
# Los Osos Community Services District

# Local Hazard Mitigation Plan (LHMP)

## August 4, 2005

LOS OSOS COMMUNITY SERVICES DISTRICT

Adoption by Local Governing Body: §201.6(c)(5)

RESOLUTION NO. 2005 - 32

A RESOLUTION OF THE BOARD OF DIRECTORS
OF THE LOS OSOS COMMUNITY SERVICES DISTRICT
ADOPTING A LOCAL HAZARD MITIGATION PLAN

**WHEREAS**, the Federal Emergency Management Agency (FEMA) has directed that all public agencies have an adopted and approved Local Hazard Mitigation Plan (LHMP) by November 1, 2004, in order to remain eligible for FEMA funding; and

**WHEREAS**, the Board previously authorized the District to apply for grant assistance from the Federal Emergency Management Agency (FEMA) under the Hazard Mitigation Grant Program in order to obtain grant assistance to produce the District LHMP, and was notified in January 2005 that this grant was approved; and

**WHEREAS**, the Board requested proposals from interested firms for preparation of the LHMP, and on March 3, 2005, selected Bluecrane, Inc. to prepare the LHMP; and

**WHEREAS**, the District prepared and circulated a preliminary draft for public review, and on May 17, 2005 held a public information meeting to answer questions and incorporate public comments on the LHMP; and

**WHEREAS**, the Board on this date has received a formal presentation on the final draft LHMP and taken public comment;

**NOW, THEREFORE, THE BOARD OF DIRECTORS OF THE LOS OSOS COMMUNITY SERVICES DISTRICT DOES HEREBY RESOLVE, DECLARE, DETERMINE AND ORDER THE FOLLOWING:**

1. The Local Hazard Mitigation Plan attached hereto is approved and adopted, including such edits as approved by the Board for incorporation at this hearing.

2. District staff is directed and authorized to submit this adopted and approved Local Hazard Mitigation Plan to the California Office of Emergency Services and the Federal Emergency Management Agency for final regulatory approval.

On the motion of Director LeGros, seconded by Director Schicker, and on the following roll call vote, to wit:

AYES: Directors Tacker, Hensley, Schicker, LeGros, Gustafson
NOES: None
ABSENT: None
CONFLICTS: None

The foregoing resolution is hereby passed, approved and adopted by the Board of Directors of the Los Osos Community Services District this 4th day of August, 2005.

Stan Gustafson, President
Board of Directors, Los Osos CSD

ATTEST:

Bruce Buel, General Manager
and Secretary to the Board

# Table of Contents

# LHMP Evaluation Requirements
# Cross Reference Table

| Category of Requirement | Federal Emergency Management Agency (FEMA) / California Office of Emergency Services (OES) Evaluation Requirement and Statutory Authority | Los Osos Community Services District LHMP Response |
|---|---|---|
| Prerequisite | Adoption by Local Governing Body: §201.6(c)(5) | Precedes Table of Contents |
| Planning Process | Documentation of the Planning Process: §201.6(b) and §201.6(c)(1) | Pages 2 – 3 |
| | Local Capabilities Assessment: §201.4(c)(ii) and §201.6(c)(1) | Page 4 |
| Risk Assessment | Identifying Hazards: §201.6(c)(2)(i) | Pages 12 – 15 |
| | Assessing Vulnerability: Analyzing Development Trends: §201.6(c)(2)(ii)(C) | Page 16 |
| | Profiling Hazards: §201.6(c)(2)(i) | Pages 17 – 92 |
| | Assessing Vulnerability: Overview: §201.6(c)(2)(ii) | Pages 17 – 92 |
| | Assessing Vulnerability: Structures: §201.6(c)(2)(ii)(A) | Pages 17 – 92 |
| | Assessing Vulnerability: Estimating Potential Losses: §201.6(c)(2)(ii)(B) | Pages 17 – 92 |
| Mitigation Strategy | Local Hazard Mitigation Goals: §201.6(c)(3)(i) | Pages 93 – 95 |
| | Identification and Analysis of Mitigation Actions: §201.6(c)(3)(ii) | Pages 93 – 96 |
| | Implementation of Mitigation Actions: §201.6(c)(3)(iii) | Pages 96 - 98 |
| Plan Maintenance Process | Monitoring, Evaluating, and Updating the Plan: §201.6(c)(4)(i) | Page 107 |
| | Incorporation into Existing Planning Mechanisms: §201.6(c)(4)(ii) | Page 107 |
| | Continued Public Involvement: §201.6(c)(4)(iii) | Page 108 |

# 1. Purpose / Vision / Values

## Purpose of LHMP

The Los Osos Community Services District (District) has developed this Local Hazard Mitigation Plan (LHMP) to create a safer community. The Los Osos Community Services District LHMP is the representation of the District's commitment to reduce risks from natural and other hazards, and serves as a guide for decision-makers as they commit resources to reducing the effects of natural and other hazards. The District LHMP serves as a basis for the State Office of Emergency Services (OES) to provide technical assistance and to prioritize project funding. (See CFR §201.6.)

While the Disaster Mitigation Act of 2000 ("DMA 2000") requires that local communities address only natural hazards, the Federal Emergency Management Agency (FEMA) recommends that local comprehensive mitigation plans address man-made and technological hazards to the extent possible. Towards that goal, Los Osos Community Services District has addressed an expansive set of hazards.

For disasters declared after November 1, 2004, Los Osos Community Services District must have an LHMP approved pursuant to §201.6 in order to receive FEMA Pre-Disaster Mitigation (PDM) project grants or to receive post-disaster Hazard Mitigation Grant Program (HMGP) project funding. The LHMP is written to meet the statutory requirements of DMA 2000 (P.L. 106-390), enacted October 30, 2000 and 44 CFR Part 201 – Mitigation Planning, Interim Final Rule, published February 26, 2002 and another on October 1, 2002.

## Support of Broader Los Osos Community Services District Vision

The LHMP supports the broader vision and values of the Los Osos Community Services District, reflected in their Mission Statement:

### *Mission Statement*

*The Los Osos Community Services District shall provide the best possible services to the community of Los Osos including water, wastewater, drainage, parks, recreation, street lighting, solid waste, fire, emergency and rescue response. The Board of Directors and staff shall respond with excellence to meet the community's needs and desires. The Board shall encourage community participation in its decision-making and shall facilitate the interaction between the community and other agencies and levels of government.*

# 2. The Planning Process

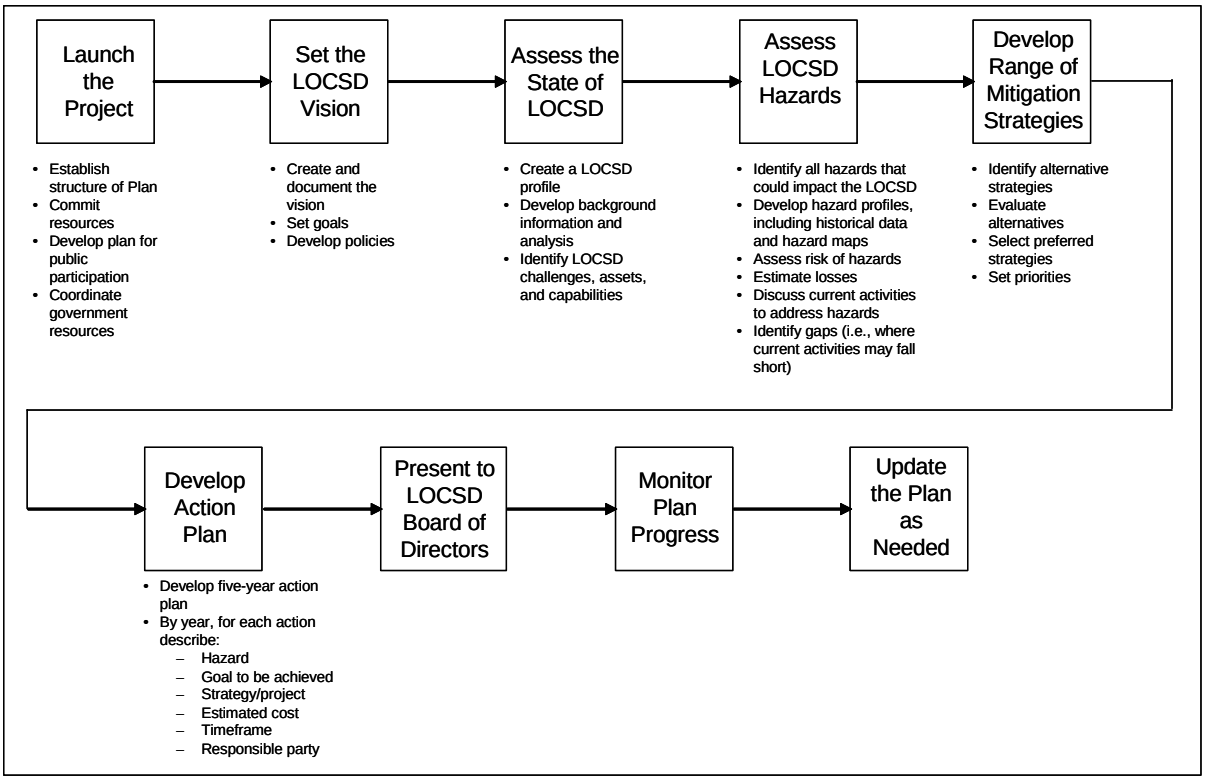
**Planning Process Requirements Cross-Reference Table**

| Element | Requirement | Los Osos Community Services District LHMP Response |
|---|---|---|
| A | Narrative Description of the Process Followed to Prepare the Plan | Pages 2 – 3 |
| B | Documentation of Who Was Involved in the Planning Process | Page 2 |
| C | Documentation of How Public was Involved in Process | Page 3 |
| D | Documentation of Opportunity for Neighboring Communities, Agencies, Businesses, Academia, Nonprofits, and Other Interested Parties to be Involved in the Planning Process | Page 3 |
| E | Description of Review and Incorporation, if Appropriate, of Existing Plans, Studies, Reports, and Technical Information | Page 3 |

The Los Osos Community Services District was responsible for the development of the LHMP. The District has hired a consultant, Bluecrane Inc. (*bluecrane*), to assist in the preparation of the plan. The District formed a Planning Team with the following representatives:

- District General Manager
- Administrative Services Manager
- Administrative Secretary
- District Engineer
- Utilities Department Manager
- CDF/County of San Luis Obispo Fire Department

The planning process utilized by the Los Osos Community Services District is depicted in the following figure.




Following the Board of Director's approval of the project, the effort was launched in March 2005 in a meeting of the Planning Team. The Planning Team has participated actively in the LHMP's development, meeting every two to three weeks throughout the process to review draft documents and assess progress on the plan.

In addition to the steps shown in the diagram above, an effort was made to solicit public input during the planning process by allowing the preliminary draft and completed plan to be reviewed by the public at a Public Information Meeting prior to going in front of the Board of Director's for review and adoption.

Since the Los Osos Community Services District is prohibited by law from engaging in land use planning, this responsibility falls to San Luis Obispo County. The County currently utilizes comprehensive land use planning, capital improvements planning, and building codes to guide and control development within the County. The San Luis Obispo County General Plan Safety Element is documented in Chapter 6 of the General Plan. Along with the Safety Element, the February 2003 Final Report of the Review of Fire Protection Services, the December 1997 and April 1998 Preliminary Engineering Drainage Project Evaluations and the July 2004 Fire Management Plan were considered by and integrated into the LHMP process.

## Local Capabilities Assessment

The table below is an inventory of key capabilities and assets for the Los Osos Community Services District.

| Fire Department | |
|---|---|
| **Asset / Capability** | **Inventory** |
| Rolling Stock | • 1500 gpm ICS Type 1 Fire Engine with Paramedic<br>• 1000 gpm ICS Type 2 Fire Engine<br>• 150 gpm ICS Type 3 Fire Engine, stationed as available through CDF<br>• ICS Type 3 Rescue with Paramedic<br>• Command Vehicle<br>• Utility Vehicle |
| Personnel | • 8 Full-time positions<br>• 25 Part-time reserve firefighters<br>• 1 Full-time secretary |
| Facilities | • Main Station is within the District with communications capabilities |
| Other Asset | • Tanks and Water Distribution System to provide adequate fire flow to service areas |

| Utility / Administration Department | |
|---|---|
| **Asset / Capability** | **Inventory** |
| Rolling Stock - Utility | • 8 Pick-up Trucks<br>• 1 GEM Utility Vehicle<br>• 1 Power Vacuum Trailer<br>• 1 Box Utility Trailer |
| Personnel | • 8 Utility crew members<br>• 1 Administrative coordinator |
| Rolling Stock - Administration | • 1 Six-passenger sedan |

# 3. Los Osos Community Services District Profile

## History

Los Osos Community Services District (District) lies within an unincorporated coastal area of San Luis Obispo County. The District is a multi-service district that provides water, sewer, fire protection services, and other services. It is located south of the city of Morro Bay and to the west of the City of San Luis Obispo. Los Osos Community Services District is also bordered on the northwest by the Morro Bay Estuary and Morro Bay State Park. It is bounded on the east by Los Osos Creek and to the south and southwest by Irish Hills and Montano de Oro State Park.

The Los Osos Community Services District was created on November 3, 1998. The creation of a special district is one of the provisions of state law that provides a high degree of visibility to both management decisions and local accountability.

The District replaces the old County Service Area 9 with Los Osos' first public agency governed by community residents. District services include fire protection and emergency response, storm water drainage management, solid waste management, water supply for the Baywood area, parks and recreation, street lighting, and wastewater management.

The electorate also selected the first District Board of Directors during the November 3, 1998 vote. The District has in place many elements of contemporary management techniques that provide visibility to both the processes that are used to manage the departments and documentation of the District's intent through the budget process.

## Governing Body and Advisory Council

The Los Osos Community Services District is governed by an elected Board of Directors with the authority to make decisions about various public utilities and services. The Board's primary responsibilities are water, sewage, drainage, and emergency services. The Board meets on the first Thursday of each month. All Board Meetings are public meetings and any member of the public can speak to the Board regarding any matter of District authority during the public comment period.

The Los Osos Community Services District has established five committees (Emergency Services Advisory Committee, Environmental, Finance, Water Utilities and Wastewater) to advise the Board on various aspects of its operations. The Committees are currently inactive.

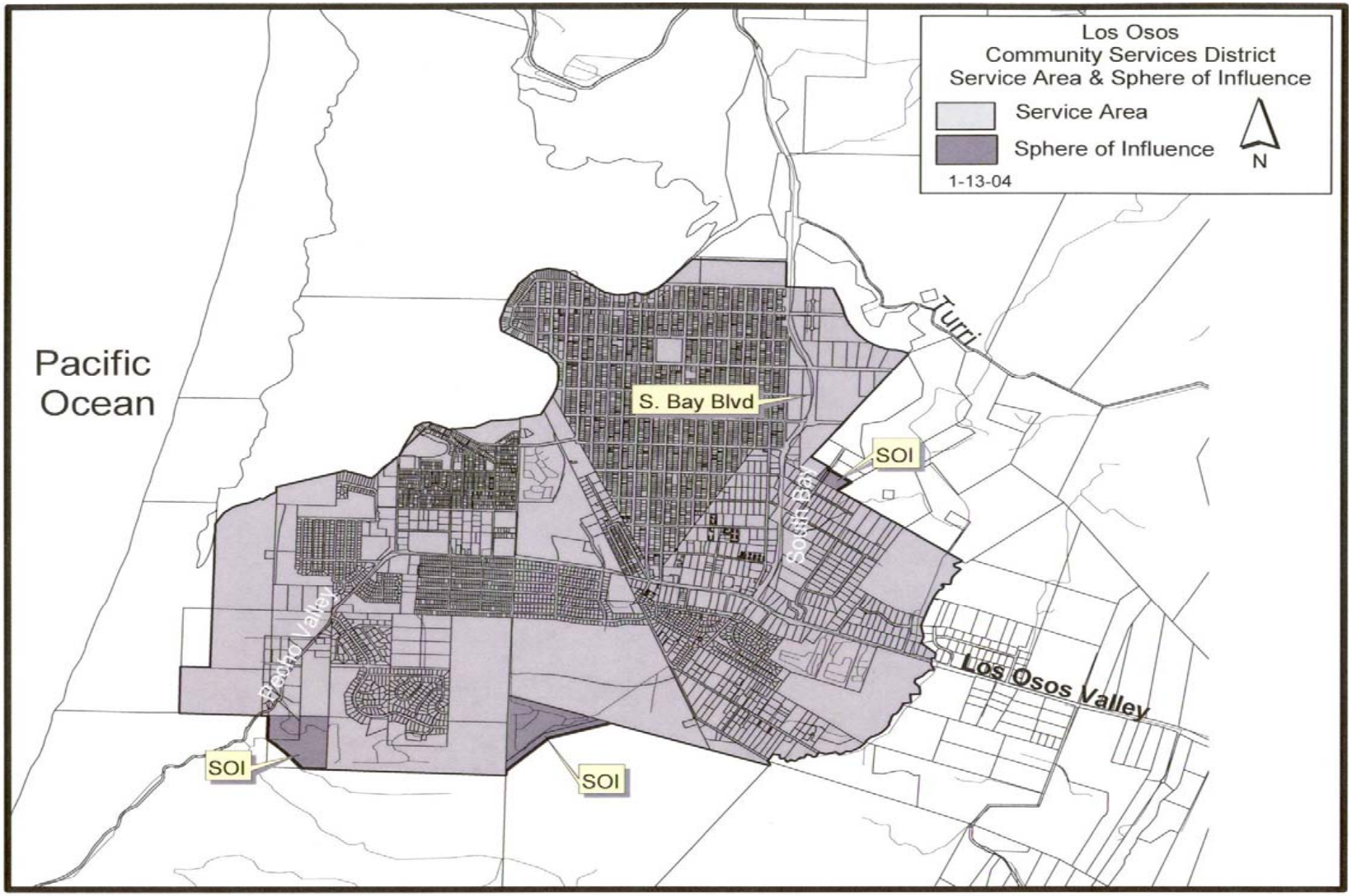
Community service districts are prohibited by law from engaging in land use planning. Thus, a volunteer group, the Los Osos Community Advisory Council (LOCAC) has been

formed to advise the San Luis Obispo County Board of Supervisors on land use planning, parks, transportation, and other issues that affect the community of Los Osos. LOCAC is an advisory council only; it does not have the authority to make decisions.

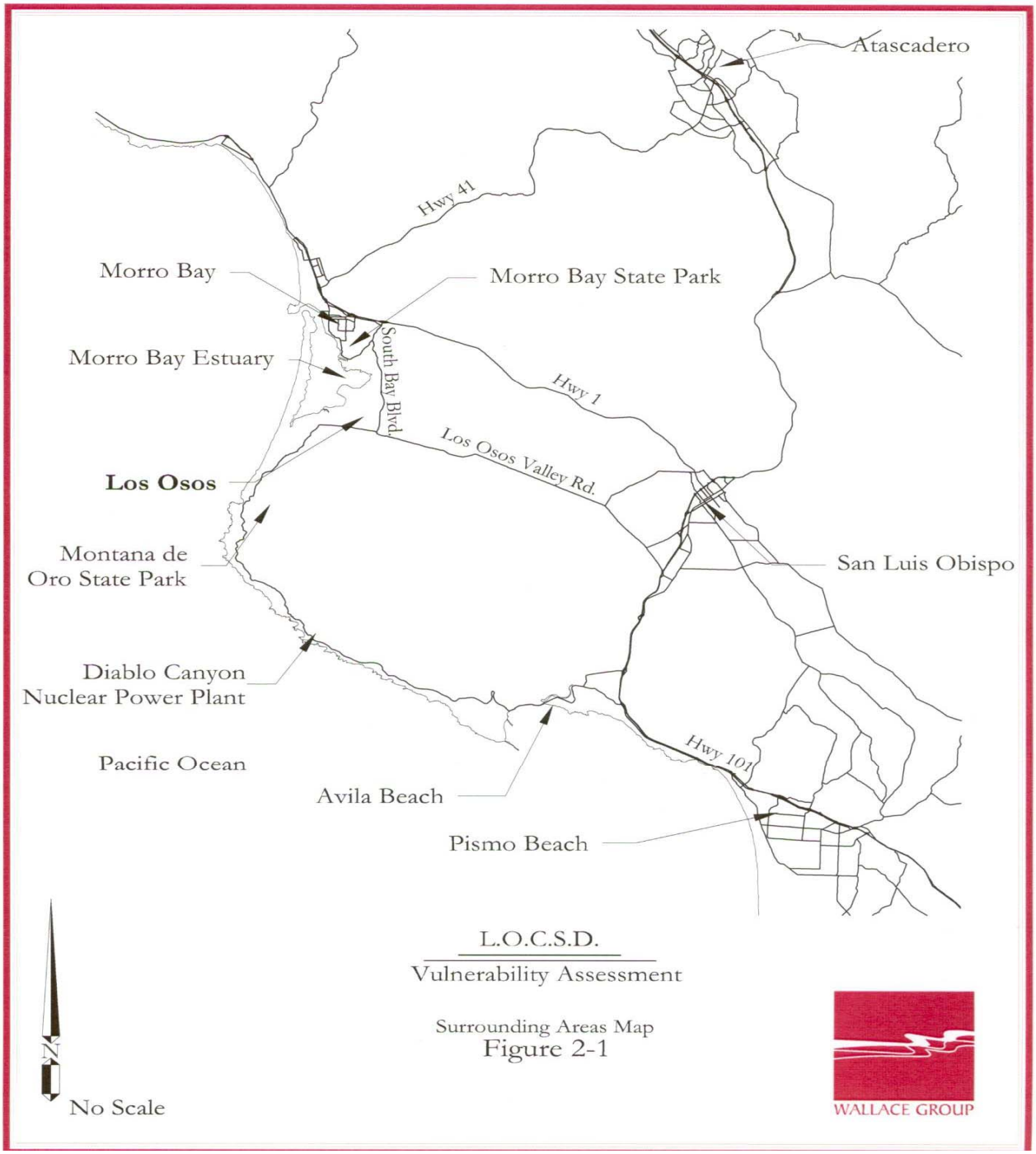
## CERT

Los Osos Community Services District provides Community Emergency Response Team (CERT) classes to local residents. These classes provide valuable training to students on actions that can be taken after a large earthquake, flood, fire, or other disasters.

The Map on the following page provides a perspective on the size of the Los Osos Community Services District.


Los Osos
Community Services District
Service Area & Sphere of Influence
Service Area
Sphere of Influence
1-13-04
N
Pacific
Ocean
S. Bay Blvd
Turri
SOI
South Bay
Los Osos Valley
Pecho Valley
SOI
SOI

The following Map (Figure 2-1) shows the Los Osos Community Services District and surrounding areas.



## Population

The population of Los Osos Community Services District as of 2003 was 14,600. The following chart provides estimated growth projections:

| Year | Population |
|---|---|
| 2007 | 15,279 |
| 2012 | 17,119 |
| 2017 | 19,180 |

As shown, it is estimated that in the next 12 years, the population of the District is projected to increase well over 5,000 persons from the 2003 count.

## Climate

Los Osos Community Services District enjoys a moderate climate all year with the average minimum temperature of 47.4 degrees and average maximum temperature of 64.9 degrees.

Typical "seasonal" variations in weather are:

Winter – sunny days, clear nights
Spring – breezy days, cool nights
Summer – foggy mornings, sunny afternoons and cool nights
Fall – warm, sunny days, cool nights

## Transportation

Los Osos Community Services District is easily accessible by land and air, as follows:

| | |
|---|---|
| Highways: | 12 miles west of Highway 101, via Los Osos Valley Road<br>3 miles south of Highway 1, via South Bay Boulevard |
| Bus: | 15 miles to Greyhound (San Luis Obispo)<br>Regional Transit |
| Rail: | 12.2 miles to Amtrak Passenger Train |
| Air: | 14 miles to San Luis Obispo County Airport serviced by:<br>American West Express, Sunwest Aviation and United Express |

## Top Attractions Surrounding Los Osos Community Services District

**Los Osos Oaks State Reserve**: A one-mile trail under the low canopy of "Pygmy Oaks," dwarfed coast live oaks that are 600 to 800 years old. The leaf-covered trail winds among the trees' gnarled gray trunks, and mushrooms, wild cucumbers, hollyleaf cherry, and other flora that exist in this shaded land where Chumash Indians once lived.

**Baywood Park**: Downtown Baywood Park has a "village atmosphere" with small shops that are framed by abundant grass, trees, and flowers. The variety of businesses serving the community include art galleries, antiques, food and spirits, restaurants, specialty shops, and two waterfront inns. The Baywood Park Pier overlooks the shores of the lagoon-like estuary.

**Farmers' Market:** An outdoor market offering local, in-season farm fresh produce and locally grown flowers is held in Baywood Park and is open year-round every Monday.

**Audubon Overlook:** Hundreds of species of birds live or over-winter in the Morro Bay Estuary area.

**Elfin Forest**: The Elfin Forest is located just off South Bay Boulevard north of Santa Ysabel. The Elfin Forest is a special small wilderness bordering the community of Los Osos that is an important buffer between residential development and the Morro Bay Estuary.

**Sweet Springs Nature Preserve**: Trails with Monterey cypress and eucalyptus lead to two freshwater ponds and, around a salt marsh, to the edge of Morro Bay. Birds are attracted to the variety of habitats in the preserve, and many shorebirds and ducks spend the winter in the adjoining bay. From late October into March, monarch butterflies traditionally cluster here.

**Montaña De Oro State Park:** At the west side of the community is Montana de Oro State Park with miles of unpopulated rocky shores and sandy beaches and 7,828 acres of hills and eucalyptus groves. 50 miles of hiking, biking, and equestrian trails provide access to the park's back-country, wooded stream canyons, tide pools, and hidden coves and beaches. Trails following the edge of the coastal bluffs provide spectacular views of the tilted and twisted strata of the rocky shoreline and, in the distance, Morro Rock, and the Morro Bay sandspit.

**Scenic 7-Mile Drive**: Seven-mile driving route through unpopulated country side and open space.

**Los Osos Community Park**: Located west of the Los Osos commercial district. Complete with neatly manicured landscape, tennis courts, a well planned playground and restrooms, this small imaginatively designed Park is a pleasant place for walking or picnicking. It is also the site of the Los Osos Valley School constructed in 1872.

