings held by the Planning Commission.

1.3. Scope and Organization

The Safety Element is organized into four chapters which are described as follows:

- The *Introduction* provides an overview of the document and describes its purpose and authority.
- The *Natural Hazards* chapter discusses hazards arising from faults and geologic conditions, fires and flood related hazards and provides development standards intended to reduce risks associated with: ground shaking; structural failures; surface rupture; liquefaction; tsunamis or seiches; landslides/slope instability, fires and floods.
- The *Man Made Hazards* chapter identifies policies and programs to reduce risks associated with the creation, storage, transport and disposal of hazardous wastes. In addition, it provides information about the public airports operating within the County and development standards for airports or activities occurring within the vicinity of an airport.
- The *Emergency Preparedness* chapter describes how disaster planning and emergency response are coordinated within the County.

2.0 AUTHORITY AND PURPOSE

2.1 Authority for the General Plan and Its Constituent Elements

State law (Article 5, Section 65300 et seq.) requires the County to have a General Plan which contains seven elements: Land Use; Transportation; Housing; Open Space; Conservation; Safety and Noise. The plan expresses the County's vision for the future and is the roadmap for achieving the community's desired quality of life. It is an assessment of current and future needs, and the resources needed to implement the goals and policies established. As the needs of the County change, the Planning Department with citizen comment and input makes recommendations to the Board of Supervisors to reflect the direction for the future and to update the General Plan.

2.2 Element Purpose and Focus

This document comprises the required Safety Element of the Alameda County General Plan. The primary purpose of a safety element is to resolve development issues that arise from known or previously unknown hazards.

This Element includes descriptive information, analysis and policies pertaining to geologic, seismic, flood and fire hazards within the County. The focus of the Safety Element is to minimize human injury, loss of life, property damage, and economic and social dislocation due to natural and human-made hazards. The policies included in this Element sets forth general and broad goals, policies and implementation actions that are intended to provide more specific direction to current and future actions undertaken by the public and private sectors.

Furthermore, in October 2007, Governor Schwarzenegger signed Assembly Bill (AB) 162 which strengthens flood protections in California by requiring jurisdictions, upon the next revision of the mandatory Housing Element, on or after January 1, 2009, to update flood related information in its General Plan, including but not limited to the Conservation Element, Housing Element, Safety Element, and the Land Use Element. This update of the Safety Element is intended to comply with AB 162.

2.3 Relationship to the General Plan

Alameda County's existing General Plan comprises area plans for the County's unincorporated rural and urbanized areas as well as the required County-wide elements. The area plans contain the land use and circulation policies for their specific areas. The Housing, Open Space, Resource, Conservation, Seismic Safety and Safety, and Noise Elements contain general policies that pertain to the entire unincorporated

area of Alameda County. This document updates and supersedes the existing Seismic Safety and Safety Elements (1982).

2.4. Consistency with Other Portions of the General Plan

The Safety Element is part of the Alameda County General Plan. The Element presents background data and analysis, and policies and implementation recommendations which supplement materials contained in other portions of the General Plan. The Safety Element taken together with these other documents comprise the Alameda County General Plan.

State law requires the elements of the General Plan to be consistent. The Safety Element is consistent with all of the other elements of the General Plan, in that it does not require any significant changes to the other elements of the General Plan, or recommend policies and programs that would contradict the goals and policies contained therein. The Safety Element's goals should be interpreted and implemented consistent with those in other portions of the General Plan. As the General Plan may be amended over time, goal, policies, and implementing programs in other General Plan elements will be comprehensively reviewed for internal consistency.

The following text provides a brief overview of the General Plan Elements, as well as the County's process for maintaining consistency between each document.

The Alameda County General Plan consists of a number of elements, both geographic and functional. The Safety Element developed as a separate document containing background and policy information that is useful in guiding public and private decisions affecting safety. In the event that policies conflict with earlier elements, the more recently adopted policies will prevail.

Supplemented by background information, analysis and policy statements, the following Elements and Plans, including the updated Safety Element, comprise the comprehensive General Plan for the County:

- Castro Valley Plan, adopted March 2012
- Alameda County Housing Element, adopted April 2011
- Eden Area General Plan, adopted March 2010
- East County Area Plan, adopted May 1994; modified by voters through Measure D, November, 2000, codified by Board of Supervisors May, 2002
- Open Space Element, adopted May 1973, and amended May 1994

- Conservation Element, adopted January 1976, and amended May 1994
- Noise Element, adopted January 1976, and amended May 1994
- Park and Recreation Element, adopted June 1956, and amended May 1994
- Scenic Route Element, adopted May 1966, and amended May 1994

Parts of the 2002 revised East County Area Plan (ECAP) evolved out of voter support for Measure D (2000) and therefore will not be superseded by the Safety Element. In this case, the County has made a concerted effort to ensure that the Safety Element is consistent with Measure D.

In addition, the County is currently revising its Resource, Conservation and Open Space Elements and is working on an additional Agriculture Element to the General Plan. These Elements will be cross-referenced with the Safety Element to ensure that they are consistent with one another.

2.5. State Required Consultation

Pursuant to Government Code Section 65302 (g), staff contacted the State Division of Mines and Geology and the State Office of Emergency Services to advise them that preparation of the County Safety Element was about to commence and to solicit advice concerning plan preparation. In September 2012, drafts of the Safety Element were sent to their offices for consideration, and no further action is needed.

3.0 REGIONAL AND LOCAL CONTEXT

3.1. Regional Setting

Alameda County, one of the nine San Francisco Bay Area counties, is located along the eastern shore of the San Francisco Bay. The County covers approximately 738 square miles, and is one of only two Bay Area counties that spans an area that reaches from the Bay to California's Central Valley. The western portion of Alameda County is located generally on the East Bay Plain between the coastal hills and the Bay. The area is heavily urbanized and contains the incorporated cities of Albany, Berkeley, Emeryville, Piedmont, Oakland, Alameda, San Leandro, Hayward, Union City, Newark, and Fremont, as well as the unincorporated urban areas of Castro Valley, Fairview, San Lorenzo, Ashland, and Cherryland.

Eastern Alameda County is primarily composed of the coastal range's rough terrain that extends from the hills above the Bay Plain to the border with San Joaquin County in the Central Valley. It is comprised

mainly of non-urban uses including agriculture, parkland, watershed, and open space. This area has relatively low population density except for the Livermore-Amador Valley, in which the incorporated cities of Dublin, Pleasanton, and Livermore are located. A map of the county in its regional context is provided as Figure i-1.

3.2. Planning Area

The Safety Element covers the unincorporated areas of Alameda County which include the communities of Ashland, Castro Valley, Cherryland, Fairview, unincorporated Livermore, San Lorenzo, and Sunol. A map of the Planning Area is provided as Figure i-2.

3.3. Intergovernmental Planning Coordination

In preparing the Element staff has consulted with the following departments to ensure that the proposed amendments are consistent with the County's disaster mitigation and preparation efforts:

- Alameda County Sherriff's Office
- Alameda County Fire Department
- Alameda County General Services Agency
- Alameda County Public Works Agency
- Alameda County Department of Public Health
- Alameda County Department of Environmental Health
- Alameda County Flood Control and Water Conservation District
- The Zone 7 Water Agency

4.0 RISK

4.1. Risk Determination

The efficiency of safety and noise programs lies in the definition of acceptable levels of risk for the community. The criteria for determination of risk is based upon:

- Reduction of loss in life and injuries
- Reduction or prevention of property damage
- Prevention of economic and social dislocations

Based upon these criteria a risk may be categorized as acceptable, unacceptable, and avoidable. The determination of acceptable and unacceptable risk requires judgments based on weighing several factors including the nature of the hazard, the frequency, or risk, of a damaging event associated with the hazard, and the relative number of persons exposed to the risk. The degree or intensity of any specific hazard is a major consideration in public mitigation efforts. Thus, hazards with a high life-loss potential are less acceptable than hazards which primarily affect property, and hazards which could impact entire communities are less acceptable than hazards which may impact relatively few persons. Only minimal risk to critical facilities and functions (including water supply, emergency services, evacuation routes, and medical and mass care facilities) is considered acceptable since these facilities and functions are critical to disaster recovery for entire communities.

The County is not able to guarantee that any particular development will not, at some time in the future, be adversely affected by the hazards identified in this element because such hazards, by their nature, defy precise prediction. In those instances where there is a significant factual question about whether a particular development has mitigated risks from natural hazards to an "acceptable" level and the property owner wishes to proceed in the face of such factual question, the County may require the owner of the property to provide indemnification to the County, insurance or other security and a recorded notice which will protect the interests of the County and provide notice of the potential problem to future purchasers.

5.0 CALIFORNIA ENVIRONMENTAL QUALITY ACT (CEQA)

5.1. Overview of CEQA

The California Environmental Quality Act (CEQA) is a state law that requires state and local government to consider the potential environmental effects of a project before a decision is made. Under CEQA, a project is an activity undertaken by a public agency or a private activity which must receive some discretionary approval (meaning that the agency has the authority to deny the requested permit or approval) from a government agency which may cause either a direct physical change in the environment or a reasonably foreseeable indirect change in the environment. CEQA's purpose is to disclose the potential impacts of a project, suggest methods to minimize those impacts, and discuss project alternatives so that decision-makers will have full information upon which to base their decision. CEQA

also provides for review of environmental documents by government agencies and the public in order to provide a thorough and transparent environmental review process.

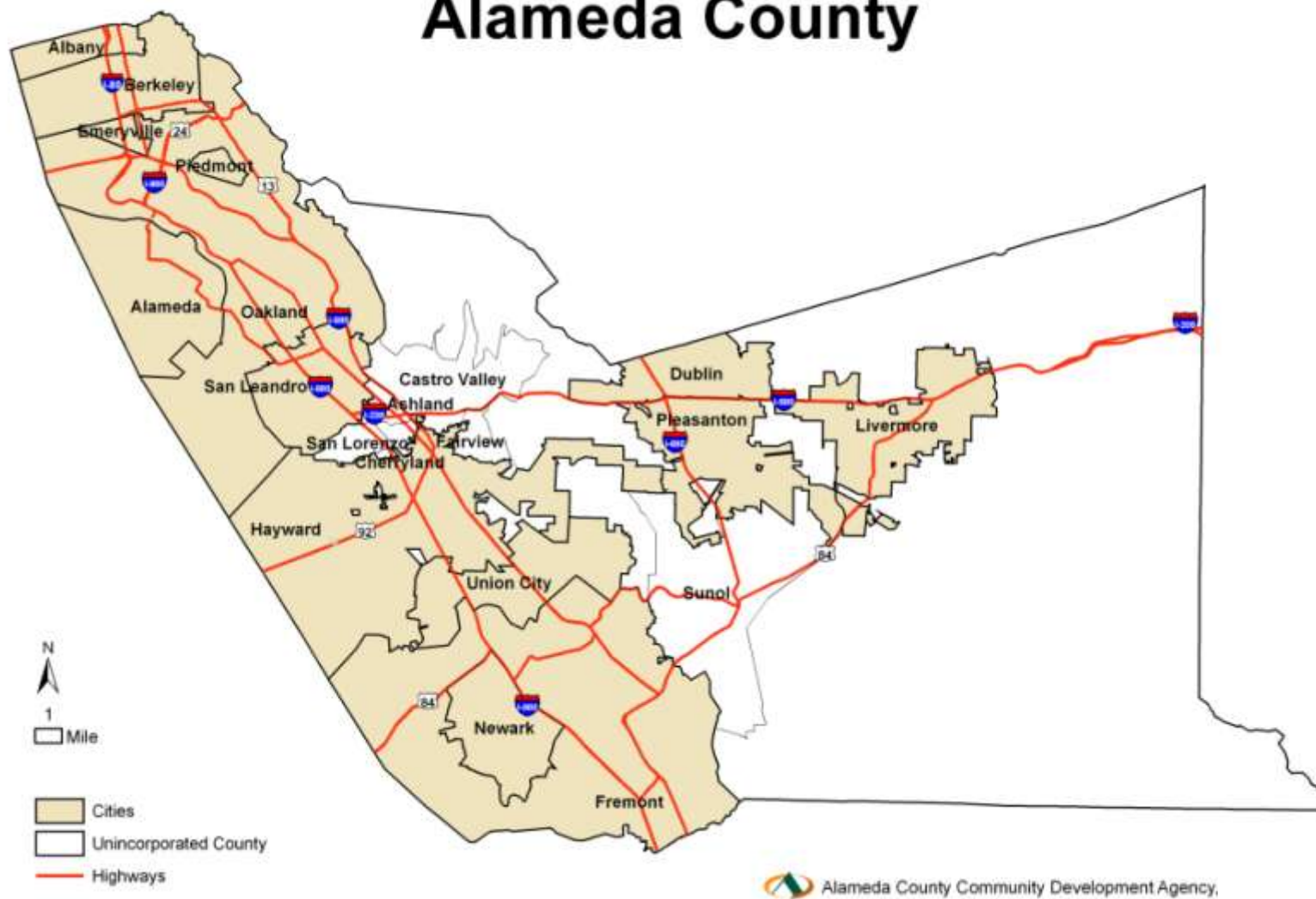
Most proposals for physical development in California are subject to the provisions of CEQA, as are many governmental decisions which do not immediately result in physical development (such as adoption of a general or community plan). Every development project which requires a discretionary governmental approval will require at least some environmental review pursuant to CEQA, unless an exemption applies.

The Safety Element of the Alameda County General Plan has been analyzed in accordance with CEQA. The Initial Study and Negative Declaration prepared for this element is available as a separate document.

5.2. CEQA and Hazards

Projects that would result in a seismic/geologic, flood, fire, noise, or aviation hazard, or that involve hazardous materials generally require some discretionary level review. As such these projects will be reviewed in accordance with the provisions of the Act.

Alameda County



CHAPTER 1: NATURAL HAZARDS

1.0 PURPOSE AND INTENT

This chapter describes natural hazards present within unincorporated Alameda County and goals, policies and actions to minimize the losses due to seismic/geologic, fire and flood hazards.

2.0 SEISMIC/GEOLOGIC HAZARDS

2.1. Background

An earthquake is the release of stored energy from the earth's crust. The energy is released along a fault or a plane of weakness between two large masses of the earth's crust or its outer surface. The crust, between 10 to 15 miles thick in Alameda County, is fractured along fault lines. At a global scale, for reasons that are not completely known, pieces of the earth's crust are moving. Typically, two crustal masses move past one another at a rate of less than one inch per year. The energy released from an earthquake may be so small as to go unnoticed, except by sensitive measuring instruments or of an intensity so large it can destroy any structure within its range.

The Planning Area is located in the San Andrea and Hayward fault zones, one of the most seismically active regions in the United States. This site has been the location of numerous moderate to strong earthquakes. Due to the high level of seismic activity, much of the area has been classified as seismic risk Zone 4, the highest risk category specified under the California Building Code.

Earthquakes can lead to various seismic hazards including: ground shaking, liquefaction, ground rupture and the generation of large waves in bodies of water. Seismic hazards may vary from area to area, and the level of risk is tied to the geologic conditions and the extent of land use proposed for any given site.

The strength of an earthquake is measured using the Richter scale, a numerical scale for quantifying an earthquake's magnitude. The force of an earthquake at a particular place is measured on the Modified Mercalli (MM) Scale. The MM scale is a subjective ranking of the earthquake's effect on persons and structures. Table S-1 summarizes the relationship between these two measurements. Table S-2 provides an abbreviated description of the MM scale.

Table S - 1: Relationship between the Richter and Modified Mercalli Scales¹

Richter Magnitude	Modified Mercalli Category
1.0 - 3.0	I
3.0 - 3.9	II-III
4.0 - 4.9	IV-V
5.0 - 5.9	VI-VII
6.0 - 6.9	VII-IX
7.0 and higher	VIII or higher
8+	X-XI

Table S - 2: Abbreviated Modified Mercalli Scale²

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

¹U.S. Geological Survey (USGS), http://earthquake.usgs.gov/learn/topics/mag_vs_int.php

²Ibid.

2.2. Setting and Geomorphology

Alameda County is located on the East Bay of the San Francisco Bay Region of Central Coastal California. Principal physiographic features include the Bay plain and Diablo Range. Alameda County lies within the bounds of the Coast Ranges geomorphic province. The Coast Range geomorphic province includes the northwest trending belt of mountain ranges, valleys, and basins that parallel the California coastline from Point Conception north to the Oregon border. It is bounded on the north by the south flank of Mount Diablo, one of the highest peaks in the Bay Area, reaching an elevation of 3,849 ft. San Francisco Bay forms the western boundary, the San Joaquin Valley borders it on the east and an arbitrary line from the Bay into the Diablo Range forms the southern boundary.³

The bay plain and the valley areas of Alameda County are underlain by Quaternary (from the present to 2 to 3 million years ago) unconsolidated deposits which, in turn, are underlain by sedimentary metamorphic and igneous rocks of up to 150 million years in age. The Quaternary deposits consist primarily of alluvial and estuarine sediments. The alluvial ranges from stream deposited sands, gravel, silts, clays and intermixtures to fine windblown sand. Estuarine sediments consists of silty clays and some sand and shell layers deposited in the bay and marshlands. Adjacent to the San Francisco Bay the younger alluvial deposits grade into younger bay mud, a variable, semi-fluid to firm silty clay with lenses of water-saturated fine sand. Younger bay mud is covered by landfills that vary from dense, engineered fills to trash accumulations of uncertain geotechnical properties.⁴

Bedrocks of various types and age underlie the areas within the Diablo Range. Almost all of the hills have a mantle of topsoil and weathered bedrock. These soil materials vary in depth from a few to many feet and present a substantial slope instability hazard. Where the bedrock is well bedded and erosion of man-made excavation undercuts the bedding, slope instability problems exist.⁵

2.3. Active and Potentially Active Faults

The County has been subjected to numerous seismic events, originating both on faults within the County and in other parts of the region. Six major Bay Area earthquakes have occurred since 1800 that have affected the County, and at least two of the faults that produced them run through or into the County. These earthquakes and the originating faults include the 1836 and 1868 earthquakes on the Hayward-Rogers Creek fault, and the 1861 earthquake on the Calaveras fault. Three earthquakes, in 1838, 1906 and 1989 originated on the San Andreas fault, west of the county near San Francisco or to the south. The

³ E.J. Helley and R.W. Graymer, 1997, *Quaternary Geology of Alameda County, and Parts of Contra Costa, Santa Clara, San Mateo, San Francisco, Stanislaus, and San Joaquin Counties, California: A Digital Database*, U.S. Geological Survey, <http://geopubs.wr.usgs.gov/open-file/of97-97/alggeo.pdf>

⁴ Ibid.

⁵ Ibid.

Working Group of California Earthquake Probabilities has determined that earthquakes of equally destructive forces are a certainty within the region.⁶ According to their findings, the Hayward-Rodgers Creek fault system is estimated to have a probability of 31% of producing an earthquake of a magnitude of 6.7 or higher within the next 30 years, this probability is the highest of the Bay Area faults.

Faults that have been active during the Holocene period, approximately the last 11,000 years, are considered to be active faults, and those faults that have been active during the Quaternary period, approximately the last 1.8 million years, are considered to be potentially active faults.⁷ This serves to differentiate faults for which sufficient evidence of recent activity has been noted to explicitly include them as known geologic hazards, distinct from those faults for which recent displacement is known or suspected, and whose latest activity has not been determined, but may have been within approximately the last 11,000 years. In addition to faults that have been classified as active or potentially active, there are others whose activity has not been clearly established by presently available information. Some of these faults are shown on Table S-2; others remain to be studied. Figure S-1 maps the location of active and potentially active faults within the County.

Other active faults within the unincorporated areas include the Calaveras, Greenville, and Las Positas faults, as well as several potentially active faults and unnamed secondary faults adjacent to these faults. There are few or no studies pertaining to these additional secondary faults; therefore it is unknown if these faults may or may not experience secondary ground rupture during a large earthquake. Table S-3 summarizes the active faults within the planning area and Table S-4 provides a summary of potentially active faults.

Scientists have yet to determine a way in which to predict the precise day and time of the next earthquake; however, past evidence points to the conclusion that areas of historically high seismicity⁸ are the locations where damaging earthquakes are most likely to occur in the future.

⁶ Working Group of California Earthquake Probabilities, 2008, *The Uniform California Earthquake Rupture Forecast Version 2 (UCERF 2)*, U.S. Geological Survey Open-File Report 2007-1437 and California Geological Survey Special Report 203 <http://pubs.usgs.gov/of/2007/1437/>

⁷ California Geological Survey, *Note 31: Faults and Earthquakes in California*, 2003, http://www.consrv.ca.gov/CGS/information/publications/cgs_notes/note_31/note_31.pdf

⁸ Seismicity is earth movement phenomena as related to earthquakes and also a measure of an area's susceptibility to earthquakes.

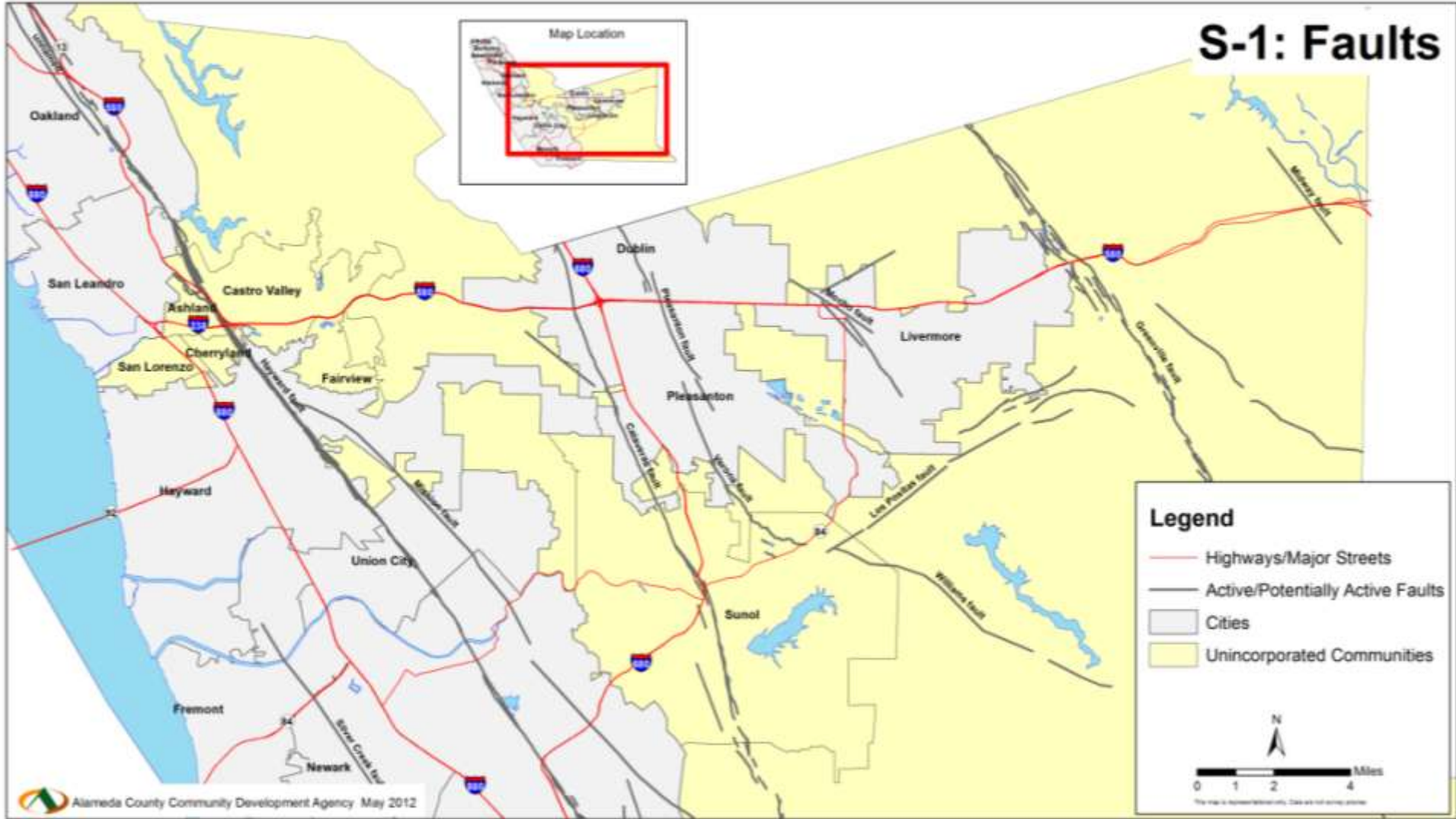


Table S - 3: Active Faults within unincorporated Alameda County⁹

Fault	Classification	Criteria for Classification	Probability of Earthquake with a Magnitude \geq 6.7 (Richter)	Estimated Maximum Magnitude (Richter) ¹⁰
Hayward-Rogers Creek ¹¹	Active	Historical surface faulting, strong earthquakes	31%	6.5-7.3
Calaveras ¹²	Active	Historical surface faulting, strong earthquakes	7%	5.7-7.0
Greenville-Las Positas	Active	Surface faulting	3%	6.8-7.0

Note: This list is not exhaustive. Additional information may establish that other faults in the County to be active, potentially active, or inactive.

Table S - 4: Potentially Active Faults within unincorporated Alameda County

Fault	Classification	Criteria for Classification	Probability of Earthquake with a Magnitude \geq 6.7 (Richter)	Estimated Maximum Magnitude (Richter)
Verona ¹³	Potentially Active	Offset of soil deposits	Undetermined	Undetermined
Williams ¹⁴	Potentially Active	Recent seismicity	Undetermined	Undetermined
Midway ¹⁵	Potentially Active	Field observations	Undetermined	Undetermined
Mocho ¹⁶	Activity Unknown	Field observations	Undetermined	Undetermined
Mission	Inactive	Geologic setting, microearthquake epicenters	Not Applicable	Not Applicable

⁹ 2007 Working Group on California Earthquake Probabilities, 2008, *The Uniform California Earthquake Rupture Forecast, Version 2 (UCERF 2)*, U.S. Geological Survey Open-File Report 2007-1437 and California Geological Survey Special Report 203 <http://pubs.usgs.gov/of/2007/1437/>

¹⁰ Ibid. The ranges provide an estimate of the maximum intensity along various segments of the fault.

¹¹ Ibid. The Hayward-Rogers Creek Fault consists of three segments: the Hayward North, Hayward South, and Rogers Creek.

¹² Ibid. The Calaveras Fault is comprised of three segments: the Calaveras North, Calaveras Central and Calaveras South.

¹³ Unruh, Jeff and Sunderman, Sean, 2006, *Final Technical Report, Digital Compilation of Thrust and Reverse Fault Data for the Northern California Map Database: Collaborative Research with William Lettis & Associates, Inc., and the U.S. Geological Survey* http://www.deltarevision.com/2006_docs/2006thrust_final_report.pdf

¹⁴ Ibid.