**Los Osos School 1872**: The naming of California's only valley of the bears (La Cañada de Los Osos) took place about a mile from the original site of the one room, one teacher, Los Osos school. This was the fourth campsite of Captain Gaspar de Portola's 1769 sacred expedition through San Luis Obispo County.

**Morro Bay Estuary:** The Morro Bay estuary is a bird watcher's paradise. It is an important point on the Pacific Migratory Bird Flyway, which stretches from Alaska to South America. This location attracts over 250 species of birds in it abundant waters surrounded by grass and brush covered hills. The vast mud flats are home to oysters and a variety of shellfish; while halibut, perch, and smelt fish seek the shallow, safe waters of this unspoiled coastal marsh.

**Museum of Natural History - Morro Bay State Park:** West of California's Highway 1, midway between Los Angeles and San Francisco, the Morro Bay State Park Museum of Natural History sits on a hill overlooking the Morro Bay Estuary. In addition to panoramic views of the coastline, the view from the museum includes world-famous Morro Rock.

**Hearst San Simeon State Historical Monument:** Monument is located north of Los Osos (about a 45-minute drive).

**Performing Arts Center:** The Performing Arts Center is the result of a partnership between California Polytechnic State University, the City of San Luis Obispo, and the Foundation for the Performing Arts Center.

# 4. Hazards Facing Los Osos Community Services District

## List of Risk Assessment Requirements

| Element | Requirement | Los Osos Community Services District LHMP Response |
|---|---|---|
| Identifying Hazards – A* | Description of the Types of Hazards Affecting Los Osos Community Services District | See following table for page numbers by hazard |
| Profiling Hazard Events – A* | Location of Hazards Identified | See following table for page numbers by hazard |
| Profiling Hazard Events – B* | Extent of Hazards Identified | See following table for page numbers by hazard |
| Profiling Hazard Events – C* | Information on Previous Occurrences | See following table for page numbers by hazard |
| Profiling Hazard Events – D* | Probability of Future Events | See following table for page numbers by hazard |
| Assessing Vulnerability: Overview – A* | Overall Summary Description of Los Osos Community Services District's Vulnerability | See following table for page numbers by hazard |
| Assessing Vulnerability: Overview – B* | Impact of Each Hazard on Los Osos Community Services District | See following table for page numbers by hazard |
| Assessing Vulnerability: Identifying Structures – A* | Description of Vulnerability in Terms of Types and Numbers of Existing Buildings, Infrastructure, and Critical Facilities Located in Identified Hazard Areas | See following table for page numbers by hazard |
| Assessing Vulnerability: Identifying Structures – B* | Description of Vulnerability in Terms of Types and Numbers of Future Buildings, Infrastructure, and Critical Facilities Located in Identified Hazard Areas | See following table for page numbers by hazard |
| Assessing Vulnerability: Estimating Potential Losses – A* | Description of Vulnerability in Terms of an Estimate of Potential Dollar Losses to Existing Buildings, Infrastructure, and Critical Facilities Located in Identified Hazard Areas | See following table for page numbers by hazard |
| Assessing Vulnerability: Estimating Potential Losses – B* | Description of Vulnerability in Terms of an Estimate of Potential Dollar Losses to Future Buildings, Infrastructure, and Critical Facilities Located in Identified Hazard Areas | See following table for page numbers by hazard |
| Assessing Vulnerability: Analyzing Development Trends – A* | Description of Land Uses and Development Trends | Page 16 |

* California Office of Emergency Services Local Capabilities Assessment Elements

## Risk Assessment Requirements Cross-Reference Table

| Hazard | Location, Extent, History, Future Event Probability | Vulnerability: General Impact on People, Structures, and Infrastructure | High-level Discussion of Potential Losses |
|---|---|---|---|
| Wildfire | Pages 17 – 23 | Pages 23-25 | Pages 25-26 |
| Flooding | Pages 28 - 32 | Pages 32 – 33 | Pages 32 – 33 |
| Extreme Weather / Heavy Rainfall | Pages 34 – 35 | Page 36 | Page 36 |
| Tsunami | Pages 37 - 38 | Page 38 | Page 38 |
| Earthquakes | Pages 39 – 46 | Pages 46 – 47 | Pages 46 – 52 |
| Fault Rupture / Groundshaking / Liquefaction | Pages 53 – 64 | Page 65 | Page 65 |
| Coastal Storm / Coastal Erosion | Pages 66 – 67 | Pages 67 – 68 | Pages 67 – 68 |
| Landslides / Rockslides | Pages 69 – 70 | Page 71 | Page 71 |
| Water Tank Failure | Page 72 | Pages 72 – 73 | Pages 72 – 73 |
| Hazardous Materials (Hazmat) Incidents | Pages 74 – 76 | Pages 76 – 77 | Pages 76 – 77 |
| Toxic Pollution | Page 78 | Pages 78 – 79 | Pages 78 – 79 |
| Nuclear Incidents | Pages 80 – 83 | Page 83 | Page 83 |
| Terrorism | Pages 85 - 91 | Pages 85 - 91 | Pages 92 |

## Identification of Hazards

There are three broad categories of hazards that may threaten the Los Osos Community Services District, namely:

- Natural hazards
- Technological hazards
- Domestic security threats

Natural hazards include:

- Wildfires
- Floods
- Extreme Weather / Heavy Rainfall
- Tsunami
- Earthquakes
- Fault Rupture / Groundshaking / Liquefaction
- Coastal Storm / Coastal Erosion
- Landslides / Rockslides
- Naturally-Occurring Biological Threats
- Insect Infestation

Technological hazards include:

- Water Tank Failure
- Hazardous Materials (Hazmat) Incidents
- Transportation Emergencies
- Blackout
- Toxic Pollution
- Nuclear Incidents

Domestic security threats include:

- Terrorism (CBRNE)
    - Chemical
    - Biological
    - Radiological
    - Nuclear
    - Explosive

The LHMP for Los Osos Community Services District will be addressing the following hazards:

- Wildfires
- Floods
- Extreme Weather / Heavy Rainfall

- Tsunami
- Earthquakes
- Fault Rupture / Groundshaking / Liquefaction
- Coastal Storm / Coastal Erosion
- Landslides / Rockslides
- Water Tank Failure
- Hazardous Materials
- Toxic Pollution
- Nuclear Incidents
- Terrorism

The following table describes how and why the hazards listed above were identified by Los Osos Community Services District in preparing its LHMP.

| Hazard | How and Why Identified |
|---|---|
| Wildfire | History of events |
| Flooding | History of events |
| Extreme Weather / Heavy Rainfall | History of events |
| Tsunami | History of events |
| Earthquakes | History of events; presence of fault line and geologic activity |
| Fault Rupture / Groundshaking / Liquefaction | History of events; presence of fault line and geologic activity |
| Coastal Storm / Coastal Erosion | History of events |
| Landslides / Rockslides | History of events |
| Water Tank Failure | Vulnerability due to presence of multiple water tanks in the District |
| Hazardous Materials (Hazmat) Incidents | History of events |
| Toxic Pollution | Vulnerability due to presence of pollution in air, water, and soil |
| Nuclear Incidents | Vulnerability due to transportation routes and relative proximity of the Diablo Canyon Power Plant |
| Terrorism | Heightened sense of awareness since September 2001 |

## Land Use and Development Trends

### Land Use

Existing land use within the Los Osos Community Services District is of varying types, uses, ownership, character, and intensity. Uses include:

- Rural residential
- Single family detached
- Single family attached
- Mobile homes
- Recreational open space
- Other open space
- Warehouse
- Vacant
- Agriculture
- Water
- Utilities
- Public facilities
- Schools
- Retail / Office
- Tourist / Commercial recreation
- Light industrial / Business park

### Development Trends

While the population of the Los Osos Community Services District is expected to continue growing at a modest pace, land use is governed by San Luis Obispo County. Within the County General Plan there are policies and elements to help assure orderly development.

In addition, the Local Agency Formation Commission (LAFCO) of San Luis Obispo County is tasked with the mission to provide an orderly pattern of growth that reconciles the varied needs of the County. One of the fundamental principles of LAFCO is to ensure the establishment of an appropriate and logical municipal government structure for the distribution of efficient ad appropriate public services. LAFCO Land Use Objectives include:

- the discouragement of urban sprawl;
- the preservation of open space within urban development patterns;
- the orderly formation and development of agencies by shaping local agency boundaries; and
- the utilization of Spheres of Influence to guide future development of agency boundaries.

## Hazard: Wildfires

| Severity: Medium | Probability: Low |
|---|---|

### Hazard Definition

A wildfire is an uncontrolled fire spreading through vegetative fuels, posing danger and destruction to property. Wildfires can occur in undeveloped areas and spread to urban areas where structures and other human development are more concentrated.

While some wildfires start by natural causes, humans cause four out of every five wildfires. Wildfires started by humans are usually the result of debris burns, arson, or carelessness. As a natural hazard, a wildfire is often the direct result of a lightning strike that may destroy personal property and public land areas, especially on state and national forest lands. The predominate dangers from wildfires are:

- The destruction of timber, property, wildlife; and
- Injury or loss of life to people living in the affected area or using the area for recreational facilities.

### History

The climate in Los Osos Community Services District is generally referred to as "Mediterranean" with warm dry summers and relatively cool, moderately wet winters. Rainfall throughout the District occurs primarily between November and April, and ranges between 20-25 inches per year. Because summers are generally warm and dry, the risk of wildfires is highest in late summer and early fall. Fog and cool weather that are common in the coastal regions help to maintain moisture levels in vegetation along the coast, which helps to minimize fire risk.

Other weather-related elements can have complex and important effects on wildfire intensity and behavior. Wind is of prime importance because as wind velocity increases, the rate of fire spread also increases. Gusty and erratic wind conditions can cause a fire to spread irregularly, making it difficult to predict its path and effectively deploy fire suppression forces. Relative humidity is also an important fire-related weather factor. Los Osos Community Services District has been identified as one of the areas associated with population growth into wildland areas. Many of these areas experience higher residential density as a result of lot splits and the desire of many homeowners to live in a rural environment. The District is a residential development that has occurred in the foothill areas around Los Osos and Montana De Oro State Park. The residential

development is intermixed with native vegetation which results in a high-value, high-risk area.

As humidity levels drop, the dry air causes vegetation moisture levels to decrease, thereby increasing the likelihood that plant material will ignite and burn.

A large portion of the District is covered by natural vegetation. This vegetation can be grouped into approximately 14 regimes, each of which contributes varying degrees to fire hazard severity. Table 4-1 below depicts general vegetation communities that are found throughout the District, and their likely relative fire hazard severity rated by fuel conditions only. The likely fire hazard severity depicted in the table can be influenced by many factors, including the age of vegetation, accumulation of dead plant material, vegetation management programs that may have been implemented, period of time since a stand of vegetation was last burned, historic climate, and topography of the region.

Chaparral plant communities present the most significant fire hazard severity, as this type of vegetation burns with intense heat and the amount of fuel available to burn can be very high if the area is not properly managed or has not been recently burned. Controlled burning is one method that can greatly reduce the fire hazard severity for a given area. In developed areas, some ornamental plantings can provide hazardous fuel loading. A significant increase in dead material as the result of insect or disease infestations can lead to a much higher fire hazard.

**Table 4-1: Likely Fire Hazard Severity Rated by Fuel Conditions Only**

| Very High | High | Moderate |
|---|---|---|
| Chaparral | North Coast Scrub | Riparian Woodland |
| | Foothill Woodland | North Coast Grassland |
| | Juniper Oak Woodland | Evergreen Forest |
| | | Interior Herbaceous |
| | | Desert Scrub |
| | | Beach-Dune |
| | | Coastal Sand-Plains |
| | | Saline Plains |
| | | Coastal Salt Marsh |
| | | Freshwater Marsh |

## Historic Wildfires in Los Osos Community Services District

There is no specific history of wildfires within the boundaries of the Los Osos Community Services District except for a less-than-10 acre event in 1996. However, bordering areas are very much prone to wildfires and, therefore, the District is exposed to a threat from wildfires originating outside the District.

## Wildland Risk

While the predominant fuel types in the Los Osos Community Services District area are not considered to be particularly volatile, under the right climatic conditions, wildland fire could threaten single family dwellings on the western and southerly side of the Community.

Table 4-2 identifies communities in and around the District that are located in or near wildland areas and that have an increased risk of wildfire-related hazards. When residential development occurs within or adjacent to an area that has a high wildfire hazard severity, the ability of fire fighting forces to combat a fire may also be impaired.

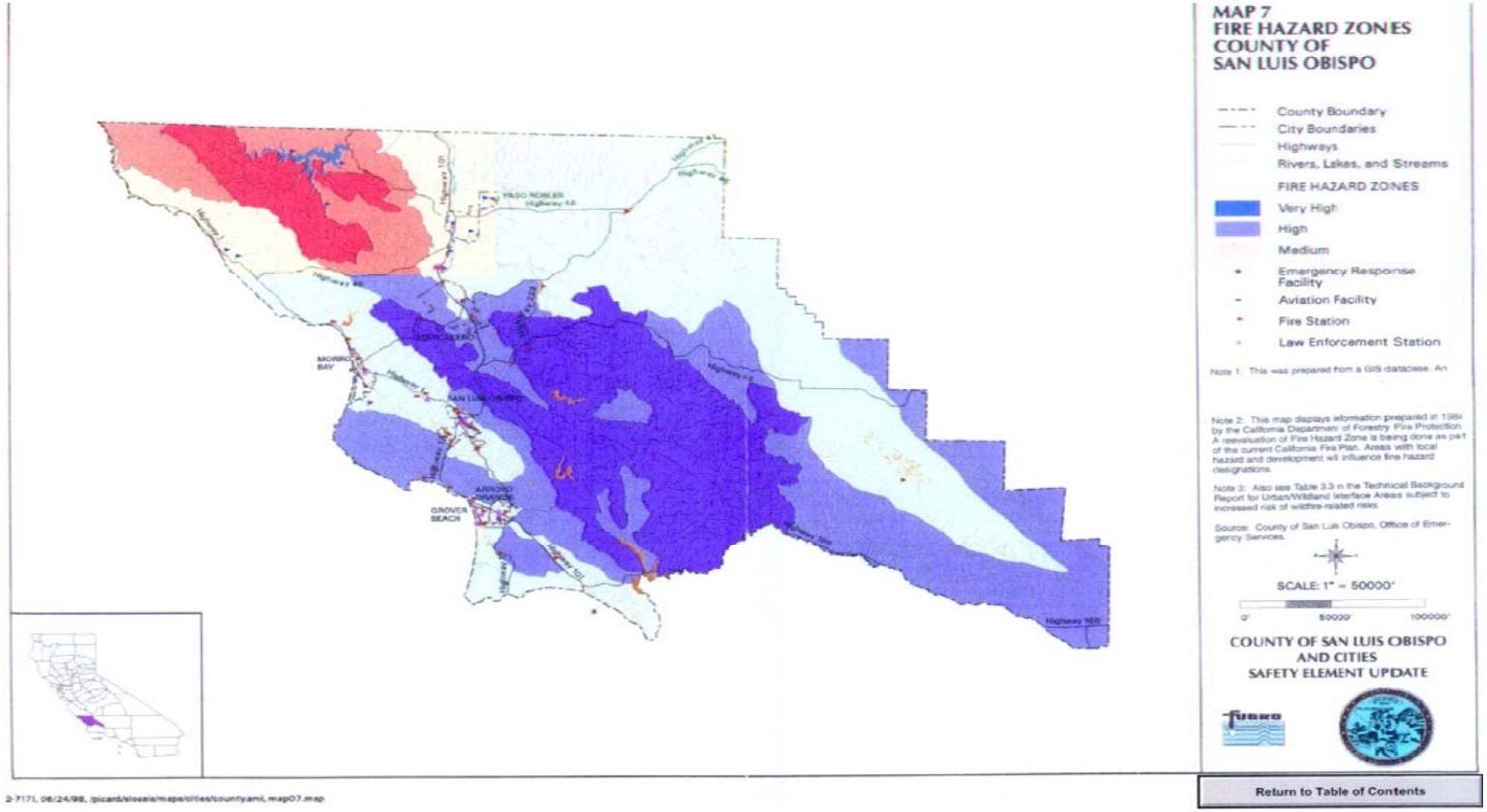
When residences are located in the vicinity of wildfire, typical fire fighting techniques, such as the use of backfires, may not be feasible. Additionally, fire fighting equipment and personnel may be used for structure protection, instead of being used to fight the fire. This results in the need for additional equipment to effectively minimize structural losses and to control the fire.

Some unincorporated communities located near the Los Osos Community Services District are not confronted with a high wildfire risk. These communities include much of the Cayucos and Oceano areas. This low wildfire risk results primarily from the type of vegetation that is dominant throughout these areas. The low-growing native grasses and shrubs found in these communities present a minimal vegetative fuel source and a corresponding low wildfire risk. Additionally, in the coastal communities, cool marine influenced temperatures and relatively high humidity levels help to minimize potential wildfire risks.

**Table 4-2: List of Urban/Wildland High-Value High-Risk Areas of Los Osos Community Services District and Immediate Surrounding Areas.**

| Location | Description |
|---|---|
| Los Osos Community Services District | Residential development that has occurred in the foothill areas around Los Osos Community Services District and Montana De Oro State Park are intermixed with native vegetation. |
| Diablo Canyon | A power plant and its critical power grid sit in a densely vegetated canyon with a long response for wildland fire suppression. |
| Avila Valley and Irish Hills Areas | Development in the areas around Indian Knob, Squire Canyon, See Canyon, and Perfumo Canyon are intermixed with extensive stands of native vegetation. |
| San Luis Obispo Areas | The San Luis Obispo City and the surrounding area intermix with the wildlands on all sides. |

The following maps depict the fire hazard zones in Los Osos Community Services District as well as the entirety of San Luis Obispo County.


MAP 7
FIRE HAZARD ZONES
COUNTY OF
SAN LUIS OBISPO
County Boundary
City Boundaries
Highways
Rivers, Lakes, and Streams
FIRE HAZARD ZONES
Very High
High
Medium
Emergency Response Facility
Aviation Facility
Fire Station
Law Enforcement Station
SCALE: 1" = 50000'
COUNTY OF SAN LUIS OBISPO
AND CITIES
SAFETY ELEMENT UPDATE
Return to Table of Contents

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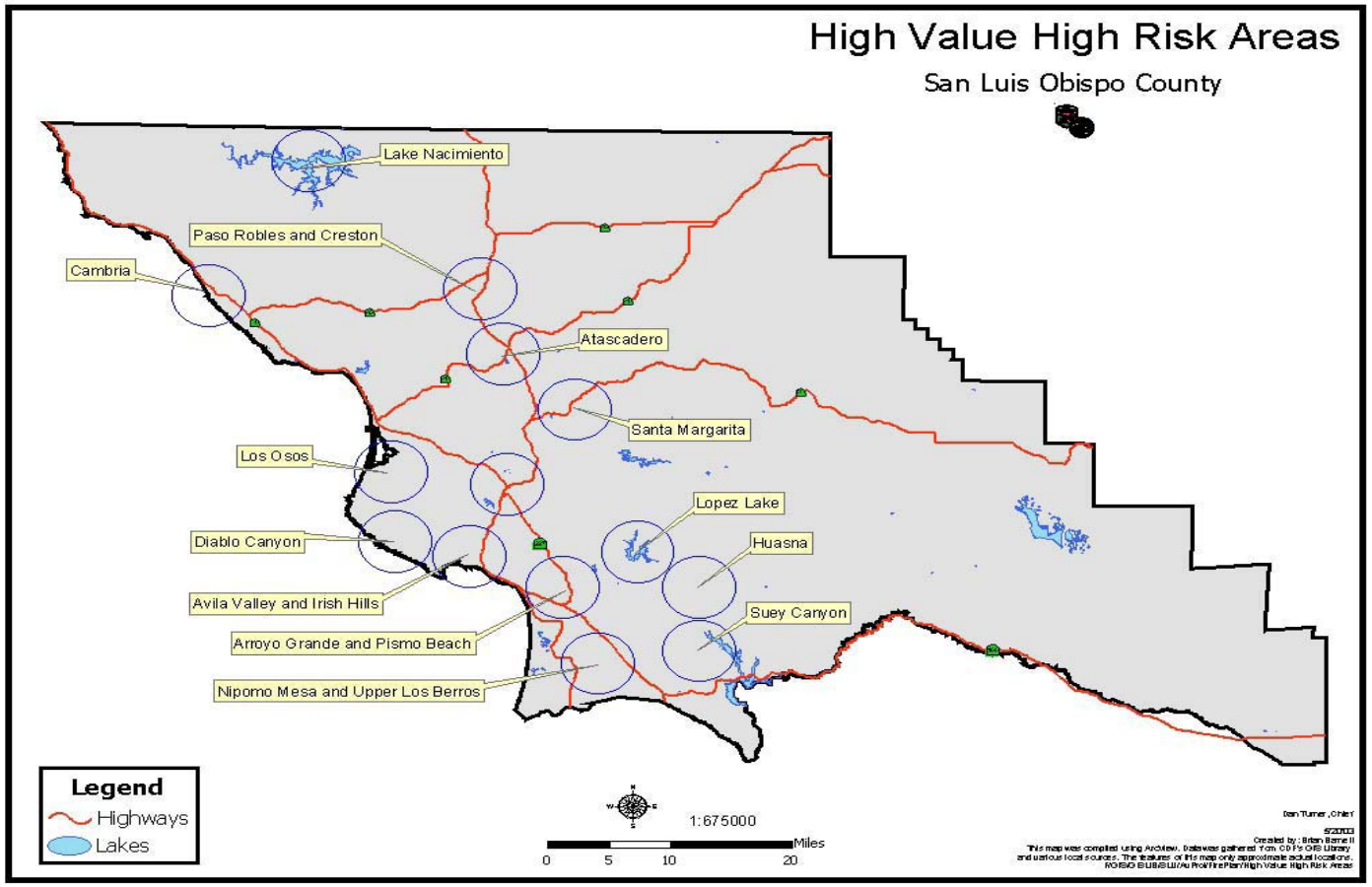

High Value High Risk Areas
San Luis Obispo County
Lake Nacimiento
Paso Robles and Creston
Cambria
Atascadero
Santa Margarita
Los Osos
Lopez Lake
Diablo Canyon
Huasna
Avila Valley and Irish Hills
Suey Canyon
Arroyo Grande and Pismo Beach
Nipomo Mesa and Upper Los Berros
Legend
Highways
Lakes
1:675000
Miles
0
5
10
20

+

## Urban Fire Hazards - Hazard Description

### Effects of Urban Fire Hazards

The potential for loss of life and property from urban fire hazards is greatest in places where large groups of people gather, such as offices, stores, hotels, and theaters. Uses which may suffer large monetary losses due to a major fire include businesses, factories, and shopping areas. Types of development and conditions that present the most difficult fire-protection problems in urban areas include:

- Multiple-story, wood frame, high-density apartment developments
- Developed areas where structures have little or no setbacks
- Structures that contain combustible roofing and other building materials
- The storage, handling, and use of hazardous materials
- Natural disasters

### Influences on Urban Fire Hazards

The risk to life and property resulting from fires in urban settings is influenced by many factors. Some of the factors that must be considered when assessing potential urban fire hazards and the appropriate level of fire protection that should be provided include the following:

- Availability of adequate supplies of water
- The size and height of the structure
- Flammable or hazardous items that may be stored within the structure
- Response time by fire suppression personnel
- On-site fire suppression systems
- The type of use occupying the structure
- The type of building construction and materials
- Adequate emergency ingress and egress

Different types of structures and land uses present their own fire prevention and suppression characteristics, as well as potential problems. In the developed area throughout the District, residential structural fires are the prevalent urban fire risk. This risk is increased when development is located in urban/wildland intermix areas, such as hillside and canyon areas. The additional fire risk associated with residential development in urban fringe areas results from the proximity of structures to flammable vegetation, the increased distance from fire protection services, limited access, and potential for low fire flows for combating fires.

## Hazard Analysis

### Los Osos Community Services District

The District is characterized by low to medium density housing and limited commercial activities. Surrounding the developed community are hundreds of acres of agriculture and chaparral covered lands. The chaparral covered lands present a moderate fire hazard during most of the year due to the coastal influence; however, these lands present a high fire hazard area due to increased weather-induced risks during certain times of the year.

### Existing Fire Protection Services

Fire suppression, fire prevention, and paramedic services are provided by the Los Osos Community Services District Fire Department under contract with the San Luis Obispo County Fire Department/CDF. The District fire station is centrally located within the community. The Department is presently staffed with eight full-time professional firefighters and officers and 25 Reserve Firefighters that work part-time. A full-time secretary is included in the staff. Fire response equipment that is operated by the Department includes:

(1) 1500 gpm ICS Type 1 Fire Engine with Paramedic
(1) 1000 gpm ICS Type 2 Fire Engine
(1) 150 gpm ICS Type 3 Fire Engine, stationed as available through CDF
(1) ICS Type 3 Rescue with Paramedic
(1) Command Vehicle
(1) Utility Vehicle

Additionally, the District's Water Master Plan includes specific elements, assets and capacity in the form of tanks and distribution system to provide adequate fire flow to the service area.

### Risk Assessment

Currently, fire hazard severity is a function of fuel conditions, historic climate, and topography. Neither population density figures nor the number of structures in a particular region are currently used to determine the fire hazard severity for a particular region.

In the Los Osos Community Services District, the predominant type of fire risk is the single-family dwelling. There are small to medium sized commercial occupancies scattered in the community and a limited number of multi-family dwellings also. There are very few dwellings that would be classified as maximum or significant risk. The area has

no large manufacturing or industrial facilities, and there are very few public assemblies. The primary occupancy beyond the residential occupancy is the mercantile and business type structure. In addition, there are several small strip malls.

Geographically, the Los Osos Community Service District is somewhat isolated because of topographic conditions. The area is served by two bridges that provide access over natural waterways. Catastrophic failure of these bridges from an event such as fire, flooding or earthquake could create vulnerability for the community.

**Relationship to Other Hazards – Cascading Effects**

Wildfires in or near the Los Osos Community Services District will have several types of impacts on the natural environment. Generally, some ecosystems are dependent upon recurrent fire to survive and have adapted to reestablish after a fire. These types of adaptations are common in the chaparral plant present in the District which typically has a very high wildfire risk. After a wildfire stops burning, the burned land is laid bare of its protective vegetation cover and is susceptible to excessive run-off and erosion from winter storms, particularly in areas immediately adjacent to and "upstream" of the District. The intense heat from the fire can also cause a chemical reaction in the soil that makes it less porous, and the fire can destroy the root systems of shrubs and grasses that aid in stabilizing slope material. When the winter rains come, the possibility of severe landslides and debris/mud flows is greatly increased.

In addition to damage to natural environments, wildfires result in a high risk for personal injury, loss of life to inhabitants of the fire area and firefighters, and losses of structures and personal property. Public utilities can be strained by the impacts of wildfire, including depletion of water reserves, downed power lines and blackouts throughout the District, disrupted telephone service and blocked roads. Furthermore, flood control facilities within the District may be inadequate to handle an increase in storm runoff, sediment, and debris that is likely to be generated from barren, burned over hillsides.

- **Effects on people and structures.** The Los Osos Community Services District is not confronted with a high wildfire risk and the effects on people and housing have been minimal.

- **Effects on structure and infrastructure.** The District historically has never lost a substantial number of structures to wildfire.

- **Effects on infrastructure.** Wildfire can cause damage to roads, communication facilities, and other infrastructure.

**Risk assessment conclusion:** There is no specific history of wildfires within the boundaries of the Los Osos Community Services District except for a less-than-10 acre event in 1996. However, bordering areas are very much prone to wildfires and, therefore, the District is exposed to a threat from wildfires originating outside the District. The probability of this threat is rated as Low.

**Fire Prevention and Response**

The District has an overall program which evaluates the existence of a program directed towards fire prevention, life safety and risk reduction of hazards. It includes the inspection of buildings, the detection, reporting and control of conditions that affect occupant life safety such as emergency egress. It also includes provisions for monitoring build in fire protection equipment. Fireflow management is addressed in the District's Water Master Plan.

The District's Public Education program has specific goals and objectives in place which describes a set of techniques for conducting formal and informal community outreach programs to inform and educate the public regarding fire prevention and living safely. The District's Fire Department distributes education materials during formal programs, at the fire station, and informal events. Educational and informative articles are included in the District's newsletter. The District has a website that allows for Internet access to specific information on the Department and its activities.

Formal citizen involvement includes the District's Emergency Services Advisory Committee. These meetings are open to the public. Members are appointed by the District's Board of Directors. The Board meetings are open to the public and are televised.

**Plans and Programs**

Current activities in the Los Osos Community Services District include an aggressive weed abatement program and an ongoing program of conducting vegetation management burns adjacent to the District. The District is in the process of implementing the first priority Capital Improvement Projects as outlined in the District's Water Master Plan which along with calling for the installation of five new fire hydrants throughout the service area, will also execute and construct projects to improve pressures throughout the distribution system, increase hydraulic flows in main corridors of town, and provide back-up standby power stations.

The Public Resources Codes (PRC) 4290 and 4291are State laws that have a significant impact on the prevention of large losses of life and property in the wildland/urban intermix areas from a destructive wildfire. The intent of these codes is to require new

development in wildfire prone areas to be built with adequate road access, water for firefighting, addressing, fire resistive construction, and vegetation clearance. The code also requires the owners to maintain an adequate defensible space around their buildings from an approaching fire.

**Ordinances and Regulations**

The District has adopted the 1997 Uniform Fire Code with amendments. A Fire Code Appeals Board has been appointed. This Board is responsible to act upon appeals of provisions of the Fire Code.

## Hazard: Flooding

| Severity: Low | Probability: Medium |
|---|---|

### Hazard Definition

A flood is defined as an overflowing of water onto an area of land that is normally dry. Floods generally occur from natural causes, usually weather-related, such as a sudden snow melt, often in conjunction with a wet or rainy spring or with sudden and very heavy rainfalls.

For floodplain management purposes, the following discussion describes the Federal Emergency Management Agency (FEMA) definition of "100-year flood." The term "100-year flood" is misleading. It is not a flood that will occur once every 100 years. Rather, it is the flood elevation that has a one percent chance of being equaled or exceeded each year. Thus, a 100-year flood could occur more than once in a relatively short period of time. The 100-year flood, which is the standard used by most federal and state agencies, is used by the National Flood Insurance Program (NFIP) as the standard for floodplain management and to determine the need for flood insurance. A structure located within a special flood hazard area shown on a map has a 26 percent chance of suffering flood damage during the term of a 30-year mortgage.

### History

Responsibility for drainage and flooding on roads within the District primarily rests with San Luis Obispo County, although some areas immediately surrounding District facilities are a shared responsibility. The District's government building situated in the flood-prone areas of the District is the Water Operations Building. Private residences are the primary assets vulnerable to flooding damage.

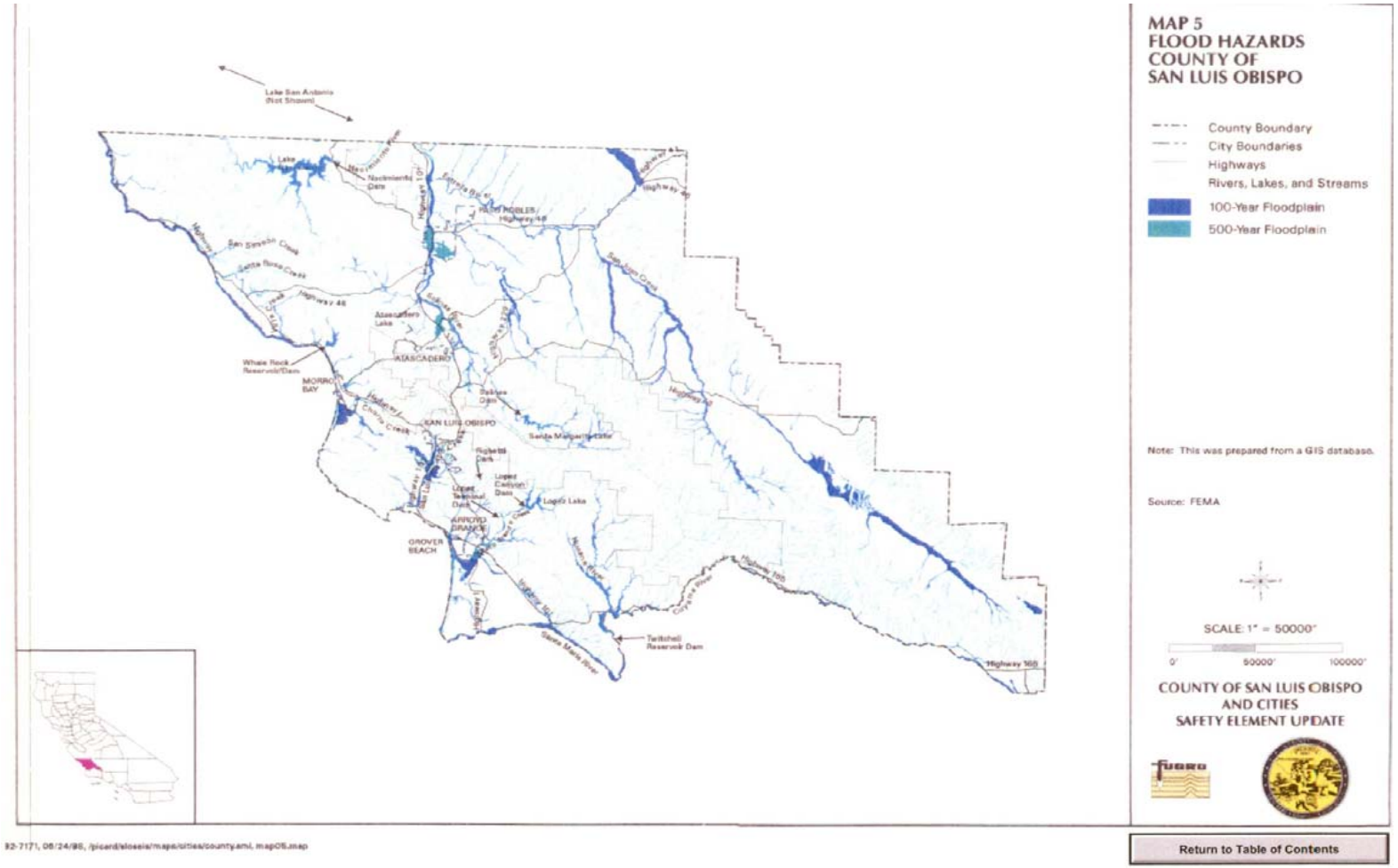
The following table list historical flooding events that have affected Los Osos Community Services District.

## Table 4-3: Historical Flooding Events affecting Los Osos Community Services District

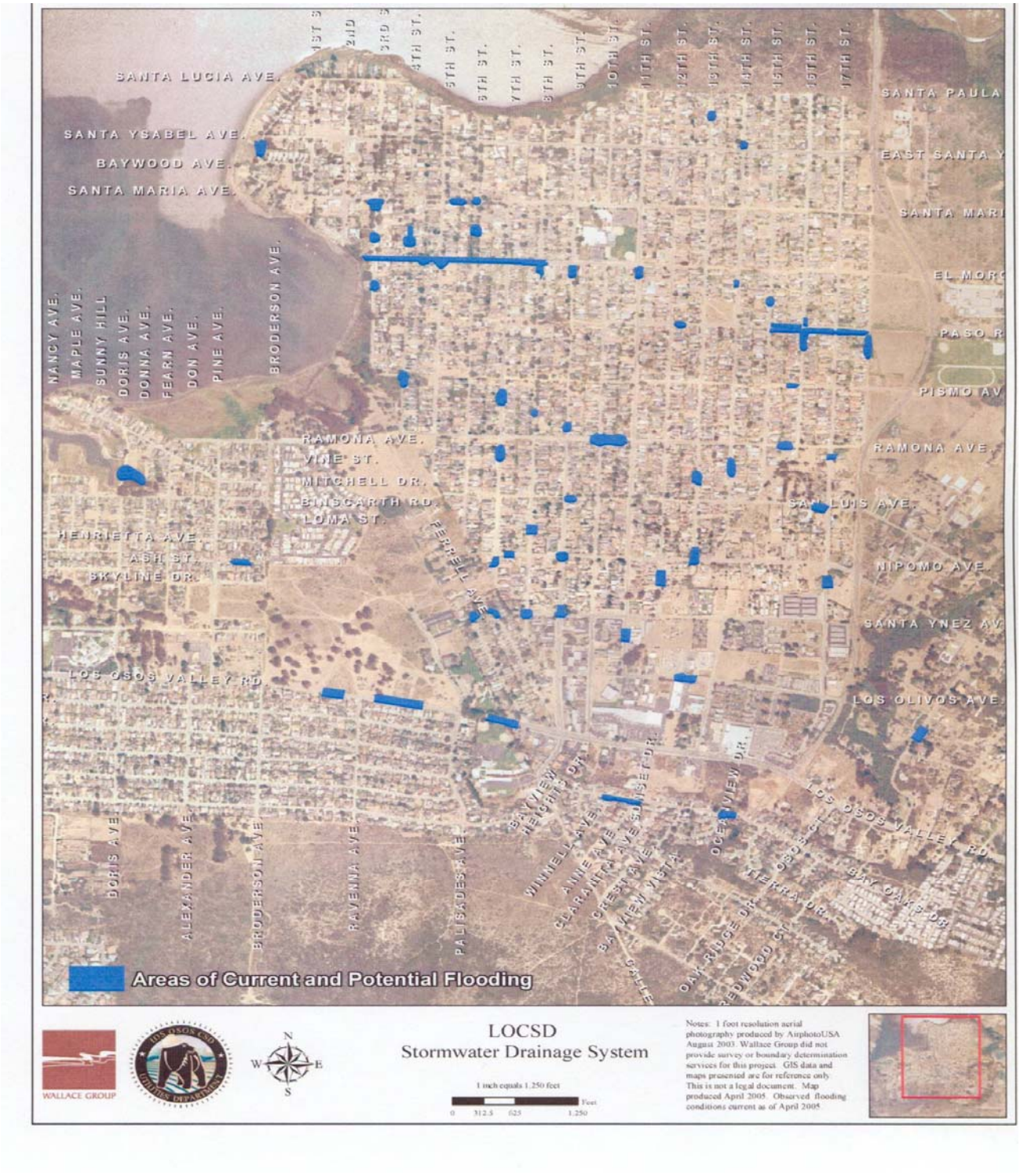
| Location | Date of Incident | Declaration | Intensity | Reported Damage | Number Injured | Structures Affected | Incident Description | Source |
|---|---|---|---|---|---|---|---|---|
| San Luis Obispo County including Paso Robles, San Luis Obispo, Morro Bay, Avila Beach, Pismo Beach | January - February 1969 | | 12 to 21 inches of rain | | | | Flooding. In January of 1969, a series of storms delivered rainfall totals that ranged from approximately 12 inches to 21 inches over an eight-day period. In February, another series of storms delivered over 5 inches of rain. Severe damages were sustained by streets, highways, and utilities throughout the County. The sewage-treatment plants at Morro Bay, Avila Beach, and Pismo Beach were inundated by both floods. | SE |
| Coastal Flooding including San Luis Obispo County | 1/11/2001 | | | | 0 | 0 | Coastal Flooding. An extremely large swell, combined with high astronimical tides, produced heavy surf and flooding of coastal areas along Central and Southern California. | NCDC |
| San Luis Obispo County | 3/5/2001 | | 2 to 13 inches of rain | | 0 | Over 30 homes and 5 classrooms damaged | Coastal Flooding. A powerful and slow-moving storm brought heavy rain, strong winds to Central and Southern California. Across San Luis Obispo County rainfall totals ranged from 2 to 6 inches over coastal and valley areas to 6 to 13 inches in the mountains. In San Luis Obispo County, the heavy rain produced numerous flooding incidents. | NCDC |
| Countywide | 12/27/2004 | | | | | | Flash Flooding A powerful Pacific storm brought more heavy rain, snow and flash flooding to Central and Southern California. Total rainfall amounts ranged from 1 to 3 inches on the coastal plain to between 3 and 6 inches in the mountains. The heavy rain resulted in numerous reports of urban and rural flooding. | NCDC |

SE: County Safety Element NCDC: National Climatic Data Center NOAA: National Oceanic & Atmospheric Administration FMP: CDF/San Luis Obispo Fire Management Plan

The following Maps depict the Flood Hazards in Los Osos Community Services District and throughout San Luis Obispo County.


MAP 5
FLOOD HAZARDS
COUNTY OF
SAN LUIS OBISPO
County Boundary
City Boundaries
Highways
Rivers, Lakes, and Streams
100-Year Floodplain
500-Year Floodplain
Note: This was prepared from a GIS database.
Source: FEMA
SCALE: 1" = 50000'
0'
50000'
100000'
COUNTY OF SAN LUIS OBISPO
AND CITIES
SAFETY ELEMENT UPDATE
Lake San Antonio
(Not Shown)
Nacimiento Dam
Highway 46
San Simeon Creek
Santa Rosa Creek
Highway 1
Atascadero Lake
ATASCADERO
Whale Rock Reservoir/Dam
MORRO BAY
Morro Bay
Chorro Creek
Salinas River
Highway 101
SAN LUIS OBISPO
Santa Margarita Lake
Righetti Dam
Upper Terminal Dam
Lopez Canyon Dam
Lopez Lake
ARROYO GRANDE
GROVER BEACH
Nipomo Creek
Oso Flaco Lake
Twitchell Reservoir Dam
Santa Maria River
Highway 166
92-7171, 08/24/98, /picard/slosela/maps/cities/county.aml, mapOS.map
Return to Table of Contents

The following Map depicts specific areas of current and potential flooding in Los Osos Community Services District.



## Flood Hazard Potential

The Los Osos Community Services District is located in the South Bay area and includes the communities of Los Osos, Baywood Park, and Cuesta-by-the Sea. The District has not been identified as being located within a 100-year storm floodplain by the most recent Flood Insurance Rate Maps. Flooding in response to a 100-year storm is generally confined to shoreline areas surrounding nearby Morro Bay. There are locations in this area, however, that are subject to chronic localized flooding. After a significant rain, localized flooding occurs throughout the Los Osos area. Numerous intersections within the community experience flooding during storm events.

Only one area near the Los Osos Community Services District has been mapped by FEMA as being located within the 100-year floodplain and has resulting in some flooding to the District, namely:

**Morro Bay**
Flooding in the City of Morro Bay would impact the District and could occur as a result of inflows to Morro Creek, Little Morro Creek, Chorro Creek, and several other smaller creeks. Flooding from Morro Creek and Little Morro Creek in response to a 100-year storm would inundate areas between Little Morro Creek Road and Highway 41 on the east side of Main Street, and an extensive area north of Embarcadero Road on the west side of Main Street. Flooding from these creeks could potentially render State Highway 1 bridges over these waterways unusable during a major storm.

During the rains of 1995, Highway 1 was closed through Morro Bay due to flooding. Flooding from Chorro Creek inundated Twin Bridges (now Chorro Creek Bridge) for several days, forcing travelers from the Los Osos Community Services District to detour through San Luis Obispo in order to reach Morro Bay.

## Relationship to Other Hazards – Cascading Effects

While there are some benefits associated with flooding, such as the replenishment of sand to beaches and nutrients to agricultural lands, it is generally considered a hazard to development in floodplains. Floods can cause many cascading effects. Fire can break out as a result of dysfunctional electrical equipment. Hazardous materials can also get into floodways, causing health concerns and polluted water supplies. In many instances during a flood, the drinking water supply will be contaminated. Floods can create power outages and blackouts throughout the District.

- **Effects on people and housing.** Direct impacts of flooding can include injuries and loss of life, damage to property and health hazards from ruptured sewage

lines and damaged septic systems. Secondary impacts include the cost and commitment of resources for flood fighting services, clean-up operations, and the repair or replacement of damaged structures.

- **Effects on commercial and industrial structures.** Flooding can cause damage to commercial and industrial structures, and damage to vegetation and crops. Beach erosion results in the loss of sand from coastal areas. This hazard can accelerate the rate of erosion of coastal bluffs, and can also contribute to increased wave-related damage to coastal structures.

- **Effects on infrastructure.** Flooding can cause damage to roads, communication facilities, and other infrastructure.

**Risk assessment conclusion:** Although not located in a FEMA-defined 100 year flood plain, because of soil composition, proximity to the Pacific Ocean, and natural drainage flows of inland areas beyond the District boundaries, the District is vulnerable to "flash", short-duration flooding in low lying areas. This threat is rated as Medium.

**Plans and Programs**

The District currently maintains four drainage pumping stations throughout the community to facilitate the movement of storm water from critical areas in the District. The Los Osos Community Services District has identified flood-vulnerable areas and has initiated some localized projects. The District has plans to develop a Storm Water Management Plan specific to the District. Further, the District is undertaking discussions with San Luis Obispo County on ways to better determine and coordinate implementation of local drainage improvements. The District actively makes available sandbags for purchase at cost and provides free sand to residents and businesses located within the District.

## Hazard: Extreme Weather / Heavy Rainfall

| Severity: Low - Medium | Probability: High |
|---|---|

### Hazard Definition

Extreme weather could include drought, freeze, hail, high wind, tornados, and thunderstorm.

**High Wind** is caused by air moving from an area of high pressure to an area of low pressure. Winds vary in strength and destructive power.

**Thunderstorms** are formed from a combination of moisture, rapidly rising warm air and a force capable of lifting air such as a warm and cold front, a sea breeze or a mountain. Thunderstorms can cause torrential rain to fall in a brief period of time, as well as damaging high winds. All thunderstorms contain lightning. Thunderstorms may occur singly, in clusters or in lines.

### History

Los Osos Community Services District has a history of extreme weather and heavy rainfall hazards. The following table represents major storms affecting San Luis Obispo County in general which, in turn, had significant impact on the District as well.

## Table 4-4: Major Area Storms

| Location | Date of Incident | Declaration | Intensity | Reported Damage | Number Injured | Structures Affected | Incident Description | Source |
|---|---|---|---|---|---|---|---|---|
| San Luis Obispo County | 2/2/1998 to 2/3/1998 | | | | | | High Wind. The first powerful sotm of the month slammed into Central and Southern California. Powerful winds buffeted the entire area. Hearst Castle reported winds gusting to 90 mph. Elsewhere, winds gusting in excess of 70 mph were reported. Hundreds of trees and power lines were blown down, resulting in numerous power outages. Along with the strong winds, heavy rain drenched the entire area. On average, rainfall totals ranged from 2 to 8 inches over coastal areas, up to 12 inches in the mountains. Widespread flooding was reported in all areas. | NCDC |
| San Luis Obispo County | 2/5/1988 to 2/6/1988 | | | | | | High Wind. The second storm of the month struck Central and Southern California. Once again, strong winds, gusting up to 70 mph, knocked down many trees and power lines. Rainfall totals ranged from 1 to 3 inches over coastal areas, up to 6 inches in the mountains. Numerous flooding problems were reported across the area. | NCDC |
| San Luis Obispo County | 2/7/1998 to 2/8/1998 | | | | | | High Wind. The third storm of the month brought more weather-related problems to Central and Southern California. Strong winds, gusting up to 70 mph, knocked down many trees and power lines. Rainfall totals ranged from 1 to 4 inches over the coast, up to 7 inches in the mountains. Widespread reports of urban and rural flooding were reported. | NCDC |
| Countywide | 12/21/1998 to 12/24/1998 | | | $5.4M Crop Damage | | | Freeze. An unseasonably cold airmass produced a three-night period of sub-freezing temperatures across Central and Southern California. Agricultural interests suffered heavy crop losses. | NCDC |
| San Luis Obispo County | 4/3/1999 to 4/4/1999 | | | | | | High Wind. Strong northwest winds developed across Central and Southern California. Sustained wind speeds of at least 35 to 45 mph with gusts up to 65 mph were reported. Widespread power outages and felled trees were reported. | NCDC |
| San Luis Obispo County | 2/11/2000 to 2/12/2000 | | | | | | High Wind. A powerful cold frong brought strong winds to parts of Central and Southern California. In Morro Bay, southeast winds, gusting to 60 mph ahead of the front, knocked down numerous trees and power lines. | NCDC |
| San Luis Obispo County | 3/4/2001 to 3/6/2001 | | | | | | High Wind. A powerful and slow-moving storm brought heavy rain, strong winds to Central and Southern California. Across San Luis Obispo County, rainfall totals ranged from 2 to 6 inches over coastal and valley areas to 6 to 13 inches in the mountains. In San Luis Obispo County, the heavy rain produced numerous flooding incidents. | NCDC |
| San Luis Obispo County | 11/24/2001 | | | | | | High Wind. A strong cold front moved though San Luis Obispo County, producing strong and gusty winds. Weather spotters and the Morro Bay Fire Department reported sustained winds between 35 and 45 mph with gusts as high as 62 mph. Numerous small trees and power lines were blown down. | NCDC |
| San Luis Obispo County | 12/7/2001 | | | | | | High Wind. Gusty northeast winds knocked down power lines and small trees in the community of Morro Bay. Wind speeds were estimated between 25 and 35 mph with local gusts as high as 60 mph. | NCDC |
| San Luis Obispo County | 12/19/2002 | | | | | | High Wind. A powerful early season storm brought high wind across San Luis Obispo County. Southeast winds gusting to 60 mph knocked down numerous power lines and small trees. | NCDC |
| San Luis Obispo County | 2/25/2004 | | | | | | High Wind. A very powerful Pacific storm brought heavy rain, and gusty winds to Central and Southern California. The storm dumped between 1.50 and 6 inches of rainfall across the area. Along with the precipitation, gusty southeast to south winds buffeted the area. | NCDC |

SE: County Safety Element NCDC: National Climatic Data Center NOAA: National Oceanic & Atmospheric Administration FMP: CDF/San Luis Obispo Fire Management Plan

### Relationship to Other Hazards – Cascading Effects

Heavy rainfall and high winds can cause many cascading effects. Fire can break out as a result of dysfunctional electrical equipment. Hazardous materials can also get into floodways, causing health concerns and polluted water supplies. In many instances during heavy rainfall causing flooding, the drinking water supply will be contaminated and power outages and blackouts throughout the District could occur.

- **Effects on people and housing.** There is a high probability that a heavy rainfall or a high wind event constituting significant property damage or loss of life will occur in the District.

- **Effects on commercial and industrial structures.** When severe storms occur in the District, they can have devastating effects in terms of property damage, injuries and even loss of life. The danger is multiplied by the risks of power and communications line downing and floods.

- **Effects on infrastructure.** A heavy rainfall or a high wind event can cause damage to roads, communication facilities, and other infrastructure.

**Risk assessment conclusion:** The Los Osos Community Services District has incurred frequent heavy rainfall events annually. Because of the proximity to the Pacific Ocean, storms hitting the area tend to be more extreme than inland. Combined with soil conditions and the presence of shallow-rooted Eucalyptus trees, heavy rains and moderate winds cause numerous tree-toppling events each year. Downed trees knock down power and communications lines, bringing disruptions lasting from a few hours to days in some locales in the District. This threat is rated as High.

### Plans and Programs

In addition to detection and alarm systems, the Los Osos Community Services District currently maintains battery back-up systems at all existing critical infrastructure sites throughout the District and will maintain this practice for all subsequent facilities constructed in the future. The District also maintains a Water Management Plan and a Waste Water Management Plan which, from their individual perspectives, addresses some elements of an overall Flood Management Plan.

## Hazard: Tsunami and Seiche

| Severity: Low | Probability: Low |
|---|---|

### Hazard Definition

A tsunami is a wave caused by a displacement of the ocean floor, usually by movement along a fault. In deep ocean water, tsunamis may travel as fast as 600 miles per hour. As the wave approaches shore, it increases in size and can cause extensive damage to coastal structures.

Seiche (pronounced seish) is defined as oscillations of enclosed and semi-enclosed bodies of water, such as bays, lakes, or reservoirs, due to strong ground motion from seismic events, wind stress, volcanic eruptions, and local basin reflections of tsunami. Seiches can result in the creation of long-period waves which can cause water to overtop containment features or cause seiche runup on adjacent land masses, similar to tsunami runup.