¹⁵ Clark, M. M., et al, 1984, *Preliminary Slip-rate Table and Map of Late Quaternary Faults of California*, U.S. Geological Survey

¹⁶ Carpenter, D.W. et al, 1984, *Geology of the Lawrence Livermore National Laboratory Site and Adjacent Areas* <http://www-erd.llnl.gov/library/UCRL-53316.pdf>. This fault has also been associated with the Greenville fault.

2.4. Hazards

Ground Shaking

Ground shaking is the source of the most widespread earthquake damage. An earthquake produces seismic waves that emanate in all directions from the fault rupture surface. The seismic waves cause strong ground shaking, which typically is strongest near the fault and diminishes as the waves move through the earth away from the fault. The severity of ground shaking at a particular site is controlled by the interaction of several factors, including:

- the distance from the earthquake source; and
- earthquake magnitude; and
- the directivity (focusing of earthquake energy along the fault axis rather than perpendicular to the fault); and
- condition of underlying geologic materials (bedrock, sediment, soils, and man-made fill)¹⁷

Research occurring after the 1989 Loma Prieta earthquake has shown that areas underlain by unconsolidated, or man-made fill may amplify the strength and duration of strong ground motions, increasing the risk of damage.¹⁸ These findings are consistent with earlier evidence suggesting that structures placed on man-made fill are especially susceptible to earthquake hazards. Strong ground shaking caused by fault movement during an earthquake has the potential to result in significant loss of life and property damage throughout the Planning Area. Maximum ground shaking would be expected to result from a large earthquake on one of the nearby active faults as described in Table S-2, although strong ground shaking may also occur as a result of moderate or large earthquakes on other faults in the San Francisco Bay region.

Structural Failures

As was noted above, ground shaking intensity is highly variable from one site to another. In addition, the effect of ground shaking on structures is related to their form, structural design, materials, construction quality, and location. One of the objectives of the California Building Code (CBC) is to protect the life and safety of building occupants and the public. The County has adopted the CBC as the basis of the County Building Ordinance (Chapter 15.08 of its General Ordinance Code). The application of the design and

¹⁷ ABAG, *On Shaky Ground*, 1995, 1998, <http://www.abag.ca.gov/bayarea/eqmaps/doc/contents.html>

¹⁸ Stewart, Jonathan, 1997, *Key Geotechnical Aspects of the 1989 Loma Prieta Earthquake*, http://nisee.berkeley.edu/loma_prieta/stewart.html

construction standards of Chapter 15.08 should ensure that new construction will withstand the forces associated with a major earthquake. Since the 1970s, the CBC has used data on the response of structures to earthquakes as a basis for structural design. However, buildings constructed prior to the mid-1970's generally would not meet current design provisions for earthquake forces as prescribed in the Chapter 15.08 of the County's General Ordinance Code. Of these buildings, concrete tilt up structures, unreinforced masonry and soft story buildings, and older single family homes that have not been seismically retrofitted are the most susceptible to damage. Special occupancy buildings, including schools, hospitals, and other structures important to protecting public health and safety, are required by the State, and by Chapter 15.08, to meet more stringent design requirements.

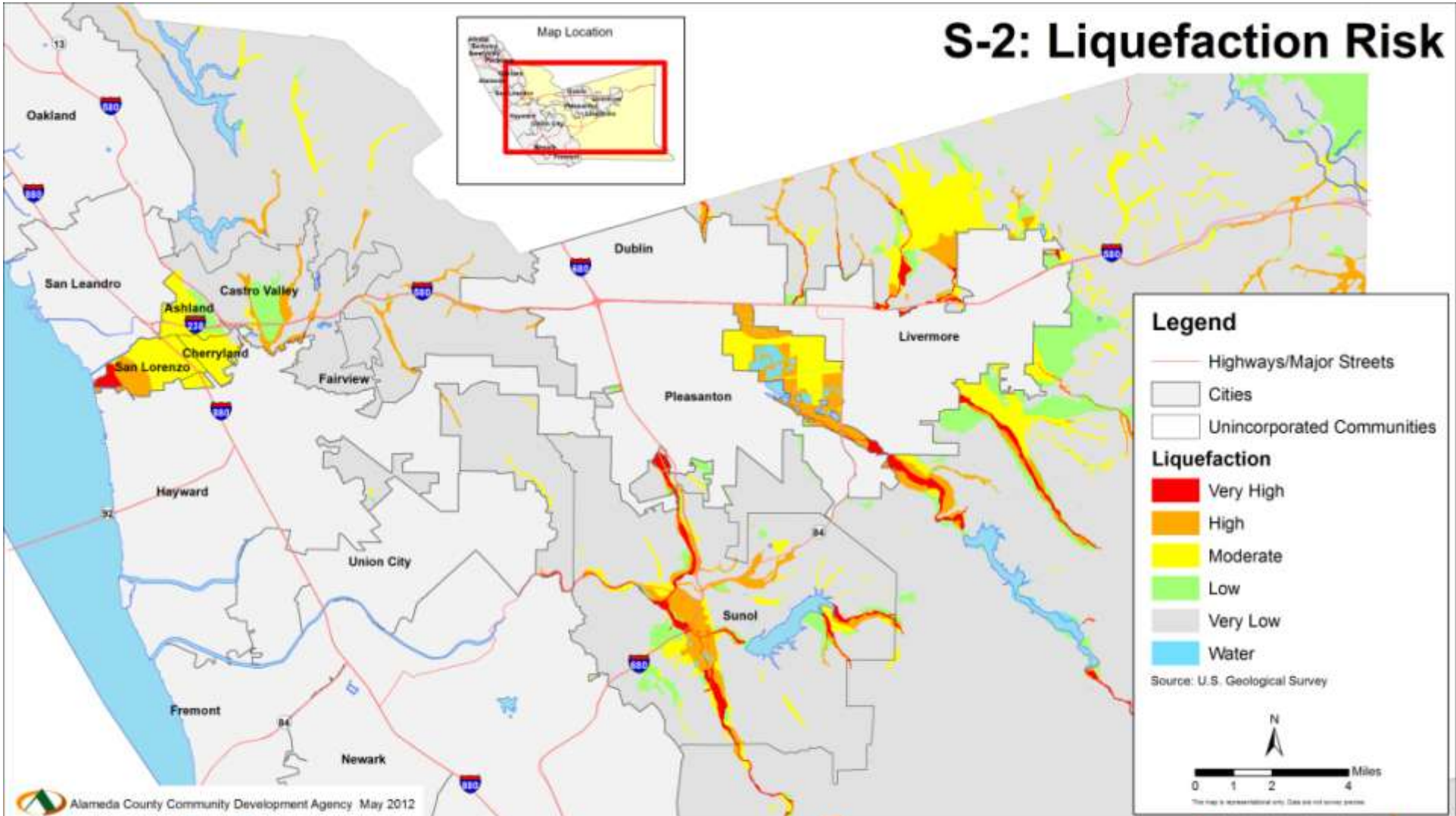
Surface Rupture

Surface fault rupture occurs when a movement on a fault deep within the earth breaks through the surface causing ground displacement. Ground rupture occurs along fault lines, and is normally limited to a fairly narrow zone along the trend of the primary fault, and to a lesser degree along secondary faults. The Alquist-Priolo Fault Zoning Act was developed by the State of California to regulate development occurring near active faults and to mitigate the risks associated with surface rupture.

Liquefaction

Liquefaction is the rapid transformation of saturated, loose, fine-grained sediment to a fluidlike state and is typically caused by strong ground shaking during an earthquake. Liquefaction can result in substantial loss of life, injury, and damage to property. In addition, liquefaction increases the hazard of fires because of explosions induced when underground gas lines break, and because the breakage of water mains substantially reduces fire suppression capability.

The potential for liquefaction to occur depends on both the susceptibility of near-surface deposits to liquefaction, and the likelihood that ground motions will exceed a specified threshold level. Much of the Planning Area is in the vicinity of an active fault (See Figure S-1); thus, the immediate area surrounding the earthquake epicenter will be exposed to strong ground shaking should a large earthquake occur. Areas most susceptible to liquefaction are underlain by loose granular sediments and low-lying lands adjacent to creeks and estuaries. Figure S-2 shows the liquefaction risk for the County.



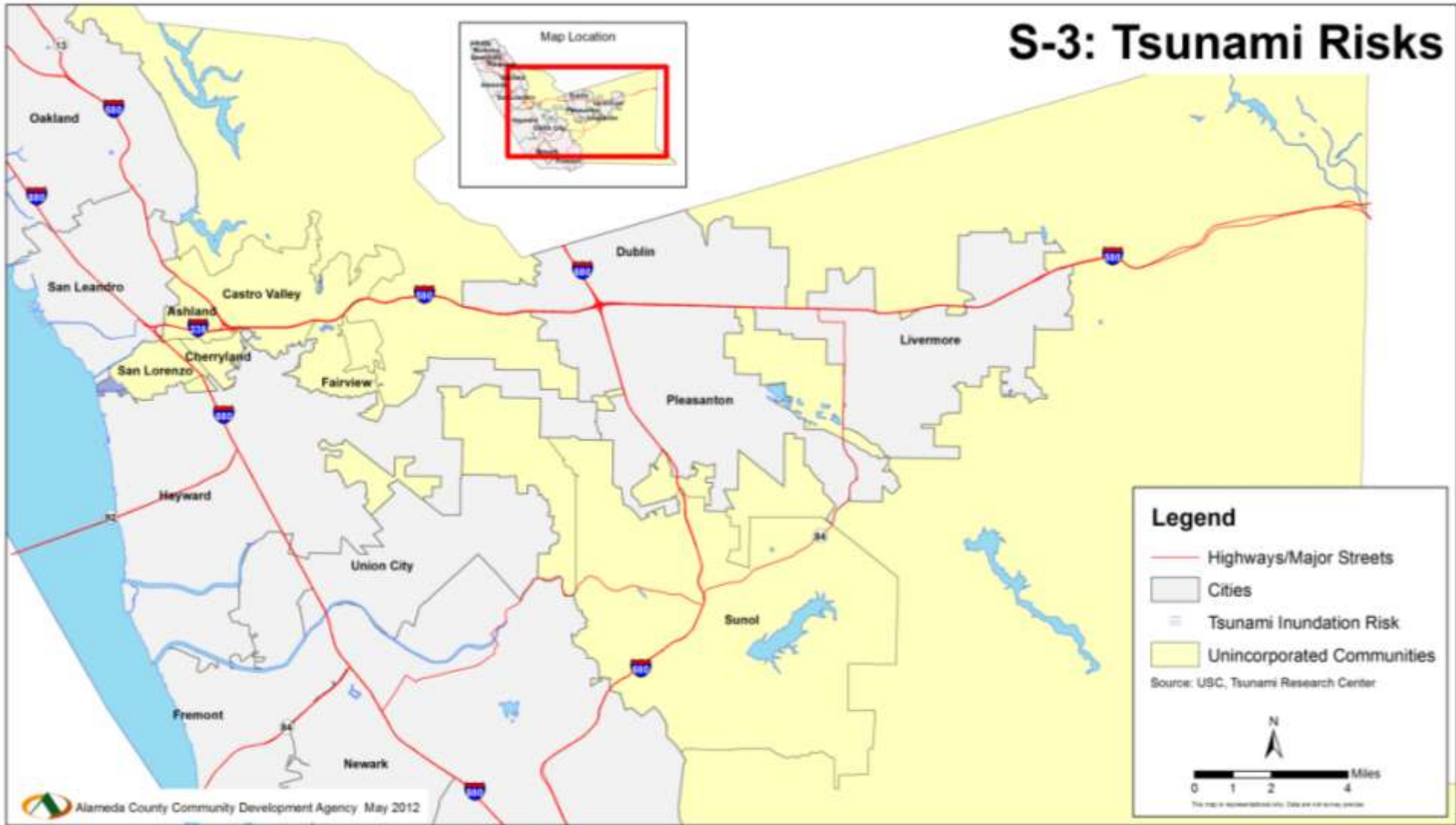
Tsunamis or Seiches

A major hazard associated with earthquakes is water inundation resulting from a tsunami or seiche. Tsunamis are a series of waves typically produced by an offshore earthquake, volcanic eruption, or landslide. A tsunami with a wave height of 20 feet at the Golden Gate Bridge, which is likely to occur approximately once every 200 years, would result in a runoff of less than 10 feet above sea level on lands surrounding the San Francisco Bay.¹⁹ Some areas of San Lorenzo may be subject to flooding if a tsunami were to occur. Figure S-3 is a map of tsunami hazards within unincorporated Alameda County.

A seiche is a long wave set up on an enclosed body of water such as a lake or reservoir. Seiches are inundations of the water surface that travel back and forth at regular periods determined by the depth and size of the water body. Seiches are usually caused by unusual tides, winds or currents, but may also be triggered by earthquake ground motion. The largest seiche wave ever measured in the San Francisco Bay, following the 1906 earthquake, was four inches high. Despite this occurrence, the Bay Area has not been adversely affected by seiches during its history within this seismically active region of California.²⁰ While damage caused by a seiche has not been reported since the 1906 earthquake, the various lakes and reservoirs within the unincorporated areas may be at risk of a seiche in the event of an earthquake.

¹⁹ Ritter, J. R.; Dupre, W. R., 1972, *Maps Showing Areas of Potential Inundation by Tsunamis in the San Francisco Bay Region, California*, U.S. Geological Survey

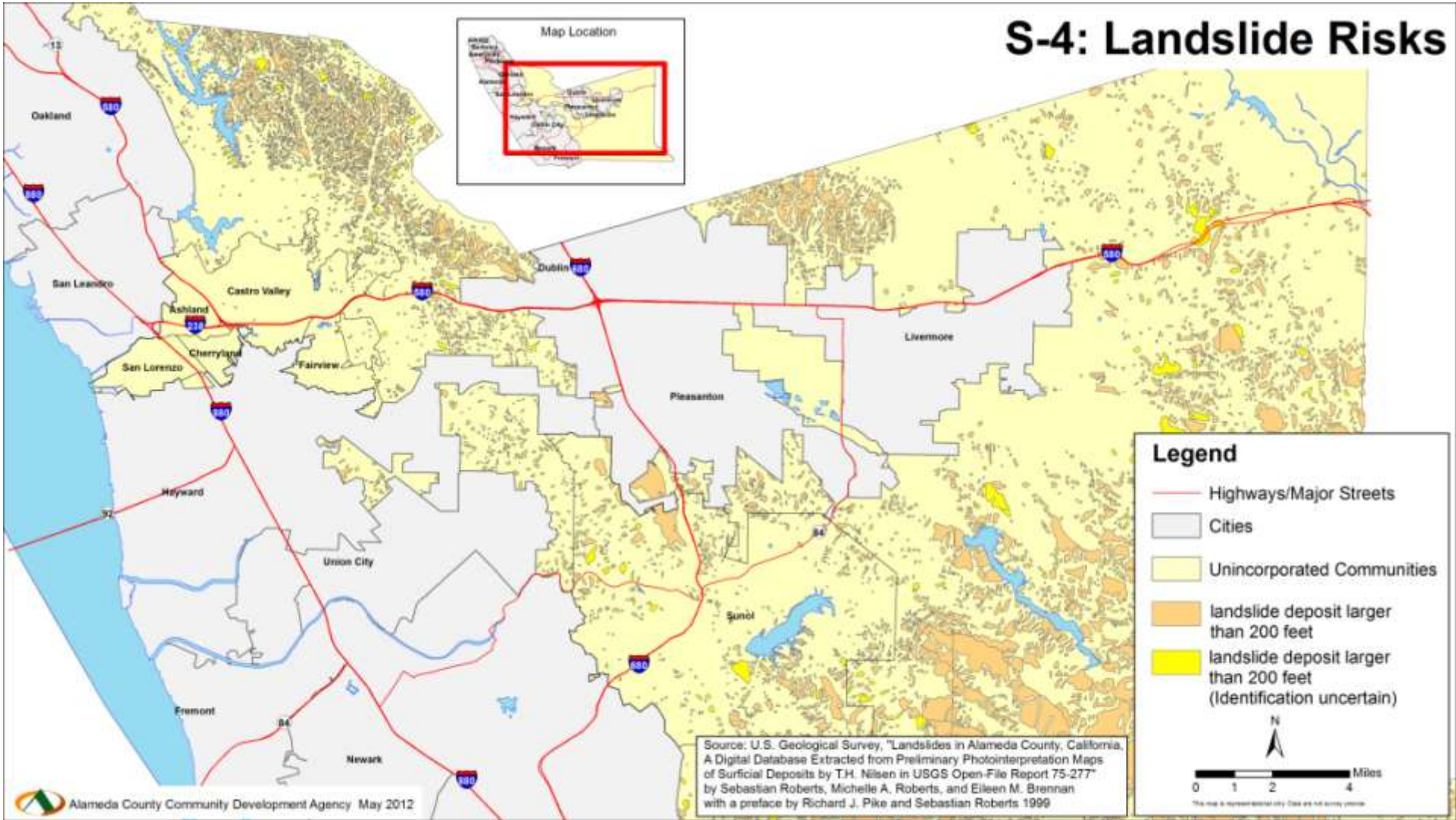
²⁰U.S. Army Corps of Engineers San Francisco District, Port of Oakland, May 1998, Updated January 2000, *Oakland Harbor Navigation Improvement (-50 Foot) Project SCH No. 97072051 Final Environmental Impact Statement/Report*



Landslides/Slope Instability

Landslides and slope instability are generally caused by earthquakes, weak materials, stream and coastal erosion, and heavy rainfall. The rate of landsliding is affected by the type and extent of vegetation, the slope angle, the degree of water saturation, the strength of the rocks, and the mass and thickness of the deposit. In addition, certain human activities tend to make the earth materials less stable and increase the chance of ground failure. Activities contributing to instability include extensive irrigation, poor drainage or ground-water withdrawal, removal of stabilizing vegetation and over-steepening of slopes by undercutting them or overloading them with artificial fill. The causes of failure, which normally produce landslides and differential settlement, are augmented during earthquakes. As a result of these potential risks, construction on slopes steeper than about 15 percent typically requires special grading, special foundation design, or site modification to mitigate slope ground conditions and reduce the potential for slope instability. Threats to structures would be greatest in areas that are close to natural channels or are situated on potentially unstable slopes.

Figure S-4 is a map of landslide risks within unincorporated Alameda County. The mapping indicates those areas that are considered “least susceptible,” “marginally susceptible,” “generally susceptible,” and “most susceptible” to slope failure. The criteria used to delineate the relative hazard areas included the nature of the geologic materials underlying the surface, the steepness of slopes, the presence or absence of visible slope failures, and the presence or absence of active forces that could cause failures, such as stream processes or shrink-swell potential soils.



2.5. Development Standards for Known Seismic and Geologic Hazards

The County is statutorily obligated to follow certain requirements with respect to the permitting and construction of new (or modifications to existing) buildings for human occupancy. Site specific investigations are required within Alquist-Priolo and Seismic Hazard Zones (both described below), and reports must be prepared that address hazards (mitigation for liquefaction and landslide potential) identified at the project site (please see Actions A3 and A12). The following is a summary of development guidelines and regulations pertaining to seismic and geologic hazards.

The Alquist-Priolo Earthquake Fault Zoning Act

The Alquist-Priolo Earthquake Fault Zoning Act (Public Resources Code 2621, et seq.) was passed in 1972 to mitigate the hazard of surface faulting to structures for human occupancy. The Alquist-Priolo Earthquake Fault Zoning Act's main purpose is to limit the construction of buildings used for human occupancy on the surface trace of active faults. The Act only addresses the hazard of surface fault rupture and is not directed toward other earthquake hazards. Under the Act, development of a building for human occupancy is generally restricted within 50 feet of an identified fault. A fault or fault zone is considered active under the provisions to the act if there is evidence of surface displacement in the last 11,000 years. The California Geological Survey has produced a document entitled *Fault-Rupture Hazard Zones in California: Alquist-Priolo Earthquake Fault Zoning Act with Index to Earthquake Fault Zones Maps* which may be accessed at the following webpage <ftp://ftp.consrv.ca.gov/pub/dmg/pubs/sp/Sp42.pdf> to clarify the roles and responsibilities of local jurisdictions and the State in implementing the Act.

The Seismic Hazards Mapping Act

The Seismic Hazards Mapping Act (Public Resources Code 2690, et seq.), (SHMA) passed in 1990, addresses non-surface fault rupture earthquake hazards, including liquefaction and seismically induced landslides. The SHMA requires the California Geological Survey (CGS) (formerly the Department of Mines and Geology, DMG) to prepare new Seismic Hazard Zone Maps showing areas where liquefaction or earthquake-induced landslides have historically occurred or where there is a high potential for such occurrences. The purpose of the maps is to help reduce and, where feasible, mitigate earthquake hazards in new construction. The County is required to use the maps in the regulatory process to mitigate the potential danger and high costs of such events. CGS has prepared a document entitled *Guidelines for Evaluating and Mitigating Seismic Hazards in California, 2008* which may be accessed here <http://www.conservation.ca.gov/cgs/shzp/webdocs/Documents/SP117.pdf> to ensure ongoing compliance with the SHMA.

The Alameda County General Ordinance Code

Section 15.08.240 of the Alameda County Building Ordinance requires applicants for new construction to submit soils or geologic reports for sites affected by a number of seismic and geologic hazards. In addition, new structures are required to incorporate design elements to reduce building failures. The Grading, Erosion and Sediment Control Ordinance (Alameda County General Ordinance Code, Chapter 15.36) establishes standards for grading, construction and the control of erosion and sediments. In addition, Section 15.36.110 of the County Grading Ordinance gives the Director of Public Works the authority to require a soils and geologic investigation in support of any proposed development on private property. Chapter 16, the Subdivision Ordinance, contains various provisions relating to the investigation of seismic and geologic hazards, and the design and construction of improvements relating to the subdivision of property.

The California Environmental Quality Act (CEQA)

CEQA requires that all projects be evaluated to determine if they “expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:”

1. Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault.
2. Strong seismic ground shaking.
3. Seismic-related ground failure, including liquefaction.
4. Landslides.

Projects must also be evaluated for their potential to:

- Result in substantial soil erosion or the loss of topsoil.
- Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse.
- Be located on expansive soil, as defined in the California Building Code, creating substantial risks to life or property.

- Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water.

2.6. Goals, Policies and Implementing Actions

Goal 1.	To minimize risks to lives and property due to seismic and geologic hazards.
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Policies

- P1. To the extent possible, projects should be designed to accommodate seismic shaking and should be sited away from areas subject to hazards induced by seismic shaking (landsliding, liquefaction, lurking, etc.) where design measures to mitigate the hazards will be uneconomic or will not achieve a satisfactory degree of risk reduction. (Source: Seismic Safety and Safety Element, pg. 6)
- P2. Structures should be located at an adequate distance away from active fault traces, such that surface faulting is not an unreasonable hazard. (Source: Seismic Safety and Safety Element, pg. 6)
- P3. Aspects of all development in hillside areas, including grading, vegetation removal and drainage, should be carefully controlled in order to minimize erosion, disruption to natural slope stability, and landslide hazards. (Source: Seismic Safety and Safety Element, pg. 6)
- P4. Within areas of demonstrated or potential slope instability, development should be undertaken with caution and only after existing geological and soil conditions are known and considered. In areas subject to possible widespread major landsliding, only very low density development should be permitted, consistent with site investigations; grading in these areas should be restricted to minimal amounts required to provide access. (Source: Seismic Safety and Safety Element, pg. 7)
- P5. All existing structures or features of structures which are hazardous in terms of damage, threat to life or loss of critical and essential function in the event of an earthquake should be, to the extent feasible, brought into conformance with applicable seismic and related safety (fire, toxic materials storage and use) standards through rehabilitation, reconstruction, demolition, or the reduction in occupancy levels or change in use. (Source: Seismic Safety and Safety Element, pg. 7, with a minor revision)

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- P6. The County shall not approve new development in areas with potential for seismic and geologic hazards unless the County can determine that feasible measures will be implemented to reduce the potential risk to acceptable levels, based on site-specific analysis. The County shall review new development proposals in terms of the risk caused by seismic and geologic activity. (Source: ECAP, pg. 74)
- P7. The County, prior to approving new development, shall evaluate the degree to which the development could result in loss of lives or property, both within the development and beyond its boundaries, in the event of a natural disaster. (Source: ECAP, pg. 74)
- P8. The County shall ensure that new major public facilities, including emergency response facilities (e.g., hospitals and fire stations), and water storage, wastewater treatment and communications facilities, are sited in areas of low geologic risk. (Source: ECAP, pg. 74)
- P9. Site specific geologic hazard assessments, conducted by a licensed geologist²¹, shall be completed prior to development approval in areas with landslide and liquefaction hazards as indicated in Figures S-2 and S-4 and for development proposals submitted in Alquist-Priolo Zones as indicated in Figure S-1, hazards to be mapped include:
- Seismic features
 - Landslide potential
 - Liquefaction potential

Mitigation measures needed to reduce the risk to life and property from earthquake induced hazards should be included. (Source: Eden Area Plan, pg. 8-11)

- P10. Buildings shall be designed and constructed to withstand ground shaking forces of a minor earthquake (1-4 magnitude) without damage, of a moderate (5 magnitude) earthquake without structural damage, and of a major earthquake (6-8 magnitude) without collapse of the structure. The County shall require that critical facilities and structures (e.g. hospitals, emergency operations centers) be designed and constructed to remain standing and functional following an earthquake. (Source: ECAP, pg. 75)

²¹ In staff correspondence dated July 25, 2012, John Rogers of the Public Works Agency provided the following clarification pertaining to this policy “Soils studies within areas of earthquake-induced landslide and liquefaction are not required to be performed by a licensed geologist. The rule is that any portion of the study that is defined as civil engineering should be conducted by a geotechnical engineer, and that any portion classified as the practice of geology should be conducted by an engineering geologist or a geologist. Most soils studies are performed by geotechnical engineers. Geologists typically perform fault zone studies.”