### History

The threat of tsunami-related damage is primarily confined to low-lying coastal areas. Los Osos Community Services District could be affected by a tsunami caused by fault-related ground displacement on a local offshore fault, or on a more distant fault. Several tsunami events have been recorded along the coastline of San Luis Obispo County which is the western boarder of the Los Osos Community Services District; however, previous studies have predicted a maximum tsunami wave "runup" of approximately 9.5 feet above sea level for a 100-year event. Wave runup could be increased substantially if a tsunami occurred during a major storm or at high tides.

Although faults are near several of the reservoirs in San Luis Obispo County, since there are no reservoirs within close proximity to the Los Osos Community Services District, seiche is not considered a significant risk to the District. Large waves in these water-bodies are not anticipated because they are not large enough to develop such events. Seiches could occur in Morro Bay which boarders the District.

The following table represents historical tsunami events in the Morro Bay area and, therefore, the Los Osos Community Services District

### Table 4-5: Historical Tsunami Events

| Location | Date of Incident | Declaration | Intensity | Reported Damage | Number Injured | Structures Affected | Incident Description | Source |
|---|---|---|---|---|---|---|---|---|
| Morro Bay | ?/1868 | | | | | | Tsunami. Source location: Unknown. Source event: Unknown | NOAA |
| Morro Bay | ?/1878 | | | | | | Tsunami. Source location: Unknown. Source event: Unknown | NOAA |
| Avila Beach, Morro Bay, San Luis Obispo | 4/1/1946 | | Height (meters): 1.3 Source magnitude: (Ms) 7.3 | | | | Tsunami. Source location: Alaska. Source event: E. Aleutian Islands. Travel time: 5 hours 36 minutes. | NOAA |

SE: County Safety Element NCDC: National Climatic Data Center NOAA: National Oceanic & Atmospheric Administration FMP: CDF/San Luis Obispo Fire Management Plan

### Relationship to Other Hazards – Cascading Effects

The threat of tsunami-related damage is primarily confined to low-lying coastal areas, which is the predominate environment of the District. With a gradient which is shallow, tsunami waves will travel upstream into river channels and creek beds. The primary effects of a tsunami can be widespread destruction and damage to coastal structures.

- **Effects on people and housing.** There is a low probability that a tsunami event constituting significant property damage or loss of life will occur in the District.
- **Effects on commercial and industrial structures.** A tsunami event occurring in the District can have devastating effects in terms of property damage, injuries and even loss of life.
- **Effects on infrastructure.** A tsunami event can cause damage to roads, communication facilities, and other infrastructure.

**Risk assessment conclusion:** The Los Osos Community Services District has historically incurred tsunami events. Because of the proximity to the Pacific Ocean and the seismically active "Pacific Ring of Fire" the District is vulnerable to a future tsunami event. This threat is rated as Low.

### Plans and Programs

The District, in concert with San Luis Obispo County participates in the state-wide tsunami warning effort with the State Office of Emergency Services, NOAA, and the Tsunami Warning Center. Utilizing the siren warning system installed as part of the Diablo Canyon Power Plant infrastructure, unique signals will alert citizens to tune in to radio or television messages concerning any impending tsunami with emergency instructions on actions to be taken.

## Hazard: Earthquakes

| Severity: Medium - High | Probability: High |
|---|---|

### Hazard Definition

An earthquake is a sudden, rapid shaking of the ground caused by the breaking and shifting of rock beneath the Earth's surface. For hundreds of millions of years, the forces of plate tectonics have shaped the Earth as the huge plates that form the Earth's surface move slowly over, under, and past each other. Sometimes the movement is gradual. At other times, the plates are locked together, unable to release the accumulating energy. When the accumulated energy grows strong enough, the plates break free causing the ground to shake. Most earthquakes occur at the boundaries where the plates meet; however, some earthquakes occur in the middle of plates.

The major form of direct damage from most earthquakes is damage to construction. Bridges are particularly vulnerable to collapse, and dam and water tank failure may generate major downstream flooding. Buildings vary in susceptibility, dependent upon construction and the types of soils on which they are built. Earthquakes destroy power and telephone lines; gas, sewer, or water mains; which, in turn, may set off fires and/or hinder firefighting or rescue efforts.

The hazard of earthquakes varies from place to place, dependent upon the regional and local geology. Where earthquakes have struck before, they will strike again. Earthquakes strike suddenly, without warning. Earthquakes can occur at any time of the year and at any time of the day or night.

Ground movement during an earthquake is seldom the direct cause of death or injury. Most earthquake-related injuries result from collapsing walls, flying glass, and falling objects as a result of the ground shaking, or people trying to move more than a few feet during the shaking. Much of the damage in earthquakes is predictable and preventable.

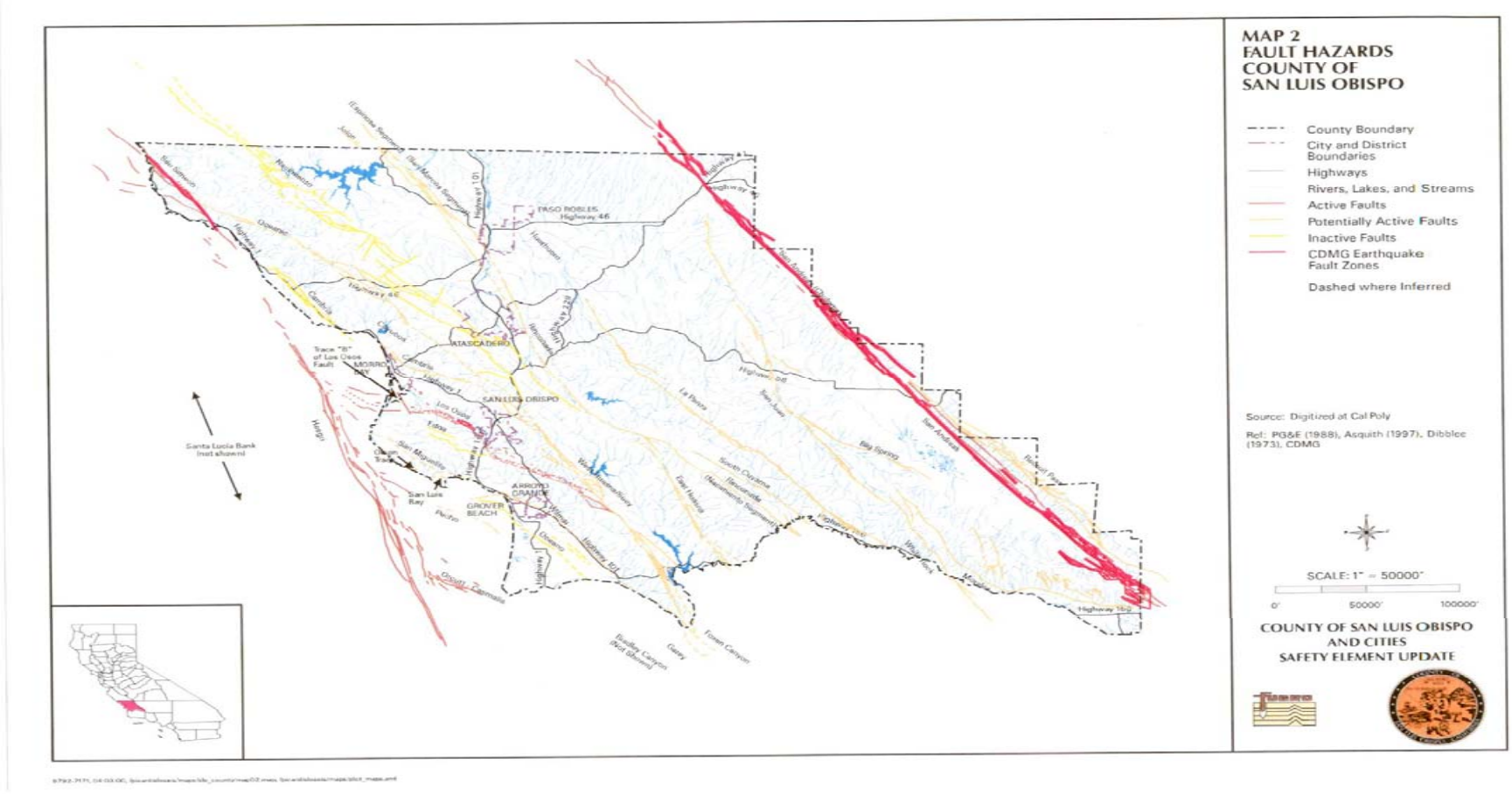
### History

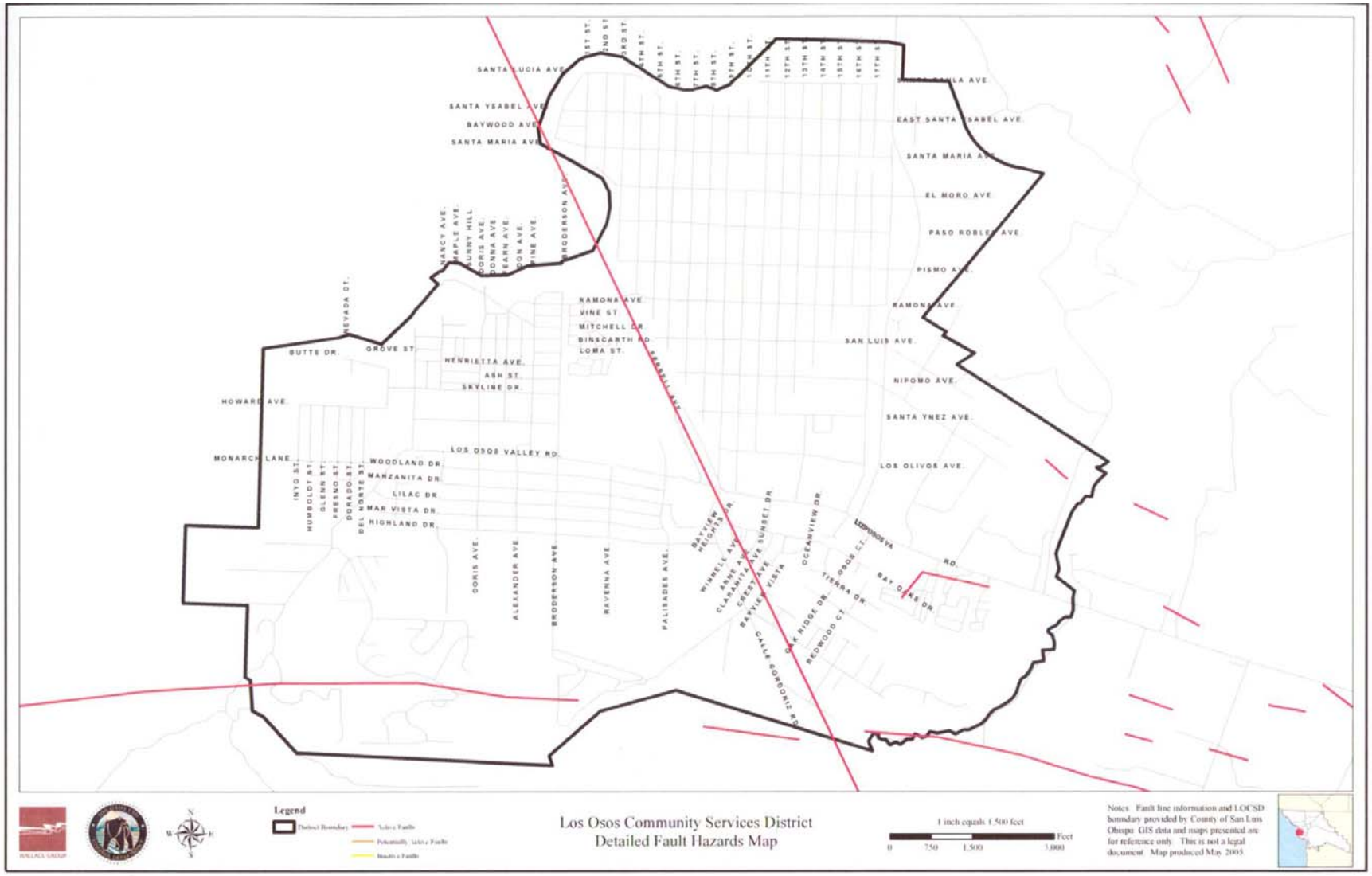
The communities within the boundaries of the Los Osos Community Services District have experienced the effects of earthquakes affecting California, the Pacific Coastline, and San Luis Obispo County. Some historical earthquakes with a magnitude of 5.0 or greater occurring in the County are summarized on Table 4-6. Larger earthquakes that have been felt in the County during the last century have generally occurred outside of the County, and include events such as the 7.0 Lompoc earthquake in 1927, and the 7.7

Arvin-Tehachapi earthquake of 1952. Other more recent earthquakes, such as the 1983 - 6.7 Coalinga earthquake, 1989 - 7.1 Loma Prieta earthquake, 1992 - 7.5 Landers earthquake and the 1994 - 6.6 Northridge earthquake were felt in San Luis Obispo County, however, no damage to structures is known to have occurred.

The latest major earthquake, the 2003 San Simeon event caused significant damage to the Los Osos Community Services District's 16th Street water storage tank. The District has currently received bids to either repair or replace the facility and anticipates the 16th Street storage facility to be back on-line in fall of 2005. Other critical infrastructure, including the fire station, suffered damage that was either immediately repaired or, like the 16th Street tank, for which repairs are pending bids from contractors. The community at large also suffered structural damage and losses. Fortunately, however, there was no loss of life or injuries within the District.

The following maps depict the location of the major mapped faults throughout San Luis Obispo County and immediately in or near the Los Osos Community Services District.


MAP 2
FAULT HAZARDS
COUNTY OF
SAN LUIS OBISPO
County Boundary
City and District Boundaries
Highways
Rivers, Lakes, and Streams
Active Faults
Potentially Active Faults
Inactive Faults
CDMG Earthquake Fault Zones
Dashed where Inferred
Source: Digitized at Cal Poly
Ref: PG&E (1988), Asquith (1997), Dibblee (1973), CDMG
SCALE: 1" = 50000'
0'
50000'
100000'
COUNTY OF SAN LUIS OBISPO
AND CITIES
SAFETY ELEMENT UPDATE
PASO ROBLES
Highway 46
ATASCADERO
SAN LUIS OBISPO
MORRO BAY
GROVER BEACH
ARROYO GRANDE
Santa Lucia Bank
Inset shown


SANTA LUCIA AVE
SANTA YSABEL AVE
BAYWOOD AVE
SANTA MARIA AVE
EAST SANTA YSABEL AVE
SANTA MARIA AVE
EL MORO AVE
PASO ROBLES AVE
PISMO AVE
RAMONA AVE
SAN LUIS AVE
NIPOMO AVE
SANTA YNEZ AVE
LOS OLIVOS AVE
RAMONA AVE
VINE ST
MITCHELL DR
BINSCARTH RD
LOMA ST
BUTTE DR
GROVE ST
HENRIETTA AVE
ASH ST
SKYLINE DR
HOWARD AVE
MONARCH LANE
LOS OSOS VALLEY RD
WOODLAND DR
MANZANITA DR
LILAC DR
MAR VISTA DR
HIGHLAND DR
INYO ST
HUMBOLDT ST
GLENN ST
FRESNO ST
DORADO ST
DEL NORTE ST
DORIS AVE
ALEXANDER AVE
BRODERSON AVE
RAVENNA AVE
PALISADES AVE
BAYVIEW HEIGHTS DR
WINNELL AVE
ANNE AVE
CLARAMITA AVE
CRESTVIEW DR
SUNSET DR
BAYVIEW VISTA
OCEANVIEW DR
LOS OSOS CT
TIERRA DR
BAY OAKS DR
OAK RIDGE DR
REDWOOD CT
CALLE GORDONIZ
Legend
Los Osos Community Services District
Detailed Fault Hazards Map
1 inch equals 1,500 feet
Feet
0
750
1,500
3,000
Notes: Fault line information and LOCSD boundary provided by County of San Luis Obispo GIS data and maps presented are for reference only. This is not a legal document. Map produced May 2005

## Table 4-6: Historical area earthquakes with a magnitude of 5.0 or greater.

| Location | Date of Incident | Declaration | Mercalli Intensity | Richter Intensity | Number Injured | Structures Affected | Incident Description | Source |
|---|---|---|---|---|---|---|---|---|
| **Santa Maria Basin/San Luis Range Domain** | | | | | | | | |
| Los Alamos area | 7/28/1902 | | VIII | 5.4 | | | | SE |
| Los Alamos area | 12/12/1902 | | VII | 5 | | | | SE |
| Arroyo Grande area | 10/20/1913 | | | 5 | | | | SE |
| Los Alamos area | 1/20/1915 | | VIII | 5.8 | | | | SE |
| Avila area | 12/1/1916 | | VI | 5 | | | This event occurred offshore of Avila Beach in San Luis Bay. The earthquake reportedly resulted in tumbling smokestacks of the Union Oil Re finery at Port San Luis, and a landslide that blocked the railroad tracks. The maximum intentist appears to be approximately IV, but the available descriptions of the shaking are somewhat limited. | SE |
| Santa Maria area | 11/18/1927 | | VI | 5 | | | | SE |
| Orcutt Frontal fault | 5/29/1930 | | V | 5.1 | | | | SE |
| **Coastal Franciscan Domain** | | | | | | | | |
| San Luis Obispo area | ??/??/1830 | | VII | 5 | | | The 1830 earthquake is noted in the annual report from the Mission. The location of the event is poorly constrained and cannot be attributed to a specific fault source, but the eqrthquake reportedly occurred somewhere near San Luis Obispo. | SE |
| San Simeon area | 2/1/1853 | | VI | 5 | | | | SE |
| Lopez Canyon area | 7/9/1917 | | VI | 5 | | | | SE |
| Bryson area | 11/22/1952 | | VII | 6.2 | | | This earthquake likely occurred on the Nacimiento fault, and resulted in intensity ratings of VI throughout most of the western portion of the County. Intensities of IV-V were experienced in the eastern portion of the County. Higher intensities were generally felt in the coastal valley areas. | SE |
| San Simeon area | 8/29/1983 | | VI | 5.4 | | | | SE |
| San Simeon area | 12/22/2003 | Y | VII | 6.5 | 42 | 75 | Two people killed and about 40 buildings collapse or severely damaged at Paso Robles. At least 40 people injured in the Paso Robles-Templeton areas. Buildings damaged and small fires occurred at Cambria and Morro Bay. The airport at Oceano was closed due to cracks in the runway. More than 10,000 homes and businesses were without power in the Paso Robles area. | USGS |
| **Salinian Domain** | | | | | | | | |
| Poor location | 1852 | | | 6 | | | | SE |
| San Ardo area | 2/26/1932 | | IV | 5 | | | | SE |
| | 9/27/1938 | | V | 5 | | | | SE |
| San Ardo area | 11/2/1955 | | VI | 5.1 | | | | SE |
| Point Sur area | 1/23/1984 | | | 5.2 | | | | SE |
| **Western San Joaquin Valley Domain** | | | | | | | | |
| | 3/6/1882 | | VI | 5.7 | | | | SE |
| Paicines area | 8/6/1916 | | VII | 5.5 | | | | SE |
| Idria area | 7/25/1926 | | VI | 5 | | | | SE |
| Coalinga area | 12/27/1926 | | VI | 5 | | | | SE |
| | 2/5/1947 | | VI | 5 | | | | SE |
| Ned Idria area | 10/25/1982 | | VI | 5.4 | | | | SE |
| Coalinga | 5/2/1983 | | VIII | 6.7 | | | | SE |
| Coalinga aftershock | 7/22/1983 | | VI | 6 | | | | SE |
| Kettleman Hills | 8/4/1995 | | | 5.7 | | | | SE |

| Location | Date of Incident | Declaration | Mercalli Intensity | Richter Intensity | Number Injured | Structures Affected | Incident Description | Source |
|---|---|---|---|---|---|---|---|---|
| **San Andreas Fault and Vicinity** | | | | | | | | |
| Fort Tejon | 1/9/1857 | | IX+ | 7.9 | | | | SE |
| San Andreas Fault | 2/2/1881 | | VIII | 6.6 | | | | SE |
| San Andreas Fault | 3/31/1885 | | VII | 5.5 | | | | SE |
| San Andreas Fault | 4/2/1885 | | V-VI | 5.4 | | | | SE |
| San Andreas Fault | 4/12/1885 | | VII | 6.2 | | | | SE |
| San Andreas Fault | 11/13/1892 | | VII | 5.6 | | | | SE |
| San Andreas Fault | 7/22/1899 | | VII | 5.5 | | | | SE |
| San Andreas Fault | 7/22/1899 | | VIII | 6.5 | | | | SE |
| Parkfield area | 3/3/1901 | | VIII | 5.5 | | | | SE |
| San Andreas Fault | 9/20/1907 | | VII | 6 | | | | SE |
| Hollister area | 12/31/1910 | | VII | 6 | | | | SE |
| Tejon Pass area | 10/23/1916 | | VII | 6 | | | | SE |
| Tejon Pass area | 10/23/1916 | | VI | 5.5 | | | | SE |
| Tejon Pass area | 2/16/1919 | | VII | 5 | | | | SE |
| Choalame Valley area | 3/10/1922 | | IX | 6.5 | | | | SE |
| Choalame Valley area | 8/18/1922 | | VII | 5 | | | | SE |
| Parkfield area | 6/5/1934 | | V | 5 | | | | SE |
| Parkfield area | 6/8/1934 | | VIII | 6 | | | The Parkfield earthquakes had magnitudes of 6 and 5.5 respectively, and occurred on the San Andreas fault in the northeast corner of the County. Earthquake intensities generally conformed to anticipated characteristics for events of this size, with intense shaking (VII-VIII) being limited to a relatively small area near the epicenters of the quakes. Moderate shaking was experienced in most of the central and eestern parts of the County. A variation from the expected intensity characteristics was experienced in the La Panza area. La Panza is approximately 40 miles south of the fault rupture area, but experienced earthquake intensities of VII. | SE |
| Parkfield area | 12/24/1934 | | IV | 5 | | | | SE |
| Hollister area | 6/24/1939 | | VII | 5.5 | | | | SE |
| Parkfield area | 12/28/1939 | | V | 5 | | | | SE |
| Cuddy Valley area | 9/21/1941 | | VI | 5.2 | | | | SE |
| Southeast of Mulberry | 7/29/1951 | | VI | 5 | | | | SE |
| Southwest of Coalinga | 11/16/1956 | | VI | 5 | | | | SE |
| South of Hollister | 1/20/1960 | | VI | 5 | | | | SE |
| Parkfield sequence | 6/28/1966 | | | 5.1 | | | | SE |
| Parkfield sequence | 6/28/1966 | | VII | 5.5 | | | The Parkfield earthquakes had magnitudes of 6 and 5.5 respectively, and occurred on the San Andreas fault in the northeast corner of the County. Earthquake intensities generally conformed to anticipated characteristics for events of this size, with intense shaking (VII-VIII) being limited to a relatively small area near the epicenters of the quakes. Moderate shaking was experienced in most of the central and eestern parts of the County. A variation from the expected intensity characteristics was experienced in the La Panza area. La Panza is approximately 40 miles south of the fault rupture area, but experienced earthquake intensities of VII. | SE |
| Lytle Creek area | 9/12/1970 | | VII | 5.4 | | | | SE |
| Southeast of Hollister | 2/24/1972 | | VI | 5 | | | | SE |
| Parkfield area | 9/28/2004 | | | 6 | | | | USGS |

SE: County Safety Element NCDC: National Climatic Data Center NOAA: National Oceanic & Atmospheric Administration

Following is a description of the major mapped faults within Los Osos Community Service District:

**Los Osos, Edna and Indian Knob Fault Zones.** The Los Osos fault zone has been mapped generally in an east/west orientation, along the northern flank of the Irish Hills. The western end of the onshore fault zone is located near the community of Los Osos, and the eastern end is located near U.S. Highway 101. To the east of U.S. Highway 101, the fault may continue along the northeast flank of the Irish Hills as the Edna fault zone.

The location and recent activity of various strands of the Los Osos fault zone is discussed by a PG&E (1988) report that identifies the Los Osos fault zone as including both the Los Osos and the Edna faults, and identifies the Los Oso fault as being offset Holocene sediment (faults that show evidence of displacement during the most recent epoch of geologic time, the Holocene, are classified as active. The Holocene epoch is generally considered to have begun about 11,000 years ago.) The California Division of Mines and Geology (CDMG) conducted field evaluations for the main strand of the Los Osos fault near the intersection of Los Osos Valley Road and Foothill Road. This investigation indicated that faulting activity has taken place along the main strand of the fault within the last 11,000 years.

Mapping in 1994 by Lettis and Hall and recent geotechnical studies (Asquith 1997) suggest that the Los Osos fault may segment or splay within the community of Los Osos. The studies mapped a northwest-southeast striking fault strand that may offset the main strand of the Los Osos fault. The location of the northwest-southeast fault strand has been inferred based on ground water levels and other geologic conditions. The activity of this fault segment is unknown, but is inferred to be potentially active The existence and activity of this fault segment is of concern because it is located several hundred feet south of the South Bay fire station and the Sunnyside Elementary School.

The CDMG considers the Edna fault to have Quaternary-age (recent or Holocene epoch) movement, therefore, the fault is considered potentially active (Faults which displace geologic formations of Pleistocene age but show no evidence of movement in the Holocene period can be considered to be potentially active. Pleistocene time is the period between about two million years ago and 11,000 years ago.).

A second mapped thrust fault, the Indian Knob fault is located about one mile southeast of the Edna fault. The activity status of the Indian Knob fault is uncertain, but is assumed to be similar to the Edna fault (potentially active).

Assuming an overall fault length of 35 miles, the Los Osos fault has the potential to generate an earthquake with a magnitude of 6.8.

**San Simeon-Hosgri Fault Zone.** The San Simeon-Hosgri fault system generally consists of two fault zones: the Hosgri fault zone represented by a series of faults that are mapped off of the San Luis Obispo County coast; and the San Simeon fault zone, which appears to be associated with the Hosgri, and comes onshore near the pier at San Simeon Point. Studies map a western trace of this fault zone as the Arroyo del Oso fault and the eastern-most trace of the faults as the Arroyo Laguna fault.