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- P11. All construction in unincorporated areas shall conform to the Alameda County Building Ordinance, which specifies requirements for the structural design of foundations and other building elements within seismic hazard areas.
- P12. To the extent feasible, major infrastructure including transportation, pipelines, and water and natural gas mains, shall be designed to avoid or minimize crossings of active fault traces and to accommodate fault displacement without major damage that could result in long-term service disruptions. (Source: Eden Area Plan, pg. 8-12)
- P13. The County shall encourage the retrofitting of existing structures and other seismically unsafe buildings and structures to withstand earthquake ground-shaking. (Source: Eden Area Plan, pg. 8-12)
- P14. In order to minimize off-site impacts of hillside development, new construction on landslide-prone or potentially unstable slopes shall be required to implement drainage and erosion control provisions to avoid slope failure and mitigate potential hazards. (Source: Eden Area Plan, pg. 8-12)

Actions

- A1. Require all new construction to meet the most current, applicable, lateral force requirements. (Source: Seismic Safety and Safety Element, pg. 6)
- A2. Require applications for development within Alquist-Priolo Study Zones to include geological data that the subject property is not traversed by an active or potentially active fault, or that an adequate setback can be maintained between the fault trace and the proposed new construction. (Source: Seismic Safety and Safety Element, pg. 6)
- A3. Require sites to be developed in accordance with recommendations contained in the soil and geologic investigations reports. (Source: Seismic Safety and Safety Element, pg. 6)
- A4. Establish standards for areas previously in Alquist-Priolo Study Zones, and eliminated in the last update. (Source: Seismic Safety and Safety Element, pg. 6)
- A5. Regulate, with collaboration from utility owners, the extension of utility lines in fault zones. (Source: Seismic Safety and Safety Element, pg. 6, with minor revisions)
- A6. Establish (with collaboration from utility owners) and enforce design standards for transportation facilities and underground utility lines to be located in fault zones. (Source: Seismic Safety and Safety Element, pg. 6)

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- A7. Require soils and/or geologic reports for development proposed in areas of erodible soils and potential slope instability. (Source: Seismic Safety and Safety Element, pg. 7)
 - A8. Pursue programs to identify and correct existing structural hazards, with priority given to hazards in critical, essential and high occupancy structures and in structures built prior to the enactment of applicable local or state earthquake design standards. (Source: Seismic Safety and Safety Element, pg. 7)
 - A9. Support regional or statewide programs providing funding or technical assistance to local governments to allow identification of existing structural hazards in private development and providing assistance to public and private sectors to facilitate and to minimize the social and economic costs of hazards abatement. (Source: Seismic Safety and Safety Element, pg. 7)
 - A10. Continue to require the upgrading of buildings and facilities to achieve compliance with current earthquake bracing requirements as a condition of granting building permits for major additions and repairs. (Source: Seismic Safety and Safety Element, pg. 7)
 - A11. Continue, and as required, expand programs to provide the public information regarding seismic hazards and related structural hazards. (Source: Seismic Safety and Safety Element, pg. 7)
 - A12. Require geotechnical studies prior to development approval in geologic and/or seismic hazard areas as identified by future studies by federal, state, and regional agencies. Require or undertake comprehensive geologic and engineering studies for critical structures regardless of location. (Source: Castro Valley Plan, pg. 10-30)
 - A13. Adopt and amend as needed the most current version of the California Building Code (CBC) to ensure that new construction and renovation projects incorporate Earthquake-resistant design and materials that meet or exceed the current seismic engineering standards of the CBC. (Source: Castro Valley Plan, pg. 10-30, with minor revision)
 - A14. Periodically update detailed guidelines for preparation of site-specific geologic hazard assessments. These guidelines shall be prepared in consultation with the County Building Official, County Engineer, County Counsel and the County Risk Manager and shall ensure that site-specific assessments for development requiring discretionary permits are prepared according to consistent criteria. (Source: Eden Area Plan, pg. 8-13, with revisions)

- A15. Develop and implement an earthquake retrofit plan to reduce hazards from earthquakes. The plan should identify and tally the seismically unsafe buildings and structures, including unreinforced masonry, unreinforced concrete and soft-story buildings, and require inspection for these structures. It should also identify sources of funding to help reconstruct or replace inadequate structures and assist homeowners with earthquake retrofitting. (Source: Eden Area Plan, pg. 8-13)
- A16. On sites with slopes greater than 30 percent, require all development to be clustered outside of the 30 percent slope area. (Source: Castro Valley Plan, pg. 10-31) With the exception that development²² upon any area outside of the Urban Growth Boundary where the slope exceeds 25% shall not be permitted. (Source: ECAP, pg. 74)
- A17. Aspects of all development in hillside areas, including grading, vegetation removal and drainage, should be carefully controlled in order to minimize erosion, disruption to natural slope stability, and landslide hazards. The County's development standards and guidelines, permit application review process, Section 15.08.240 of its Building Ordinance, the Grading Erosion and Sediment Control Ordinance (Chapter 15.36 of the Alameda County General Ordinance Code), the Stormwater Management and Discharge Control Ordinance (Chapter 13.08), and Subdivision Ordinance (Title 16) shall serve to implement this policy.

3.0 FIRE HAZARDS

3.1. Fire Related Hazards

Fire hazards exist in both developed and undeveloped areas. Those occurring in developed areas typically include buildings, rubbish, automobiles, and grass fires on vacant lots. Those in undeveloped areas often include large brush and grass fires. Alameda County is subject to the threat from urban fires, and especially wildland fires, due to its hilly terrain, weather conditions, and the nature of its plant coverage. Due to the intensity of development, the number of the potentially affected populations, and the difficulties of containment, the County must also devote major resources to controlling potential fire hazards in its urban areas. In order to quantify this potential risk, California Department of Forestry (CDF)

²² Development, as defined by the "Save Open Space and Agricultural Lands" initiative, or commonly referred to as Measure D, is the placement or erection of any solid material or structure; construction, reconstruction or alteration of any structure; change in the density or intensity of any use of land, including any division of land; grading, removing, extraction or deposition of any materials; and disposal of any waste.

has developed a Fire Hazard Severity Scale which utilizes three criteria in order to evaluate and designate potential fire hazards in wildland areas. The criteria are fuel loading (vegetation), fire weather (winds, temperatures, humidity levels and fuel moisture contents) and topography (degree of slope). A map based upon this data has been included as Figure S-5.

3.2. Provision of Fire Services

The Alameda County Fire Department (ACFD)²³ is responsible for providing emergency fire and medical response, as well as fire prevention services, to all residents of the unincorporated areas of Alameda County, exclusive of the Fairview area. In addition, fire and emergency services are provided under contractual agreements with the cities of Dublin and San Leandro, and the U.C. Lawrence Berkeley National Laboratory. The Department's total service area encompasses approximately 475 square miles and has a daytime population of 266,000. The area contains a number of major roadways, highways, and interstates that carry thousands of private and commercial vehicles on a daily basis; large suburban and commercial centers; agricultural and wildland areas; and lakes and marinas. The geography and demography of the unincorporated area excluding Fairview is served by nine stations, encompasses 431 square miles with a population of 126,397 and poses significant operational challenges. The eastern and southern areas include large portions of wildland, grazing land, and rural farmlands. The majority of the population is centered in the western area which is heavily urbanized with a mix of residential, commercial, and light industrial. The Department staffs two stations that serve two sites of the Lawrence Livermore National Laboratory. In the East County, the Department has a contract with the federal Veteran's Administration to provide service to its medical facility. First responder paramedic services are available on a 24-hour per day, 365 day per year basis throughout the entire ACFD service area. The Department also has contractual agreements with a number of other agencies including the cities of Pleasanton and Hayward to optimize service delivery to unincorporated island areas of the County. The Department is responsible for the administration and operation of the Alameda County Regional Emergency Communications Center (ACRECC), which dispatches over 62,000 EMS and fire calls annually. The dispatch center provides dispatch and communication center services for the Alameda County Fire Department, the Alameda County Emergency Medical Services Agency, US Army Camp Parks, and the cities of Alameda, Fremont and Union City. The goal of the ACRECC is to enhance the regional dispatch and communication system through the consolidation of fire and medical dispatch.

The California Department of Forestry is responsible for fire prevention and suppression in their "state responsibility areas". Protection against structural and wildland fire hazards is also provided to

²³ This information was obtained from the ACFD 2008 Annual Report <http://www.acgov.org/fire/documents/annual-report-2008.pdf>

unincorporated parts of the County by contract. These contract areas are commonly referred to as “local responsibility areas”.

The ACFD has established several mutual aid agreements with a variety of agencies to ensure a high level of fire and medical services throughout the unincorporated areas in the event of a local or regional disaster. Currently, aid agreements exist with the U.C. Berkeley Lawrence National Laboratory, the City of Oakland, the San Ramon Valley Fire Protection District and the Livermore-Pleasanton Fire Department. The ACFD agreement with the City of Oakland includes a mutual aid response to cover the southern Oakland Hills area, and a shared automatic agreement for Interstates 580, 880, and 680. All fire departments within Alameda County share a countywide mutual aid agreement and are a part of the State Master Mutual Aid Plan.²⁴

3.3. Development Standards to Mitigate Fire Hazards

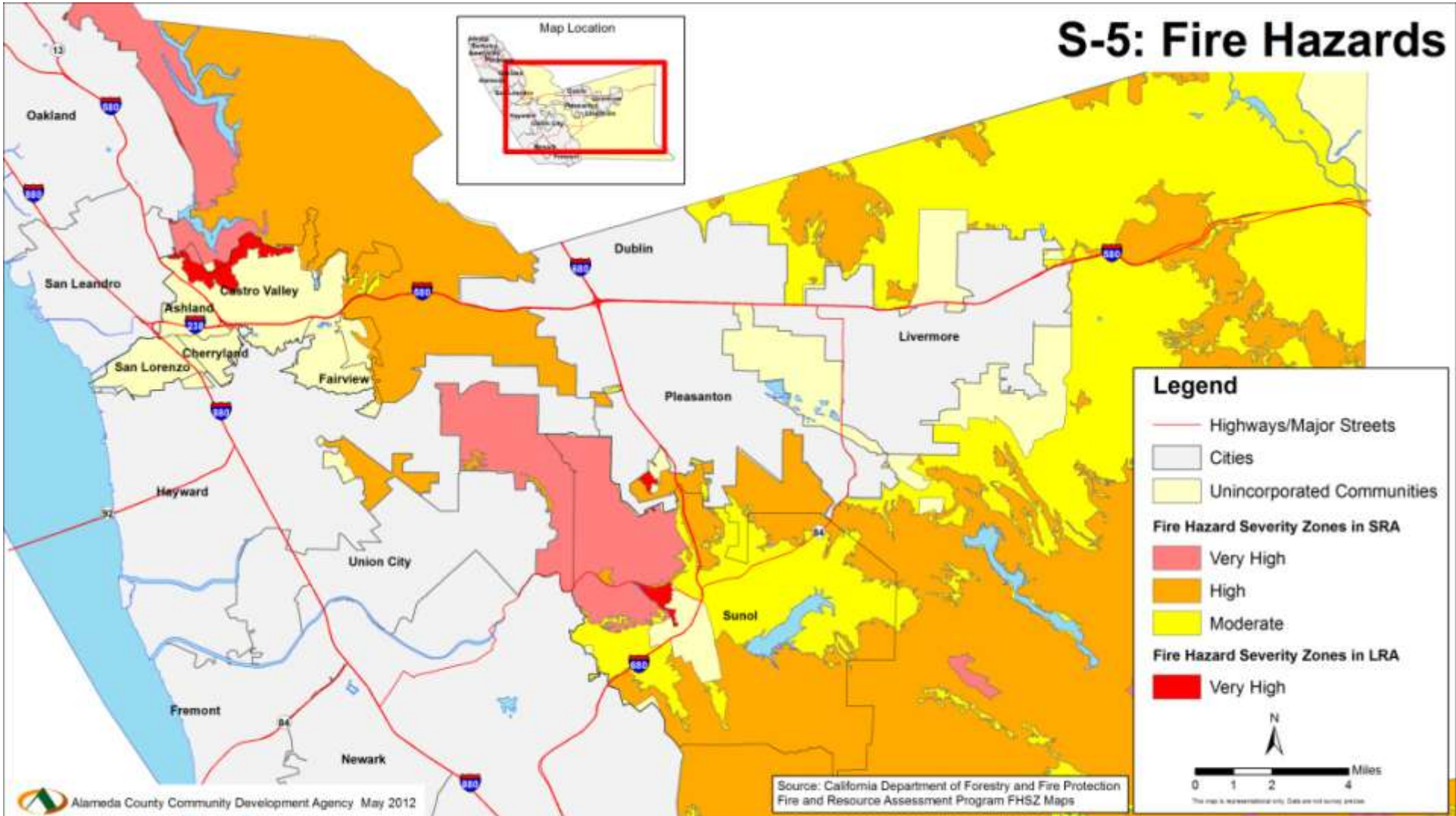
The Alameda County Ordinance Code

The Uniform Fire Code (Section 6.04 of the County Ordinance Code) and the Building Code (Title 15) form the basis of the County’s fire prevention standards. These codes call for the installation, maintenance, and ongoing inspection of fire protection systems under the direction of the local fire chief. In addition, the Fire Code authorizes the Fire Chief to specify water supply and road design standards (such as the number of roads required for access to the site, the road width, and weight capacity). Under Section 16.20.020(G) of the Subdivision Ordinance (Title 16), the subdivider or developer must install water mains, fire hydrants, and fire appurtenances to supply water for fire suppression in conformance with district standards.

The California Environmental Quality Act (CEQA)

Under CEQA, a project sponsor must declare if the project would, “Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands.” Projects that would result in increased wildland fire risk should develop appropriate alternatives and mitigations that would prevent or reduce threats from wildland fires.

²⁴ Excerpted from the Eden Area General Plan, page 5-12



3.4. Goals, Policies and Implementing Actions

Goal 2.	To reduce the risk of urban and wildland fire hazards.
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Policies

- P1. Urban and rural development and intensive recreational facilities should be discouraged in hill open space areas lacking an adequate water supply or nearby available fire protection facilities. (Source: Seismic Safety and Safety Element, pg. 7)
- P2. Hill area development, and particularly that adjoining heavily vegetated open space area, should incorporate careful site design, use of fire retardant building materials and landscaping, development and maintenance of fuel breaks and vegetation management programs, and provisions to limit public access to open space areas in order to minimize wildland fire hazards. (Source: Seismic Safety and Safety Element, pg. 7)
- P3. Development should generally be discouraged in areas of high wildland fire hazard where vegetation management programs, including the creation and maintenance of fuel breaks to separate urban uses would result in unacceptable impacts on open space, scenic and ecological conditions. (Source: Seismic Safety and Safety Element, pg. 7)
- P4. All urban and rural development, existing and proposed, should be provided with adequate water supply and fire protection facilities and services. Facilities serving hill area development should be adequate to provide both structural and wildland fire protection. The primary responsibility falls upon the owner and the developer. (Source: Seismic Safety and Safety Element, pg. 8)
- P5. Structures, features of structures, or uses which present an unacceptable risk of fire should be brought into conformance with applicable fire safety standards. (Source: Seismic Safety and Safety Element, pg. 8)
- P6. Plan new public and private buildings to minimize the risk of fires and identify measures to reduce fire hazards to persons and property in all existing development. (Source: Castro Valley Plan, pg. 9-13)
- P7. The County shall adhere to the provisions of the *Alameda County Fire Protection Master Plan* and *Fire Hazard Mitigation Plan*. (Source: ECAP, pg. 76)

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- P8. The County shall limit residential development to very low densities in high fire hazard zones identified in Figure 6. (Source: ECAP, pg. 76)
 - P9. The County shall require all new homes in rural residential areas that are located in “high” and “very high” fire hazard areas to be sited and designed to minimize risks to life and property. (Source: ECAP, pg. 76)
 - P10. The County shall require the use of fire resistant building materials, fire resistant landscaping and, and adequate clearance around structures in “high” and “very high” fire hazard areas. (Source: ECAP, pg. 76)
 - P11. The County shall require that open space within developed areas be designed and maintained to minimize fire hazards and ensure compatibility between development and any significant biological resources. (Source: ECAP, pg. 19)
 - P12. The County shall refer development applications to the Alameda County Fire Department, or the local Fire District for review and recommendation. (Source: ECAP, pg. 76)
 - P13. The County shall support fire service agencies in maintaining and improving existing Insurance Safety Organization (ISO) ratings. (Source: ECAP, pg. 76)

Actions

- A1. Limit or prohibit development and activities in areas lacking adequate water and firefighting facilities. (Source: Seismic Safety and Safety Element, pg. 7)
- A2. Enforce design standards and guidelines through the site development, planned development, and subdivision review process. (Source: Seismic Safety and Safety Element, pg. 7)
- A3. Require environmental impact assessment for development proposals in areas of severe fire hazard. (Source: Seismic Safety and Safety Element, pg. 8)
- A4. Enforce, and as required, revise development standards. (Source: Seismic Safety and Safety Element, pg. 8)
- A5. Enforce applicable provisions of the Alameda County Subdivision and Building Ordinances .

- A6. Encourage fire safety public education and information programs. (Source: Seismic Safety and Safety Element, pg. 8)
- A7. The County shall maintain a current map of areas subject to wildland fires.
- A8. Establish clearly in County zoning and other ordinances that the Fire Department has the authority to recommend denial or modification to proposed development projects, particularly for projects proposed within “high” or “very high” fire zone areas as identified in Figure 5, Fire Hazards, to reduce the risk of bodily harm, loss of life, or severe property damage and environmental degradation. (Source: Castro Valley Plan, pg. 10-7)
- A9. Establish clearly in County zoning and other ordinances that the Fire Department may require the use of appropriate fire resistant building materials, installation of fire sprinklers, and/or vegetation management, and that such requirements shall be based on a property’s access, slope, water pressure, and proximity to wildland areas. Such requirements shall apply particularly to projects proposed within Very High Fire Zone Areas as identified in Figure 5, Fire Hazards, but may also apply to other properties where access for emergency vehicles does not fully comply with adopted standards. (Source: Castro Valley Plan, pg. 10-7)
- A10. Establish an interdepartmental review process for proposed projects where Fire, Public Works, Planning, and other County Departments consult and establish reasonable and consistent requirements for streets, driveways, and emergency access prior to zoning approval. (Source: Castro Valley Plan, pg. 10-7)
- A11. Revise the review process for any project that proposes an increase in density so that any inadequacy of water pressure for fire hydrants and fire flows for fire suppression purposes is identified early in the development review process. Also identify if the roadway serving the project is deficient in terms of access for emergency vehicles. Identify any access improvements that may be required, for example roadway widening along property frontage, or additional off-street parking. (Source: Castro Valley Plan, pg. 10-8)
- A12. Upgrade and standardize fire hydrants to accept equipment from neighboring fire districts so that the County can accept assistance through a mutual aid request during an emergency. (Source: Castro Valley Plan, pg. 10-8)

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- A13. Enforce the requirement that Home Owners' Associations in Planned Unit Development areas are responsible for vegetation management by establishing a regular review schedule for areas subject to this requirement. (Source: Castro Valley Plan, pg. 10-8)
- A14. Revise the County's Integrated Vegetation Management Program to require private property owners to maintain the vegetation on their property in a condition that will not contribute to the spread of a fire. Requirements for private property owners could include, but need not be limited to, the following:
- Maintain a 30-foot defensible space around all buildings and structures;
 - Remove all portions of trees within 10 feet of chimneys and stovepipe outlets;
 - Remove materials or plants that may act as a fuel or a conveyance of fire (such as dead/dying wood on trees adjacent to/overhanging structures, leaves, pine needles, etc. on rooftops or elsewhere on the property); and
 - Install spark arrester in chimney and or stovepipe outlets. (Source: Castro Valley Plan, pg. 10-9)
- A15. Consider establishing and funding an enforcement district for fire hazard areas and wildland, intermix and interface areas; and establish an inspection period to be conducted annually for properties located in these areas. Mail notices to the residents in these areas notifying them of the inspection period, listing the standards for vegetation management on their properties, and suggesting tips for compliance. Additional funding would be required, such as the formation of an assessment district or other means. (Source: Castro Valley Plan, pg. 10-9)
- A16. In hillside areas where street widths are substantially below the minimum 20-foot width standard required for emergency access, one or more of the following requirements should be imposed to ensure adequate emergency access:
- Sprinklers;
 - Turnouts along the paved roadway;
 - Additional on-site parking;
 - Increased roadway width along the front of the property; or
 - Parking Restrictions. (Source: Castro Valley Plan, pg. 10-10)

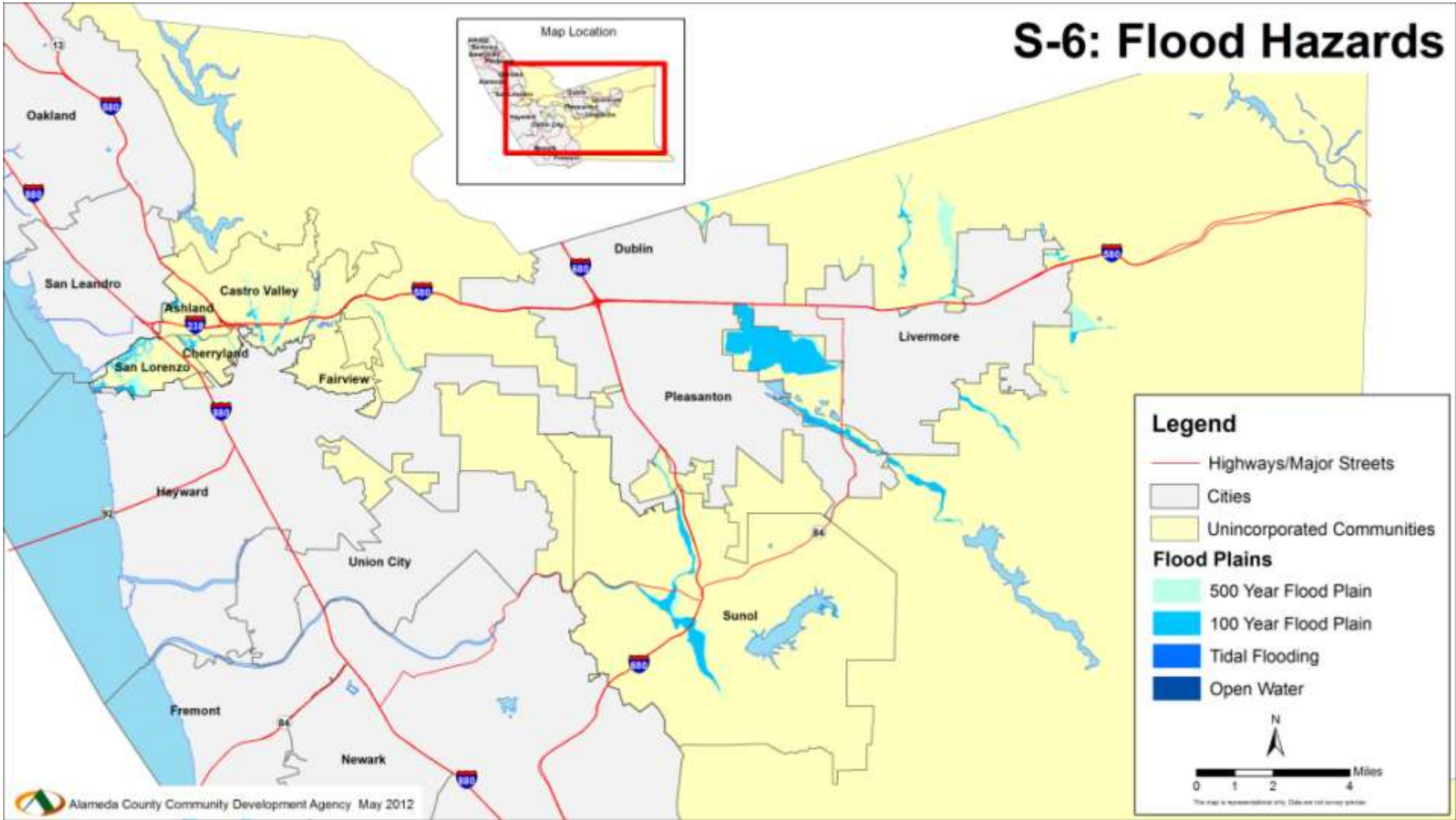
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- A17. Establish consistent standards for private streets depending on the number of units that the street will serve the number of required parking spaces per unit, and reasonable access requirements and operational needs of emergency access vehicles and garbage trucks. Standards should include:
- Minimum paved roadway width requirements (i.e., 20 feet for roads serving five or more units or when part of required fire apparatus access, and 12 feet for roads serving between two and five units that is not part of required fire apparatus access);
 - Turnarounds;
 - Landscaping;
 - Red curbs and signage for no parking zones;
 - Sidewalks; and
 - Parking standards. (Source: Castro Valley Plan, pg. 10-10)
- A18. The County shall prepare a comprehensive wildland fire prevention program including fuelbreaks, brush management, controlled burning, and access for fire suppression equipment. (Source: ECAP, pg. 77)
- A19. The County shall prepare a disaster response plan for buildings exceeding 3 stories (or 30 feet, whichever is less), public assembly facilities, and facilities housing dependent populations. (Source: ECAP, pg. 77)
- A20. The County shall develop wildland fire regulations including site criteria building setbacks, construction standards, minimum road widths, maximum road grades, and evacuation routes. (Source: ECAP, pg. 76)
- A21. The County shall adopt by ordinance the "Wildland Fire Safety Requirements" contained in the Alameda County Fire Protection Master Plan. (Source: ECAP, pg. 76)
- A22. The County shall work with the California Department of Forestry and Fire Protection to designate "very high fire hazard severity zones" in conformance with AB 337 (1992). The County shall ensure that all zones designated as such meet the standards and requirements contained in this legislation. (Source: ECAP, pg. 77)

4.0 FLOOD HAZARDS

4.1. Flood Related Hazards

A flood plain is a naturally-occurring feature near a river or creek that floods periodically. When development brings pavement, roofs, and other hard surfaces, rainfall percolates less into the ground. Runoff to the nearby river or creek increases, and the development within the flood plain can be subject to flooding. Hazards often are the result of above average rainfall over a short duration, resulting in increased runoff and flooding along area creeks and areas with poor drainage. Flood prone areas are generally described as areas that have a one in a hundred (or 1%) chance of being inundated in any given year. Areas potentially subject to flooding from a 100-year event include various low-lying areas and areas adjacent to creek channels as mapped by the Federal Emergency Management Agency (FEMA). In conjunction with FEMA's effort, flood elevations and limits have been determined for the affected areas. A map of flood hazards is provided in Figure S-6.

Flooding occurring within the boundaries of the Planning Area is typically caused by heavy rainfall and runoff volumes that exceed the capacity of existing storm drainage and flood control systems. However, throughout the urbanized parts of the County, flood hazards have been greatly reduced through the efforts of the Alameda County Flood Control and Water Conservation District (ACFCWCD) and the Zone 7 Water Agency. Each of these entities designs, constructs and maintains flood protection facilities to meet existing and projected community needs. Their systems are adequate for most situations.



4.2. Dam Inundation

In accordance with State law, the County has also evaluated possible flood risks arising from the failure of dams or reservoirs. Within the state of California, oversight of dams falls to the Department of Water Resources, Division of Safety of Dams (DOSD). Existing dams under DOSD jurisdiction are inspected annually to ensure adequate maintenance and to direct the dam owner to correct any known deficiencies. Regular inspections and routine maintenance of the dams substantially reduces the risk of catastrophic failure. Figure S-7 highlights those areas that within the Planning Area that might be affected by flooding in the event of a dam or reservoir failure. The depth of inundation would vary from zero in upland areas to many feet on low-lying areas and in creek channels. There are no State or local restrictions for development within dam failure inundation areas; however, the Emergency Services Act (Government Code Section 8589.5) requires that dam inundation maps be prepared to identify flood risk and that local jurisdictions prepare evacuation procedures in the event of a catastrophic dam failure.