Studies have determined that the San Simeon fault zone is considered to be active, and a Earthquake Fault Zone has been established along strands of the fault by the Division of Mines and Geology under the Alquist-Priolo act.

The Hosgri fault zone has been interpreted to extend from the northern termination west of the southern San Simeon fault in the Cambria/Point Estero area to its southern termination offshore of Point Pedernales. The fault is located entirely offshore.

### Hazard Potential

The South Bay area includes the communities of Los Osos, Cuesta by-the-Sea, Baywood Park, and the south Morro Bay area. Mapped faults in the South Bay area include the active Los Osos fault and the Edna and Indian Knob faults. As mapped, the Los Osos fault consists of a several hundred meter wide zone of west-northwest striking lineaments and scarps located along the southern side of the Los Osos Valley. Portions of the Los Osos fault have been zoned active by California Division of Mines and Geology (CDMG).

### Relationship to Other Hazards – Cascading Effects

Earthquakes can cause many cascading effects such as fires, flooding, hazardous material spills, utility disruptions, blackouts, landslides, transportation emergencies, liquefaction, seismic settlement, structural hazards, landslides, and the possible failure of dams.

### Risk Assessment

- **Effects on people and housing.** In any earthquake, the primary consideration is saving lives. Time and effort must also be dedicated to providing for mental health by reuniting families, providing shelter to displaced persons, and restoring basic needs and services. Major efforts will be required to remove debris and clear roadways, demolish unsafe structures, assist in reestablishing public services and utilities, and provide continuing care and temporary housing for affected citizens.

- **Effects on commercial and industrial structures.** After any earthquake, individuals are likely to lose wages due to the inability of businesses to function

because of damaged goods and/or facilities. Economic recovery from even a minor earthquake will be critical to the communities involved.

- **Effects on infrastructure.** The damage caused by earthquakes can lead to the paralysis of the local infrastructure: police, fire, medical and governmental services.

**Risk assessment conclusion.** Earthquakes have had, and will continue to have, devastating affects on the Los Osos Community Services District. Numerous faults are located within and immediately surrounding the boundaries of the District. Earthquakes on faults hundreds of miles from the District have the potential for serious effects on the citizens, businesses, and infrastructure of the District. This threat is rated as High.

## Plans and Programs

The County of San Luis Obispo maintains an aggressive program of seismic retrofitting and seismic-compliant new construction throughout the County and including the Los Osos Community Services District. The District's Un-reinforced Masonry Building program will continue until the sole remaining structure is retrofitted to seismic standards.

## Structural Hazards

### Un-reinforced Masonry Buildings

Un-reinforced masonry building type structures consist of buildings made of un-reinforced concrete and brick, hollow concrete blocks, clay tiles, and adobe. Buildings constructed of these materials are heavy and brittle, and typically provide little earthquake resistance. In small earthquakes, un-reinforced buildings can crack, and in strong earthquakes, they have a tendency to collapse. Of all general building types, these types of structures pose the greatest structural risk to life and safety.

Non-structural items and building components can also influence the amount of damage that buildings suffer during an earthquake. Un-reinforced parapets, chimneys, facades, signs, and building appendages can all be shaken loose, creating a serious risk to life and property.

As described above, un-reinforced masonry buildings generally perform poorly in strong earthquakes, and have a high potential to suffer extensive damage. Due to the public safety risks that are posed by un-reinforced masonry buildings, the California legislature passed Senate Bill 547 (Government Code section 8875 et seq.). This legislation went into effect January 1, 1987, and required all cities and counties located in Seismic Zone 4,

which includes San Luis Obispo County, to conduct an inventory of potentially hazardous structures, including un-reinforced masonry buildings.

To comply with the requirements of SB 547, the County of San Luis Obispo adopted the Uniform Code for Building Conservation as part of Title 19 (Building and Construction Ordinance) of the County Code. Surveys were conducted to identify potentially unsafe un-reinforced masonry buildings that required modifications to meet specified earthquake resistance structural standards. Of the identified structures located in the Los Osos Community Services District that required seismic retrofit, only one structure remains to be retrofitted.

**Seismic Upgrades and Tank Coating/Repairs to Storage Tanks**

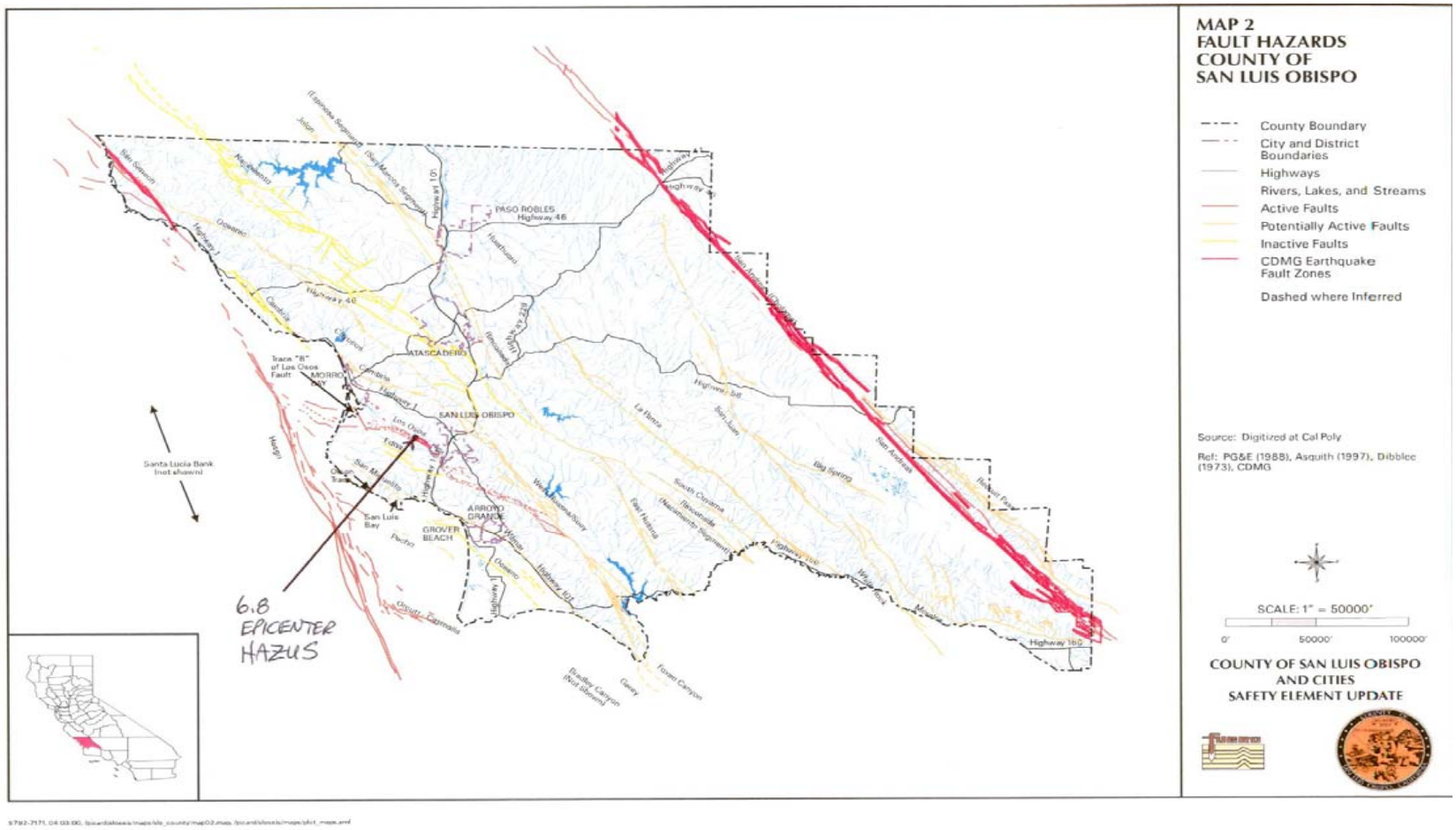
- 16th Street Tanks. The District is in the process of having the northern 0.4 MG water tank repaired and put back in service, following damage suffered in the December 2003 San Simeon earthquake. As part of this work, it is likely that the tank will also be completely re-lined and re-coated. The District will further evaluate both of the tanks, and what additional improvements to the tanks may be prudent to further safeguard from earthquake damage (such as flexible tank/pipe connections). The recommended improvements should then be included in the Priority 1 Capital Improvements.

- 10th Street Tank. It is planned to provide further evaluation of the 10th Street tank, and the possibility of consolidating this storage at the Highland tank site. This would enhance system operations by eliminating the required pumps to pump water into the distribution system due to the low elevation of this tank. This would also alleviate the need to conduct seismic retrofits and tank re-coating work that will be costly.

**HAZUS Analysis**

As part of the development of this LHMP, an earthquake scenario was created in HAZUS-MH, the FEMA-approved software program for estimating potential losses from disasters. For the scenario here, a magnitude 6.8 earthquake on the Los Osos Fault was simulated with an epicenter relatively close to Los Osos Community Services District. The following Map indicates the simulated epicenter.

The results produced by HAZUS are reported by census tract. The summarized results for Los Osos Community Services District are presented on the pages immediately following.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Active Faults
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COUNTY OF SAN LUIS OBISPO
AND CITIES
SAFETY ELEMENT UPDATE
6.8
EPICENTER
HAZUS
PASO ROBLES
Highway 46
ATASCADERO
SAN LUIS OBISPO
ARROYO GRANDE
GROVER BEACH
Santa Lucia Bank
(not shown)

# SUMMARIZED HAZUS RESULTS

## Jurisdiction: Los Osos Community Services District

### Scenario: Los Osos Fault Earthquake 6.8

| Direct Economic Loss Estimates (thousands $) | |
|---|---|
| Structural Damage | $4,360 |
| Non-Structural Damage | $21,061 |
| Building Damage | $25,421 |
| Contents Damage | $7,022 |
| Inventory Loss | $74 |
| Relocation Cost | $122 |
| Income Loss | $611 |
| Rental Income Loss | $1,183 |
| Wage Loss | $804 |
| Total Loss | $35,236 |
| **Commercial Casualties for Daytime Event** | |
| Medical Aid | 4 |
| Hospital Treatment | 1 |
| Life-Threatening Severity | 0 |
| Death | 0 |

| Commuting Casualties for Daytime Event | |
|---|---|
| Medical Aid | 0 |
| Hospital Treatment | 0 |
| Life-Threatening Severity | 0 |
| Death | 0 |

| Educational Casualties for Daytime Event | |
|---|---|
| Medical Aid | 2 |
| Hospital Treatment | 0 |
| Life-Threatening Severity | 0 |
| Death | 0 |

| Hotels Casualties for Daytime Event | |
|---|---|
| Medical Aid | 0 |
| Hospital Treatment | 0 |
| Life-Threatening Severity | 0 |
| Death | 0 |

| Industrial Casualties for Daytime Event | |
|---|---|
| Medical Aid | 1 |
| Hospital Treatment | 0 |
| Life-Threatening Severity | 0 |
| Death | 0 |

| Other Residential Casualties for Daytime Event | |
|---|---|
| Medical Aid | 1 |
| Hospital Treatment | 0 |
| Life-Threatening Severity | 0 |
| Death | 0 |

| Single Family Casualties for Daytime Event | |
|---|---|
| Medical Aid | 1 |
| Hospital Treatment | 0 |
| Life-Threatening Severity | 0 |
| Death | 0 |

| Total Casualties for Daytime Event | |
|---|---|
| Medical Aid | 9 |
| Hospital Treatment | 1 |
| Life-Threatening Severity | 0 |
| Death | 0 |

# Hazard: Fault Rupture / Groundshaking / Liquefaction

| Severity: Low | Probability: High - if Earthquake in Nearby Vicinity |
|---|---|

## Fault Rupture

### Hazard Description

A fault is a fracture in the earth's crust along which movement has occurred either suddenly during earthquakes or slowly during a process called creep. Cumulative displacement may be tens or even hundreds of miles if movement occurs over geologic time. However, individual episodes are generally small, usually less than several feet, and are commonly separated by tens, hundreds, or thousands of years. Damage associated with fault-related ground rupture is normally confined to a fairly narrow band along the trend of the fault. Structures are often not able to withstand fault rupture and utilities crossing faults are at risk of damage. Fault displacement involves forces so great that it is generally not feasible (structurally or economically) to design and build structures to accommodate this rapid displacement.

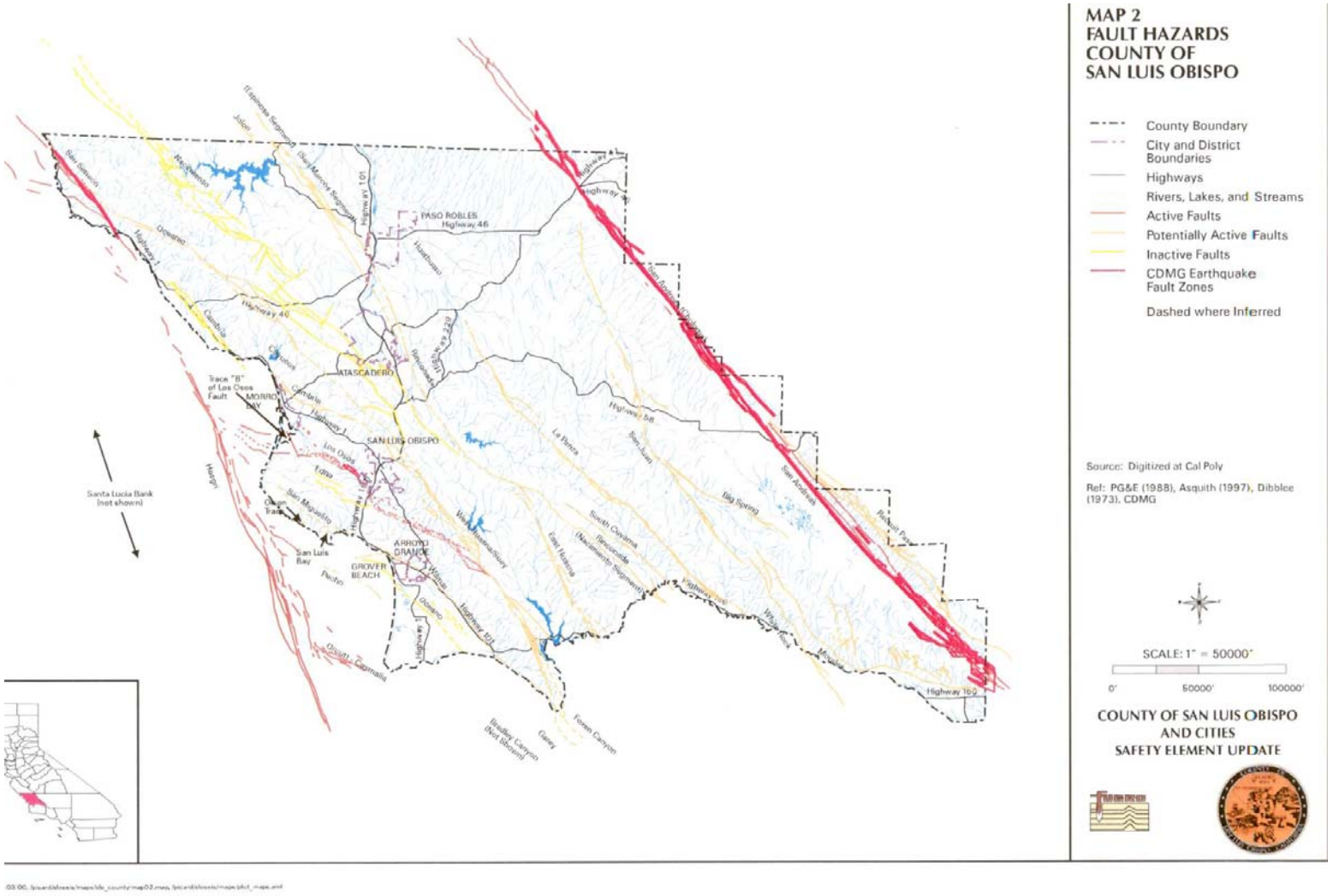
Fault displacement can also occur in the form of barely perceptible movement called "fault creep." Damage by fault creep is usually expressed by the rupture or bending of buildings, fences, railroads, streets, pipelines, curbs, and other linear features. In addition, there is also the potential for coseismic creep, where movement on a fault is triggered by an earthquake on another nearby fault.

Historically active faults are generally thought to present the greatest risk for future movement and, therefore, have the greatest potential to result in fault rupture hazards. A common problem in determining where ground displacement may occur is identifying the location of the fault. Many faults are hidden beneath deep accumulations of soil. Additionally, fault displacement may occur in rupture zones (similar to the Landers and Loma Prieta earthquakes) instead of along a single fault trace. With the difficulties associated with mitigating the effects of fault rupture and in determining the precise location of faults, the most effective method to minimize fault rupture hazard is to avoid placing structures in proximity to suspected fault locations.

### History

Because of the presence of numerous active and potentially active faults in and around the Los Osos Community Services District and throughout San Luis Obispo County, it is appropriate to consider the potential for ground surface rupture due to faulting. Portions

of the Los Osos, San Simeon-Hosgri, and San Andreas faults have been designated active by CDMG. The approximate limits of the earthquake fault zones recommended by CDMG, and active and potentially active faults in Los Osos Community Services District are shown on following map (Map 2 from the San Luis Obispo County Safety Element). Since portions of the District are located on sand in-fill areas, the vulnerability to fault rupture, ground shaking, and liquefaction events is high.


MAP 2
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COUNTY OF
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County Boundary
City and District Boundaries
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SCALE: 1" = 50000'
0'
50000'
100000'
COUNTY OF SAN LUIS OBISPO
AND CITIES
SAFETY ELEMENT UPDATE
PASO ROBLES
Highway 46
ATASCADERO
MORRO BAY
SAN LUIS OBISPO
ARROYO GRANDE
GROVER BEACH
Santa Lucia Bank (not shown)
Trace "B" of Los Osos Fault
Highway 101
Highway 1
Highway 41
Highway 58
Highway 166

### Fault Rupture Hazard Potential

Active faults identified by the Alquist-Priolo Fault Zoning act include the Los Osos fault. Fault zoning is continually updated and reviewed by California Division of Mines and Geology (CDMG). The Los Osos fault and related branches present a moderate to very high fault rupture hazard to the area. Further studies to evaluate the location and activity of the fault are warranted prior to placing structures near the mapped fault traces.

The Los Osos fault is active but presents essentially no fault rupture hazard to the District as it is only mapped in undeveloped areas. Further studies to evaluate the activity of the faults are warranted prior to placing structures near the mapped fault traces. However, the Los Osos fault presents a high to very high fault rupture hazard to developments near and southwest of the Los Osos Valley Road area.

Table 4-7 below list major faults in or near the Los Osos Community Services District that have been mapped by the CDMG. The potential for fault rupture hazards along other faults shown on Map 2 as inactive faults is generally considered to be low. However, this hazard should be considered when placing a structure near or over any suspected fault location.

**Table 4-7: Major faults which could affect Los Osos Community Services District mapped by CDMG**

| Fault Name | Maximum Moment Magnitude | Activity | Earthquake Hazard Zone? |
|---|---|---|---|
| Hosgri-San Simeon | 7.3 | Active | Yes |
| Los Osos | 6.8 | Active | Yes |

## Groundshaking

### Hazard Description

Sudden slip along all or part of a fault surface releases energy that has accumulated within the earth's crust and radiates that energy in the form of earthquake waves in all directions away from the source. As the waves pass through an area, they produce the shaking effects that are the predominant cause of earthquake damage. In general, groundshaking intensity diminishes as the distance from the earthquake epicenter increases. The loss of earthquake energy that occurs as distance from the fault increases is called "attenuation."

Groundshaking has historically resulted in a significant risk to life and property damage. The extent of loss that can result from groundshaking was demonstrated by the 1989 Loma Prieta and 1994 Northridge earthquakes which resulted in the loss of many lives, and property and infrastructure damage in the billions of dollars. Groundshaking can also trigger secondary seismic phenomenon such as liquefaction, lateral spreading, seismically induced settlement and slope instability, tsunami and seiche, and other forms of ground rupture and seismic response.

**History**

Because of the presence of numerous active and potentially active faults in and around the Los Osos Community Services District and throughout San Luis Obispo County, it is appropriate to consider the potential for ground surface rupture due to faulting. Portions of the Los Osos, San Simeon-Hosgri, and San Andreas faults have been designated active by CDMG. The approximate limits of the earthquake fault zones recommended by CDMG, and active and potentially active faults in Los Osos Community Services District are shown on the preceding map (Map 2 from the San Luis Obispo County Safety Element). Since portions of the District are located on sand in-fill areas, the vulnerability to fault rupture, ground shaking, and liquefaction events is high.

Los Osos Community Services District is located in a geologically complex and seismically active region that is subject to earthquakes and potentially strong groundshaking. The intensity of groundshaking at a particular site or structure is a function of many factors including: 1) earthquake magnitude, 2) distance from the epicenter, 3) duration of strong ground motion, 4) local geologic conditions (soil type and topography), and 5) the fundamental period of the structure.

A brief description of those factors is presented below.

**Earthquake Magnitude.** Earthquake magnitude, as measured by either the Richter or Moment Magnitude scale, is a measurement of energy released by the movement of a fault. As the amount of energy released by an earthquake increases, the potential for groundshaking impacts also increases.

**Distance From Epicenter.** Earthquake energy generally dissipates (or attenuates) with distance from a fault. Over long distances, this loss of energy can be significant, resulting in a significant decrease in groundshaking with increased distance from the epicenter.

**Duration of Strong Shaking.** The duration of the strong groundshaking constitutes a major role in determining the amount of structural damage and the potential for ground

failure that can result from an earthquake. Larger magnitude earthquakes have longer durations than smaller earthquakes.

**Local Geologic Conditions.** The geologic and soil conditions at a particular site have the potential to substantially increase the effects of groundshaking. The thickness, density, and consistency of the soil, as well as shallow ground water levels, have the potential to amplify the effects of groundshaking depending on the characteristics of the earthquake. In general, the presence of unconsolidated soils above the bedrock surface can amplify the groundshaking caused by an earthquake.

**Fundamental Periods.** Every structure has its own fundamental period or natural vibration. If the vibration of groundshaking coincides with the natural vibration period of a structure, damage to the structure can be greatly increased. The extent of damage suffered during an earthquake can also depend on non-geologic factors. The type of building and its structural integrity will influence the severity of the damage suffered. Generally, small, well constructed, one-and two-story wood and steel frame buildings have performed well in earthquakes because of their light weight and flexibility. Reinforced concrete structures will also usually perform well. Buildings constructed from non-flexible materials, such as unreinforced brick and concrete, hollow concrete block, clay tile, or adobe, are more vulnerable to earthquake damage.

**Effects of Groundshaking.** The primary effect of groundshaking is the damage or destruction of buildings, infrastructure, and possible injury or loss of life. Building damage can range from minor cracking of plaster to total collapse. Disruption of infrastructure facilities can include damage to utilities, pipelines, roads, and bridges. Ruptured gas and water lines can result in fire and scour/inundation damage, respectively, to structures. Secondary effects can include geologic impacts such as coseismic fault movement along nearby faults, seismically induced slope instability, liquefaction, lateral spreading, and other forms of ground failure and seismic response.

## Groundshaking By Fault Movement

### Hazard Description

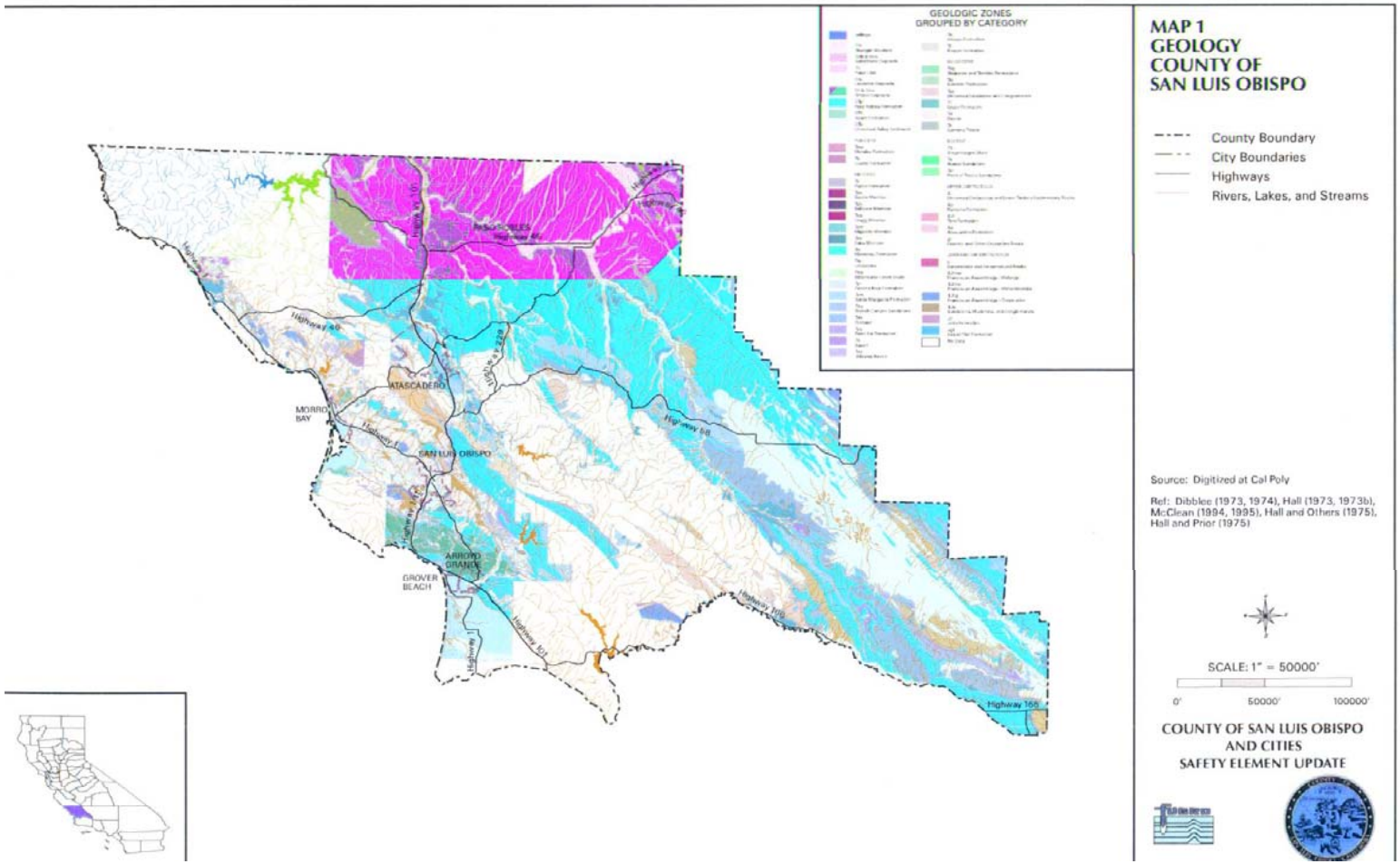
Groundshaking caused by fault movement during an earthquake has the potential to result in significant threats and impacts to life, safety, and property throughout the District. Groundshaking may occur as a result of movement along a fault located within the District or along a more distant fault. Similarly, an earthquake on any one of the faults in the San Luis Obispo County limits could affect Los Osos Community Services District.

The western portion of San Luis Obispo County has a 90 percent probability of experiencing ground accelerations in the range of 0.3 g to 0.4 g in the next 50 years. The

eastern portion of the County adjacent to the San Andreas fault has a 90 percent probability of experiencing a peak ground acceleration of 0.5 g to 0.7 g in the next 50 years. The statistical variance in estimated ground acceleration could easily be plus or minus 50 percent of the estimated ground motion. Groundshaking may occur in areas 65 miles or more from the epicenter (the point on the ground surface above the focus).

Groundshaking can change the mechanical properties of some fine grained, saturated soils, whereupon they *liquefy* and act as a fluid (liquefaction).

Los Osos Community Services District areas that are underlain by recent alluvial sediments are depicted on the following map (Map 1 from the San Luis Obispo County Safety Element).


GEOLOGIC ZONES
GROUPED BY CATEGORY
MAP 1
GEOLOGY
COUNTY OF
SAN LUIS OBISPO
County Boundary
City Boundaries
Highways
Rivers, Lakes, and Streams
Source: Digitized at Cal Poly
Ref: Dibblee (1973, 1974), Hall (1973, 1973b), McClean (1994, 1995), Hall and Others (1975), Hall and Prior (1975)
SCALE: 1" = 50000'
0'
50000'
100000'
COUNTY OF SAN LUIS OBISPO
AND CITIES
SAFETY ELEMENT UPDATE
ATASCADERO
MORRO BAY
SAN LUIS OBISPO
ARROYO GRANDE
GROVER BEACH
Highway 101
Highway 1
Highway 46
Highway 166

### Groundshaking Faults Affecting Los Osos Community Services District

#### Coastal Faults

There are numerous active and potentially active faults in the western portion of San Luis Obispo County and in the offshore area that have the potential to generate strong ground motion. On the basis of recent studies, the most likely earthquake sources for generating strong ground motion in the coastal region are considered to be the San Simeon-Hosgri, Los Osos, and Santa Lucia Bank and offshore faults, which are shown as active faults by CDMG.

#### Blind Thrust Faults

A potentially significant source of strong motion in San Luis Obispo County is buried or blind thrust faults and thrust ramps beneath the Santa Maria Basin and coastal areas of the County. The ramps are the Point San Luis, Santa Lucia, Black Mountain, and La Panza faults. Evaluations show that there are several blind thrust faults and a regional detachment fault located between about three to fourteen kilometers beneath the San Luis Obispo County area. Based on comparison with the 1983 Coalinga, 1987 Whittier Narrows, and 1994 Northridge earthquakes and a database of worldwide earthquakes, it has been estimated that the thrust faults/ramps beneath the central California coast could produce earthquakes with magnitudes in the range of magnitude 5.0 to 7.5.

Blind thrust faults have the potential to produce strong ground motion and significant structural damage without surface fault rupture. In addition, strong ground motion measurements from the Northridge earthquake demonstrate that: 1) earthquakes on blind thrust faults can produce ground accelerations in excess of those currently estimated by conventional attenuation relationships for areas directly above the thrust fault/ramp, and 2) there can be a significant amplification of the ground motion due to the variation in alluvium depth and properties, referred to as a “basin effect”. There is a potential for both of the above conditions in the coastal and central areas in the County if a large earthquake were to occur on a buried or blind thrust fault.

## Liquefaction

### Hazard Description

Liquefaction is defined as the sudden loss of soil strength due to a rapid increase in soil pore water pressures resulting from seismic groundshaking. In order for liquefaction to occur, three general geotechnical characteristics should be present: 1) ground water should be present within the potentially liquefiable zone; 2) the potentially liquefiable zone should be granular and meet a specific range in grain-size distribution; and 3) the potentially liquefiable zone should be of low relative density. If those criteria are present and strong ground motion occurs, then those soils could liquefy, depending upon the

intensity and duration of the strong ground motion. Liquefaction that produces surface effects generally occurs in the upper 40 to 50 feet of the soil column, although the phenomenon can occur deeper than 100 feet. The duration of groundshaking is also an important factor in causing liquefaction to occur. The larger the earthquake magnitude, and the longer the duration of strong groundshaking, the greater the potential for liquefaction to occur.

### Effects of Liquefaction

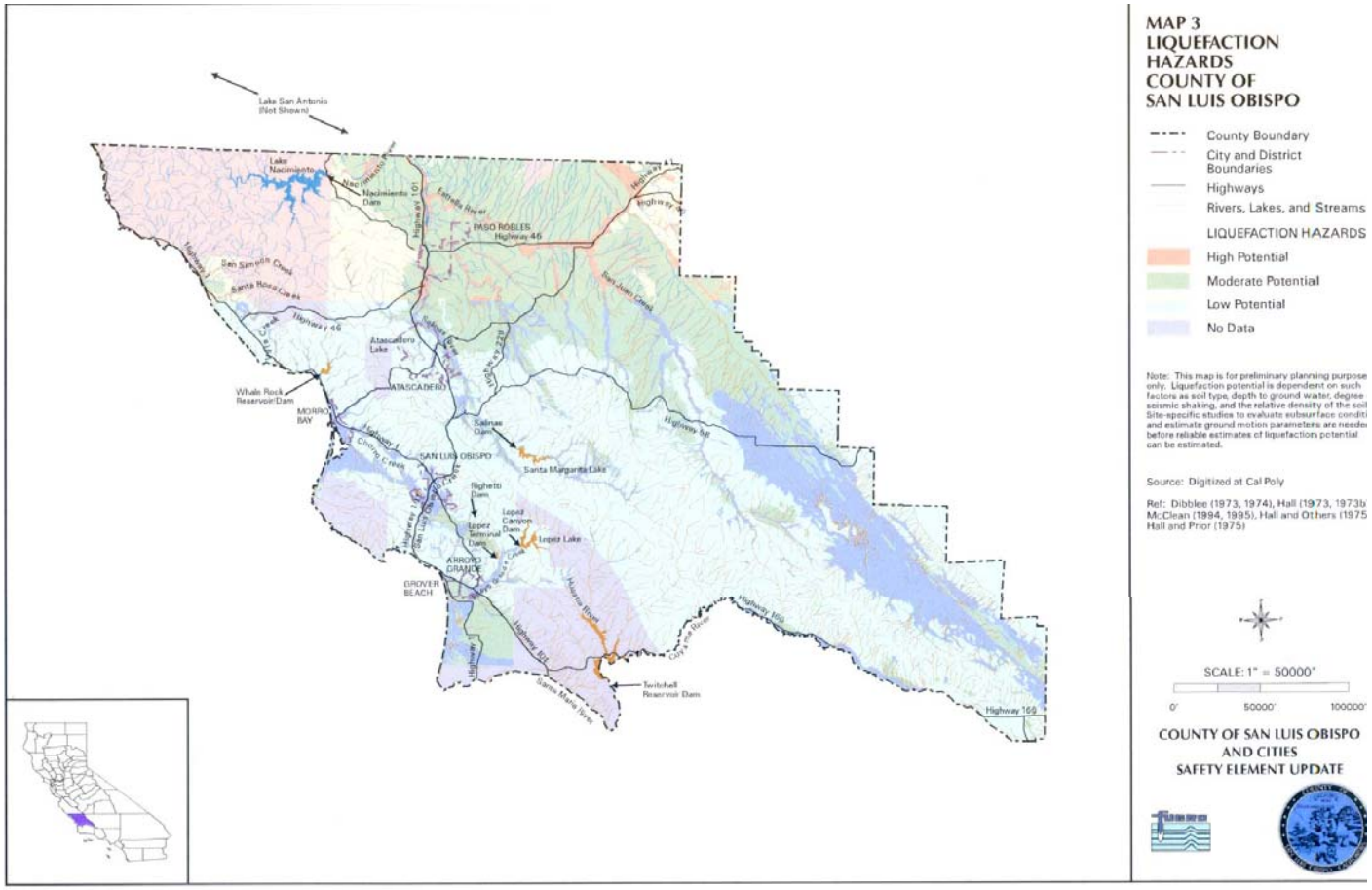
When liquefaction of the soil occurs, buildings and other objects on the ground surface may tilt or sink, and lightweight buried structures (such as pipelines) may float toward the ground surface. Liquefied soil may be unable to support its own weight or that of structures, which could result in loss of foundation bearing or differential settlement. Liquefaction may also result in the development of cracks in the ground surface followed by the emergence of a sand/water mixture, typically referred to as a "sand-boil." In areas underlain by thick deposits of saturated, loose granular sediment (such as alluvial valleys or beaches), subsidence as much as several feet may result.

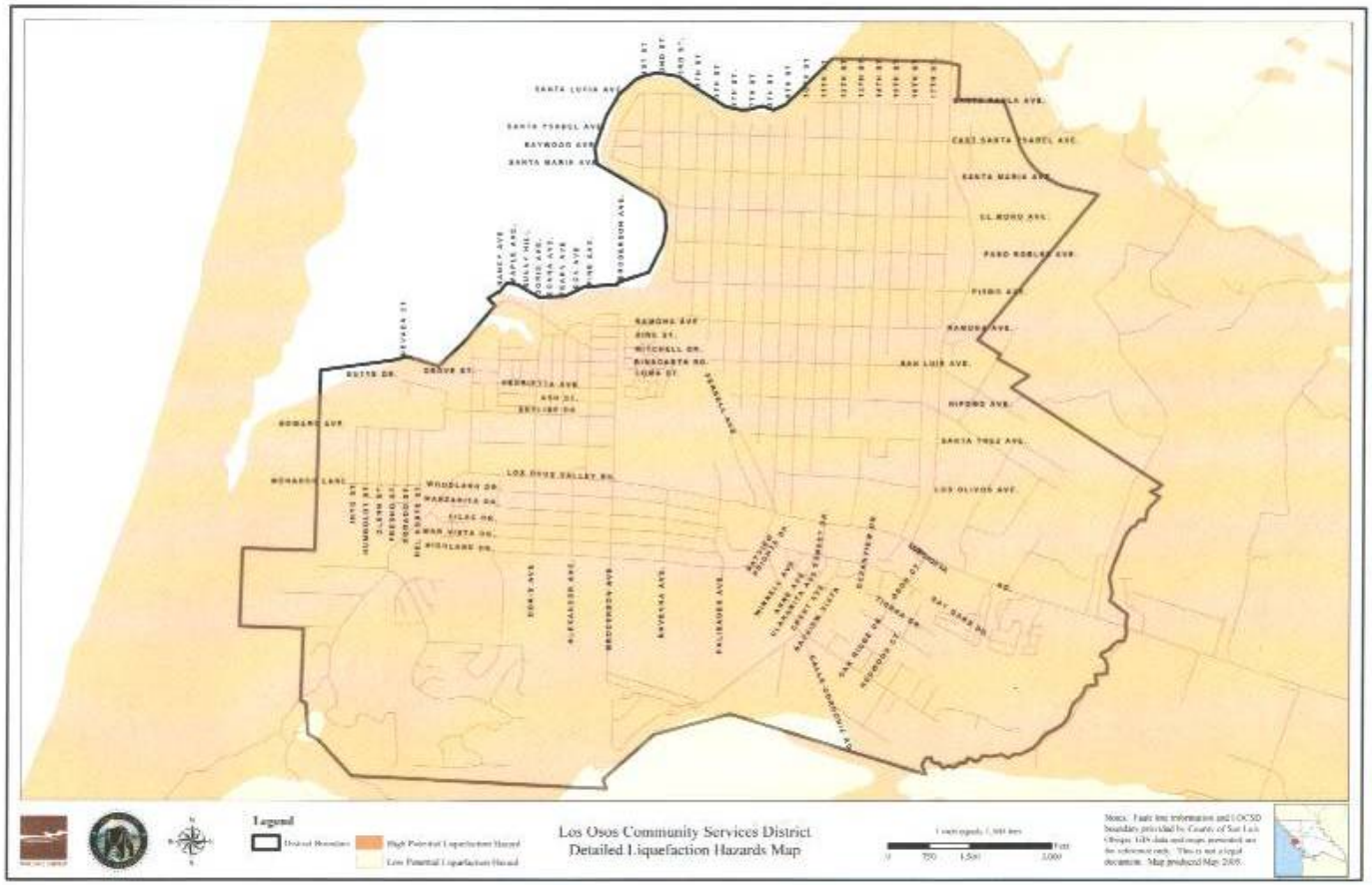
Because the alluvial sediments are a heterogeneous mixture of soil types with variable thickness, the resulting settlement is often differential. The differential settlement can cause significant damage to rigid structures such as buildings and linear features such as pipelines and highways. Liquefaction may also lead to the lateral spreading of soft saturated soils. Lateral spreading is a form of slope instability that results when the lateral movement of a soil-block toward an unconfined free face can occur when a layer of soil below the ground surface liquefies. An example of where lateral spreading may occur is adjacent to stream banks. Lateral spreading has been reported to occur on slopes of less than five percent, but it is difficult to evaluate the magnitude of the potential lateral spreading.

### Liquefaction Hazard Potential

Los Osos Community Services District is located on fill-in sand. This area, as well as those areas underlain by young, poorly consolidated, saturated granular alluvial sediments, would be most susceptible to the effects of liquefaction. These soil conditions are most frequently found in areas underlain by recent river and flood plain deposits.

The following maps indicate areas of low to high liquefaction potential based on the geologic units for San Luis Obispo County (Map 3 from the San Luis Obispo County Safety Element) and immediately in or near Los Osos Community Services District.


MAP 3
LIQUEFACTION
HAZARDS
COUNTY OF
SAN LUIS OBISPO
County Boundary
City and District Boundaries
Highways
Rivers, Lakes, and Streams
LIQUEFACTION HAZARDS
High Potential
Moderate Potential
Low Potential
No Data
Note: This map is for preliminary planning purpose only. Liquefaction potential is dependent on such factors as soil type, depth to ground water, degree seismic shaking, and the relative density of the soil Site-specific studies to evaluate subsurface conditi and estimate ground motion parameters are neede before reliable estimates of liquefactions potential can be estimated.
Source: Digitized at Cal Poly
Ref: Dibblee (1973, 1974), Hall (1973, 1973b McClean (1994, 1995), Hall and Others (1975 Hall and Prior (1975)
SCALE: 1" = 50000'
0'
50000'
100000'
COUNTY OF SAN LUIS OBISPO
AND CITIES
SAFETY ELEMENT UPDATE
Lake San Antonio (Not Shown)
Lake Nacimiento
Nacimiento Dam
PASO ROBLES
Highway 46
Atascadero Lake
ATASCADERO
Whale Rock Reservoir Dam
MORRO BAY
SAN LUIS OBISPO
Salinas Dam
Santa Margarita Lake
Lopez Lake
ARROYO GRANDE
GROVER BEACH
Twitchell Reservoir Dam
Highway 166


Legend
Los Osos Community Services District
Detailed Liquefaction Hazards Map

## Relationship to Other Hazards – Cascading Effects

Fault rupture, groundshaking, or liquefaction can cause many cascading effects such as fires, flooding, hazardous material spills, utility disruptions, landslides, transportation emergencies, liquefaction, seismic settlement, structural hazards, and the possible failure of dams and water tanks. They may cause landslides and rupture dams and water tanks. Groundshaking may cause tsunamis and seiche, the rhythmic sloshing of water in reservoirs and other bodies of water.

## Risk Assessment

- **Effects on people and housing.** The direct impacts of groundshaking, fault rupture and liquefaction can include injuries, loss of life and damage to property. In any events, the primary consideration is saving lives. Time and effort must also be dedicated to providing for mental health by reuniting families, providing shelter to displaced persons, and restoring basic needs and services. Major efforts will be required to remove debris and clear roadways, demolish unsafe structures, assist in reestablishing public services and utilities, and provide continuing care and temporary housing for affected citizens. There is concern within the district citizenry that leech fields installed as part of the construction of the new wastewater treatment facility could exacerbate the potential for liquefaction in the affected area. Further engineering studies will be needed to address these concerns.

- **Effects on commercial and industrial structures.** After any event, individuals are likely to lose wages due to the inability of businesses to function because of damaged goods and/or facilities. Economic recovery from even a minor event will be critical to the communities involved.

- **Effects on infrastructure.** The damage caused by groundshaking, fault rupture, and liquefaction can lead to the paralysis of the local infrastructure: police, fire, medical and governmental services.

**Risk assessment conclusion.** Because of the presence of numerous active and potentially active faults in and around the Los Osos Community Services District and throughout San Luis Obispo County, it is appropriate to consider the potential for ground surface rupture due to faulting. Portions of the Los Osos, San Simeon-Hosgri, and San Andreas faults have been designated active by CDMG. The approximate limits of the earthquake fault zones recommended by CDMG, and active and potentially active faults in Los Osos Community Services District are shown on Map 2 from the San Luis Obispo County Safety Element. Since portions of the District are located on sand in-fill areas, the threat of fault rupture, ground shaking and liquefaction events is rated as High.

## Coastal Storm / Coastal Erosion

| Severity: Low | Probability: Medium |
|---|---|

### Hazard Definition

**Coastal Storm.** Coastal storms may have hurricane-force winds and may cause similar kinds and amounts of damage; however, they are not classified as hurricanes because they do not originate in the tropics.

Coastal storms may have hurricane-force winds and may cause similar kinds and amounts of damage; however, they are not classified as hurricanes because they do not originate in the tropics. Coastal storms usually do most of their damage at the coast, in the form of beach erosion and flooding. The winds come from a low-pressure system offshore. Winds circulate counterclockwise around a low. When the low stops moving, its winds combine with those of the high to blow in one direction over a long period of time, which creates huge waves. The duration of such a storm — the number of high tides through which it persists — can be the most significant measure of its destructiveness.

**Coastal Erosion.** Coastal erosion is a natural geological process caused by currents, storms, earthquakes, winds, waves, tides, and the gradual movement of tectonic plates. It may take place slowly over thousands of years, or it may occur dramatically, as with landslides or severe storms. Coastal erosion rates can be accelerated by sea level rise. Coastal bluffs on the marine terraces are the most likely to result in hazards. Homes and other structures built near the edge are threatened by the retreat of the bluff.

Driven by a rising sea level, large storms, flooding, and powerful ocean waves, erosion wears away the beaches and bluffs along shorelines. Erosion undermines waterfront houses, businesses, and public facilities, eventually rendering them uninhabitable or unusable. By moving the shoreline inland, erosion also brings nearby structures ever closer to the water, often putting them at greater risk than either their owners or insurers recognize.

An April 2000 study sponsored by FEMA predicts that over the next 60 years, erosion may claim one out of four houses within 500 feet of the U.S. shoreline. To the homeowners living within this narrow strip, the risk posed by erosion is comparable to the risk from flooding, especially in beach areas.

## Coastal Erosion Hazard Potential

### Los Osos

From the Morro Rock extending into Montana de Oro State Park, large sand dunes protect the community of Los Osos Community Services District from potential wave hazards. Erosion rates for shorelines of geology similar to this area range from approximately four to six inches per year.

## Relationship to Other Hazards – Cascading Effects

Humans have the ability to alter the configuration of the shoreline by influencing long and short-term erosion rates. One of the major causes of beach erosion is the construction of dams and other structures along creeks and rivers that trap sediment and prevent it from reaching the ocean. This deprives the shoreline of the material that would replenish beach sand supplies. Coastal structures such as groins, jetties, seawalls, and breakwaters can also alter littoral drift. Beach groins and breakwaters, for example, can trap littoral sand and build beaches over a limited area but by doing so, they reduce the amount of sand that flows to down-current beaches. This can result in a rapid loss of beach sand in down-current beaches. Seawalls are often used to protect seacliffs from erosional effects of wave action. However, these structures can reflect wave energy to strip protective beach sand at an accelerated rate. This may ultimately result in increased seacliff erosion rates, particularly at sections of coastline adjacent to the seawall.

## Risk Assessment

- **Effects on people and housing.** Historically, there has been little or no loss of life or injury in Los Osos Community Services District due to coastal storms. The primary impacts have been economic in nature.

- **Effects on commercial and industrial structures.** As beaches are eroded away, the amount of recreational beach available to the public is greatly reduced. Also, changes in beach geometry can alter the wave characteristics of a particular site. Beach erosion results in the loss of sand from coastal areas. This hazard can accelerate the rate of erosion of coastal bluffs, and can also contribute to increased wave-related damage to coastal structures.

- **Effects on infrastructure.** Erosion of beach sand removes the natural barrier which protects landforms and structures from the potentially destructive wave action. The end result can be the direct destruction of roads, homes, and other structures by waves whose force is no longer dissipated by wide beaches. The

district is vulnerable to the effects of this threat in that one of only two highways to and from the District lies in a zone subject to Coastal Erosion.

**Risk assessment conclusion.** Coastal storms are a recurring hazard for the eastern and northern borders of Los Osos Community Services District. Waves erode the coastline at varying rates depending upon the geology. Coastal bluffs on the marine terraces are the most likely to result in hazards. Homes and other structures built near the edge are threatened by the retreat of the bluff. This threat is rated as Medium.

## Hazard: Landslides / Rockslides

| Severity: Low | Probability: Low |
|---|---|

### Hazard Definition

A landslide is a geologic hazard where the force of gravity combines with other factors to cause earth material to move or slide down an incline. Some landslides move slowly and cause damage gradually, whereas others move so rapidly that they can destroy property and take lives suddenly and unexpectedly. Slopes with the greatest potential for sliding are between 34 degrees and 37 degrees. Although steep slopes are commonly present where landslides occur, it is not necessary for the slopes to be long.

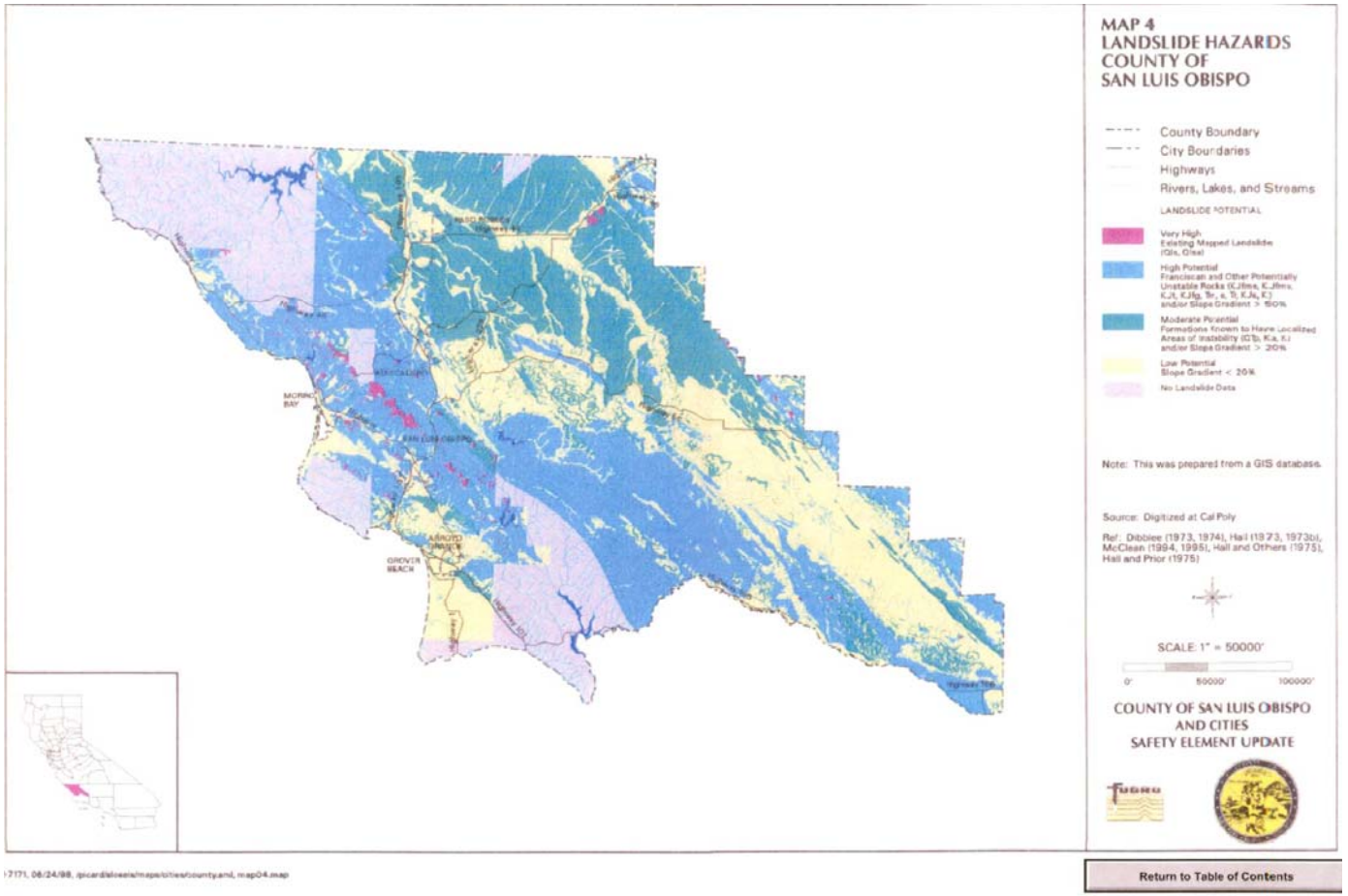
Landslides, rockslides, and debris flows occur continuously on all slopes; some processes act very slowly, while others occur very suddenly, often with disastrous results. As human populations expand over more of the land surface, these processes become an increasing concern.