The following table, Table S-5, lists all of the dams within or adjacent to the planning area.

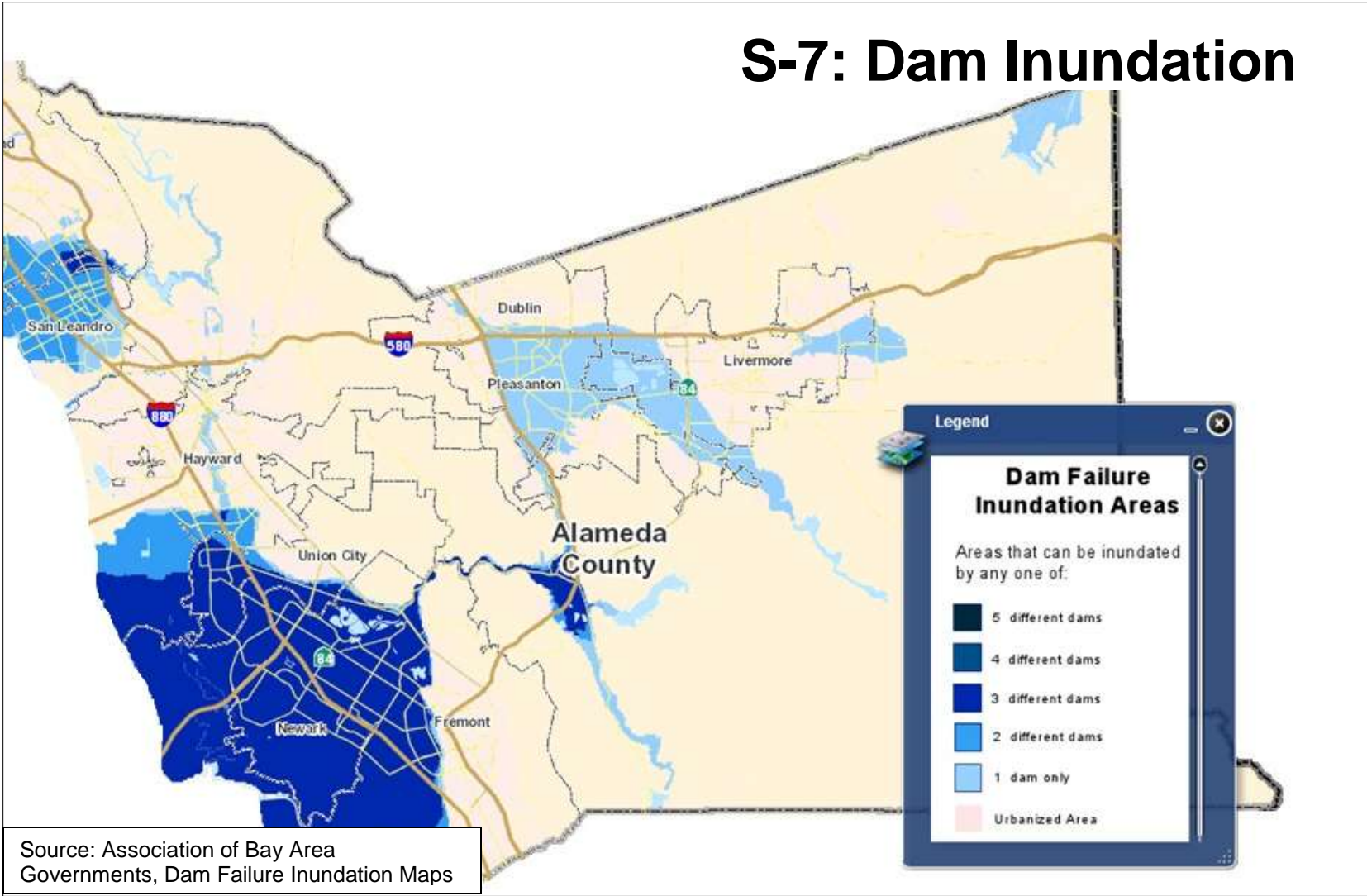
Table S - 5: Dams within or Adjacent to the Planning Area²⁵

Name	Owner	Type	Capacity (acre/feet)
Almond	EBMUD	Earth	20
Bethany Forebay	CA Department of Water Resources (CADWR)	Earth	5,250
Calaveras	City/County of SF	Hydraulic Fill	100,000
Chabot	EBMUD	Hydraulic Fill	10,281
Cull Creek	ACFCWCD	Earth	310
Del Valle	CADWR	Earth	77,100
James H. Turner	City/County of SF	Earth	50,500
New Upper San Leandro	EBMUD	Earth	42,000
Patterson (1-062)	CADWR	Earth	98
San Lorenzo Creek	ACFCWCD	Earth	380
South	EBMUD	Earth	156
Ward Creek	ACFCWCD	Earth	130

In 2011, San Francisco Public Utilities Commission began construction on a replacement for the Calaveras Dam downstream from its current location. This project may result in a change to the dam inundation areas as indicated on the map below. The County will continue to monitor the project and, if necessary, will revise its dam inundation map.

²⁵ CA Department of Water Resources, Division of Safety of Dams, [Complete Listing of Dams within the Jurisdiction of the State of California in Alphabetically order by name of the Dam](#)

S-7: Dam Inundation



4.3. Development Standards for Areas at Risk of Flooding

The following is a summary of development guidelines and regulations pertaining to flood hazards.

Federal Emergency Management Agency (FEMA), National Flood Insurance Program (NFIP)

The County in conjunction with other local jurisdictions participates in the FEMA sponsored National Flood Insurance Program (NFIP). The NFIP provides flood insurance to businesses and individuals in known flood hazard areas. As a participant, the County must comply with FEMA's standards for the regulation of development in special flood hazard areas and conduct floodplain management activities not only to reduce or prevent the loss of life or property, but also preserve and protect the floodplain.

The California Environmental Quality Act (CEQA)

The Act includes several provisions that address flood prevention and loss caused by floods. Through the environmental review process authorized under the Act a project must declare if it would:

- Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff (e.g., due to increased impervious surfaces) in a manner which would result in flooding on- or off-site (i.e. within a watershed);
- Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems due to changes in runoff flow rates or volumes;
- Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map;
- Place within a 100-year flood hazard area structures which would impede or redirect flood flows; and
- Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam

Projects that would result in one or more of these environmental effects would be required to consider an alternative to the particular project or to provide appropriate mitigations that either reduce or eliminate these hazards.

The Alameda County General Ordinance Code

The Alameda County Ordinance Code addresses flood hazard mitigation in the following documents:

- Section 15.08.230 of the Building Ordinance
- Grading Erosion and Sediment Control Ordinance (Chapter 15.36)
- Floodplain Management (Chapter 15.40)

New developments within a floodplain is generally required to be at least one foot above the 100-year flood levels, or may be restricted completely within any designated floodway (i.e. the central portion of certain 100 year flows).

These documents are periodically reviewed and updated to ensure consistency with State law and/or NFIP requirements.

4.4. Goals, Policies and Implementing Actions

Goal 3. To reduce hazards related to flooding and inundation.
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Policies

- P1. New structures located within the floodway fringe (i.e. the area bordering, but outside of the floodway) of a one hundred year floodplain should either be designed and located to allow unrestricted flow of flood-waters or be able to withstand flood forces.
- P2. Surface runoff from new development should be controlled by on-site measures including, but not limited to structural controls and restrictions regarding changes in topography, removal of vegetation, creation of impervious surfaces, and periods of construction such that the need for off-site flood and drainage control improvements is minimized and such that runoff from development will not result in downstream flood hazards. (Source: Seismic Safety and Safety Element, pg. 8)
- P3. Structures shall generally be located away from shoreline areas subject to tsunami inundation, except where they can be feasibly designed to withstand the effects of inundation. (Source: Seismic Safety and Safety Element, pg. 8)
- P4. Development shall only be allowed on lands within the 100-year flood zone if it will not:

-
- Create danger to life and property due to increased flood heights or velocities caused by excavation, fill, roads and intended use.
 - Impede access of emergency vehicles during a flood.
 - Create a safety hazard due to the expected heights, velocity, duration, rate of rise and sediment transport of the flood waters at the site.
 - Exacerbate costs of providing governmental services during and after flooding, including increased maintenance and repair of public utilities and facilities.
 - Interfere with the existing water flow capacity of the floodway.
 - Substantially increase erosion and/or sedimentation.
 - Contribute to the deterioration of any watercourse or the quality of water in any body of water. (Source: Eden Area Plan, pg. 8-19)
- P5. Both public and private service facilities and utilities in existing 100-year flood zones, shall be flood-proofed to a point at, or above, the base flood elevation. (Source: Eden Area Plan, pg. 8-19)
- P6. The County shall prevent the construction of flood barriers within the 100-year flood zone that will divert flood water or increase flooding in other areas. (Source: Eden Area Plan, pg. 8-19)
- P7. To the extent feasible, the County shall continue to improve its rating under the National Flood Insurance Program so that flood insurance premiums for residents in flood areas may be reduced. (Source: Eden Area Plan, pg. 8-20)
- P8. Property owners should be encouraged to purchase National Flood Insurance, which reduces the financial risk from flooding.
- P9. Development shall comply with applicable NPDES requirements. (Source: Eden Area Plan, pg. 8-20)
- P10. The County shall work with the Alameda County Flood Control and Water Conservation District and Zone 7 Water Agency to provide for development of adequate storm drainage and flood control systems to serve existing and future development. (Source: ECAP, pg. 67, with minor revision)

- P11. The County shall promote flood control measures that advance the goals of recreation, resource conservation (including water quality and soil conservation), groundwater recharge, preservation of natural riparian vegetation and habitat, and the preservation of scenic values of the county's arroyos and creeks. (Source: ECAP, pg. 67)
- P12. The County shall require new development to pay their fair share of storm drainage and flood control improvements. (Source: ECAP, pg. 67)
- P13. The County shall regulate new development on a case-by-case basis to ensure that, when appropriate, project storm drainage facilities shall be designed so that peak rate flow of storm water from new development will not exceed the rate of runoff from the site in its undeveloped state. (Source: ECAP, pg. 67)
- P14. The County shall ensure that development proposals within designated dam inundation areas are referred to the Office of Emergency Services and to appropriate local police departments for evaluation and updating of emergency response and evacuation plans. (Source: ECAP, pg. 67)
- P15. All development proposals shall comply with following sections of the Alameda County Ordinance Code: Chapters 13.08 (Stormwater Management and Discharge Control), 13.12 (Watercourse Ordinance), and 15.36 (Grading Erosion and Sediment Control); Section 15.08.230; Floodplain Management (Chapter 15.40); and Title 16 (Subdivision Ordinance).

Actions

- A1. Enforce applicable provisions of the Building Code (Source: Seismic Safety and Safety Element, pg. 8)
- A2. Require environmental assessment of project impacts. (Source: Seismic Safety and Safety Element, pg. 8)
- A3. Utilize site development and planned development district review. (Source: Seismic Safety and Safety Element, pg. 8)
- A4. Require studies where development is proposed in areas designated by FEMA as a having a potential flood risk and that any resulting development conform to the study findings.

-
- A5. Ensure that all construction and development activities obtain all applicable federal, state, regional, and County permits and approvals related to grading and erosion control, stormwater management and discharge control, and watercourse protection. (Source: Castro Valley Plan, pg. 10-18)
 - A6. Require new development to comply with the requirements and criteria for stormwater quantity controls established in the Alameda County Hydrology and Hydraulics Criteria Summary (HHCS) to control surface runoff from new development. (Source: Castro Valley Plan, pg. 10-19)
 - A7. Dedicate adequate resources to ensure effective and timely monitoring and maintenance of public drainage facilities, including storm drains, to maintain adequate capacity for peak flows in the area. (Source: Castro Valley Plan, pg. 10-19)
 - A8. Use the Alameda County Flood Plain Management Ordinance (Chapter 15.40) and Section 15.08.230 of the Alameda County Building Code when assessing flood risk prior to project completion, as well as ongoing risk after flood control and improvement projects are implemented.
 - A9. Work with ACFCWCD, and other agencies and jurisdictions to conduct feasibility studies, and implement flood control improvement projects, including, but not limited to: creek restoration, regional detention facilities in existing or proposed open space areas and/or parks, dredging; existing area dams that are silted-up, dredging existing facilities for increased capacity and recreation. (Source: Castro Valley Plan, pg. 10-20)
 - A10. Establish design standards, guidelines and setback requirements for development on properties that abut creeks and waterways, and require the replanting and restoration of riparian vegetation as part of any discretionary permit. Implement and enforce creek setback requirements for development for properties that abut creeks in coordination with the ACFCWCD and Zone 7 Water Agency. (Source: Castro Valley Plan, pg. 10-20, with minor revision)
 - A11. Continue to participate in activities that prevent or reduce flood impacts to existing and future development as described under the Community Rating System program developed by FEMA's National Flood Insurance Program. (Source: Eden Area Plan, pg. 8-20)
 - A12. Monitor potential changes in information regarding tsunami hazards for the unincorporated area. (Source: Eden Area Plan, pg. 8-20)

- A13. Review and revise Chapters 13.08 (Stormwater Management and Discharge Control), 13.12 (Watercourse Ordinance), 15.36 (Grading Erosion and Sediment Control), Title 15 (Subdivision Ordinance), and Section 15.08.230 of the Building Code as needed to minimize flood risks within the County and to comply with State and Federal flood control requirement.

CHAPTER 2: MAN MADE HAZARDS

1.0 PURPOSE AND INTENT

This chapter describes man made hazards present within unincorporated Alameda County and goals, policies and actions intended to minimize loss due to hazardous materials and aviation.

2.0 HAZARDOUS MATERIALS

2.1. Introduction

Residential, commercial and industrial activities are all potential sources of hazardous waste. Hazardous materials include those substances that may be described as toxic, infectious, ignitable, corrosive or reactive. In the urban unincorporated areas, common sources of hazardous waste are gasoline service stations, dry cleaners, automotive repair businesses, machine shops, printers and photo processors. Other sources include plant nurseries, building supply yards, hospitals and medical office buildings, paint stores, and welding shops. In most cases, these uses are confined to major traffic corridors. In the non-urbanized portion of the County hazardous waste is generated through agricultural and mining related activities.

2.2. Regulatory Oversight for the Creation, Containment and Disposal of Hazardous Waste

The production, storage, transport and disposal of hazardous waste is regulated by federal, state and local laws designed to protect human health and the environment. The various agencies that enforce these laws include, but are not limited to, the U.S. Environmental Protection Agency, the California Environmental Protection Agency, the California Department of Transportation (Caltrans), and the Alameda County Department of Environmental Health. In those cases where there is evidence of contamination of ground and surface water, the State and Regional Water Resources Control Boards have oversight. The Bay Area Air Quality Management District would respond to the release of airborne contaminants to ensure compliance with applicable rules and regulations.

The California Environmental Quality Act (CEQA)

CEQA provides a mechanism for investigating potential impacts arising from the transport use or disposal of hazardous materials. CEQA requires identification of projects that would:

- Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials.
- Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment.
- Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school.
- Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment.

Once these risks are known, the project applicant must either propose project alternatives or take appropriate actions (mitigation measures) to reduce the impact to acceptable levels.

Hazardous Materials Program²⁶

The Hazardous Materials / Waste Program for waste generation was established by the County Board of Supervisors in 1985 and recognized by the State of California Department of Toxic Substances Control (DTSC) through a Memorandum of Understanding. In quick succession the county's hazardous materials management plan program, underground storage tank program, tiered permitting program, and risk management program also started.

The Alameda County Department of Environmental Health (ACDEH) Certified Unified Program Agency (CUPA) is the administrative agency that coordinates and enforces numerous local, state, and federal hazardous materials management and environmental protection programs in the county. The CUPA administers the following programs:

Hazardous Materials Business Plan Program: Chapter 6.95 of the Health and Safety Code establishes minimum statewide standards for Hazardous Materials Business Plans (HMBP's). HMBP's contain basic information on the location, type, quantity, and health risks of hazardous materials and/or waste. Each business shall prepare a HMBP if that business uses, handles, or stores a hazardous material and/or waste or an extremely hazardous material in quantities greater than or equal to the following:

- 55 gallons for a liquid

²⁶ This information was obtained from the Department of Environmental Health website <http://www.acgov.org/aceh/hazard/index.htm>

- 500 pounds of a solid
- 200 cubic feet for any compressed gas
- Threshold planning quantities of an extremely hazardous substance

Hazardous Waste Generator Program: The Hazardous Waste Generator Program regulates businesses that generate any amount of a hazardous waste. Proper handling, recycling, treating, storing and disposing of hazardous waste are key elements to this program.

Underground Storage Tank Program: The Underground Storage Tank (UST) Program regulates the construction, operation, repair and removals of UST systems used to store hazardous materials and/or waste.

California Accidental Release Program: The California Accidental Release Program (Cal ARP) requires any business that handles more than threshold quantities of an extremely hazardous substance to develop a Risk Management Plan (RMP). The RMP is implemented by the business to prevent or mitigate releases of regulated substances that could have off-site consequences through hazard identification, planning, source reduction, maintenance, training, and engineering controls.

Tiered Permitting: The Tiered Permitting Program regulates the onsite treatment of hazardous waste.

Aboveground Storage Tanks: Facilities with a single tank or cumulative aboveground storage capacities of 1,320 gallons or greater of petroleum-based liquid product (gasoline, diesel, lubricants, etc.) must develop a Spill Prevention Control and Countermeasure plan (SPCC). An SPCC plan must be prepared in accordance with the oil pollution prevention guidelines in the Federal Code of Regulations (40 CFR, 112). This plan must include procedures, methods, and equipment at the facility to prevent discharges of petroleum from reaching navigable waters. A Registered Professional Engineer must certify an SPCC plan and a complete copy of the plan must be maintained on site.

The ACDEH CUPA program has jurisdiction in the following communities: Alameda, Albany, Castro Valley, Dublin, Emeryville, Piedmont, Newark, San Lorenzo, Sunol, and the unincorporated areas of Fremont, Hayward, Livermore, Pleasanton, San Leandro and parts of Byron, Mountain House and Tracy.

Household Hazardous Waste²⁷

The Alameda County Household Hazardous Waste Program is operated as a partnership between the Alameda County Department of Environmental Health and StopWaste.org. Household hazardous wastes

²⁷ For more information about this program please go to the following website
<http://www.stopwaste.org/home/index.asp?page=293>

include leftover paint, solvents, antifreeze, used oil and batteries, cleansers, pesticides and pool chemicals. Alameda County has implemented provisions of its Household Hazardous Waste Plan that called for the development of three permanent facilities for household waste collection and recycling in Oakland, Hayward, and Livermore. These facilities collect, identify, sort, store, pack, and recycle or dispose of all hazardous wastes (except radioactive waste and explosives) delivered by residents of Alameda County and small businesses.

Emergency Response

The Alameda County Fire Department would respond to any discharge of hazardous waste.

2.3. Goals, Policies and Implementing Actions

Goal 4. Minimize residents' exposure to the harmful effects of hazardous materials and waste.

Policies

- P1. Uses involving the manufacture, use or storage of highly flammable (or toxic) materials and highly water reactive materials should be located at an adequate distance from other uses and should be regulated to minimize the risk of on-site and off-site personal injury and property damage. The transport of highly flammable materials by rail, truck, or pipeline should be regulated and monitored to minimize risk to adjoining uses. (Source: Seismic Safety and Safety Element, pg. 8-9)
- P2. The County shall strive to reduce hazardous waste using the following hierarchy of waste management strategies:
- Reduce the sources of hazardous waste.
 - Recycle and reuse hazardous waste.
 - Treat or incinerate residual hazardous waste.
 - Place reduced or untreatable waste in secure land disposal units. (Source: Eden Area Plan, pg. 8-23)
- P3. The County shall minimize risks of exposure to or contamination by hazardous materials by educating the public, establishing performance standards for uses that involve

hazardous materials, and evaluating soil and groundwater contamination as part of development project review.

- P4. New or expanding businesses shall be required to demonstrate compliance with the hierarchy of waste management strategies listed in Policy 1 (P1) of this Goal as a condition of receiving land use and business permits. (Source: Eden Area Plan, pg. 8-24)
- P5. All existing hazardous waste generators shall be required to implement the hazardous waste management hierarchy listed in Policy 2 (P2) of this Goal to the maximum extent feasible, both technically and economically. (Source: Eden Area Plan, pg. 8-24)
- P6. Adequate separation shall be provided between areas where hazardous materials are present and sensitive uses such as schools, residences and public facilities. (Source: Eden Area Plan, pg. 8-24)
- P7. The County shall assist the Alameda County Waste Management Authority with the implementation of the *Alameda County Integrated Waste Management Plan* and the *Alameda County Hazardous Waste Management Plan*. (Source: Eden Area Plan, pg. 8-24)
- P8. Developers shall be required to conduct the necessary level of environmental investigation to ensure that soil, groundwater and buildings affected by hazardous material releases from prior land uses and lead or asbestos in building materials will not have a negative impact on the natural environment or health and safety of future property owners or users. This shall occur as a pre-condition for receiving building permits or planning approvals for development on historically commercial or industrial parcels. (Source: Eden Area Plan, pg. 8-24)
- P9. The safe transport of hazardous materials through the unincorporated areas shall be promoted by implementing the following measures:
- Maintain formally-designated hazardous material carrier routes to direct hazardous materials away from populated and other sensitive areas.
 - Prohibit the parking of empty or full vehicles transporting hazardous materials on County streets.
 - Require new pipelines and other channels carrying hazardous materials avoid residential areas and other immobile populations to the extent possible.

- Encourage businesses to ship hazardous materials by rail. (Source: Eden Area Plan, pg. 8-24)
- P10. Emergency response plans shall be submitted as part of all use applications for any large generators of hazardous waste. (Source: Eden Area Plan, pg. 8-25)
- P11. To the extent feasible, the County shall continue to support the removal of hazardous wastes from the solid waste stream in unincorporated Alameda County in accordance with Countywide plans. (Source: Eden Area Plan, pg. 8-25)

Actions

- A1. Enforce applicable provisions of the Zoning and Building Ordinances.
- A2. Utilize zoning to segregate potentially hazardous uses. Hazardous materials should be located so that they are not affected by disasters such as fire, floods, and earthquakes. (Source: Seismic Safety and Safety Element, pg. 9)
- A3. Enforce the Alameda County Solid Waste Management Plan. (Source: Seismic Safety and Safety Element, pg. 9)
- A4. Cooperate with the Alameda County Waste Management Authority and Alameda County Department of Environmental Health to implement the hierarchy of waste management strategies listed in Policy 2 of this Goal. (Source: Eden Area Plan, pg. 8-25)
- A5. Continue to implement local siting criteria in order to implement relevant and applicable provisions consistent with the hazardous materials and waste management plans for Alameda County. (Source: Eden Area Plan, pg. 8-25)
- A6. Coordinate with the Alameda County Department of Environmental Health, Hazardous Materials Division and other appropriate regulatory agencies during the review process of all proposals for the use of hazardous materials or those involving properties that may have toxic contamination such as petroleum hydrocarbons, asbestos, and lead. (Source: Castro Valley Plan, pg. 10-34)
- A7. Require applicants of projects in areas of known hazardous materials occurrences such as petroleum hydrocarbon contamination, USTs, location of asbestos rocks and other such contamination to perform comprehensive soil and groundwater contamination assessments in accordance with regulatory agency testing standards, and if contamination exceeds regulatory action levels, require the project applicant to undertake

remediation procedures prior to grading and development under the supervision of appropriate agencies such as Alameda County Department of Environmental Health, Department of Toxic Substances Control, or Regional Water Quality Control Board. (Source: Castro Valley Plan, pg. 10-34)

- A8. Amend the County zoning regulations and project review processes to ensure that uses involving the use, storage, or transport of highly flammable, toxic, and/or highly water-reactive materials are located at an adequate distance from other uses and where they will not be adversely affected by disasters such as major fires, floods, or earthquakes. Regulate these uses to minimize the risk of on-site or off-site personal injury and property damage. (Source: Castro Valley Plan, pg. 10-34)
- A9. Educate businesses and residents (for example through information on the County's website, etc.) about the proper use, storage, and disposal of hazardous materials, but also ways to reduce or eliminate the use of hazardous materials, including the use of non-toxic or less-toxic alternatives. (Source: Castro Valley Plan, pg. 10-33)

3.0 AVIATION HAZARDS

Within Alameda County there are three airports: Oakland International, Hayward Executive, and the Livermore Municipal Airports. The unincorporated areas are affected by flights not only arriving and departing from these airports, but also from the nearby San Francisco International Airport and the San Jose International Airport. As a result, the airspace over Alameda County is quite crowded, making the potential for crash an ever-present concern.

3.1. Aviation Regulations Related to Land Use and Development

In California, there are various levels of government oversight for land use planning near airports.

- **Federal:** Federal Aviation Administration (FAA) FAA approves airport noise studies, is the lead in the federal environmental processes, and manages the nation's airspace. The FAA publishes standards for the airside of the airport and provides planning guidelines for use by airport sponsors.
- **State:** The Caltrans Division of Aeronautics provides for the integration of aviation into transportation system planning on a regional, statewide, and national basis. Staff administers noise regulation and land use planning laws that foster compatible land use around airports heliports and encourages environmental mitigation measures to prevent incompatible land

use encroachment. In addition, the California Environmental Quality Act (CEQA) requires that a project be screened for the creation of potential hazards within two miles of a public airport.

- **Airport Land Use Commissions (ALUCs):** Airport Land Use Commissions (ALUCs) are established pursuant to the State ALUC law (Public Utilities Code Article 3.5, State Aeronautics Act, Section 21661.5, Section 21670 et seq., and Government Code Section 65302.3 et seq.) to protect the public health, safety, and welfare by promoting the orderly expansion of airports and adoption of land use measures by local public agencies to minimize exposure to excessive noise and safety hazards near airports, heliports and helipads. ALUCs establish policies for land uses around airports, heliports and helipads, ensuring that those uses are compatible with airport operations. This is accomplished through the development of Airport Land Use Compatibility Plans (ALUCPs) which address these four impact areas: Noise, Safety, Airspace Protection, and Overflight. ALUCs also ensure that county and city plans (general, specific and other) and proposed land use policy actions are consistent with the ALUCP. This is done on an advisory basis.
- **Local Governments:** Cities and/or counties have a responsibility to ensure the orderly development of the airports within their local jurisdiction and make sure all applicable planning documents and building regulations are consistent with the ALUCP. They also have the final decision on local land use issues and have the ability to overrule ALUC determinations, with conditions.

Alameda County Airport Land Use Commission

The Alameda County Airport Land Use Commission (ALUC) is an advisory body that assists local agencies in their efforts to comply with the provisions of the four compatibility impact areas (noise, safety, airspace, and overflight) when planning for land uses near airports. Safety Zone Compatibility Criteria have been established for seven distinct zones within the Airport Influence Areas (AIAs) for each of the three airports in the county. Please refer to the following webpage for specific information

<http://www.acgov.org/cda/planning/generalplans/airportlandplans.htm>.

Heliports and Helipads

The ALUCP applies to any site and environs of any existing or proposed public-use, private-use, or special-use heliport or helipad (as defined by Caltrans) in the County. Table S – 6 summarizes information regarding heliports located in unincorporated Alameda County.

Table S - 6: Heliports in Unincorporated Alameda County²⁸

Heliport Name	Location	Public/Private	Number of Daily Operations	Number of Night Operations (10:00 PM to 7:00 AM)
ACFD, Station 14	11345 Sunol Blvd. Sunol, CA 94586	Public	N/A	N/A
Eden Medical Center	20103 Lake Chabot Road Castro Valley, CA 94546	Private	Variable*	Variable*
Fairview Site	27218 Fairview Avenue Fairview, CA 94542	Private	N/A	N/A
Little Valley Site	Sunol, CA	Private	N/A	N/A

Notes: *Variable use at hospitals is based upon need. N/A = Not available

FAA Advisory Circular (AC) 150-5390-2B "Heliport Design" provides recommendations for heliport design and describes the federal requirements associated with heliport development. Alameda County encourages those with heliport proposals to implement the guidance set forth in the AC to the greatest extent practicable. The AC is available online from the FAA website at www.faa.gov. For more information about heliport permitting, please contact Caltrans' Division of Aeronautics (www.dot.ca.gov/hq/planing/aeronaut/index.html). Also see section 2.7.4 of the ALUCPs for ALUC review criteria for new heliports, or heliport master/development plans.

Emergency Response

The Alameda County Fire Department has staff capable of responding to aviation accidents, both on land and the sea. The City of Oakland also has a special fire-fighting unit at the Oakland International Airport equipped with special apparatus for aviation accidents. The US Coast Guard will respond to an aircraft incident over the water. The County, Port of Oakland, and the US Coast Guard have periodic drills to ensure readiness in the event of a water crash landing.

3.2. Goals, Policies and Implementing Actions

Goal 5.	Minimize potential impacts from aircraft accidents at facilities that contain hazardous materials and waste
---------	--

Policies

- P1. Require proposed land use projects within Airport Influence Areas (AIAs) that utilize hazardous materials (flammable, explosive, corrosive or toxic) be referred to the ALUC for a compatibility determination.

²⁸ *Oakland Airport ALUCP*, December 2010, page 2-5

Actions

- A1. Consult the Alameda County's ALUCPs for proposed land uses prior to approval of Discretionary or Ministerial Projects.
- A2. Refer all updates to County General Plans, Specific Plans, and Zoning Ordinances to the Alameda County ALUC for a compatibility determination.
- A3. Special measures to minimize risk in the event of an aircraft accident to be determined by the permitting agencies in Safety Zones 3-5 in each airport's AIA.
- A4. Storage fuel and other hazardous materials within the airport environs are restricted as follows:
 - Within Safety Zones 1 and 2, storage of any such substance is prohibited.
 - Within Safety Zone 3, storage of fuel or other hazardous materials is permitted only if the substances are stored in underground tanks, and the quantity stored is no more than 2,000 gallons.

CHAPTER 3: EMERGENCY PREPAREDNESS

1.0 PURPOSE AND INTENT

The Safety Element provides a policy framework for the implementation of short-range emergency preparedness plans to maintain long-term safety goals. This chapter describes the protection and response providers for the unincorporated areas of the County.

1.1. Disaster Planning and Preparedness

Local Hazard Mitigation Plan (LHMP)²⁹

The federal Disaster Mitigation Act of 2000 (DMA 2000) requires that cities, counties, and special districts have a Local Hazard Mitigation Plan to be eligible to receive Federal Emergency Management Agency (FEMA) hazard mitigation funds. To assist local governments in meeting this requirement, the Association of Bay Area Governments is the lead agency on the multi-jurisdictional Local Hazard Mitigation Plan (LHMP) for the San Francisco Bay Area. Cities and counties can adopt and use all or part of this multi-jurisdictional plan in lieu of preparing all or part of a Local Hazard Mitigation Plan themselves. The County LHMP addresses potential damages in the unincorporated portions of the County, as well as to County facilities. Cities, schools, special districts, and eligible non-profit organizations within the County must prepare and submit separate Hazard Mitigation Plans to FEMA for approval.

The County, in conjunction with its many emergency services partners, has prepared its local annex to the LHMP that sets strategies for coping with the natural and man-made hazards faced by residents. The plan is a compilation of information from County departments correlated with known and projected hazards that face northern California. The plan complies with, and has been approved by, FEMA and the Governor's Office of Emergency Services (OES). The plan has been formally adopted by the County Board of Supervisors (BOS) for use in the development of specific hazard mitigation proposals.

Under Assembly Bill 2140 (Hancock, 2006) local jurisdictions are required to adopt the LHMP as an implementation appendix to their Safety Elements in order to receive full reimbursement of post-disaster public assistance from FEMA. The LHMP will be updated on a schedule as determined by FEMA. Mitigation strategies included in the LHMP will serve as the implementation plan for the Safety Element. A copy of the current LHMP will reside in Appendix A.

²⁹ For more information about this program please go to the ABAG website located at <http://quake.abag.ca.gov/>

Community Education

The Alameda County Fire Department offers the Personal Emergency Preparedness (PEP) and Community Emergency Response Team (CERT) trainings to provide community members with the tools and resources to become better prepared and self-sufficient during a large-scale emergency or disaster. The department also provides the Map Your Neighborhood (MYN) project, an all hazards response tool to educate members of the community to become more prepared during the pre-planning and response phase of a large-scale emergency. Please refer to the ACFD website for more information about these programs.

Standard Emergency Management System (SEMS)

Alameda County will follow the Standard Emergency Management System (SEMS) when responding to any disaster. SEMS is a management system that provides an organizational framework and guidance for operations at each level of California's emergency management system. The objective of SEMS is to improve the coordination of state and local emergency response. SEMS is not a physical agency; it is a procedure for integrating emergency response functions. As its name implies, the SEMS provides guidelines for standardization of procedures and approaches to emergency response; facilitation of the flow of information and resources between organizational levels (field, local government, operation area, regional and state); coordination between responding agencies; and rapid mobilization, deployment, use and tracking of resources. All local governments must use SEMS in multi-jurisdictional or multi-agency emergency responses to be eligible for state reimbursement of response-related personnel costs.

Operational Area Emergency Response

A crucial emergency response plan for the unincorporated areas of the County is the Operational Area Emergency Response Plan (OAERP), which is prepared by the Alameda County Office of Homeland Security and Emergency Services in consultation with various public and private entities. The intent of the plan is to strengthen short and long-term emergency responses and recovery capability, and to identify emergency procedures and emergency management routes in the County.

In Alameda County, the Operational Area was established by the January 1995 "Agreement for Participation in Alameda County Operational Area Emergency Management Organization" (Agreement). According to the Alameda County Office of Homeland Security and Emergency Services (the Sheriff's Department), all the cities in the county and the county are participants in this Agreement. The Agreement establishes an organizational structure for disaster response for the County of Alameda, cities, special districts, and other public benefit non-profit corporations (e.g. the American Red Cross) that participate in the Agreement. The Agreement forms a partnership for a systematic approach for exchanging disaster intelligence, mutual aid requests, and resource requests in emergencies. It also

provides emergency preparedness on a day-to-day basis through cooperative training and exercise activities. It establishes a primary contact point during an emergency in Alameda County for sharing disaster intelligence among local agencies and between the Operational Area Emergency Management Organization and state and federal agencies requesting information.

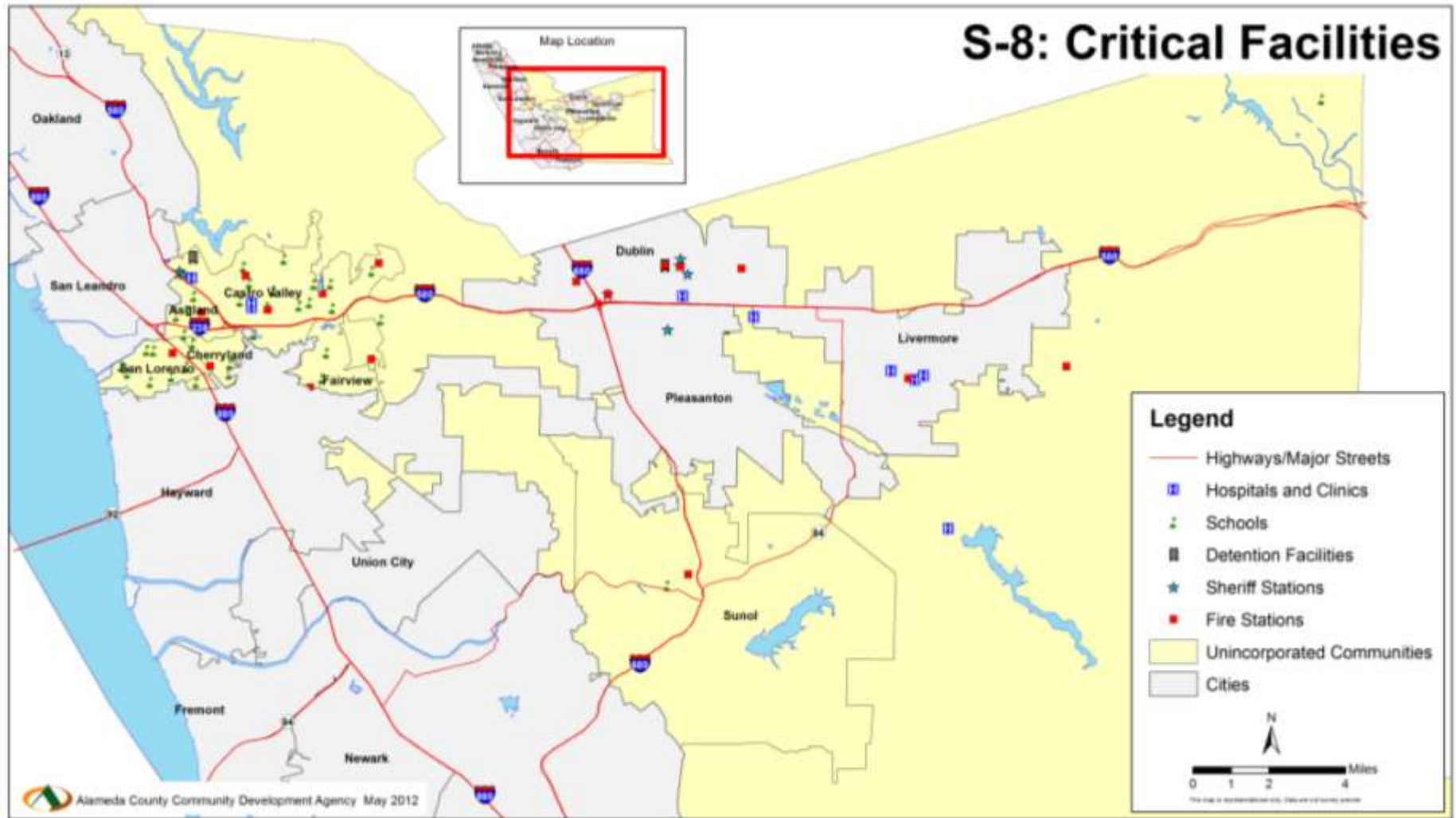
The Operational Area Emergency Management Organization assists the participating parties in sharing resources before, during, and after an emergency to prepare for, respond to, and recover from disasters that strike Alameda County. The Agreement specifies that the Alameda County Emergency Operations Plan is the primary method and criteria used to conduct Operational Area Emergency Center activities. The Emergency Operations Plan also includes a description of the various functional responsibilities for County departments.

Related Plans

The County must prepare and periodically update several policy, planning and logistical documents pertaining to emergency response. An inventory of these plans is provided in Appendix B.

Emergency Facilities and Shelter Sites

A map indicating the locations of emergency facilities and shelter sites is provided on the following page.



A listing of emergency services providers and resources for unincorporated Alameda County is provided in Appendix C.

Police Services

The Alameda County Sheriff's Office is a full service law enforcement agency accredited through the Commission on Accreditation for Law Enforcement Agencies (CALEA) and the American Correctional Association (ACA). The Sheriff's Office has 1,500 authorized positions, including 1,000 sworn personnel distributed among five divisions, each headed by a Commander. The County's Emergency Operations Center (EOC) was dedicated in 1996 and is coordinated and maintained by the Sheriff's Office of Homeland Security and Emergency Services (SOHSE). The SOHSE is a proactive effort to enhance the Department's response to potential threats related to local homeland security issues, such as terrorism or bio-terrorism. The SOHSE maintains a 24-hour response capability that includes the mobilization of the following volunteer units: Air Squadron, Communications Team, Mounted Posse, Search and Rescue Unit, and two Underwater Recovery Units.

1.2. Goals, Policies and Implementing Actions

Goal 6. Prepare and keep current County emergency procedures in the event of potential natural or man-made disaster.

Policies

- P1. The County shall coordinate its efforts with other local jurisdictions for hazard and disaster response planning and to minimize risks associated with man-made and environmental hazards. (Source: Eden Area Plan, pg. 8-26)
- P2. Adequate emergency water flow, emergency vehicle access and evacuation routes shall be incorporated into any new development prior to project approval. (Source: Eden Area Plan, pg. 8-26)

Actions

- A1. Complete regularly scheduled reviews and updates of its emergency preparedness plans. (Source: Eden Area Plan, pg. 8-26)

- A2. Conduct periodic mock exercises using emergency response systems to test the effectiveness of County procedures included in the emergency management plan. (Source: Eden Area Plan, pg. 8-27)
- A3. Develop public education programs on first-aid training and disaster preparedness that encourage residents and businesses to stockpile emergency food, water and medical supplies, and provide information on emergency access routes. Other topics should be included as necessary. (Source: Eden Area Plan, pg. 8-27)
- A4. Work with Caltrans, and the local and Countywide fire and police departments to identify appropriate emergency access routes through the unincorporated areas. (Source: Eden Area Plan, pg. 8-27)
- A5. Coordinate with the school districts, hospitals, and other major public and private agencies and organizations, including agencies that serve seniors, persons with disabilities, non-English speakers and others who may need special support during an emergency, to develop and implement an effective disaster plans. (Source: Castro Valley Plan, pg. 9-13)
- A6. Adopt and amend as needed the Alameda County Annex to the Multi-jurisdictional Local Hazard Mitigation Plan as required under the federal Disaster Mitigation Act of 2000.
- A7. The Alameda County Annex to Multi-jurisdictional Local Hazard Mitigation Plan (LHMP) adopted by the Board of Supervisors and approved by the Association of Bay Area Governments (ABAG) shall serve as the implementation program for the coordination of hazard planning and disaster response efforts within the County and is incorporated by reference to this Element as the Implementation Appendix, Appendix A.
- A8. The County will ensure that the LHMP is updated regularly to keep pace with the needs of its residents.

The pages that follow contain the Alameda County Annex to the Local Hazard Mitigation Plan (LHMP) that was adopted by the Alameda County Board of Supervisors on January 24, 2012 with subsequent approval by the Federal Emergency Management Agency (FEMA).



County of Alameda

Annex to 2010 Association of Bay
Area Governments
Local Hazard Mitigation Plan
Taming Natural Disasters

County of Alameda



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Introduction

In 1853, just three years after the addition of California as the 31st state of the union, the County of Alameda was established. Located on the east side of San Francisco Bay, it was carved out of territory from two previously established neighboring counties, Contra Costa and Santa Clara. The name of the County, “*Alameda*” means “a place where poplar trees grow”. It was derived from the Spanish/Mexican heritage of the region and was actually the name originally given to a local creek, the Arroyo de la Alameda (Poplar Grove Creek).

Though sparsely populated in the early years after incorporation, the County has since become the 7th most crowded in California. With a population of 1,556,657 – a density of 2,110 persons per square mile – the number of County residents has increased 4% since 2007 when the original Annex to the ABAG Multi-jurisdictional Plan was completed. Its 14 cities and 6 unincorporated areas are located within 738 square miles of land alongside 84 square miles of water for a total area of 831 square miles.

The County government, with 9,103 employees and a current operating budget of \$2.44 billion, currently owns and occupies approximately 6.5 million square feet of office and institutional space, leases another 1.2 million, and also owns, operates, and maintains bridges, dams, and other infrastructure (see the map of the County’s jurisdictional boundaries in **Exhibit A**).

Alameda County’s residents, since the time of incorporation, have enjoyed a diverse and beautiful landscape which includes rolling open spaces, urban marinas and coastal plains along the bay, and densely vegetated hillsides with lakes and streams. Along with this natural beauty, however, come the associated dangers that such features bring. These include wildfires, landslides, flooding, and earthquakes. This last natural hazard is the result of a network of faults that permeate the area. Running mostly north to south, the primary faults include Greenville, northern Calaveras, the southern tip of Diablo, and one of the most dangerous fault systems in the United States, the North-South Hayward. And, lurking to the west across the bay is the ever-present San Andreas fault. While not located within the boundaries of Alameda County, it, too, poses a serious threat.

These inherent dangers, both in and around the County, have produced a number of emergencies and major disasters including numerous floods, the Hayward Quake of 1868, The Great San Francisco Earthquake and Fire of 1906, the Oakland Hills Fire Storm of 1991, and the Loma Prieta Earthquake of 1989.

The Regional Planning Process

The County participated in various ABAG workshops, conferences, and meetings, including:



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- The Sub-Regional meeting on May 8, 2009 to review draft priorities and reach consensus on priorities for mitigation (representatives from county staff);
- 8 ABAG Regional Planning Committee meetings (two Board of Supervisors members plus representatives from County staff);
 - Various dates: 04/02/2008, 08/06/2008, 10/01/2008, 12/03/2008, 04/01/2009, 06/03/2009, 08/05/2009, 10/07/2009.
- ABAG Executive Board meeting (two Board of Supervisor members) on September 17, 2009, and;
- Wildfire Workshop (representatives from county staff) on July 2, 2009.

At these meetings Alameda County representatives provided input on the regional mitigation strategies that were important to the County and shared relevant mitigation successes and challenges with the various groups. For more information on these meetings and for rosters of attendees, please see Appendix A and H in the ABAG Multi-Jurisdictional Local Hazard Mitigation Plan 2010 (MJ-LHMP). In addition, the County has provided written and oral comments on the multi-jurisdictional plan and provided information on facilities that are defined as “critical” to ABAG.

The Local Planning Process – History and Current Structure

Starting in 2004, a team composed of Alameda County senior management and staff began working with ABAG to develop an Annex to the then pending 2005 ABAG Multi-Jurisdictional Local Hazard Mitigation Plan. The County’s Mitigation Planning Team was composed of an Executive Committee, a Working Group, and individual agency Disaster Mitigation Teams, as follows:

- The Executive Committee (EC): Chaired by the County Administrator’s Office and composed of senior management personnel from General Services (GSA), Community Development (CDA), Public Works (PWA), Health Care Services (HCSA), Public Health (PHD), Office of Emergency Services (OES), Sheriff’s Office (ACSO), and Fire Department (ACFD). This was the ultimate decision-making unit that also provided leadership and support for creating the plan and represented the County to various interest groups, government agencies, and the community.
- Working Group (WG): Chaired by GSA and CDA and comprised of two staff each from the participating agencies/departments noted above, plus participation from the Alameda County Medical Center (ACMC). The unit was responsible for day-to-day research, legwork, analysis, and making recommendations to the EC such as identifying mitigation strategies, prioritizing them, and making revisions to the Annex. This group also represented the County at ABAG workshops, conferences, and various public meetings.



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- Disaster Mitigation Teams (DMT): Led by two Agency Representatives from each participating agency who report to the WG. This unit was further comprised of staff from various departments within each respective agency and responsible for performing research and developing recommendations for their respective agencies on a variety of subjects, among them being revisions to the Annex and the identification and prioritization of mitigation strategies. In addition, these staff members were also available to the WG as a resource to develop multi-disciplinary sub-committees for specialized research.

The Annex was adopted in 2007 under a process which followed FEMA guidelines, such that after approval by FEMA of the Annex, the County Board of Supervisors then adopted the plan in a public meeting via an official Board Resolution. Said resolution required the Annex and its mitigation strategies become an implementation appendix of the Safety Element in the County's General Plan. In addition, a subsequent resolution now requires that if the Board adopts any future FEMA-approved updates or amendments to the LHMP "...the revised document shall replace any previous version of the document." This insures the continued implementation of Annex updates and mitigation activities in perpetuity.

It was through this three-tiered structure that each agency participated in the development of the 2007 Alameda County Annex to the 2005 ABAG plan and, with the current exception that GSA alone chairs the Mitigation Planning Team, it has remained essentially unchanged to this day as the method used to develop the updated 2010 Annex.

Review and Incorporation of Existing Information

Below is a table of existing plans, reports, studies, and technical information that were used in the development of this Annex.

EXISTING PLANS, STUDIES, REPORTS, AND TECHNICAL INFORMATION	METHOD OF INCORPORATION INTO THE JURISDICTION ANNEX
Alameda County General Plan (with recent amendments from March 2010)	Hazards assessment and mitigation strategies
2010-2015 Alameda County Capital Improvement Plan	Mitigation projects
Grading Ordinance 0-2010-19	Risk assessment
Geotechnical Evaluations of County Dams (w/ the California Div. of Safety of Dams)	Risk assessment and mitigation strategies/projects
Geotechnical Evaluations of County Levees (w/ California Dept. of Water Resources)	Risk assessment and mitigation strategies/projects (levee certification is being done by FEMA)



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PWA-FCD Hydraulic & Hydrologic Studies.	Flood risk assessment
2007-2008 Alameda County Final Budget Report	Demographics and background data
2009-2010 Alameda County Final Budget Report	Demographics and background data
2010 ABAG Multi-Jurisdictional LHMP	Mapping, hazards assessment, strategies, risk data
1998 Seismic Evaluation of Eight Alameda County Fire Stations as “Essential Facilities” (cost estimates adjusted for local construction inflation)	Cost estimating for mitigation projects and historical data
2005 Alameda County Fire Department Program Budget Analysis New Construction and Seismic Retrofit and Remodeling – Fire Stations 1, 2, 4, 5, 6, 7, 8 (cost estimates adjusted for inflation)	Cost estimating for mitigation projects and historical data
Housing Repair and Reconstruction After Loma Prieta (from the UC Berkeley National Information Service for Earthquake Engineering)	Historical data

Process for Updating Plan Sections in the 2010-2015 Update

Under the auspices of the three-tiered structure and approval process noted above, subject-matter experts from the aforementioned County departments, made up of architects, planners, building department officials, facility managers, civil engineers, public health specialists, emergency managers, and sheriff and fire officials met on a regular basis to review the various plan sections as well as identify and prioritize appropriate mitigation strategies. Members of this group also participated in regional ABAG workshops, conferences, and meetings (see *Regional Planning Process* above).

At the first Working Group meeting, general priorities, a milestone schedule, and participants from appropriate County departments were confirmed along with beginning the review of ABAG’s regional mitigation strategies (Exhibit F). Subsequent meetings built upon this task, prioritized said strategies specifically for Alameda County, examined the cost/benefit of each strategy, and reviewed preliminary budgets and potential funding sources for strategies designated as “High” priority for County-owned-and-operated facilities.

In addition, various sections of the Annex also needed to be reviewed, expanded, and restructured by the Mitigation Planning Team based on new requirements, information and/or improved data, as follows:



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- **Introduction:** This section was revised and expanded to introduce key statistics and information about the origins of the County, its demographics, and the natural hazards prevalent in the area.
- **The Planning Process:** This section was revised and expanded to better depict the interface of regional and local planning efforts and reflect the activities that took place as part of the plan update process. In addition, this section includes the history and current structure of the County’s Mitigation Planning Team, a brief review of resources and processes used to develop this Annex, and describes the goals and methodology of the public notification process.
- **Hazards Assessment:** This section was revised and expanded to include more history on the affects of natural hazards in Alameda County and tabulate more recent events that have occurred since the 2007 Annex. In addition, there are updates to the hazard maps referenced in the exhibits.
- **Risk Assessment:** This section was revised and expanded to include the most recent hazard mapping and land use data available, including easy-to-read charts tabulating differences between the 2007 and 2010 Annexes for hazard exposures to infrastructure and facilities.
- **National Flood Insurance Program:** This is a new section illustrating the County’s partnering relationship with FEMA to modernize floodplain mapping and improve the County’s CRS class rating for the benefit of County residents.
- **Mitigation Activities and Priorities:** This section was revised and expanded to include evaluation of progress from the 2007 Annex and development of mitigation strategies and projects for the next 5 years, both of which are tabulated in Exhibits D and E.
- **Incorporation in Existing Planning Mechanisms:** This is a new section delineating how hazard mitigation concepts are imported into standard County operations and planning initiatives for coordination purposes as well as to increase the visibility – and highlight the importance of – pre-disaster mitigation planning and emergency management.
- **The Plan Update Process:** This section was revised to include a means to monitor mitigation progress and a brief section on “lessons learned” regarding public participation enhancements for the next update cycle.

Public Meetings

Opportunity for public comments on the DRAFT mitigation strategies was provided at a public meeting at GSA headquarters on September 28, 2009 in Oakland from 6pm to 8pm. Complimenting that event was a second invitation for public input posted on the County website with a comment period stretching from October 12 to October 19, 2010 inviting members of the public to offer questions, suggestions, and comments via email and phone. In both instances, the



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draft mitigation strategies and related links were published on the County website for public viewing.

The purpose of the public notifications was threefold: first, to educate local residents about hazard mitigation's importance to overall disaster preparedness for the community and region; secondly, to remind our residents about the hazards prevalent in our area; and third, to give them a voice in the development of the plan, especially with respect to developing and prioritizing the strategies to mitigate against said hazards.

The County's intent was to collate all public comments and suggestions received; have the Working Group and Executive Committee review them with the assistance of our emergency managers and ABAG; and then verify the congruency of the comments and suggestions with FEMA guidelines prior to inclusion in the Annex. However, no public comments were received from either the meeting or the internet posting. Copies of the text for the meeting invitation and the internet posting are included as **Exhibit B** to the Alameda County Annex. A brief "lessons learned" section at the end of this Annex notes possible methodologies to improve public participation for the 2015 Annex update (see the *Plan Update Process*).

Hazards Assessment

The 2010-2015 ABAG Multi-Jurisdictional Local Hazard Mitigation Plan, to which this is an annex, lists nine hazards that impact the Bay Area, five related to earthquakes (faulting, shaking, earthquake-induced landslides, liquefaction, and tsunamis) and four related to weather (flooding, landslides, wildfires, and drought). Maps of these hazards and risks are shown on the ABAG website at <http://quake.abag.ca.gov/mitigation/>.