There are predictable relationships between local geology and landslides, rockslides, and debris flows. Knowledge of these relationships can improve planning and reduce vulnerability. Slope stability is dependent on many factors and their interrelationships, including rock type, pore water pressure, slope steepness, and natural or man-made undercutting.

Steep topography and geologic formations prone to slope stability problems in Los Osos Community Services District are located on the following map.

### History

In San Luis Obispo County, there are several geologic formations commonly associated with slope stability problems. The data presented on the following map (Map 4 from the San Luis Obispo County Safety Element) presents a limited summary of landslides hazards related to slope gradient and topography that were identified. The Los Osos Community Services District has low landslide potential and has no history of landslides or rockslides.




Return to Table of Contents

## Relationship to Other Hazards – Cascading Effects

Landslides and rockslides are usually a cascading effect of severe weather.

## Risk Assessment

The risk of landslides and rockslides in Los Osos Community Services District is low.

- **Effects on people and housing.** Historically, there has been no loss of life or injury in Los Osos Community Services District due to landslides and rockslides.

- **Effects on commercial and industrial structures.** Historically, there have been no commercial or industrial structures lost in Los Osos Community Services District due to landslides and rockslides.

- **Effects on infrastructure.** Landslides and rockslides can result in the destruction of infrastructure such as roadways, electrical and telecommunications utilities that may affect the District.

**Risk assessment conclusion.** While landslides and rockslides are a potential with the District, minimal exposure is determined. This threat is rated as Low

## Hazard: Water Tank Failure

| Severity: Low | Probability: Low |
|---|---|

**History**

The Los Osos Community Services District supplies its customers with domestic water service and fire protection, among other services. The Los Osos Community Services District's water service area encompasses approximately 633 acres of land with predominantly residential land uses. Residential single family, residential multi-family, and residential suburban zoning make up 85 percent of the total service area with a total of 2750 service connections.

The District currently operates three water storage tanks with combined storage volume of approximately 1.4 million gallons and one hydro-pneumatic tank in two separate pressure zones. The pressure zones are summarized as follows:

- Main Zone: Approximately 85 percent of the District's water use occurs within the main pressure zone. The main zone is fed by gravity via all three water storage tanks.

- Hydro-pneumatic Zone: Approximately 15 percent of the District's water use occurs within the hydro-pneumatic zone. This zone is fed by the two tanks at 16th Street. The two tanks feed the zone through three pumps and a hydro-pneumatic tank, to provide sufficient system pressure to this area of higher elevation. The hydraulic grade line is approximately 275 feet.

The water supply source facilities for the Los Osos Community Services District consist of five active ground water wells which produce from the Los Osos ground water basin. The District has a daily production capacity of approximately 1580 gallons per minute with all five wells being active.

The District does have an emergency connection to other water purveyors within San Luis Obispo County in the event of temporary system failures. Each water district is capable of receiving water from the other. However, in the event of an area-wide emergency, water supply may not be reliable.

**Risk Assessment**

A rupture of the water tanks in the District could have serious effects in terms of flooding and property damage to businesses and residences.

- **Effects on people and housing.** The consequences to people and housing of flooding and lack of water sources could be significant.

- **Effects on commercial and industrial structures.** Similarly, the effects on commercial and industrial structures from flooding could be severe.

- **Effects on infrastructure.** Water tank failure can include damage to community infrastructure and interruption of public services.

**Risk assessment conclusion.** Although the probability of a water tank failure occurring is highly unlikely, there is the potential for an incident since there are several water tanks in Los Osos Community Services District located within the business district and residential areas of the community.

**Plans and Programs**

To further lessen the threat of a tank rupture due to a failure in the connection between the tank and intake and outflow piping, the District is planning to engineer and install flexible connections at all vulnerable points.

Other planned activities include:

- 16th Street Tanks. The District is in the process of having the northern 0.4 MG water tank repaired and put back in service, following damage suffered in the December 2003 San Simeon earthquake. As part of this work, it is likely that the tank will also be completely re-lined and re-coated. The District will further evaluate both of the tanks, and what additional improvements to the tanks may be prudent to further safeguard from earthquake damage (such as flexible tank/pipe connections). The recommended improvements should then be included in the Priority 1 Capital Improvements.

- 10th Street Tank. It is planned to provide further evaluation of the 10th Street tank, and the possibility of consolidating this storage at the Highland tank site. This would enhance system operations by eliminating the required pumps to pump water into the distribution system due to the low elevation of this tank. This would also alleviate the need to conduct seismic retrofits and tank re-coating work that will be costly.

- In conjunction with the Waste Water Treatment (WWTP) project, design and construct upgrades to the SCADA system for the District's water supply and distribution system.

## Hazard: Hazardous Materials

| Severity: High | Probability: Low |
|---|---|

### Hazard Definition

Hazardous materials (Hazmat) consist of substances that by their nature, lack of containment, and reactivity, have the capability for inflicting harm. Hazmat poses a threat to health and the environment when improperly managed. Hazmat can be toxic, corrosive, flammable, explosive, reactive, an irritant, or a strong sensitizer. Hazmat substances also include certain infectious agents, radiological materials, oxiders, oil, used oil, petroleum products, and industrial solid waste substances.

Hazardous materials can pose a threat where they are manufactured, stored, transported or used. They are used in almost every manufacturing operation and by retailers, service industries, and homeowners.

Hazardous material incidents are one of the most common technological threats to public health and the environment. Incidents may occur as the result of natural disasters, human error, and/or accident.

Hazmat incidents typically take three forms:

- Fixed facility incidents
    - It is reasonably possible to identify and prepare for a fixed site incident, because laws require those facilities to notify state and local authorities about what is being used or produced there.
- Transportation incidents
    - Transportation incidents are more difficult to prepare for because it is impossible to know what material(s) could be involved until an accident actually happens.
- Pipeline incidents
    - Pipelines carry natural gas and petroleum. Breakages in pipelines carry differing amounts of danger, depending on where and how the break occurs, and what is in the pipe.

## History

There are several hazardous material processing and or storage facilities within the boundaries of the District. Specifically, a large Trans Pacific telecommunications facility with a significant presence of batteries for power back-up, a butane cigarette lighter storage facility, an electronic manufacturing facility, District stores of water treatment chemicals, and numerous nurseries with caches of fertilizers and solvents. To date, there have been no significant events involving hazardous materials.

## Hazard Analysis

The potential for hazardous material transportation-related hazards to impact Los Osos Community Services District is somewhat reduced when compared to the inland cities of the County. Transportation-related hazardous material risks are not as prevalent in the District because it is not located adjacent to U.S. Highway 101 or the Union Pacific Railroad tracks. The major roadway serving the District is Highway 1, which is not used to transport hazardous materials to the same extent that Highway 101 and the railroad are. Within the District, however, there are industrial operations that store and use substantial quantities of hazardous materials, i.e., MCI building with batteries, cigarette lighter storage facility, an electronics firm, nurseries (fertilizers, solvents), and the storage of liquid sodium and hypocloride by the District. The Fire Department works cooperatively with these firms on an ongoing basis to address potential concerns, and also conducts ongoing inspections. The District has developed pre-fire plans, and has access to the County's Environmental Health Department inventory database.

## Radiation Hazards

The Diablo Canyon Power Plant is the primary radiation hazard risk in Los Osos Community Services District. An uncontrolled release of radioactive material would have the potential to result in significant health and safety impacts. To prepare for potential emergency situations that might develop at the power plant, extensive warning, reporting, and response plans have been developed. Updated information regarding the Emergency Response Plan is distributed to the public each year. There are additional radiation hazards, mostly low-level radioactive waste from medical facilities and elsewhere. The hauling, handling and disposal of these materials are governed by federal regulations.

The electricity-generating process at the power plant relies on the process of "fission," where uranium atoms are split, resulting in the creation of heat. This heat is used to create steam, which is then used to spin a turbine and generator, which creates electricity. The plant is designed to use slightly enriched uranium dioxide as a fuel. This fuel poses

no major risk in its unirradiated state since it is of very low radioactivity. However, after being in the core during operation of the reactor, the fuel becomes extremely radioactive from fission by-products. These highly radioactive by-products would be the main hazard in a nuclear power plant accident.

To control power plant operations and the potential for a release of radioactive material, the plant is provided with multiple safety systems and barriers. These systems, however, cannot provide absolute certainty that a system failure will not occur. To prepare for potential emergency situations that might develop at the power plant, extensive warning, reporting, and response plans have been developed. The response plan for an emergency at the Diablo Canyon Power Plant is contained in a document called the County/Cities Nuclear Power Plant Emergency Response Plan. Updated information on the Emergency Response Plan is distributed to the public each year, as required by federal law.

### Risk Assessment

Hazardous material use in manufacturing is widely known; however, hazardous materials are also commonly used by agricultural, commercial, and service establishments that are located throughout the Los Osos Community Services District. Examples of common businesses that rely on the use of hazardous materials include automobile service stations, hospitals and medical labs, dry cleaners, water treatment facilities, agricultural production, and a variety of light manufacturing uses. Households are also a major source of hazardous material use and hazardous waste generation, resulting from the use of paints, solvents, cleaners, pesticides and other similar products.

Due to the widespread use of hazardous materials, accidental releases at user locations are likely to occur from time to time. These types of incidents are usually small and are contained quickly with little risk to the public. The most significant risk resulting from an uncontrolled release of hazardous materials is likely to result from the transportation of large quantities of these substances using truck transportation.

### Relationship to Other Hazards – Cascading Effects

Besides the immediate effect of a hazardous materials incident at the scene of the emergency, there are ancillary effects as well. For instance, there may be impacts on waterways and drainage systems, and the evacuation of schools, business districts, and residential areas.

- **Effects on people and housing.** People may be evacuated when a Hazmat incident occurs. Relative to some of the other natural hazards assessed earlier in this LHMP, the number of people affected by Hazmat incidents are usually less.

However, in Los Osos Community Services District, a disruption of operations at the Diablo Canyon Power Plant could impact – or at least inconvenience – every citizen of the District.

- **Effects on commercial and industrial structures.** There may be economic consequences due to Hazmat incidents, but the damage is generally limited to clean-up of facilities and grounds, or simply interruption of business due to evacuation.

- **Effects on infrastructure.** Hazmat materials may impact waterways and drainage systems, and incidents can lead to the evacuation of schools, business districts, and residential areas. Again, in the Los Osos Community Services District, a disruption of operations at the Diablo Canyon Power Plant would impact the infrastructure of the entire District.

**Risk assessment conclusion.** Although the point of hazard in a Hazmat incident can have serious property damage and even loss of life, Hazmat accidents do not generally affect extremely large areas. Hazmat incidents present a real danger and are highly unpredictable in terms of determining when or where they will occur, but they generally do not pose a serious threat to the ability of the District to respond. Reasonable preparation by law enforcement, the fire department, the medical community, and a variety of other agencies and jurisdictions enables the District to deal with the majority of likely events. Many emergency workers prepare for Hazmat events as part of their ongoing training. Agencies and facilities are also routinely equipped to deal with most events that might occur. This threat is rated as Low.

### Plans and Programs

To mitigate the potential danger of hazardous materials, specific governmental agencies maintain inventories of the names, locations, and substances used by individual businesses and other entities. Per state and federal law, the County Environmental Health Department maintains lists of materials that are used at fixed facilities and where they are used. In addition, Environmental Health and other agencies perform inspections of these facilities to ensure compliance with state and federal standards.

Due to the common threat that a hazardous material incident could occur anywhere in the County, the Los Osos Community Services District, County of San Luis Obispo, all cities and fire departments located throughout the County, and a variety of other agencies and jurisdictions have entered into a regional hazardous material cooperative agreement which provides mutual aid response to hazardous materials emergencies. This program has resulted in the creation of a specialized team of personnel to respond to hazardous material emergencies.

# Hazard: Toxic Pollution

| Severity: Low | Probability: Medium |
|---|---|

## Hazard Definition

People are exposed to toxic pollutants in many ways that can pose health risks:

- Breathing contaminated air
- Eating contaminated food products, such as fish from contaminated waters; meat, milk, or eggs from animals that fed on contaminated plants; and fruits and vegetables grown in contaminated soil
- Drinking water contaminated by toxic pollutants
- Ingesting contaminated soil. Young children are especially vulnerable because they often ingest soil from their hands or from objects they place in their mouths
- Touching (making skin contact with) contaminated soil, dust, or water (for example, during recreational use of contaminated water bodies)

## History

There is one known MTBE contaminated location within the Los Osos Community Services District boundaries. Plans are being developed to create a mitigation fund from monies received by the District as part of a settlement with the firm responsible for the MTBE contamination.

## Risk Assessment

Potential exposure of the public to toxic pollutants in the District can result from their use by industry, agriculture, commercial, and service establishments. Household use of hazardous materials also has the potential in the District, as anywhere else, to result in their release into the environment. There are industrial operations in the District that store and use substantial quantities of hazardous materials, i.e., MCI building with batteries, an electronics firm, nurseries (fertilizers, solvents), and the storage of liquid sodium and hypocloride for water treatment by the District.

## Relationship to Other Hazards – Cascading Effects

Cascading effects of toxic pollution are limited.

- **Effects on people and housing.** The quality of the air that people breathe and water that they drink directly affects their health, environment, economy and quality of life. An overabundance of pollutants in air or water can cause mild to severe health effects, including increased hospitalization and emergency room visits, respiratory illnesses, increased risk of developing cancer, decreased breathing capacity, lung inflammation, difficulty in exercising, and even a reduction in life-span.

- **Effects on commercial and industrial structures.** Pollutants may cause damage to property. Certain air pollutants are responsible for discoloring painted surfaces, eating away at stones used in buildings, dissolving the mortar that holds bricks together, and cracking tires and other items made from rubber.

**Risk assessment conclusion.** Soil contamination, air and water pollution are hazards for the Los Osos Community Services District. While there are risks to humans, animals, and plants, there are also numerous impacts to the economy including lost work days due to illness, a desire on the part of business to locate in areas with a healthy environment, and increased expenses from medical costs.

### Plans and Programs

The District anticipates developing plans to reduce the potential for exposure to humans and the environment by hazardous substances and reduce the potential for pesticide exposure to humans and the environment.

## Hazard: Nuclear Incidents

| Severity: High | Probability: Low |
|---|---|

### Hazard Definition

There are two general situations that could affect the Los Osos Community Services District, namely:

- A situation involving nuclear weapons, which is discussed in the Terrorism section of this LHMP;
- An incident involving the Diablo Canyon Power Plant.

As will be discussed in the Terrorism section of this LHMP, the possibility exists that a terrorist organization might acquire the capability of creating a small nuclear detonation. A single nuclear detonation in the United States would likely produce fallout affecting an area many times greater than that of the blast itself. There is also the possibility that a terrorist will construct a "dirty bomb", a bomb that is used to distribute nuclear contaminated materials. It would have less of an effect than a "traditional" nuclear bomb, but the terror effect on the population would be great.

The Diablo Canyon Power Plant is located approximately six miles southeast of the Los Osos Community Services District. The plant has two power-generating units that are both pressurized water reactors. Each reactor has an electrical generating capacity of about 1,100 megawatts. Unit 1 began commercial operation on May 7, 1985, and Unit 2 was put online on March 13, 1986.

The electricity generating process at the power plant relies on the process of "fission," where uranium atoms are split, resulting in the creation of heat. This heat is used to create steam, which is then used to spin a turbine and generator, which creates electricity. The plant is designed to use slightly enriched uranium dioxide as a fuel. This fuel poses no major risk in its un-irradiated state since it is of very low radioactivity. However, after being in the core during operation of the reactor, the fuel becomes extremely radioactive from fission by-products. These highly radioactive by-products would be the main hazard in a nuclear power plant accident.

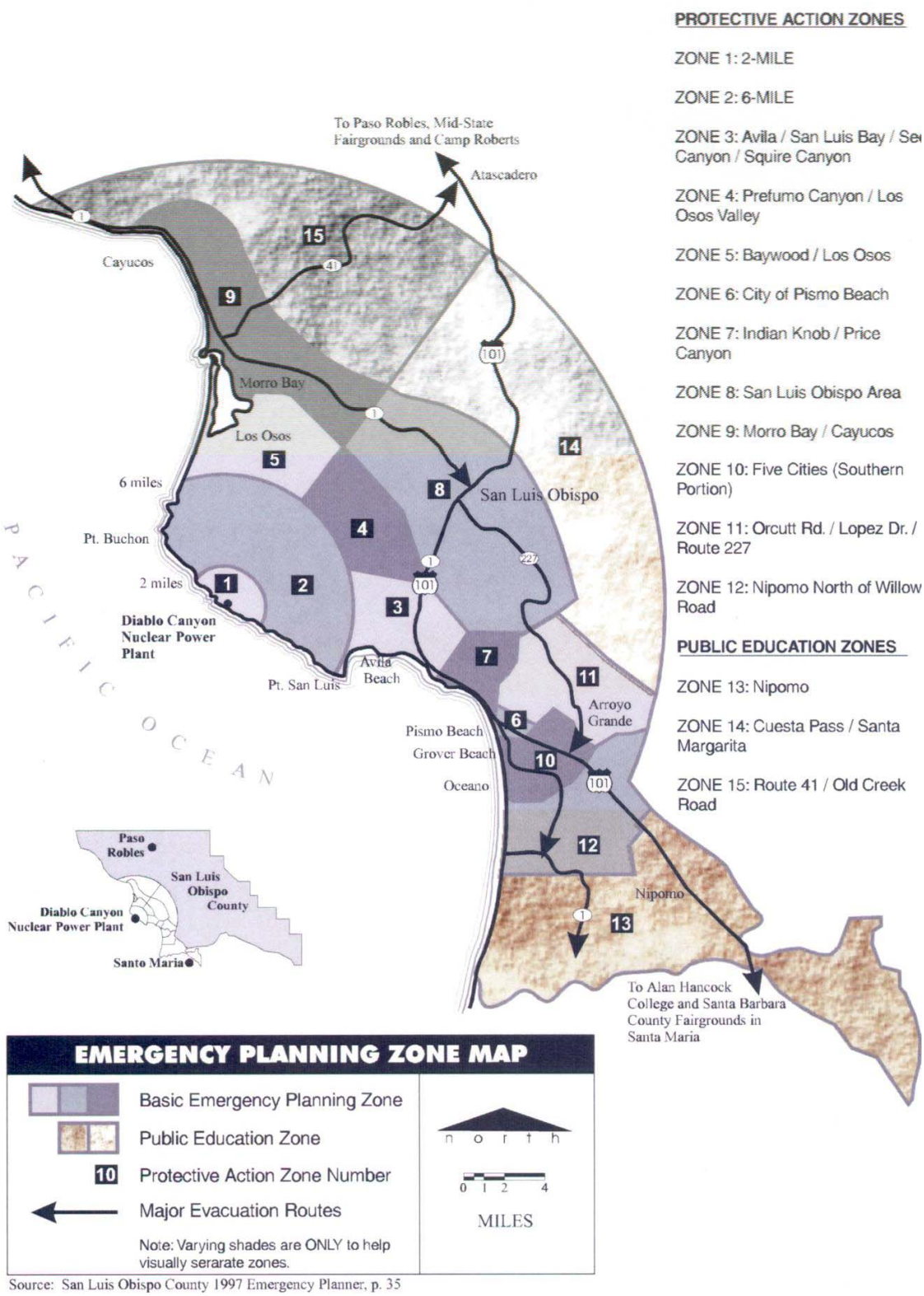
To control power plant operations and the potential for a release of radioactive material, the plant is provided with multiple safety systems and barriers. These systems, however, cannot provide absolute certainty that a system failure will not occur. To prepare for potential emergency situations that might develop at the power plant, extensive warning, reporting, and response plans have been developed. The response plan for an emergency

at the Diablo Canyon Power Plant is contained in a document called the County/Cities Nuclear Power Plant Emergency Response Plan. Updated information on the Emergency Response Plan is distributed to the public each year, as required by federal law.

The area around the power plant (see map on the following page) has been divided into two types of zones for emergency planning purposes: the Basic Emergency Planning Zone, and the Public Education Zone. The Basic Emergency Planning Zone is roughly a 14-mile circle around the power plant. Since it is unlikely that the entire Basic Emergency Planning Zone would be affected by a power plant emergency, it has been divided into 12 smaller sub zones called Protective Action Zones (PAZ). The Public Education Zone extends out from the power plant approximately 20 miles and has been divided into three zones. It is unlikely that people in a Public Education Zone would need to take protective actions in the event of a power plant emergency. The Los Osos Community Services District is in Zone Number PAZ 5.

Two basic factors would determine what, if any, emergency response actions would be required in any of the Protective Action Zones: the amount of radioactive material that is released, and the speed and direction of the wind. Based on the nature and severity of the emergency, a variety of warning and response plans could be implemented.

Many of these programs are overseen and required by state and federal agencies. The Federal Emergency Management Agency (FEMA) provides regulatory guidelines on what local agencies' emergency plans must contain. FEMA requires the County and other local agencies to demonstrate the adequacy of the plans through drills and exercises on an annual or bi-annual basis. In addition to FEMA, agencies such as the Nuclear Regulatory Commission (NRC) and State Department of Health Services (DHS) provide oversight and guidance on many health related issues. These issues including standards for monitoring potential radiological releases, and providing policies and guidance on protective guidelines such as issuing




Source: San Luis Obispo County 1997 Emergency Planner, p. 35

## History

Fortunately, Los Osos Community Services District has not experienced a nuclear accident.

## Risk Assessment

A detailed discussion of radiation hazards and their effects on humans along with a description of the operation of a nuclear power generating facility and the hazards posed thereby are contained in the State of California Nuclear Power Plant Emergency Response Plan and in other documents. Planning programs are overseen and required by state and federal agencies.

The Federal Emergency Management Agency (FEMA) provides regulatory guidelines on what local agencies' emergency plans must contain. FEMA requires the County and other local agencies to demonstrate the adequacy of the plans through drills and exercises on an annual or bi-annual basis. In addition to FEMA, agencies such as the Nuclear Regulatory Commission (NRC) and state Department of Health Services (DHS) provide oversight and guidance on many health related issues.

- **Effects on people and housing.** Depending on levels of radiation exposure, the effects could range from minimal to devastating.

- **Effects on commercial and industrial structures.** Depending on levels of radiation exposure, the effects could range from minimal to devastating.

- **Effects on infrastructure.** Depending on levels of radiation exposure, the effects could range from minimal to devastating.

**Risk assessment conclusion.** While having never experienced a nuclear incident, the potential for such incident exists. However, this threat is rated as Low.

## Relationship to Other Hazards – Cascading Effects

Cascading effects of a nuclear incident could include contaminated water, air, and soil.

## Plans and Programs

Since 9/11, numerous anti-terrorism programs and policies have been put into effect by law enforcement, fire, public health, and other departments. Other plans and programs in place include:

- The Emergency Alert System (formerly known as the Emergency Broadcast System) - a network of radio stations that would broadcast information to the Los Osos Community Services District about the power plant emergency.

- Early Warning Siren System – if a power plant emergency becomes serious enough to warrant evacuation of one or more Protective Action Zones, or residents should take shelter, Early Warning Sirens will be activated. This siren is also used in other emergencies, such as, hazardous material incidents, dam failure, or tsunami. Sirens are tested on a quarterly and annual and basis.

- Evacuation – if it is determined that certain Protective Action Zone areas should be evacuated, the Early Warning Siren in that zone would be activated and specific information about the evacuation would be provided by the Emergency Alert System ratio stations.

## Hazard: Terrorism

| Severity: Medium | Probability: Low |
|---|---|

### Hazard Definition

Terrorism is the use of force or violence against persons or property in violation of the criminal laws of the United States for purposes of intimidation, coercion or ransom. Terrorists often use threats to create fear among the public, to try to convince citizens that their government is powerless to prevent terrorism, and to get immediate publicity for their causes.

Terrorist acts or and acts of war may cause casualties, extensive property damage, fires, flooding, and other ensuing hazards. Terrorism takes many forms, including:

- Chemical
- Biological
- Radiological
- Nuclear
- Explosive
- Cyber-terrorism

**Chemical.** Chemical weapons have been used primarily to terrorize an unprotected civilian population and not as a weapon of war. This is because of fear of retaliation and the likelihood that the agent would contaminate the battlefield for a long period of time.

Some analysts suggest that the possibility of a chemical attack would appear far more likely than either the use of nuclear or biological materials, largely due to the easy availability of many of the necessary precursor substances needed to construct chemical weapons. Additionally, the rudimentary technical knowledge needed to build a working chemical device is taught in every college level chemistry course in the world.

Some chemical agents are odorless and tasteless and are difficult to detect. They can have an immediate effect (a few seconds to a few minutes) or a delayed effect (several hours to several days).

A terrorist would not have to build a complicated chemical release device. During favorable weather conditions an already existing chemical plant could be sabotaged or bombed releasing a toxic cloud to drift into a populated area. The result could be just as dangerous as having placed a smaller chemical device in a more confined space. This type of incident would cause the maximum amount of fear, trepidation, and potential panic among the civilian population...and thus achieve a major terrorist objective.

**Biological.** Biological weapons are defined as any infectious agent such as a bacteria or virus used to produce illness or death in people, animals, or plants. This definition is often expanded to include biologically-derived toxins and poisons. Biological agents can be dispersed as aerosols or airborne particles. Terrorists may use biological agents to contaminate food or water because the agents are extremely difficult to detect. The agents are cheap, easy to make, and simple to conceal. Even small amounts, if effectively deployed, could cause massive injuries and overwhelm emergency rooms. The production of biological weapons can be carried out virtually anywhere — in simple laboratories, on a farm, or even in a home.

However, experts say it remains very difficult to transform a deadly virus or bacterium into a weapon that can be effectively dispersed. A bomb carrying a biological agent would likely destroy the germ as it explodes. Dispersing the agents with aerosols is challenging because biomaterials are often wet and can clog sprayers. Most agree that, while a biological attack could be devastating in theory, in reality, the logistical challenges of developing effective agents and then dispersing them make it less likely a terrorist could carry out a successful widespread assault.