The County has reviewed the hazards identified and ranked the hazards based on a review of our current General Plan Safety Element, reports and studies noted earlier (see *Review of Existing Plans* above), past disasters, and risk assessments from recognized experts on expected future impacts. The conclusion is that earthquakes (particularly shaking and liquefaction), flooding (including dam failure), wildfire, and landslides (including unstable earth) pose the most significant risks for potential loss in Alameda County.

Based on the risk assessment in the following sections, tsunamis do not pose a significant threat to Alameda County's facilities, infrastructure, or in the unincorporated areas. In addition, the County does not face any natural disasters not listed in the ABAG multi-jurisdictional plan and no new hazards have been identified by the County since the original development of the County's 2007 Annex to ABAG's 2005 plan.

While the County has undertaken a number of general hazard mapping activities since its first Safety Element was prepared, most of these maps are less detailed and are not as current as those



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shown on the ABAG website at <http://quake.abag.ca.gov/mitigation/>. However, some additional maps developed by the County for earthquakes and wildfires are included as **Exhibit C**.

Past Occurrences Of Disasters (natural and human-induced)

The County has experienced a number of different disasters over the course of its history, including numerous earthquakes, floods, droughts, wildfires, energy shortages, civil disturbances, landslides, and severe storms.

One of the great early disasters in Alameda County occurred just a scant 15 years after incorporation. The Great Hayward Quake of October 21, 1868, with an epicenter near the small town of Hayward, was estimated to be between 6.8 and 7.0 and was one of California's most destructive ever. Damage was extensive and widespread throughout the region with reports from as far south as Gilroy to Santa Rosa in the north. In San Francisco, many buildings were damaged and 5 persons were reported killed.

However, most of the deaths and destruction occurred in Alameda County, which at the time had a population of approximately 21,000 (a density of approximately 28 persons per mile). In Hayward, a small town of only 500 residents, every building was destroyed or damaged. In neighboring San Leandro, with a population of only 400, the second floor of the Alameda County courthouse collapsed, and many other buildings were also damaged. In Mission San Jose in southern Fremont, the old adobe church and other buildings were also severely damaged.

The Hayward quake was originally referred to as the "Great San Francisco Earthquake", but that distinction was supplanted by a magnitude 7.8 temblor along the San Andreas Fault on April 18 1906. This quake and the ensuing fire, with an epicenter approximately 2 miles offshore of San Francisco's Golden Gate Park, caused an estimated 3,000 deaths and \$524 million in property losses. Damage in the Alameda County cities Berkeley, Oakland, and Alameda also was severe. The Oakland Hills Fires of 1991, too, ranks as one of the worst wildland-urban firestorm disasters to ever strike the United States with 25 deaths, 150 injuries, and the displacement of over 10,000 persons. The blaze started when a 5-acre grass fire in the hills above Berkeley reignited after it was mistakenly thought to have been extinguished. With destruction and damage to over 3,400 family dwellings and 456 apartments, losses were approximately \$1.7 Billion.

The Loma Prieta Earthquake of 1989 is yet another example of the kind of large scale disaster that can strike the Bay Area. Across the entire region it killed 63 persons, injured 3,757, displaced over 12,000 and caused approximately \$6 Billion of damage. Area-wide, there were approximately 12,000 housing units destroyed or significantly damaged and over 30,000 experiencing some level of minor damage.



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Within Alameda County itself, the quake significantly damaged the city halls of Oakland, Alameda, and Hayward. In addition, 42 of the 63 persons killed in the quake lost their lives at the Cypress Street Viaduct of the Nimitz 880 Freeway collapse. Finally, some 3,300 homes in Alameda County were destroyed or damaged, with total losses in Alameda County nearly \$1.5 Billion. Reconstruction continues over two decades later as the replacement for the Oakland-Bay Bridge is still several years from completion.

Floods, too, have repeatedly taken their toll on the County throughout its history. According to the US Army Corps of Engineers, major flooding of San Lorenzo Creek occurred in the 1860s, 1870s, and the early 1880s. This trend continued through the 20th century with major floods occurring in January 1911, January 1916, February 1919, February 1925, December 1931, February 1940, January 1942, December 1950, December 1955, and April 1958. While damage reports from these events are scant at best, we do know that during the storms of 1962, flooding took place in the unincorporated areas of Alameda County, which, in combination with mud slides and gale winds, caused the region to be declared an emergency area.

The County has had a number of lesser incidents as well, such as landslides in the hills on the east side of the County, including one that damaged 12 homes in 1980. More information on State and Federally declared disasters in Alameda County can be found at <http://quake.abag.ca.gov/wp-content/documents/ThePlan-D-2011.pdf>. There have only been a few locally significant incidents that have impacted Alameda County between the adoption of the 2007 Annex and this current update. Two are related to natural events but most were human-induced incidents, including:

- January 2009 – Mehserle Shooting. Civil Disturbance. City of Oakland activated their EOC. Alameda County monitored the situation.
- May 2009 Vehicle vs Tanker truck. Gasoline spill in city of Dublin. City had partial activation. Alameda County OES monitored the situation.
- November 2009 -Takeover of Wheeler Hall, UC Berkeley. Students protested Increased Fees. Law Enforcement Mutual Aid from surrounding cities and Alameda County. UC Berkeley activated their EOC, Alameda County OES monitored the situation.
- February 27, 2010 – Chile Earthquake/Tsunami. State EOC activated. Alameda County EOC monitored the situation.
- July 8, 2010 – Mehserle Verdict. Civil Disturbance. City of Oakland activated its command post and main staging areas and requested mutual aid from other law enforcement agencies within Alameda County (including AC Sheriff's Office).
- Weather – Summer Heat and Winter Cold. During weather extremes Alameda county OES monitors the situation with cities that are affected.



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Risk Assessment

Urban Land Exposure

The County examined the hazard exposure of unincorporated Alameda County urban land based on information in ABAG's website at <http://quake.abag.ca.gov/mitigation/pickdbh2.html>. The "2005 Existing Land Use with 2009 Mapping" file was used for this evaluation (in the existing plan, the file used was "Existing Land Use in 2000").

In general, the hazard exposure of the county is increasing over time as the amount of urban land increases (In the last 5 years, 2,655 acres of land has become urban) and in some cases where new and more accurate mapping has become available. Alameda County actually reduced the acres of urban land in the 100 year flood zone over the last 5 years due to certification of several levees in the County which removed those areas from the flood plain. The following table described the exposure of urban land within the unincorporated County to the various hazards.

Exposure (acres of urban land – unincorporated area)			
Hazard	2005	2010	Change
<i>Total Acres of Urban Land</i>	33,366	36,021	2,655
Earthquake Faulting (within CGS zone)	1,594	2,054	460
Earthquake Shaking (within highest two shaking categories) ¹	17,593	18,638	1,045
Earthquake-Induced Landslides (within CGS study zone) ²	2,766	4,965	2,199
Liquefaction (within moderate, high, or very high liquefaction susceptibility)	9,095	11,212	2,117
Flooding ³ (within 100 year floodplain)	1,010	984	(26)
Flooding (within 500 year floodplain)	900	1,430	530
Landslides (within areas of existing landslides) ⁴	3,999	4,466	467
Wildfire (subject to high, very high, or extreme wildfire threat) ⁵	15,686	13,981	(1,705)
Wildland-Urban Interface Fire Threat	10,178	11,100	922
Dam Inundation (within inundation zone)	4,334	4,597	263
Tsunamis ⁶ (within inundation area)	not applicable		
Drought ⁷	33,366	36,021	2,655

¹ In large part because the Hayward, Greenville, and Calaveras fault systems run through the County.

² The California Geological Survey continues to map Alameda County and added the Livermore-Altamont area in late 2009. Though some areas of the County have not yet been completely mapped, the densely populated areas in Alameda County are mostly done.

³ The decrease of 26 acres is due to better and more accurate mapping.

⁴ The California Geological Survey continues to map Alameda County and added the Livermore-Altamont area in late 2009. Though some areas of the County have not yet been completely mapped, the densely populated areas in Alameda County are mostly done.

⁵ The decrease is due to better and more accurate mapping.

⁶ Tsunami evacuation planning maps were not available inside the San Francisco Bay in 2005. This map became available in December 2009. It should be noted that this map is not a hazard map and should be used for evacuation planning purposes only. The inundation line represents the highest inundation at any particular location from a suite of tsunami sources. It is not representative of any single tsunami.

⁷ The entire Alameda County unincorporated area is subject to drought.



County of Alameda

Infrastructure Exposure

The County also examined the hazard exposure of infrastructure within the unincorporated County based on the information on ABAG's website at <http://quake.abag.ca.gov/mitigation/pickdbh2.html>. The "Existing Infrastructure, 2004" file was used for this evaluation. It was determined that the infrastructure data did not need to be updated for this plan, but the data was re-evaluated against the newest hazard maps available.

Exposure (miles of infrastructure – unincorporated area)						
Hazard	Roadway		Transit		Rail	
	2005	2010	2005	2010	2005	2010
<i>Total Miles of Infrastructure</i>	1,524	947	11	34	38	52
Earthquake Shaking (within highest two shaking categories)	701	537	8	18	22	23
Liquefaction Susceptibility (within moderate, high, or very high liquefaction susceptibility)	333	360	2	18	21	6
Liquefaction Hazard (within CGS study zone) ¹	140	222	3	8	9	11
Earthquake-Induced Landslides (within CGS study zone) ²	50	61	1	4	1	6
Earthquake Faulting (within CGS zone)	75	59	0	2	2	2
Flooding (within 100 year floodplain)	31	10	0	0	4	1
Flooding (within 500 year floodplain)	28	46	0	0	2	1
Landslides (within areas of existing landslides)	440	116	2	5	4	7
Wildfires (subject to high, very high, or extreme wildfire threat)	1140	359	5	16	24	30
Wildland-Urban Interface Fire Threat	280	283	3	7	10	12
Dam Inundation (within inundation zone)	143	123	1	9	18	21
Tsunamis ³ (within inundation area)	not applicable					
Drought ⁴	not applicable					

¹ 1,083 miles of roadway, 3 miles of transit, and 21 miles of rail are outside the area that has been evaluated by CGS for this hazard

² The California Geological Survey continues to map Alameda County and added the Livermore-Altamont area in late 2009. Though some areas of the County have not yet been completely mapped, the densely populated areas in Alameda County are mostly done. 1,083 miles of roadway, 3 miles of transit, and 21 miles of rail are outside the area that has been evaluated by CGS for this hazard

³ Tsunami evacuation planning maps were not available inside the San Francisco Bay in 2005. This map became available in December 2009. Miles of exposed infrastructure is not an appropriate analysis for this hazard. This map is not a hazard map and should be used for evacuation planning purposes only. The inundation line represents the highest inundation at any particular location from a suite of tsunami sources. It is not representative of any single tsunami.

⁴ Miles of exposed infrastructure is not an appropriate analysis for this hazard.



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Exposure of County-Owned Buildings, Critical Healthcare Facilities, and Schools

Finally, the County examined the hazard exposure of critical health care facilities and schools located within the unincorporated County, and County-owned buildings based on the information on ABAG's website at <http://quake.abag.ca.gov/mitigation/pickcrit2010.html> and compared it to the data available from the 2005 plan year at <http://quake.abag.ca.gov/mitigation/pickcrit.html>. The County provided a list of the critical facilities it owns to ABAG. ABAG provided a detailed assessment of the hazard exposure of each of its facilities. The following number of facilities is exposed to the various hazards analyzed.



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Exposure (number of facility types)								
Hazard	Hospitals (Total County Area)		Schools (Total County Area)		County-owned bridges and interchanges (Unincorporated Area)		County-owned critical facilities (Total County Area)	
	Plan Year 2007	Plan Year 2010	Plan Year 2007	Plan Year 2010	Plan Year 2007	Plan Year 2010	Plan Year 2007	Plan Year 2010
<i>Total Number of Facilities</i>	3	4	36	53	53	54	15	22
Earthquake Shaking (within highest two shaking categories)	3	4	31	38	29	22	6	9
Liquefaction Susceptibility (within moderate, high, or very high liquefaction susceptibility)	0	3	16	28	25	4	2	10
Liquefaction Hazard (within CGS study zone) ¹	2	2	15	23	15	17	2	5
Earthquake-Induced Landslides (within CGS study zone) ²	0	4	0	43	2	34	6	11
Earthquake Faulting (within CGS zone)	0	1	0	0	2	2	0	5
Flooding (within 100 year floodplain)	1	0	1	0	3	3	0	1
Flooding (within 500 year floodplain)	1	1	0	7	0	2	0	0
Landslides (within areas of existing landslides)	0	0	0	0	4	7	2	2
Wildfires (subject to high, very high, or extreme wildfire threat)	0	0	3	3	25	25	3	9
Wildland-Urban Interface Fire Threat	0	0	16	6	10	6	2	1
Dam Inundation	0	0	4	4	8	1	0	6
Sea Level Rise (within 16 in inundation zone)	-	0	-	0	-	0	-	0
Sea Level Rise (within 55 in inundation zone)	-	0	-	0	-	0	-	0
Tsunamis ³ (within inundation area)	-	0	-	0	-	0	-	0
Drought ⁴	-	-	-	-	-	-	-	-

¹ Two county-owned critical facilities are outside the area that has been evaluated by CGS for this hazard

² The California Geological Survey continues to map Alameda County and added the Livermore-Altamont area in late 2009. Though some areas of the County have not yet been completely mapped, the densely populated areas in Alameda County are mostly done.

³ Tsunami evacuation planning maps were not available inside the San Francisco Bay in 2005. This map became available in December 2009. It should be noted that this map is not a hazard map and should be used for evacuation planning purposes only. The inundation line represents the highest inundation at any particular location from a suite of tsunami sources. It is not representative of any single tsunami.

⁴ Drought will not affect locally owned facilities directly.



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Repetitive Loss Properties

Based on FEMA data, as of March 2, 2011, and information from ABAG (refer to <http://quake.abag.ca.gov/mitigation/pickflood.html>), there are two repetitive loss properties on record for the unincorporated areas of the County (both residential). As of 2004, the County has had one repetitive loss property in the unincorporated area (residential) that was outside the floodplain.

Other Risks

The County has used HAZUS to depict in map form several additional risks, including distribution of *In Home Supportive Service* (IHSS) cases, estimated concrete, steel debris and highway damage in a Hayward fault earthquake scenario, estimated highway infrastructure damage in a Hayward fault earthquake scenario, estimated impaired hospitals in a Hayward fault earthquake based on hospital beds and highway functionality. These maps, attached as Exhibit C, are used by the Sheriff and Fire Departments for emergency planning purposes. ABAG has evaluated hospitals and infrastructure which are located in areas of high shaking and given that information to the county for each facility. The data is summarized in the Risk Assessment section of this annex.

The County plans to work with ABAG to develop specific information about the kind and level of damage to buildings, infrastructure, and critical facilities which might result from any of the hazards previously noted.

National Flood Insurance Program

The Alameda County PWA Flood Control District (PWAFCDD) has participated in the National Flood Insurance Program since 1981. Since 1992, the County has also participated in the Community Rating System and is currently rated Class 7. The County is striving to reach the highest possible rating under the Community Rating System by undertaking additional studies and/or programs such as floodplain analysis and delineation, and rainfall and stream flow monitoring, in addition to complying with all FEMA NFIP requirements.

In June of 2009, the County entered into an agreement with FEMA to become a FEMA Cooperating Technical Partner. PWAFCDD has developed a cooperative relationship with FEMA allowing for the sharing of hydrologic/hydraulic data for flood insurance rate maps and detailed topographic data for floodplain map modernization and map corrections.

The PWAFCDD's dedicated participation in the program beyond the standard requirements of NFIP's Floodplain Management means property owners of the unincorporated areas of the County who are located within FEMA-designated Special Flood Hazard Areas have been qualified by FEMA for a reduction in their flood insurance premium.



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The PWAFCDD's currently uses FEMA digital flood insurance rate maps available on the ABAG website at: <http://www.abag.ca.gov/bayarea/eqmaps/eqfloods/floods.html>. In addition, the County also uses PWAFCDD's hydrology and hydraulic studies. Both sources of information are used to assess the flood risk potential that may impact new development.

Alameda County has several existing mitigation strategies aimed at reducing flood losses:

- ◆ Balance the housing needs of residents and the need for private commercial and industrial development against the risk from potential flood-related hazards. (HSNG-h-2, ECON-f-2)
- ◆ Ensure that new private development pays its fair share of improvements to the storm drainage system necessary to accommodate increased flows from the development, or does not increase runoff by draining water to pervious areas or detention facilities. (HSNG-h-3, ECON-f-3)
- ◆ Apply floodplain management regulations for private development in the floodplain and floodway. (HSNG-h-6, ECON-f-6)
- ◆ Ensure that new subdivisions are designed to reduce or eliminate flood damage by requiring lots and rights-of-way be laid out for the provision of approved sewer and drainage facilities, providing on-site detention facilities whenever practicable. (HSNG-h-7)
- ◆ Encourage home and apartment owners to participate in home elevation programs within flood hazard areas. (HSNG-h-8)
- ◆ Require an annual inspection of approved flood-proofed privately-owned buildings to ensure that (a) all flood-proofing components will operate properly under flood conditions and (b) all responsible personnel are aware of their duties and responsibilities as described in their building's Flood Emergency Operation Plan and Inspection & Maintenance Plan. (ECON-f-9).

Mitigation Goals and Objectives

The goal of the ABAG MJ-LHMP is to maintain and enhance a disaster-resistant region by reducing the potential for loss of life, property damage, and environmental degradation from natural disasters, while accelerating economic recovery from those disasters. This goal remains unchanged for the 2010 plan.



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In addition, the County has the specific objective of reducing the number of public and private buildings within the County that are vulnerable to the effects of earthquakes.

Mitigation Activities and Priorities

Evaluation of Progress from the 2007 Annex

In 2006 and 2007, mitigation actions and priorities were identified and incorporated into the 2007 County Annex. The attached list, *Status of 2007-2010 Mitigation Projects*, Exhibit D in the Alameda County 2010 Annex, indicates each of the strategies identified, along with responsible party, action taken, and current status, or result, of mitigation activities undertaken in the previous plan period.

Given that the development of the 2007 Annex was a public process, implementation of the mitigation strategies from that plan also engaged the public. For example, the County's Public Works Agency (PWA) conducted project information meetings to inform the public of the mitigation projects (see Appendix D) and posted project information on the Agency's website. Project information sheets were also mailed to the community in the immediate areas. For projects along Alameda Creek which impacted the Alameda Creek Regional Trail, the East Bay Regional Parks District also posted project information on their website as well.

PWA also engages in Community Rating System outreach efforts on a regular basis. Every year a letter containing information on the National Flood Insurance Program is sent to property owners and renters living within the Special Flood Hazard Areas, as well as to those in the immediate vicinity. When FEMA published the new Flood Insurance Rate Maps in 2009, that information along with the maps' effective dates were also disseminated to the public. Yearly notifications as well as informational brochures are also distributed to local insurance companies, lending institutions, real estate offices and libraries.

For Mitigation projects and activities that were not listed in the 2007 Annex but developed later, public input is also sought. For instance, on a regular basis the Public Health Emergency Planning Coordinator and the Health Officer and others involved in emergency preparedness participate in numerous emergency preparedness planning groups. These groups include internal partners in addition to the public, private, governmental and nongovernmental constituents.

Future Mitigation Actions and Priorities

As a participant in the 2010 ABAG multi-jurisdictional planning process with other jurisdictions, the staff of Alameda County assisted in the development and review of the comprehensive list of mitigation strategies in the overall ABAG multi-jurisdictional plan (**Exhibit F**). The decision on



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priority was made based on the STAPLEE criteria, not simply on an economic cost-benefit analysis. These criteria include being socially appropriate, technically and administratively feasible, politically acceptable, legal, economically sound, and not harmful to the environment or our heritage.

Upon completion of ABAG's regional process the County Planning team, utilizing the three-tiered structure noted earlier (see the *Local Planning Process* section) met on a regular basis to review and prioritize specific mitigation tasks for Alameda County in the current plan period (2010-2015). Disaster Mitigation Teams from within the various agencies nominated projects to be included on the list, which were then evaluated by members of the Working Group and senior management members of the Executive Committee. This list, *2010-2015 Mitigation Projects (Exhibit E)*, includes implementation process, funding strategy, and approximate time frame. Prioritization of the specific mitigation tasks was done using the STAPLEE criteria and then submitted to County Agency Directors and the County Administrator's Office for review and approval. All of the tasks identified appear to have benefits that outweigh the costs of implementation. The draft priorities will be provided to the County Board of Supervisors for adoption pending approval of this LHMP Annex by FEMA.

On-Going Mitigation Strategy Programs

The County has many on-going mitigation programs which help create a more disaster-resistant region. The following list highlights those programs identified as *Existing Programs* in the mitigation strategy spreadsheet. Others are on-going programs that are currently underfunded. It is the County's priority to find additional funding to sustain these on-going programs over time.

- Vulnerability assessments of County facilities and infrastructure (GOVT-a-1) – Ongoing, but underfunded;
- Non-structural mitigation for building contents (GOVT-a-4) – Underfunded;
- Installation of micro and/or surveillance cameras at critical public assets tied to web-based software (GOVT-a-6) – Ongoing, but underfunded;
- The County continues to develop interoperability of communications for first responders via the East Bay Regional Communications Systems and the Communications Interoperability Plan, and coordinates these activities with the State of California. (GOVT-c-7) – Ongoing;
- The County operates under the auspices of SEMS and provides ongoing training for staff when appropriate. (GOVT-c-12) – Ongoing;
- The County operates under the auspices of the Mutual Aid Agreement. (GOVT-c-13);



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- The County PWA is going through a FEMA accreditation process for its levees. Part of this process has included the geotechnical evaluation of the levees to determine their stability. The County has received funds from the California Department of Water Resources to help offset the cost of this work. Actual levee rehabilitation work began this year (2010) at 4 locations along the Alameda Creek and Lines B and C (Zone No. 6) levees. Along the creek, work has been already completed at two locations, a third is expected to be completed in the Summer of 2011, and a fourth in 2012. Zone 6 work, started as a 3-phase project in 2009, is nearly finished and scheduled for completion in 2011. During the geotechnical evaluation of the County's levee system, these locations were determined to be at risk. This work is expected to be completed in 2012. (Infra-b-2);
- The County conducts watershed analysis to predict areas of insufficient capacity in the storm drain and natural creek systems (INFR-d-1, INFR-d-2, INFR-d-3);
- The County continues to make repairs and structural improvements to the storm drain system as needed to ensure their adequacy to convey the design stormwater flows. (INFR-d-6, INFR-d-7);
- Alameda County participates in FEMA's National Flood Insurance Program and works to reduce flood risk. (GOVT-d-5) ;
- The County has updated the Grading Ordinance (HSNG-h-2, ECON-g-2);
- The County conducts training for Community Emergency Response Teams 6 times a year (GOVT-c-3, ECON-J-5, HSNG-K-6);
- The County has developed Family Plan Templates and posted information on the Public Health website for public and private preparedness for health emergencies (HEAL-a-7);
- Annual inspections of the County's three dams are conducted by the State Division of Safety of Dams. Annual inspection reports are then provided to the County. In addition, the County submits to the State Division of Safety of Dams semi-annual status reports for Cull Creek Dam. This dam has been determined to be at risk during a seismic event. Presently, the County does not have funds available for dam upgrades. In the interim, until funding is secured, a discharge pipe has been added to the outlet works to lower the lake level to reduce flood hazard due to dam failure. (Infra-a-2, Infra-a-13, Infra-b-5).



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Incorporation into Existing Planning Mechanisms

The County has a number of planning and operational mechanisms which have had disaster and mitigation concepts incorporated into their development in order to ensure that disaster awareness and mitigation becomes embedded in standard County practice. For example:

- ◆ **Alameda County Capital Improvements Plan (CIP):** In order to meet its service and facility requirements in the most responsive and efficient manner possible, the County GSA developed the CIP to identify the County's capital needs and provide a method through which the County can take a planned and programmed approach to development. It is a 5-year projection that indicates timing and estimated cost as well as identifying responsible parties and stakeholders. It is updated annually and includes a number of structural mitigation projects, including the *Highland Hospital Acute Tower Replacement* and the *Peralta Oaks Seismic Retrofit and Reassignment to Sheriff and Healthcare* (see Exhibit E).

- ◆ **Alameda County Climate Action Plan:** Recognizing the need to take action now to protect our climate in order to maintain the quality of life in our communities, the Alameda County's Board of Supervisors directed County staff to develop a comprehensive climate protection strategy. The resulting Climate Action Plan provides the blueprint for meeting our greenhouse gas (GHG) reduction goals through specific policies, programs, and actions. Working in conjunction with other local governments, businesses, and residents the Climate Action Plan is comprised of two parts - one covering the unincorporated private sector communities in Alameda County and the other covering County government operations and services. By taking specific steps to reduce our GHG emissions, such as updating mitigation and emergency operations plans related to climatic issues, the County's long-term goal is to reduce our impact on the climate to mitigate against the following:
 - Flooding from sea level rise and increased storm intensities that would otherwise have an impact on local buildings and infrastructure;
 - Water shortages from summer droughts that will impact residential, commercial, and agricultural water users;
 - Increased risk of wildfires from drier conditions;
 - Community health impacts from warmer temperatures that allow tropical and subtropical diseases to spread.

In addition to the comprehensive strategies in the *Climate Action Plan*, the County has also embarked on complementary initiatives such as the multi-jurisdictional *County and City Climate Coordination* initiative and the nationwide *Cool Counties* initiative (Alameda County is a founding member). The intent is to work with other local



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governments across the region and nation to address climate change in our communities. See the County's website for more information at <http://acgov.org/sustain/what/climate/index.htm>.

Since October 2010, PWA-FCD is also an active participant in a new state program, the "Adapting to Rising Tides" (ART) project which is managed and organized by the San Francisco Bay Conservation and Development Commission (BCDC) in partnership with the National Oceanic and Atmospheric Administration Coastal Services Center (NOAA CSC). The purpose is to examine how sea level rise and other climate change will affect the future of Bay Area communities, ecosystems, infrastructure, and economy. The ART project is working with Bay Area communities to:

- Identify current and future vulnerabilities within a sub-region of the Bay Area.
- Evaluate strategies and tools to support community-based adaptation planning.
- Use the lessons learned to develop a regional adaptation planning process.

The goal of the ART project is to increase the preparedness and resilience of Bay Area communities to sea level rise and other climate change impacts while protecting ecosystem and community services

- ◆ **Alameda County Strategic Visioning:** This "broad brush" planning process, which includes senior management and elected officials, first occurred in 2006 and was last updated in 2008. The intent was to chart the County's path and its environmental and economic sustainability over the course of the next 5 years. The plan is a multi-year, comprehensive and far-reaching roadmap for our County with five strategic priorities identified as follows: (1) Environment / Sustainability, (2) Safe and Livable Communities, (3) Healthy and Thriving Populations, (4) Housing, and (5) Transportation. Included in this planning process were natural hazards and their impact in item 2, the *Safe and Livable Communities* section. See the County's website for more information at <http://acgov.org/strategic.htm>
- ◆ **Multi-agency incorporation of mitigation and preparedness concepts into day-to-day operations:** Mitigation planning and cross referencing of the current mitigation plan with daily operations is done to enhance disaster resiliency in various planning efforts as well as in the design, procurement, construction, and maintenance of County facilities and infrastructure. For example...
 - *Corrective Maintenance Inspection and Repair:* As noted above in "On Going Mitigation Strategies Programs", Alameda County's Building Maintenance Department conducts a variety of non-structural mitigation projects as part of its normal operation and maintenance of facilities. This includes, for example, the



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bracing and retrofitting of equipment, shelves, cabinets, and piping to make them less susceptible to damage from earthquakes.

- *Inter-Agency Coordination for Private and Public Sector Development:* The Planning Department of Alameda County's Community Development Agency routinely refers projects under consideration for discretionary approval to the Alameda County Public Works Agency, Flood Control and Water Conservation District, and the Fire Department for review and comment to ensure consistency with various ordinances, including but not limited to the Building, Grading, and Watercourse ordinances.
- *The Safety Element in the County's General Plan:* This includes a discussion of fire, earthquake, flooding, and landslide hazards. This plan was adopted as an implementation appendix to the Safety Element. In addition, the County enforces the requirements of the California Environmental Quality Act (CEQA), which, since 1988, requires mitigation for identified natural hazards. The Safety Element of the Alameda County General Plan was updated in 2010 in accordance with the California Disaster Assistance Act. Another update is anticipated to begin in 2011.
- *Building Code Ordinance:* Imposes design standards to increase the ability of buildings to better withstand the forces of earthquakes so as to minimize loss of life and property.
- *Grading Ordinance:* Requires grading activities do not create or enhance soil instability, landslides, or erosion.
- *Watercourse Ordinance:* Imposes setbacks on new developments to prevent or lessen the likelihood of property damage due to flooding and to ensure that new creek side development does not occur on unstable creek bank areas.

The County has used these pre-existing programs as a basis for identifying gaps that may lead to disaster vulnerabilities in order to work on ways to address these risks through mitigation.

Plan Update Process

The County General Services Agency will ensure that monitoring of this Annex during the 5-year period will occur. The plan will be monitored on an on-going basis, with members of the Working Group meeting 3 to 4 times a year to ensure ongoing implementation of the mitigation strategies and for coordination with other agencies and departments on specific projects. However, the major disasters affecting our County, legal changes, notices from ABAG as the lead agency in this process, and other triggers will be used. Finally, the Annex will be a



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discussion item on the agenda of the meeting of Department leaders at least once a year in April. At that meeting, the department heads will focus on evaluating the Annex in light of technological and political changes during the past year or other significant events. The Department leaders will be responsible for determining if the plan should be updated.

The County is committed to reviewing and updating this plan annex at least once every five years, as required by the Disaster Mitigation Act of 2000. The County General Services Agency Director will contact ABAG four years after this plan is approved to ensure that ABAG plans to undertake the plan update process. If so, the County again plans to participate in the multi-jurisdictional plan. If ABAG is unwilling or unable to act as the lead agency in the multi-jurisdictional effort, other agencies will be contacted, including the County's Office of Emergency Services. The County will then determine if it will work together with other local jurisdictions to identify another regional forum for developing a multi-jurisdictional plan or develop its own mitigation plan.

The public will continue to be involved whenever the plan is updated and as appropriate during the monitoring and evaluation process. Prior to adoption of updates, the County will provide the opportunity for the public to comment on the updates. A public notice will be posted prior to the meeting to announce the comment period and meeting logistics. In addition, given the lack of response from the public in this and previous plans, the County is exploring alternative means of communication and outreach. Among the ideas being considered for the 2015 Annex update are the following:

- County Library System: Educational displays at Libraries throughout the county complete with forms for resident input can provide another venue for residents to participate in the development of the plan.
- County PIO: Partner with the County Public Information Officer to tap into pre-existing channels of communication.
- Existing Community Forums: Participate in Regional Community Advisory Groups, Town Hall meetings at Board of Supervisor districts, and other pre-existing public forums to inform residents about mitigation and how they can get involved.
- Transit Organizations: Display information posters at key transit centers, such as Bay Area Rapid Transit stations, bus stations, and similar types of facilities.



County of Alameda

Mitigation Plan Point of Contact

Mitigation Plan Point of Contact

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Exhibit B – Public Meeting Announcements

(Internet Posting, original text, Sep 2009)

LOCAL HAZARD MITIGATION PLAN

Major natural disasters strike the United States every year causing deaths and injuries to our residents and billions of dollars in property damage. Hurricanes, tornadoes, wildfires, floods, and earthquakes are some of the most common natural disasters we face. We know that the Bay Area will most likely suffer the effects of a major disaster in the coming years.

Disasters are not just events in a single point of time either. Rebuilding and recovery efforts last for many years, sapping the vitality out of local economies by diverting resources from other public and private endeavors. Disasters also have significant impacts on landfills and the environment, as enormous amounts of energy and natural resources are required to rebuild. This in turn stretches our landfills to their limits with the extensive amounts of debris and reconstruction waste generated.

Given the trend towards ever-increasing impacts of natural and human-induced disasters, experts in both the public and private sectors began promoting the concept of pre-disaster mitigation planning. Defined as “sustained activities to reduce or eliminate long-term risk to people and property from hazards and their effects”, its purpose is to reduce the potential loss of life, property damage, and environmental degradation from natural disasters and minimize the time and cost of response and recovery.

In light of these developments, the Disaster Mitigation Act of 2000 (Public Law 106-390) was signed into law by President Clinton in October of 2000. It reinforces the importance of mitigation activities at the local government level and emphasizes planning for disasters before they occur. As such, DMA 2000 enshrines pre-disaster hazard mitigation planning as its central core and has requirements for national post-disaster mitigation programs as well. The Act requires all state and local governments to develop a plan based on FEMA guidelines. Key components of a mitigation plan include hazard identification, asset inventory, risk analysis and loss estimation, and a plan to reduce the effects the identified hazards will have. In addition, these plans must be updated periodically with public input.

The following information and links show how Alameda County is working with the Association of Bay Area Governments (ABAG) and other local jurisdictions to update the current plan via ABAG’s multi-Jurisdictional Local Hazard Mitigation Plan (MJ-LHMP) for the Bay Area.

Public input for Alameda County’s plan is encouraged. As such, a public meeting to discuss Alameda County’s mitigation strategies will be held on **September 28** from 6pm to 8 pm at 1401 Lakeside Drive, Conference Room 1107, 11th Floor, in Oakland. Here is a map to the location:

<http://maps.yahoo.com/#mvt=m&lat=37.801157&lon=-122.262897&z=17&q=1401%20Lakeside%20Drive%2C%20oakland%20ca>.



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- To view the mitigation strategy priorities Alameda County is considering, follow this link <http://quake.abag.ca.gov/mitigation/resources.html> and click on “New City and County Template.”
- <http://www.fema.gov/plan/mitplanning/index.shtm>
- To learn more about the State of California’s FEMA-approved mitigation plan, see http://hazardmitigation.calema.ca.gov/plan/state_multi-hazard_mitigation_plan_shmp
- To see Alameda County’s current FEMA-approved plan that was part of ABAG’s multi-jurisdictional effort, see <http://quake.abag.ca.gov/mitigation/plan.html> . Scroll down to “Alameda County Local Governments” and click on Alameda County’s “Annex” and “Resolution.”
- To see ABAG’s informative power point presentation on mitigation, click on this link: <http://quake.abag.ca.gov/mitigation/resources.html> and scroll down to **NEW 2009 SAMPLE PowerPoint Slide Show** on LHMP and Development of LOCAL Mitigation Strategy Priorities.

(Copy of internet post inviting public input via phone and email – 2 pages; 10/12/10 thru 10/19/10)



County of Alameda



Alameda County's Official Website

Quick Links Citizens Business Government Emergencies

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Online Services

Online Payments

- Birth, Death, Marriage Certificates
- Business Licenses
- Central Collections Web Pay
- Public Records Copies
- View or Pay Property Taxes
- Traffic Tickets
- Wells Drilling Permit

LIVE! Audio/Video Broadcasts

- Board of Supervisors Meetings
- Planning Commission Meeting

Video

- Importance of Libraries
- Santa Rita Jail Photovoltaic Project
- Voting Videos

Maps

- Election Results Maps
- Board of Supervisors Map
- Community Based Services
- County Geospatial Data Files
- Local Oversight Program (LOP)
- Records
- Restaurant Inspection Results

Other Services

- Criminal Docket Finder
- Website Survey
- Inmate Locator
- Property Assessment
- Jury Reporting Instructions
- Supplemental Tax Estimator
- Lookup Fictitious Business Names
- Lookup Public Records
- Street Lighting - Questions / Concerns
- GSA Business Outreach Events
- District 5 Community Events
- Redevelopment Meetings
- CDA Planning Meetings
- Fire Department Events
- More online services...

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We Need Poll Workers!!

Alameda County needs poll workers for the November 2, 2010, General Election. Poll Workers are the backbone of our election system. It's an enjoyable and rewarding way to be part of our free democratic process. Apply online today!



Hazard Mitigation Planning

Major natural disasters strike every year causing deaths and injuries and billions of dollars in damage to property and infrastructure. We know the Bay Area may suffer the effects of a major disaster in the coming years, so preparing now for whatever may come is the surest means of reducing the risks we all face. Learn more and participate in helping Alameda County become more prepared.



Historic Halls Available For Special Events

Rent rooms of various sizes and capacities that are reasonably priced and ideal for: Graduation Parties, Weddings, Receptions, Banquets, or Quinceañeras.



Your County Government

- Board of Supervisors
- County Administrator's Office
- Departments & Agencies
- Fair Political Practice Ticket Reporting Information
- County Budget

Green Corner

Sustainability Website

Alameda County Community Climate Action Plan

Learn more...



Doing Business With Us

- Small, Local & Emerging Business Program
- County Contract Compliance System: Elation
- Office of Acquisition Policy
- Awarded/Closed Contracts
- Current Contracting Opportunities
- Upcoming Contracting Opportunities
- Sole Source Procurements
- Vendor Application

Popular Forms

County standard file format is Portable Document Format (PDF). Free Adobe Reader is required.

- Fictitious Business Name Statement
- Informal Request for "Decline in Market Value" Reassessment
- Unrestricted Copy of a Birth Certificate
- Preliminary Change of Ownership Report
- Application For Changed Assessment
- More forms...





County of Alameda



Alameda County's Official Website

Quick Links Citizens Business Government Emergencies

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Alameda County Hazard Mitigation Planning

Major natural disasters strike the United States every year causing deaths and injuries to our citizens and billions of dollars in damage to property and infrastructure. Wildfires, floods, and earthquakes are some of the most common natural disasters we face. We know the Bay Area may suffer the effects of a major disaster in the coming years, so preparing now for whatever may come is the surest means of reducing the risks we all face.

Alameda County Local Hazard Mitigation Plan

The rebuilding and recovery efforts following a disaster can last for many years, sapping the vitality out of local economies by diverting resources from other public and private endeavors. Disasters also have significant impacts on landfills and the environment, as debris is generated and enormous amounts of energy and natural resources are required to rebuild. This in turn stretches our landfills to their limits.



photo by LT. Craig Byron

Given the trend towards ever-increasing impacts of natural and human-induced disasters, experts in both the public and private sectors began promoting the concept of *pre-disaster mitigation planning*. Defined as "sustained activities to reduce or eliminate long-term risk to people and property from hazards and their effects", the purpose of mitigation planning is to reduce the potential loss of life, property damage, and environmental degradation from natural disasters as well as minimize the time and cost of response and recovery.

In light of these developments, the Disaster Mitigation Act of 2000 (Public Law 106-390) was signed into law by President Clinton in October of 2000. It reinforces the importance of mitigation activities at the state and local government levels and emphasizes planning for disasters *before they occur*. As such, DMA 2000 enshrines pre-disaster hazard mitigation planning as its central core idea and has requirements for national post-disaster mitigation programs as well. The Act requires all state and local governments to develop a plan based on FEMA guidelines. Key components of a mitigation plan include hazard identification, asset inventory, risk analysis, loss estimation, and a plan to reduce the effects the identified hazards will have. In addition, these plans must be updated periodically with public input.

The following information and links show how Alameda County is working with the Association of Bay Area Governments (ABAG) and other local jurisdictions to update the current plan via ABAG's Multi-Jurisdictional Local Hazard Mitigation Plan (MJ-LHMP) for the Bay Area.

Public input for Alameda County's plan Annex is encouraged. As such, citizens are encouraged to review the documents herein and provide their comments and suggestions. To view the County's 2010 Draft Annex and the mitigation strategy priorities we are considering, follow this link... <http://quake.abag.ca.gov/mitigation/local-materials.html> ...and then follow the link that says Alameda County Draft.

All comments on the Annex should be directed to Michael E. Cadrecha by email or by phone at 510-208-9589.

For general information on mitigation planning, here are some interesting links...

To learn more about pre-disaster mitigation planning, visit FEMA's website at <http://www.fema.gov/plan/mitplanning/index.shtml>

To see the State of California's FEMA-approved mitigation plan, see http://hazardmitigation.ca.gov/plan/state_multi-hazard_mitigation_plan_shmp

To see Alameda County's current FEMA-approved plan from 2007, see <http://quake.abag.ca.gov/mitigation/plan.html>. Scroll down to "Alameda County Local Governments" and click on Alameda County's "Annex" and "Resolution."

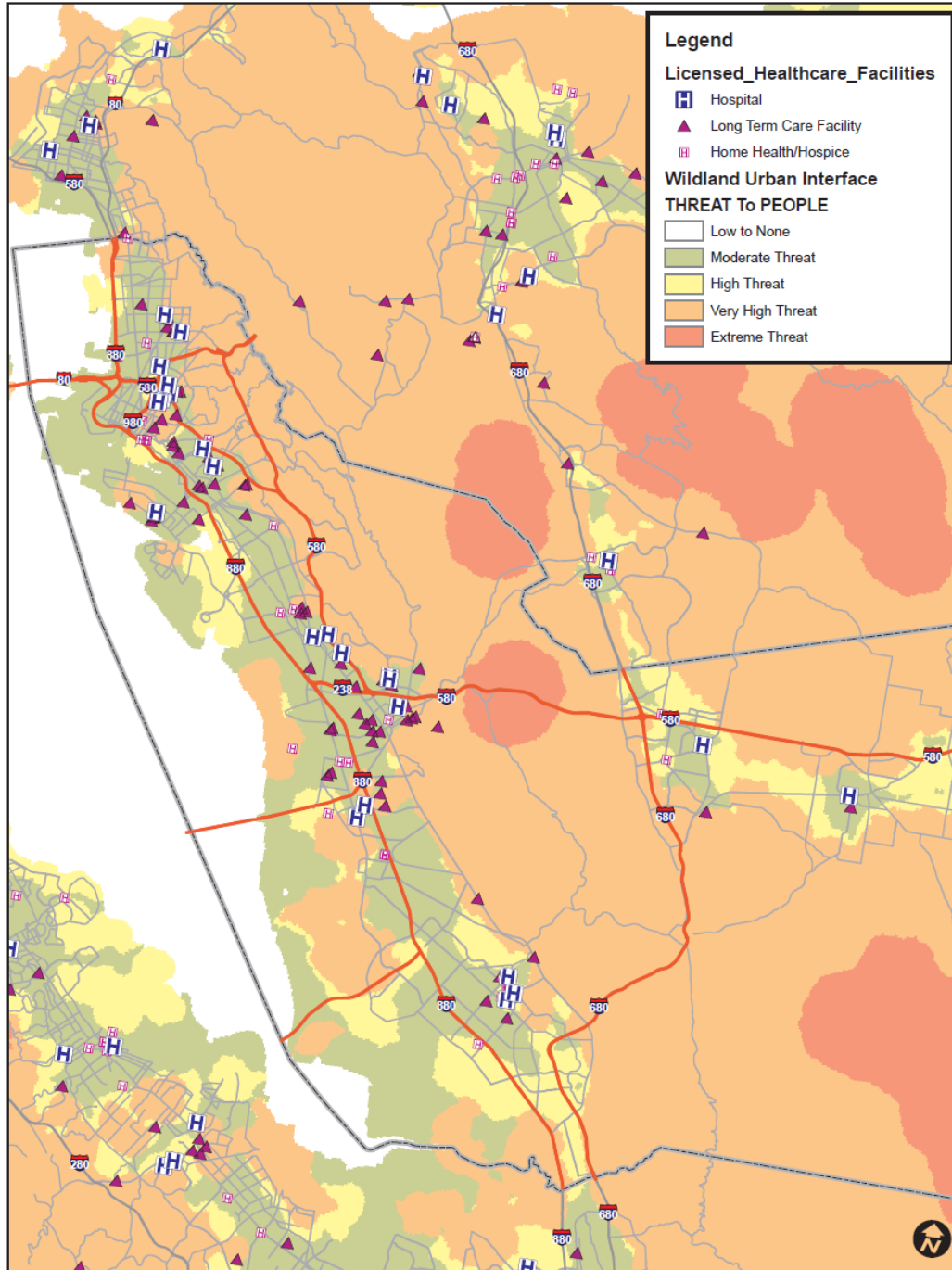
For a summary list of ABAG's Regional Mitigation Strategies upon which the County's strategies are based, click on this link: <http://quake.abag.ca.gov/mitigation/ThePlan-G-Version-August10.pdf> (PDF - 214kb) *

* Portable Document Format (PDF) file requires the free [Adobe Reader](#).



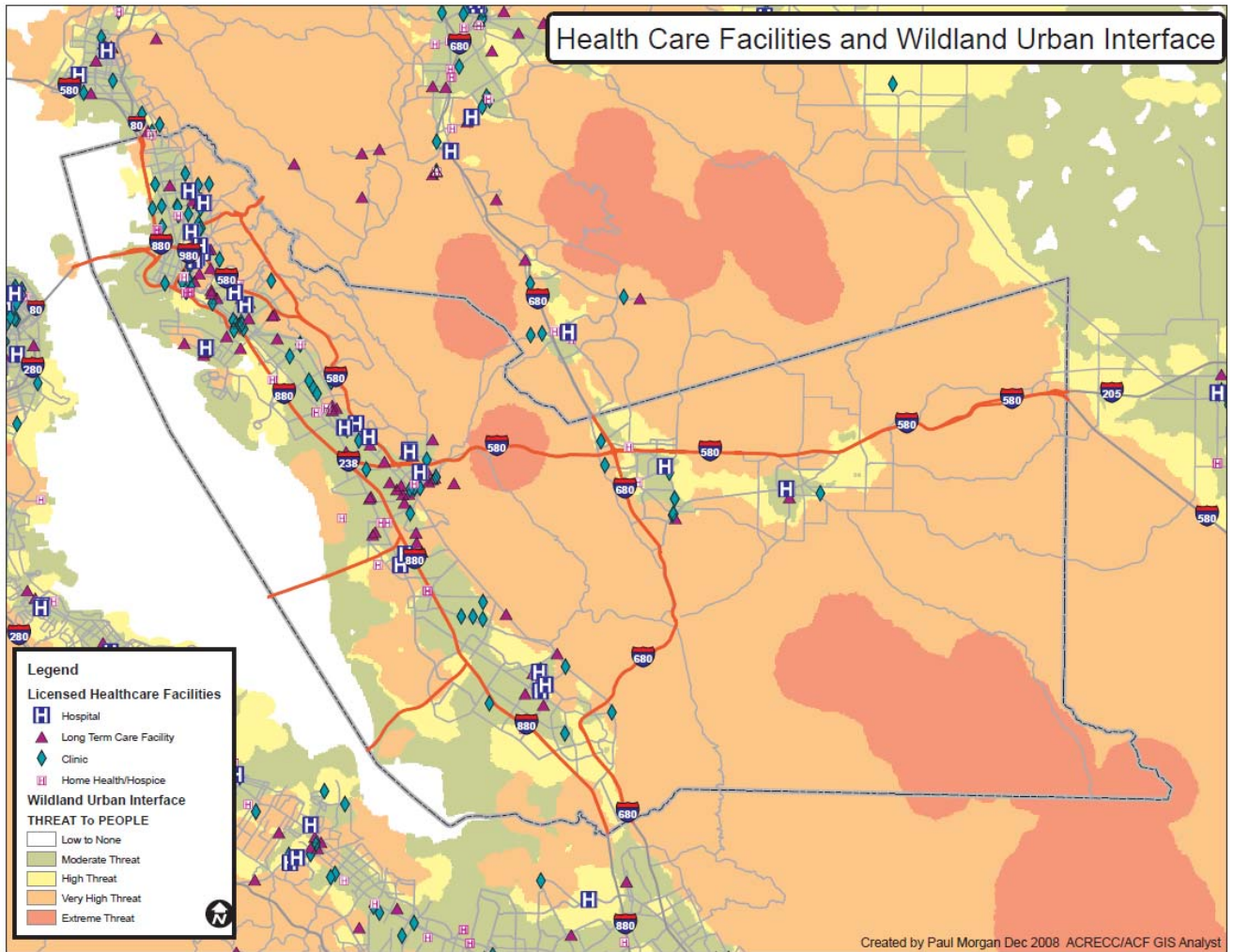
County of Alameda

Exhibit C – Additional Maps



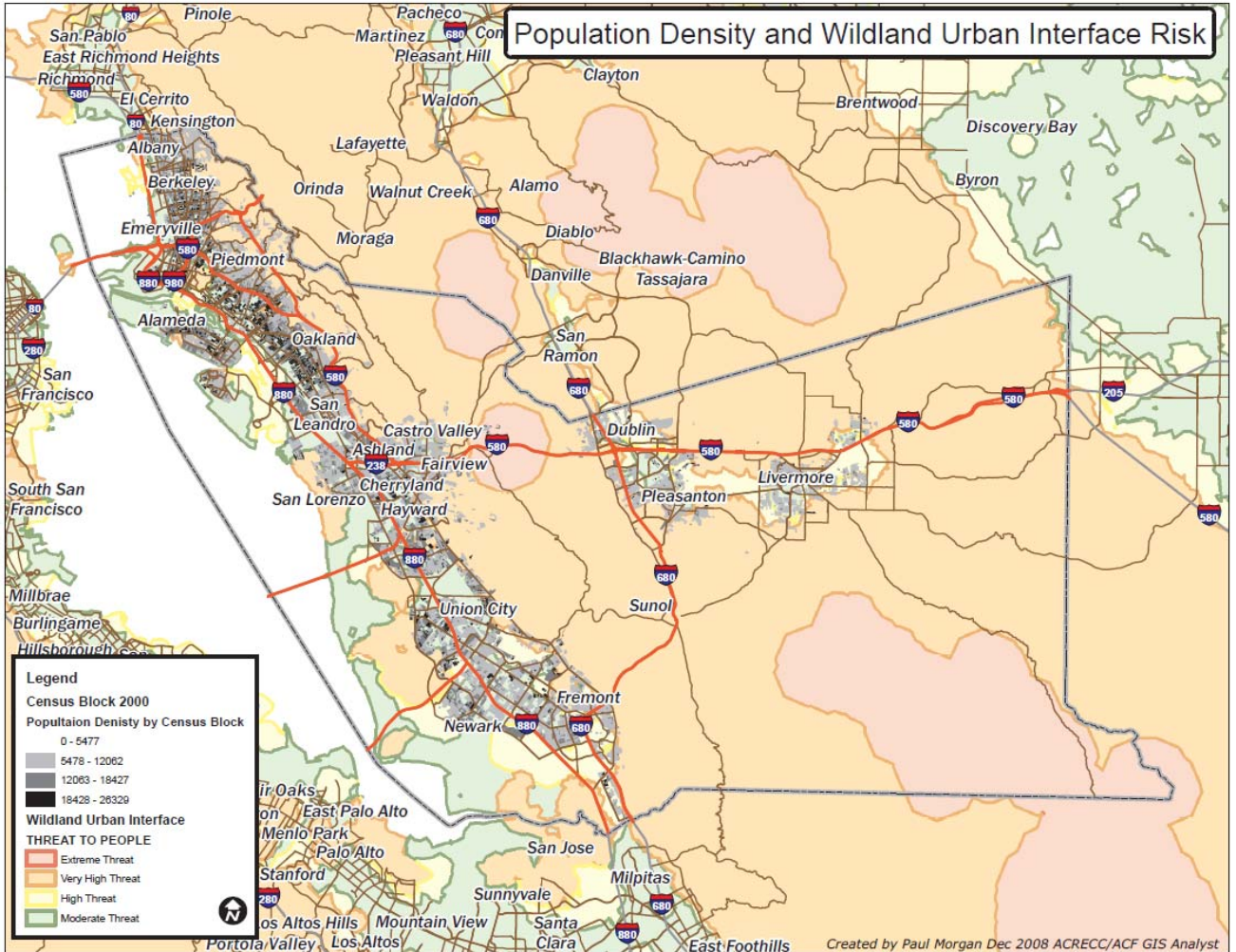


County of Alameda





County of Alameda





County of Alameda

Exhibit D – Evaluation of Mitigation Progress from 2007 Plan

No.	Mitigation Project	2010 MJ-LHMP Strategy Number	Responsible Agency	Action Taken	Status	Comments
1	Seismically Retrofit 3 Fire Stations	GOVT-a-2	GSA and ACFD	Submitted NOI to apply for ARRA (American Recovery and Reinvestment Act of 2009, or "the stimulus") July 2010 for FS 25.	ARRA grant ("stimulus") application not awarded in 2010.	Retrofit FS 24 (old #3), 25 (old #4), & 7 per Seismic Study dated September 2000.
2	Construct 4 new Replacement Fire Stations	GOVT-a-3	GSA and ACFD	Applied for ARRA 2009 Federal Grant	Not funded	Replace FS 22 (old #1), 23 (old #2), & 26 (old #5), and 8 per Seismic Study dated September 2000
3	Pre-Disaster Planning	GOVT-b-2	All Departments	underway	Planning Phase	Develop pre-disaster plans such as COG / COOP Plans, and Post-Disaster Recovery plans.
4	Upgrade the levee system	INFR-b-2	PWA	Underway	Planning grant awarded for design, design complete	Upgrade to Alameda Creek levee system -- construction starts in early August 2010.
5	Conduct a watershed analysis of runoff and drainage systems to predict areas of insufficient capacity in the storm drain and natural creek system.	INFR-d-1, INFR-d-2, INFR-d-3	PWA Flood Control District	Underway	Awarded	Completed Zone Nos. 3A and 4; awarded contract for Zone No. 6; Zone Nos. 2, 2A, 5, 9, 12 & 13 still in planning stage.
6	Continue to repair and make structural improvements to storm drains, pipelines, and/or channels to enable them to perform to their design capacity in handling water flows as part of regular maintenance activities	INFR-d-6, INFR-d-7	PWA Flood Control District	underway	ongoing program	This is financed via County funding.
7	Conduct an inventory of existing or suspected soft-story residential, commercial and industrial structures	HSNG-c-4, ECON-b-4	PWA	On Hold	Awaiting for funding	Due to lack of funding and staff resource, this project has been put on hold.