**Radiological/Nuclear.** A radioactive material is a material made up of unstable atoms which give off excess energy in the form of radiation through the process of radioactive decay. Radiation cannot be detected by human senses. Wherever radioactive materials are used, transported, or stored there is a potential for a radiological accident to occur. Some of their most common uses include use:

- By doctors to detect and treat serious diseases.
- By educational institutions and companies for research.
- By the military to power large ships and submarines.
- By companies in the manufacture of products.
- As a critical base material to help produce the commercial electrical power that is generated by a nuclear power plant.

As one of the critical components in nuclear weapons, which are relied upon to help deter the threat of war. Under extreme circumstances an accident or intentional explosion involving radiological materials can cause very serious problems. Consequences may include death, severe health risks to the public, damage to the environment, and extraordinary loss of, or damage to, property. The possibility exists that a terrorist organization might acquire the capability of creating a small nuclear detonation. A single nuclear detonation in the United States would likely produce fallout affecting an area many times greater than that of the blast itself. There is also the possibility that a terrorist will construct a “dirty bomb”, a bomb that is used to distribute nuclear contaminated materials. It would have less of an effect than a “traditional” nuclear bomb, but the terror effect on the population would be great.

**Explosive.** The possibility exists that a terrorist may attack with conventional explosives, particular in a public setting. Innumerable incidents have occurred around the world involving car bombs, truck bombs, and bombs attached directly to terrorist individuals. While generally more limited in the extent of the damage inflicted, explosive terrorist attacks may have consequences including death and damage to property.

**Cyber-terrorism.** Cyber-terrorism is the use of computer network tools to shut down critical government infrastructures such as energy, transportation, and government operations, or to coerce or intimidate a government or civilian population. The premise of cyber terrorism is that as nations and critical infrastructure became more dependent on computer networks for their operation, new vulnerabilities are created. A hostile nation or group could exploit these vulnerabilities to penetrate a poorly secured computer network and disrupt or even shut down critical public or business operations. The goal of cyber terrorism is believed to be aimed at hurting the economy of a region or country, and to amplify the effects of a traditional physical terrorist attack by causing additional confusion and panic. Like all jurisdictions today, the District is vulnerable to cyber-terrorism.

## History

Fortunately, the Los Osos Community Services District has no history of incidents of chemical, biological, radiological, nuclear, or explosive terrorism. The District supplies its customers with domestic water services among other services. The District's public water system which serves approximately 8,150 persons may be the most vulnerable to any terrorism attacks.

The District has been impacted – as has the rest of the world – by recent computer viruses and worms and has experienced several incidents of arson. As mandated by Homeland Security in conjunction with the Environmental Protection Agency, the District has prepared and submitted a vulnerability assessment of the District facilities and has implemented a majority of the recommendation in the report.

## Risk Assessment

**Chemical.** During favorable weather conditions an already existing chemical plant or storage facility could be sabotaged releasing a toxic cloud to drift into a populated area. This type of incident could cause the maximum amount of fear, trepidation, and potential panic among the civilian population...and thus achieve a major terrorist objective.

**Biological.** The agents are cheap, easy to make, and simple to conceal. Even small amounts, if effectively deployed, could cause massive injuries and overwhelm emergency

rooms. The production of biological weapons can be carried out virtually anywhere — in simple laboratories, on a farm, or even in a home.

However, experts say it remains very difficult to transform a deadly virus or bacterium into a weapon that can be effectively dispersed. A bomb carrying a biological agent would likely destroy the germ as it explodes. Dispersing the agents with aerosols is challenging because biomaterials are often wet and can clog sprayers. Most agree that, while a biological attack could be devastating in theory, in reality, the logistical challenges of developing effective agents and then dispersing them make it less likely a terrorist could carry out a successful widespread assault.

**Radiological/Nuclear.** Under extreme circumstances an accident or intentional explosion involving radiological materials can cause very serious problems. Consequences may include death, severe health risks to the public, damage to the environment, and extraordinary loss of, or damage to, property.

**Explosive.** While generally more limited in the extent of the damage inflicted, explosive terrorist attacks may have consequences including death and damage to property.

Although, the Los Osos Community Services District has no history of terrorism incidents, the potential of such acts could occur within the water system. The District has prioritized the potential for a variety of malevolent acts to occur in each of their water system sites. The following Table 4-8 shows the probability of an act occurring, the consequences of such an act, and how effective a deterrent would be at minimizing the consequences of the act. Each of the three criteria is based on a number system.

**Table 4-8: Probability of Occurrence/Consequences of Action/Effectiveness of Deterrents**

| **Probability of Occurrence** | | **Consequences of Action** | | **Effectiveness of Deterrents** | |
|---|---|---|---|---|---|
| ▪ Not likely to happen | 1 | ▪ Low | 1 | ▪ Highly effective | 1 |
| ▪ Not likely, but possible | 2 | ▪ Medium | 2 | ▪ Moderately Effective | 2 |
| ▪ Could and is likely | 3 | ▪ High | 3 | ▪ Ineffective | 3 |
| ▪ Likely (has happened) | 4 | | | | |

The Probability of Occurrence is how likely the malevolent act actually is to occur. The Consequence of Action is what impact the malevolent act has on the water system assets and the District's customers. The Effectiveness of deterrents is the evaluation of the current security features at each site and the effectiveness of keeping each of the malevolent acts from occurring.

Table 4-9 on the following page evaluates each of the District's assets based on the three criteria and the numbering system presented above.

**Table 4-9: Facility Risk Assessment**

## Risk Assessment

| Site Name | Threat # | Threat Name | Probability of Occurrence | Consequences of Action | Effectiveness of Deterrents | Relative Risk |
|---|---|---|---|---|---|---|
| 16th Street Tanks and Booster Station | 1 | On-Site Vandalism | 3 | 3 | 3 | 27 |
| | 2 | Remote Vandalism | 3 | 3 | 3 | 27 |
| | 3 | Power Loss | 2 | 3 | 3 | 18 |
| | 4 | Controls Tampering | 1 | 1 | 3 | 3 |
| | 5 | Bioterrorism Contaminant Release | 3 | 3 | 2 | 18 |
| 10th Street Tank, Booster Station and Well | 6 | On-Site Vandalism | 3 | 1 | 3 | 9 |
| | 7 | Remote Vandalism | 3 | 1 | 3 | 9 |
| | 8 | Power Loss | 2 | 1 | 2 | 4 |
| | 9 | Controls Tampering | 1 | 1 | 2 | 2 |
| | 10 | Bioterrorism Contaminant Release | 3 | 3 | 2 | 18 |
| Palisades Well | 11 | On-Site Vandalism | 3 | 3 | 3 | 27 |
| | 12 | Remote Vandalism | 1 | 3 | 3 | 9 |
| | 13 | Power Loss | 1 | 3 | 2 | 6 |
| | 14 | Controls Tampering | 2 | 2 | 2 | 8 |
| | 15 | Bioterrorism Contaminant Release | 2 | 3 | 2 | 12 |
| 3rd Street Well | 16 | On-Site Vandalism | 2 | 1 | 3 | 6 |
| | 17 | Remote Vandalism | 1 | 1 | 2 | 2 |
| | 18 | Power Loss | 1 | 1 | 2 | 2 |
| | 19 | Controls Tampering | 1 | 1 | 2 | 2 |
| | 20 | Bioterrorism Contaminant Release | 2 | 3 | 2 | 12 |

## Table 4-9: Facility Risk Assessment, Continued

| Risk Assessment | | | | | | |
|---|---|---|---|---|---|---|
| **Site Name** | **Threat #** | **Threat Name** | **Probability of Occurrence** | **Consequences of Action** | **Effectiveness of Deterrents** | **Relative Risk** |
| Water Yard/Office and 8th Street Well | 21 | On-Site Vandalism | 3 | 2 | 3 | 18 |
| | 22 | Remote Vandalism | 2 | 2 | 3 | 12 |
| | 23 | Power Loss | 1 | 2 | 2 | 4 |
| | 24 | Controls Tampering | 1 | 1 | 2 | 2 |
| | 25 | Bioterrorism Contaminant Release | 2 | 3 | 2 | 12 |
| South Bay Well | 26 | On-Site Vandalism | 2 | 1 | 3 | 6 |
| | 27 | Remote Vandalism | 1 | 1 | 2 | 2 |
| | 28 | Power Loss | 1 | 1 | 2 | 2 |
| | 29 | Controls Tampering | 1 | 1 | 2 | 2 |
| | 30 | Bioterrorism Contaminant Release | 2 | 3 | 2 | 12 |

- **Effects on people and housing.** Depending on levels of contamination and exposure, effects could range from minimal to devastating. The effects of an explosive attack incident could be devastating.

- **Effects on commercial and industrial structures.** Depending on levels of contamination and exposure, effects could range from minimal to devastating.

- **Effects on infrastructure.** Nuclear, radiological, and cyber-terrorism can have profound effects on infrastructure.

**Risk assessment conclusion.** Due to recent events such as the 9/11 Twin Towers attack and the declared war against terrorism, national and local governments have assigned high priority to terrorist attack preparedness.

**Plans and Programs**

The Los Osos Community Services District has evaluated each of their water system sites and identified potential modifications to the sites and processes to decrease the likelihood of vandalism/terrorism attacks and have:

- Identified modifications to decrease likelihood of bioterrorism contaminant release, controls tampering, power loss, remote vandalism, and on-site vandalism

- Conduct background checks into the hiring process and, upon dismissal of an employee, immediately remove passwords and codes from all facilities, and retrieve all facility keys and badges.

The Los Osos Community Services District fire staff (CDF) has completed the following activities:

- Replaced self-contained breathing apparatus with weapons of mass destruction compliant-devices with a homeland security grant
- Improved counter cyber-terrorism preparedness
- Completed terrorism awareness training

# 5. Goals, Objectives, and Mitigation Strategies

**Mitigation Strategy Requirements Cross-Reference Table**

| Element | Requirement | Los Osos Community Services District LHMP Response |
|---|---|---|
| Local Hazard Mitigation Goals - A | Description of Mitigation Goals to Reduce or Avoid Long-Term Vulnerabilities to the Identified Hazards | Wildfire – page - 94<br>Flooding - page - 94<br>Earthquakes / Water Tank Failure – pages 94 - 95<br>Hazardous Materials – page - 95<br>Terrorism – page - 95 |
| Identification and Analysis of Mitigation Actions - A | Identification and Analysis of a Comprehensive Range of Specific Mitigation Actions and Projects for Each Hazard | |
| Identification and Analysis of Mitigation Actions - B | Explain How Identified Actions and Projects Address Reducing the Effects of Hazards on New Buildings and Infrastructure | |
| Identification and Analysis of Mitigation Actions - C | Explain How Identified Actions and Projects Address Reducing the Effects of Hazards on Existing Buildings and Infrastructure | |

Chapter 4 of this document documented how hazards have affected the Los Osos Community Services District in the past and assessed the risks these and emerging hazards pose to the District's people and physical assets. This chapter outlines how the District intends to address each hazard and identifies the parties responsible for implementing the strategies and the timelines and costs for each.

The pages which follow detail the District-level mitigation projects.

## Hazard: Wildfire

**Wildfire Goal 1:** Reduce risks of wildfires.

**Objectives**
- Minimize the amount of fuel in areas prone to wildfires

**Strategies**
- Inside the District – implement planned greenbelts and fuel breaks, and continue hazard abatement program
- Outside District – additional vegetation management projects

## Hazard: Flooding

**Flooding Goal 1:** Improve prevention and response and the safety of residents.

**Objectives**
- Improve drainage
- Improve responses to flood events

**Strategies**
- Public education pamphlets and seminars
    - Evacuations
    - Vegetation management
    - Construction management
- Response training for Utilities Department personnel

## Hazard: Earthquakes / Water Tank Failure

**Earthquakes Goal 1:** Safety of residents, public education, awareness and preparedness

**Objectives**
- Provide more public education and earthquake hazard awareness for Los Osos Community Services District residents
- Minimize risk to residents

**Strategies**
- Public education pamphlets and seminars
- Provide improved evacuation routes

**Earthquakes Goal 2:** Protect structures; retrofit and secure the District's water tank structures.

**Objectives**
- Minimize damage to structures
- Reduce severity of incident by improving survivability of water tank structures

**Strategies**
- Retrofit the North and South 16th Street water tanks
- Retrofit the 10th Street water tank
- Additional flexible connections at tanks and booster pump stations

## Hazard: Hazardous Materials

**Hazardous Materials Goal 1:** Implement monitoring equipment

**Objectives**
- Detection of HAZMAT event

**Strategies**
- Acquire and implement monitoring equipment

**Hazardous Materials Goal 2:** Public education and awareness

**Objectives**
- Educate District residents of how to dispose of hazardous materials to minimize risk to ground water

**Strategies**
- Public education pamphlets and seminars

## Hazard: Terrorism

**Terrorism Goal 1:** Improve security at water facilities

**Objectives**
- Minimize the vulnerability to water system

**Strategies**
- Engineer and install SCADA system

# 6. Los Osos Community Services District Action Plan

### Mitigation Action Plan Requirements Cross-Reference Table

| Element | Requirement | Los Osos Community Services District LHMP Response |
|---|---|---|
| Implementation of Mitigation Actions - A | Mitigation Strategy Includes How Actions are Prioritized | Pages 96 - 97 |
| Implementation of Mitigation Actions - B | Mitigation Strategy Addresses How Actions will be Implemented and Administered | Page 97 |
| Implementation of Mitigation Actions - C | Prioritization Process Includes an Emphasis on the Use of a Cost-Benefit Review | Page 96 - 97 |

The process used to prioritize mitigation strategies involved lengthy discussions with various Los Osos Community Services District stakeholders, followed by citizen and community review. The end result is a hazard mitigation action plan with a prioritized list of strategies that the District expects to carryout during the next five years.

**Prioritizing Strategies**

The process used by Los Osos Community Services District first prioritized goals and their respective objectives based on priority maps created during the risk assessments. Available resources and public input were also considered. The District next assessed each strategy listed under the prioritized list of goals. In assessing and evaluating each strategy, the District considered the following factors:

1. The cost was justified
2. Financial resources were available; local or outside resources
3. Staff resources were adequate
4. Minimal impact on District department functions
5. Strategies mitigate risks for the riskiest hazard events
6. Strategies reflect the goals and objectives

The District then prepared a draft action plan that listed goals followed by a prioritized list of strategies which included the principal contact and cooperating parties, the cost, and the time involved in carrying out the strategy. This step involved discussions with District departments and staff.

**Implementation**

Each year the action plan will be revisited and the first year will be dropped as those activities are completed and another year will be added so that the action plan always reflects a five-year time frame and remains current. Strategies undertaken and completed will be evaluated as to their effectiveness. Those activities not completed during the first year will be re-evaluated and included in the first year of the new action plan if still appropriate.

Even though individual strategies have been assigned a principal contact to ensure implementation, overall responsibility, oversight, and general monitoring of the action plan has been assigned to the District's General Manager. The General Manager will provide periodic updates to the Board.

The General Manger will work with the principal contact agency of each action to develop a cost/benefit analysis and detailed implementation timeline for each specific action prior to initiating work on the action.

This action plan serves as a guide to spending priorities but will be adjusted annually to reflect current needs and financial resources. Some strategies will require outside funding to implement. If outside funding is not available, then the strategy will be set aside until new sources of funding can be identified.

## Action Plan

| Hazard | Goal / Strategy | Action | Priority | Responsible Party |
|---|---|---|---|---|
| Wildfire | Reduce the risks of wildfires by minimizing the amount of fuel in areas prone to wildfires | Inside the District – implement planned greenbelts and fuel breaks, and continue hazard abatement program | High | To Be Determined |
| Floods | Reduce risks of floods**,** improve prevention, response and the safety of residents | Improved drainage, public education on construction management, evacuation routes and vegetation management | High | To Be Determined |
| Earthquakes, Water Tank Failures | Mitigate severity of incident, public education, preparedness and awareness | Public education, flexible connections at tanks, tank retro-fitting | High | To Be Determined |
| Hazardous Materials | Minimize risk an event | Monitoring equipment, public awareness | Medium | To Be Determined |
| Terrorism | Protect water supply | Engineer and install a SCADA system | High | To Be Determined |

## How the Mitigation Actions Identified Address Existing and New Buildings and Infrastructure

The matrices on the following pages cross references the mitigation actions enumerated above to the specific hazards, buildings, and infrastructure that are addressed by the actions.

## How the Mitigation Actions Identified Address Existing and New Buildings and Infrastructure

| | Existing Infrastructure | | | | | | | New Infrastructure |
|---|---|---|---|---|---|---|---|---|
| | Electrical and Power Infrastructure | Water Management | Communication Facilities | Critical Roads | Coastal Harbors, Bays and Fisheries | Agricultural Infrastructure | Public Structures | Waste Water Treatment Facility |
| **Wildfire Goal 1:**<br>Reduce risks of wildfires by minimizing the amount of fuel in areas prone to wildfires.<br>***Wildfire Mitigation Action Plan***<br>*a. Inside the District - Implement planned greenbelts and fuel breaks*<br>*b. Outside the District - Conduct additional vegetation management fire burns* | X | X | X | X | X | X | X | X |
| **Flooding Goal 1:**<br>Reduce risks of flooding .<br>***Flooding Mitigation Action Plan***<br>*a. Improve drainage*<br>*b. Improve resoponses to flood events*<br>*c. Prepare public education phamphlets and seminars - evacuation plans, vegetation management, construction management* | X | X | X | X | X | X | X | X |
| **Earthquakes / Tank Failure Goal 1:**<br>Increase Public Awareness.<br>***Earthquake Mitigation Action Plan:***<br>*a. Increase public education on earthquake hazards*<br>*b. Develop and publish evacuation route information* | X | X | X | X | X | X | X | X |
| **Earthquakes / Tank Failure Goal 2:**<br>Improve survivability tanks.<br>***Earthquake Mitigation Action Plan:***<br>*a. Retrofit South 16th Street water tank*<br>*b. Retrofit 10th Street water tank*<br>*c. Install additional flexible connections at tanks and other critical junctures* | | X | | | | | X | |

## How the Mitigation Actions Identified Address Existing and New Buildings and Infrastructure

| | Existing Infrastructure | | | | | | | New Infrastructure |
|---|---|---|---|---|---|---|---|---|
| | **Electrical and Power Infrastructure** | **Water Management** | **Communication Facilities** | **Critical Roads** | **Coastal Harbors, Bays and Fisheries** | **Agricultural Infrastructure** | **Public Structures** | **Waste Water Treatment Facility** |
| **Hazardous Materials Goal 1:**<br>Detect HAZMAT events.<br>***Hazardous Materials Mitigation Action Plan:***<br>*a. Acquire and deploy monitoring equipment* | X | X | X | X | X | X | X | X |
| **Hazardous Materials Goal 2:**<br>Increase Public Awareness.<br>***Hazardous Materials Mitigation Action Plan:***<br>*a. Educate citizens on proper disposal of hazardous materials to minimize risk to groundwater*<br>*b. Phamplets and seminars* | | X | | | X | X | X | |
| **Terrorism Goal 1:**<br>Detect Presence of Contaminants<br>***Terrorism Mitigation Action Plan:***<br>*a. Install SCADA system* | | X | | | | | | |

# 7. Assets At Risk

## List of Jurisdiction's Assets at Risk for All Applicable Hazards

**List of all Jurisdictional Assets at risk including Buildings, Critical Facilities, Infrastructure, Private Property and Areas (Residential, Environmental, Historical and Economic)**

| List Critical Facilities and Infrastructure and Areas | Asset Location | (Estimated Potential Loss) % / Total Value in Dollars (K for thousands or M for millions) | Wildfire | Flood | Extreme Weather | Tsunami | Earthquake | Fault Rupture/Groundshaking/ Liquefaction | Coastal Storm / Coastal Erosion | Landslides / Rockslides | Water Tank Failure | Hazardous Material | Toxic Pollution | Nuclear Incident | Terrorism |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | |
| Fire Station | 2315 Bayview Heights Drive | $ 2.5 M / 100% | | | | | X | X | | | | | | | X |
| Schools | Sunnyside, 880 Manzanita Dr | $ 6 M / 100% | X | X | X | | X | X | | | X | | | | X |
| | Baywood, 1330 9th Street | $ 6 M / 100% | X | X | X | | X | X | | | X | | | | X |
| | Monarch, 348 Los Osos Valley Road | $ 10 M / 100% | X | X | X | | X | X | | | X | | | | X |
| | Los Osos Middle, 1555 El Moro Street | $ 12 M / 100% | X | X | X | | X | X | | | X | | | | X |

| List Critical Facilities and Infrastructure and Areas | Asset Location | (Estimated Potential Loss)<br><br>% / Total Value in Dollars (K for thousands or M for millions) | Wildfire | Flood | Extreme Weather | Tsunami | Earthquake | Fault Rupture/Groundshaking/ Liquefaction | Coastal Storm / Coastal Erosion | Landslides / Rockslides | Water Tank Failure | Hazardous Material | Toxic Pollution | Nuclear Incident | Terrorism |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | |
| Water Facilities | 8th & El Moro Operations Center | $ 700K / 100% | X | X | X | | X | X | | | X | X | X | X | X |
| | 16th Street (tanks and booster) | $ 900K / 100% | X | X | X | | X | X | | | X | X | X | X | X |
| | 10th Street (tank and booster) | $400 K / 100% | X | X | X | | X | X | | | X | X | X | X | X |
| | Palisades Well Head / Building | $300K / 100% | X | X | X | | X | X | | | X | X | X | X | X |
| | 3rd Street Well Head/Building | $200K / 100% | X | X | X | | X | X | | | X | X | X | X | X |
| | South Bay Well Head / Building / Treatment System | $600K / 100% | X | X | X | | X | X | | | X | X | X | X | X |

| List of Commercial or Industrial Buildings or Areas | Asset Location | Potential Loss / Total Value<br><br>% / Total Value in Dollars (K for thousands or M for millions) | Wildfire | Flood | Extreme Weather | Tsunami | Earthquake | Fault Rupture/ Groundshaking / Liquefaction | Coastal Storm / Coastal Erosion | Landslides / Rockslides | Water Tank Failure | Hazardous Material | Toxic Pollution | Nuclear Incident | Terrorism |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | |
| Commercial / Business Buildings | Various locations – 132 parcels | $ 36M / 100 % | X | X | X | X | X | X | X | X | X | X | X | X | X |

| List of Residential or Private Property or Areas | Asset Location | Potential Loss / Total Value<br><br>% / Total Value in Dollars (K for thousands or M for millions) | Wildfire | Flood | Extreme Weather | Tsunami | Earthquake | Fault Rupture/ Groundshaking / Liquefaction | Coastal Storm / Coastal Erosion | Landslides / Rockslides | Water Tank Failure | Hazardous Material | Toxic Pollution | Nuclear Incident | Terrorism |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | |
| Private Property (land / facilities) | Los Osos Community Services District | $ 627M / 100% | X | X | X | X | X | X | X | X | X | X | X | X | X |

| List of Environmental, Historical and Economic Areas | Asset Location | Potential Loss / Total Value | Wildfire | Flood | Extreme Weather | Tsunami | Earthquake | Fault Rupture/ Groundshaking / Liquefaction | Coastal Storm / Coastal Erosion | Landslides / Rockslides | Water Tank Failure | Hazardous Material | Toxic Pollution | Nuclear Incident | Terrorism |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Nature / Environmental Areas | None | N/A | | | | | | | | | | | | | |
| Historical Buildings/ Areas | None | N/A | | | | | | | | | | | | | |
| Tourist / Economic Areas | None | N/A | | | | | | | | | | | | | |
| **END of List of all Jurisdictional Assets at Risk** | | | | | | | | | | | | | | | |

# 8. Plan Maintenance

**Plan Maintenance Requirements Cross-Reference Table**

| Element | Requirement | Los Osos Community Services District LHMP Response |
|---|---|---|
| Monitoring, Evaluating, and Updating the Plan – A | Description of the Method and Schedule for Monitoring Plan | Pages 107 – 108 |
| Monitoring, Evaluating, and Updating the Plan – B | Description of the Method and Schedule for Evaluating the Plan | Pages 107 – 108 |
| Monitoring, Evaluating, and Updating the Plan – C | Description of the Method and Schedule for Updating the Plan within the Five-Year Cycle | Pages 107 – 108 |
| Incorporation into Existing Planning Mechanisms - A | Identification of Other Local Planning Mechanisms Available for Incorporating the Requirements of the Mitigation Plan | Page 108 |
| Incorporation into Existing Planning Mechanisms - B | Identification of Process by Which Los Osos Community Services District will Incorporate the Requirements of Other Plans, When Appropriate | Page 108 |
| Continued Public Involvement – A | Explanation of How Continued Public Participation will Be Obtained | Page 108 |

Los Osos Community Services District has developed a method to ensure that regular review and update of its Local Hazard Mitigation Plan (LHMP) occurs. FEMA regulations require an update every five years. The Los Osos Community Services District Administrative Services Department will poll agencies that participated in the development of the LHMP ("Planning Team") to see if they want to continue to participate and if their elements of the plan are up-to-date.

The Planning Team will review each goal and objective to determine its:

- Relevance to the evolving situation in Los Osos Community Services District
- Consistency with changes in State and Federal policy
- Relevance to current and expected conditions

The Planning Team will review the risk assessment portion of the plan to determine if the information should be updated or modified. The parties responsible for the various implementation actions will report on:

- Status of their projects
- Implementation processes that worked well
- Any difficulties encountered
- How coordination efforts are proceeding
- Which strategies should be revised

The District is committed to involving the public in the continual reshaping and updating of the Local Hazard Mitigation Plan. The Planning Team members are responsible for the review and update of the plan. Although they represent the public to some extent, the public will be able to directly comment on and provide feedback about the plan.

The District currently uses comprehensive land use planning, capital improvements planning, and building codes to guide and control development within the District. This LHMP will be provided to those responsible for maintenance of the District's Operational Plans to insure that consistency is maintained. Whenever there are substantive changes to this LHMP, those involved in other relevant planning mechanisms in the District will be included in the review process.

Copies of the plan will be kept on hand at the Los Osos Community Services District headquarters. The existence and location of these copies will be publicized. These copies of the plan will include the address and phone number of the District staff member responsible for tracking public comment.