County of Alameda

8	Inventory non-ductile concrete, tilt-up concrete, and other privately-owned structurally suspicious buildings	HSNG-e-2, ECON-d-1	PWA	On Hold	Awaiting for funding	Due to lack of funding and staff resource, this project has been put on hold. This item will be merged with Item #7 for 2010 project.
9	To reduce flood risk, and thereby reduce the cost of flood insurance to property owners, work to qualify for the highest-feasible rating under the Community Rating System of the National Flood Insurance Program	HSNG-h-1, ECON-f-1	PWA Flood Control District	Ongoing	Class 7.	At current class level, 15% reduction for area residents. Should reach Class 6 in the next year or two. Ongoing work in this area is a County standard operating procedure.
10	Increase efforts to reduce landslides and erosion in existing and future development through continuing education of design professionals on mitigation strategies	HSNG-i-2, ECON-g-2	CDA and PWA	Reviewed & enhanced development processes implementing State and Local Ordinances. Developed guidelines for earthwork to reduce erosion and landslide.	DONE	Procedures are in place to enhanced the enforcement of Seismic Hazards Map Act, Alameda County Grading and Erosion Control, and watercourse protection ordinances in the development processes by coordinating with BID and CDA to advise developers and design professionals in the land use entitlement processes to evaluate developments in compliance with regulations. The 1978 Alameda County Grading Ordinance has been updated and was adopted by the County Board of Supervisors (O-2010-19) on May 4, 2010
11	Incorporate FEMA guidelines and suggested activities into local government plans and procedures for managing flood hazards	LAND-c-2	PWA Flood Control District	FEMA flood design guidelines has been incorporated into development process and building permit processes	Ongoing	Procedures are in place to track each building permit and development project in flood zone to ensure proposed project is in compliance with FEMA flood design guidelines and ASCE Standard 24-05 for flood design.
12	Establish and enforce regulations concerning new construction (and major improvements to existing structures) within flood zones in order to be in compliance with federal requirements and, thus, be a participant in the Community Rating System of the National Flood Insurance Program	HSNG-h-7	PWA Flood Control District	FEMA flood design guidelines has been incorporated into development process and building permit processes	Ongoing	Procedures are in place to track each building permit and development project in flood zone to ensure proposed project is in compliance with FEMA flood design guidelines and ASCE Standard 24-05 for flood design. (Same as Item 11 above)



County of Alameda

13	Sponsor the formation and training of Community Emergency Response Teams (CERT) through partnerships with local businesses	GOVT-c-3, ECON-j-5, HSNG-k-6	ACFD	CERT program established in 2007	ongoing program	Conduct on average 3 classes/year in district
14	Assist businesses in the development of defensible space through the use of, for example, "tool libraries" for weed abatement tools, roadside collection and/or chipping services (for brush, weeds, and tree branches) in wildland-urban-interface fire-threatened communities or in areas exposed to high-to-extreme fire threat	ECON-e-1, HSNG-g-1, HSNG-g-4	ACFD		Deferred.	
15	Develop printed materials, utilize existing materials (such as developed by FEMA and the American Red Cross), conduct workshops, and/or provide outreach encouraging employees of these critical health care facilities to have family disaster plans and conduct mitigation activities in their own homes	HEAL-a-7	PHD	Family plan templates developed and posted on PH website.	ongoing	PH website is being redesigned to include additional resources for public and private agencies. Public Health emergency preparedness program has moved to all hazards planning and response.
16	Continue to develop response plans, exercises, and tools for public and private stakeholders to respond to natural and man made disasters.	HEAL-a-7	PHD	Ongoing	ongoing program	The County's Public Health Dept participates in numerous emergency preparedness planning groups. These groups include internal partners in addition to various public and private sector organizations and constituents. Alameda County BT/Public Health Emergency Response Program is recognized by the CDC and state for its innovative ideas and tool development. Currently products are shared with other health departments in the region.



County of Alameda

Exhibit E – Future Mitigation Projects

No.	Mitigation Project	2010 M-J-LHMP Strategy Number	Applies to New or Existing Assets	Primary Hazard Mitigation Target	Responsible Agencies	Implementation	Estimated Cost	Anticipated Funding Sources	Anticipated Schedule	Comments
1	Seismically Retrofit 3 Fire Stations	GOVT-a-2	Existing	Earthquake	GSA and ACFD	Seismic study completed which identified those fire stations needing retrofit. Design and construction will occur when funding becomes available.	\$8.6M	Submitted NOI to apply for Pre Disaster Mitigation Grant July 2010 for FS 25	18 to 24 months for each facility. Implementation will begin as soon as funding is awarded.	Retrofit Stations 6, 25 (old #4), & 7 per Seismic Study dated September 2000.
2	Construct 4 new Replacement Fire Stations	GOVT-a-2	New	Earthquakes	GSA and ACFD	Seismic study completed which identified those fire stations requiring replacement. Design and construction will occur when funding becomes available.	\$30M to \$35M	Applied for ARRA 2009 Federal Grant	Implementation will begin as soon as funding is awarded.	Replace FS 22 (old #1), 23 (old #2), & 26 (old #5), and 8 per Seismic Study dated September 2000.



County of Alameda

3	Pre-Disaster Planning	GOVT-b-2	New and Existing	All Hazards	All Departments	The County has undertaken a multi-agency effort to increase CERT training and complete numerous plans including medical and disaster operations plans, Debris Management, and Genset Refueling.	To Be Determined on a plan-by-plan basis	Various County agencies and departments will seek appropriate funding	Various plans are under way or planned for the near future.	Develop pre-disaster plans such as COG / COOP Plans, Post-Disaster Recovery, Medical and Health Disaster Ops Plan, PH DOC Plan, Surge/Alternate Care Site (ACS) Plan. In addition, develop Pediatric Disaster and ACS Regional Planning, training conferences, resources, and communications.
4	Conduct an inventory of existing or suspected soft-story, non-ductile concrete, tilt-up concrete, URM, and other publicly and privately-owned structurally suspicious buildings.	HSNG-c-4, ECON-b-4	Existing County-owned facilities and private-sector facilities in the unincorporated sections of Alameda County.	Earthquakes	PWA-BID	County has begun to identify multi-family buildings through Assessor's database and preparing list for buildings to investigate. County believes numbers of URM buildings still needing retrofit to be relatively small.	\$200K to \$300K	Plan to seek grant through FEMA or other appropriate sources	Implementation will begin as soon as funding is awarded.	County will seek ABAG assistance to identify potentially vulnerable structures and develop a plan for retrofitting them.
5	Conduct training for Community Emergency Response Teams (CERT) through partnerships with local community groups.	GOVT-c-3, ECON-j-5, HSNG-k-6	New and Existing	All Hazards	ACFD	CERT program established in 2007, additional funding needed for on-going training.		Plan to seek grant through FEMA or other appropriate sources	ongoing program	The ACFD conducts on average 6 classes/year within its jurisdiction.



County of Alameda

6	Adopt and enforce a repair and reconstruction ordinance to ensure that damaged buildings are repaired in an appropriate and timely manner and retrofitted concurrently.	HSNG-j-1, ECON-i-5, GOVT-a-13	Existing	All Hazards	PWA-BID	County in process of evaluating ordinance	no funding needed	no outside funding needed	Plan to adopt January 2011 with CVC adoption	Language has been adopted and became effective on Jan. 1, 2011
7	Alameda County Acute Care Hospital Tower	GOVT-a-2; HEAL-a-1	New Facility on existing hospital campus	Earthquakes	GSA and HCS	Design complete and construction contract awarded, start construction 2011	\$650M-\$700M	County funding	Construction duration from 2011 to 2015.	Per California State Assembly Bills 1953 and 306 -- replace existing Acute Care tower with seismically safe facility.
8	Peralta Oaks Seismic Retrofit and Reassignment to Sheriff and Healthcare	GOVT-a-2	Existing	Earthquakes	GSA, ACSO, and PHD	Original tenant has vacated, initial structural analysis and report complete, architectural programming and design underway.	\$15M to \$18	County funding	Completion projected for Fall 2012	This project, when complete, will house the ACSO Coroner, Crime Lab, and Public Health Lab



County of Alameda

9	Update Alameda County Watercourse Protection Ordinance to include provisions to prevent erosion and bank failure caused by flooding to meet FEMA Guidelines	GOVT-d-9	New and Existing	Flooding	PWA-Grading	Rough draft has been prepared. Board-appointed task force is reviewing.	To Be Determined	No funding needed	Expecting long (1+ year) review and approval process. The process to update the Watercourse Protection Ordinance began in 2006. There is no firm expectation as to when the updated ordinance will be completed; although PWA-FCD would like the updated ordinance to be approved by the Board of Supervisors at the earliest time.	There is high sensitivity on the part of the public with regard to the updating of this ordinance. Implementation may significantly affect future development of properties along watercourses. We have received input from the community in the form of comments by the County Board of Supervisors appointed Creeks Task Force. The new Watercourse Protection Ordinance is currently being drafted and will be circulated for initial internal (ACPWA) review.
10	Don Castro reservoir dam & outlet modification.	INFR-b-5, INFR-d-10	Existing	Flooding	PWA Flood Control District	Preliminary studies indicate that the modifications will help reduce sedimentation of the reservoir and reduce peak flows to areas downstream of the dam.	\$25M	Plan to seek grant funding from appropriate sources	Final design and then construction to commence once funding has been secured	This project is one component of the County's effort to remove downstream areas along San Lorenzo Creek from FEMA Special Flood Hazard Areas. Currently, there are approximately 2800 properties located within Special Flood Hazard Areas. No available funding at this time.



County of Alameda

11	San Lorenzo Creek floodwall.	INFR-d-4, INFR-d-9	Existing	Flooding	PWA Flood Control District	A detailed engineering study is underway to determine the locations and extent of proposed floodwalls to contain the 1% chance flows in San Lorenzo Creek.	\$10M	Plan to seek grant funding from appropriate sources	Once the study is completed and funding has been secured, construction of the floodwalls will commence.	This project is one component of the County's effort to remove areas along San Lorenzo Creek from FEMA Special Flood Hazard Areas. No available funding at this time.
12	Alameda Creek Federal Project, Old Alameda Creek levee improvements, and Lines B and C (Zone No. 6) Levees(?)	INFR-d-12	Existing	Flooding	PWA Flood Control District	Engineering and scientific studies are underway to identify ways to improve sediment transport capabilities of these facilities which in turn will improve flood conveyance capacity and reduce potential for flooding.	\$20M	Plan to seek grant funding from appropriate sources	The related South Bay Salt Pond Restoration Project is already underway; the channel improvements to be constructed from 2013 to 2015.	This project is related to the ongoing South Bay Salt Pond Restoration Project. The flood control facilities will be hydraulically connected to the former salt production ponds. State acquisition of the Cargill Salt properties and restoration of the salt ponds provided a great opportunity to reduce flood hazard in the nearby urban areas by lowering or breaching the levee systems along the common borders between the salt ponds and flood control channels. Therefore, the District is seeking grants to help reduce flooding and also restore wetland habitat. PWA has contracted with a consultant who is initiating the evaluation of how best to integrate the flood control channels with the restored former salt ponds



County of Alameda

13	Cull Creek Dam Retrofit/Upgrade Project	INFR-a-2, INFR-d-10	Existing	Earthquakes and Flooding	PWA	Seismic study has concluded that Cull Creek Dam is seismically unstable. In addition, the flood storage capacity of the reservoir behind the dam is significantly reduced due to sedimentation. PWA-FCD is exploring options to address both seismic and siltation problems.	Preliminary estimated costs are: Dam seismic retrofit ~ \$12M Spillway modification ~ \$11.5M Sediment removal ~ \$13M Fish passage ~ \$5.8M Total estimate ~ \$42.3M	awaiting funding	Design and construction will commence once funding has been secured.	Due to lack of funding, this project has been put on hold. Measures have been taken to draw down the water level in the reservoir to reduce flood hazard in the event of a seismic event.
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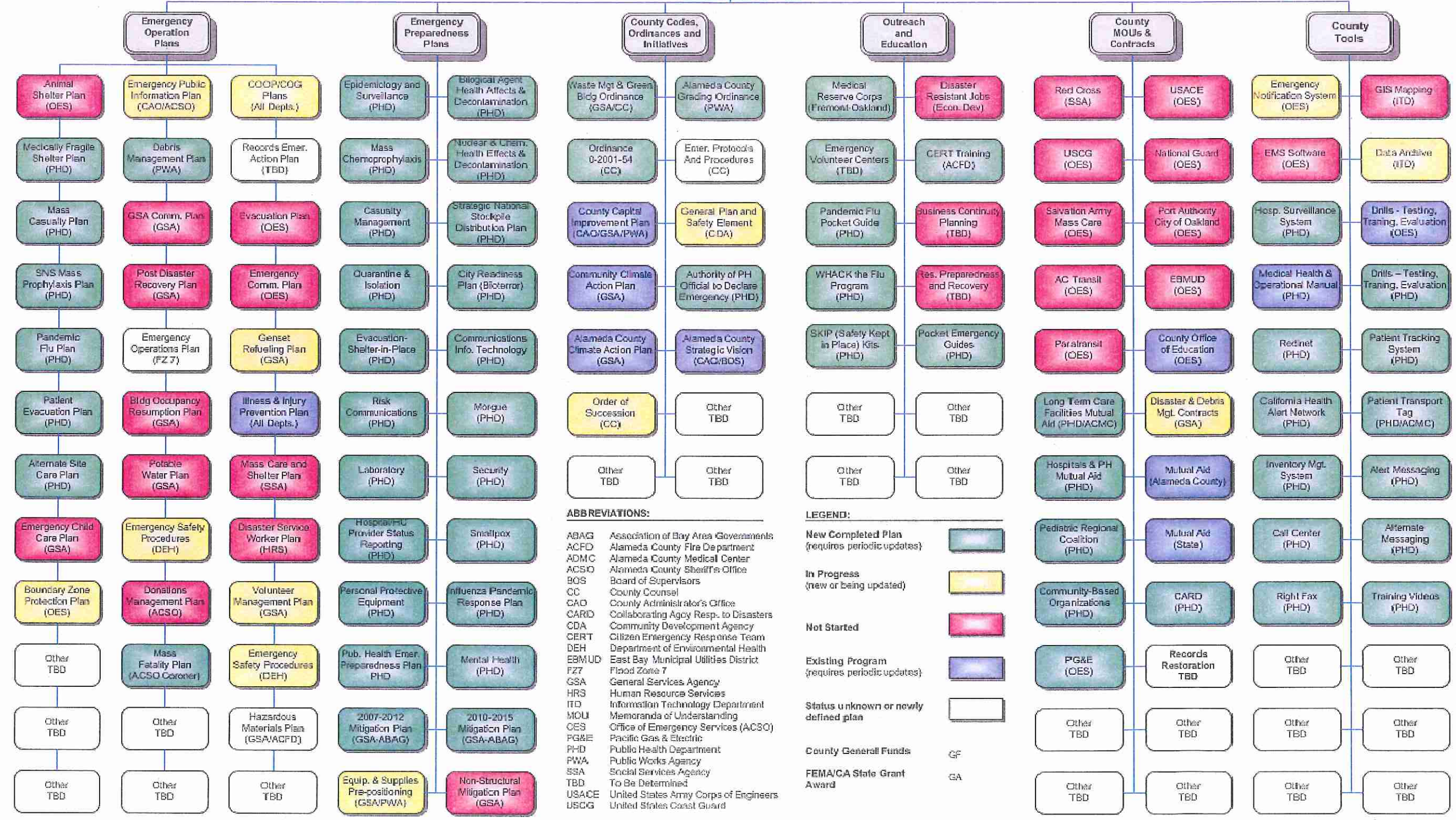
County of Alameda

Exhibit F – Regional Mitigation Strategies

[Included on Multi-Jurisdictional Plan CD and at <http://quake.abag.ca.gov/mitigation/strategy.html>]

The following pages list the disaster preparedness plans used by various Alameda County agencies and departments.

**Alameda County
Disaster
Preparedness
DRAFT**



Facility Name	Facility Address
Police Services	
Administration Office	1401 Lakeside Drive, 12th Floor, Oakland, CA 94612-4305
Airport Police Services	8980 Earhart Road, Oakland, CA 94621
A. C. Transit	2425 East 12th Street, Oakland, CA 94601
Backgrounds/Recruiting	6289 Madigan Road, Dublin, CA 94568
Civil/Bailiff Section	1225 Fallon Street, Room 104, Oakland, CA 94612
Contract Law Enforcement Services	2425 East 12th Street, Oakland, CA 94601
Coroner's Bureau	480 4th Street, Oakland, CA 94601
Criminalistics Laboratory	15001 Foothill Boulevard, San Leandro, CA 94578-1092
Departmental Watch Commanders	2000 150th Avenue, San Leandro, CA 94578
Dublin Police Services	100 Civic Plaza, Dublin, CA 94568-3100
East County Animal Shelter	4595 Gleason Drive, Dublin, CA 94568
Eden Township Substation	15001 Foothill Boulevard, San Leandro, CA 94578-1092
Emergency Services Dispatch	2000 150th Avenue, San Leandro, CA 94578
Field And Reserve Unit	4985 Broder Boulevard, Dublin, CA 94568
Human Resources	1401 Lakeside Drive, 12th Floor, Oakland, CA 94612
Internal Affairs	1401 Lakeside Drive, 7th Floor, Oakland, CA 94612
John George Psychiatric Pavillion Deputies Office	2060 Fairmont Drive, San Leandro, CA 94537
Management Services Division	1401 Lakeside Drive, 12th Floor, Oakland, CA 94612
Marine Patrol Unit	8980 Earhart Road, Oakland, CA 94603
Marshal, North County	661 Washington Street, Oakland, CA 94607
Marshal, South County	24405 Amador Street, Hayward, CA 94544
Fremont/Newark/Union City	39439 Paseo Padre Parkway, Fremont, CA 94538
Livermore/Pleasanton	5672 Stoneridge Drive, Pleasanton, CA 94588
Medical Center Police Services	1411 East 31st Street, Oakland, CA 94602
Office Of Homeland Security & Emergency Services	4985 Broder Boulevard, Dublin, CA 94568
Peralta Police Services	333 East 8th Street, Oakland, CA 94606
Planning & Research	1401 Lakeside Drive, 7th Floor, Oakland, CA 94612
Regional Training Center	6289 Madigan Road, Dublin, CA 94568
Social Service Agency Police Services	7751 Edgewater Drive, Oakland, CA 94621

Facility Name	Facility Address
Detention Facilities	
Glenn Dyer Detention Facility	550 6th Street, Oakland, CA 94607
Santa Rita Jail	5325 Broder Boulevard, Dublin, CA 94568
Juvenile Hall	2500 Fairmont Drive, San Leandro, CA 94578
Fire Protection Services	
Administration Office / Fire Prevention Bureau	835 East 14th Street, San Leandro, CA 94577
Fire Prevention Bureau - Unincorporated	399 Elmhurst Street, Hayward, CA 94544
Fire Prevention Bureau - Dublin	100 Civic Plaza, Dublin, CA
Training Facility	890 Lola Street, San Leandro, CA
Emergency Medical Services/Training Division	1426 164th Avenue, San Leandro, CA
Alameda County Regional Emergency Communication Center	Lawrence Livermore National Laboratory, Livermore, CA
Newark Fire Prevention	37101 Newark Boulevard, Newark, CA 94560
Union City Fire Prevention	34009 Alvarado-Niles Road, Union City, CA 94587
ACFD Station #6	19780 Cull Canyon Road, Castro Valley, CA 94552
ACFD Station #7	6901 Villareal Avenue, Castro Valley, CA 94552
ACFD Station #8	1617 College Avenue, Livermore, CA 94550
ACFD Station #9	450 Estudillo Avenue, San Leandro, CA 94577
ACFD Station #10	2194 Williams Street, San Leandro, CA 94577
ACFD Station #11	14903 Catalina Street, San Leandro, CA 94577
ACFD Station #12	1065 143rd Avenue, San Leandro, CA 94577
ACFD Station #13	637 Fargo Avenue, San Leandro, CA 94577
ACFD Station #14	11345 Pleasanton-Sunol Road, Sunol, CA 94586
ACFD Station #15	5325 Broder Road, Dublin, CA 94586
ACFD Station #16	7494 Donohue Drive, Dublin, CA 94586
ACFD Station #17	6200 Madigan, Dublin, CA 94586
ACFD Station #18	4800 Fallon Rd., Dublin, CA 94586
ACFD Station #19	1 Cyclotron Road, Berkeley, CA 94720
ACFD Station #20	7000 East Avenue, Livermore, CA
ACFD Station #21	15999 W. Corral Hollow Road, Tracy, CA 95377

Facility Name	Facility Address
ACFD Station #22	427 Paseo Grande, San Lorenzo, CA 94580
ACFD Station #23	109 Grove Way, Hayward, CA 94541
ACFD Station #24	1430 164th Avenue, San Leandro, CA 94578
ACFD Station #25	20336 San Miguel Avenue, Castro Valley, CA 94546
ACFD Station #26	18770 Lake Chabot Road, Castro Valley, CA 94546
ACFD Station #27	39039 Cherry Street, Newark, CA 94560
ACFD Station #28	7550 Thornton Avenue, Newark, CA 94560
ACFD Station #29	35775 Ruschin Drive, Newark, CA 94560
ACFD Station #30	35000 Eastin Court, Union City, CA 94587
ACFD Station #31	33555 Central Avenue, Union City, CA 94587
ACFD Station #32	31600 Alvarado Blvd, Union City, CA 94587
ACFD Station #33	33942 7th Street, Union City, CA 94587
Fire Station # 1	22700 Main Street, Hayward, CA 94541
Fire Station # 6	1401 West Winton Avenue, Hayward, CA 94545
Fire Station # 2	360 West Harder Road, Hayward, CA 94544
Fire Station # 7	28270 Huntwood Avenue, Hayward, CA 94544
Fire Station # 3	31982 Medinah Street, Hayward, CA 94552
Fire Station # 8	25862 Five Canyons Parkway, Hayward, CA 94552
Fire Station # 4	27836 Loyola Avenue , Hayward, CA 94545
Fire Station # 9	24912 Second Street, Hayward, CA 94541
Fire Station # 5	28595 Hayward Boulevard, Hayward, CA 94542
Cal Fire SCU Sunol	11345 Pleasanton-Sunol Rd., Pleasanton, CA 94566
Canyon Middle	19600 Cull Canyon Rd.
Schools	
Castro Valley Elementary	20185 San Miguel Ave. , Castro Valley, CA 94552
Castro Valley High	19400 Santa Maria Ave., Castro Valley, CA 94546
Chabot Elementary	19104 Lake Chabot Rd., Castro Valley, CA 94546
Creekside Middle	19722 Center St., Castro Valley, CA 94546
Independent Elementary	21201 Independent School Rd., Castro Valley, CA 94546
Jensen Ranch Elementary	20001 Carson Ln., Castro Valley, CA 94552

Facility Name	Facility Address
Marshall Elementary	20111 Marshall St., Castro Valley, CA 94552
Palomares Elementary	6395 Palo Verde Rd., Castro Valley, CA 94546
Proctor Elementary	17520 Redwood Rd., Castro Valley, CA 94552
Redwood Alternative High	18400 Clifton Way, Castro Valley, CA 94546
Redwood Continuation High	18400 Clifton Way, Castro Valley, CA 94546
Stanton Elementary	2644 Somerset Ave., Castro Valley, CA 94546
Vannoy Elementary	5100 Vannoy, Castro Valley, CA 94546
Arroyo High	15701 Lorenzo Ave., San Lorenzo, CA 94580
Bay Elementary	2001 Bockman Rd., San Lorenzo, CA 94580
Bohannon Middle	800 Bockman Rd., San Lorenzo, CA 94580
Cherryland Elementary	585 Willow Ave., Hayward, CA 94541
East Avenue Elementary	2424 East Ave., Hayward, CA 94541
Eden Gardens Elementary	2184 Thayer Ave., Hayward, CA 94545
Fairview Elementary	23515 Maud Ave., Hayward, CA 94541
Sunol Glen Elementary	11601 Main St., Sunol, CA 94586
Hospitals	
Eden Medical Center	20103 Lake Chabot Road, Castro Valley, CA 94546
Fairmount Hospital	15400 Foothill Boulevard, San Leandro, CA 94578
John George Psychiatric Pavilion	2060 Fairmont Drive, San Lorenzo, CA 94578

List of Acronyms

Abbreviation	Description
AB	Assembly Bill
ABAG	Association of Bay Area Governments
AC	Advisory Circular
ACA	American Correctional Association
ACDEH	Alameda County Department of Environmental Health
ACFCWCD	Alameda County Flood Control and Water Conservation District
ACFD	Alameda County Fire Department
ACRECC	Alameda County Regional Emergency Communications Center
AIA	Airport Influence Area
ALUC	Airport Land Use Commission
BOS	Board of Supervisors
CADWR	California Department of Water Resources
CALEA	Commission on Accreditation for Law Enforcement Agencies
CBC	California Building Code
CDF	California Department of Forestry
CEQA	California Environmental Quality Act
CERT	Community Emergency Response Team
CFR	Code of Federal Regulations
CGS	California Geological Survey
CUPA	Certified Unified Program Agency
DOSD	Department of Water Resources, Division of Safety of Dams
DTSC	State of California Department of Toxics Substances Control
EBMUD	East Bay Municipal Utility District
ECAP	East County Area Plan
EOC	Emergency Operations Center
FAA	Federal Aviation Administration
FEMA	Federal Emergency Management Agency
HMBP	Hazardous Materials Business Plan
ISO	Insurance Safety Organization
LHMP	Local Hazard Mitigation Plan
MM	Modified Mercalli
MYP	Map Your Neighborhood
NFIP	National Flood Insurance Program
NPDES	National Pollutant Discharge Elimination System
OAERP	Operational Area Emergency Response Plan
OES	Governor's Office of Emergency Services
PEP	Personal Emergency Preparedness
RMP	Risk Management Plan
SEMS	Standard Emergency Management System
SHMA	Seismic Hazards Mapping Act
SOSHES	Sheriff's Office of Homeland Security and Emergency Services
SPCC	Spill Prevention Control and Countermeasure
USGS	U.S. Geological Survey
UST	Underground Storage Tank
Zone 7	Zone 7 Water Agency
DMA 2000	federal Disaster Mitigation Act of 2000