



Chapter 11 Safety

This chapter describes potential public health and safety hazards within San Benito County and is divided into the following sections:

- Geologic and Seismic Hazards (Section 11.1)
- Flood Hazards (Section 11.2)
- Wildland Fire Hazards (Section 11.3)
- Human-made Hazards (Section 11.4)
- Airport Safety (Section 11.5)
- Air Quality (Section 11.6)





CHAPTER 11. SAFETY

San Benito County General Plan

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SECTION 11.1 GEOLOGIC AND SEISMIC HAZARDS

Introduction

This section provides an assessment of geologic and seismic hazards within San Benito County. This includes ground stability and earthquake hazards that must be considered during the planning and development process in the county.

Key Terms

Alluvial/Alluvium. Erosion caused by wind and rain introduces soils, minerals, and rock fragments into streams and rivers. These materials are reduced by the action of water movement and mixed with debris as they are washed down the mountains and hills. They are deposited as sediment that spreads out in a fan shape when the watercourse reaches a relatively level area. Such deposits are called alluvial materials or alluvium. The fan-shaped zone of deposited sediment is called an alluvial fan.

Asbestos. A general term for naturally occurring fibrous silicate minerals. The most common type of asbestos in California is from the serpentine mineral group, commonly found in ultramafic rocks.

Alquist-Priolo Fault Zones. The Alquist-Priolo Earthquake Fault Zoning Act (APEFZA), passed in 1972, requires a professional geologist to identify zones of special study around active faults.

Fault. A fault is a fracture in the crust of the earth, along which rocks on one side have moved relative to rocks on the other side. Most faults are the result of repeated displacements over a long period of time. A fault trace is the line on the earth's surface defining the fault. For the purposes of the APEFZA, an active fault is one that has ruptured in the last 11,000 years (Holocene Period).

Liquefaction. Liquefaction in soils and sediments occurs during earthquake events, when soil material is transformed from a solid state to a liquid state generated by an increase in pressure between pore space and soil particles.

Magnitude. Earthquake magnitude is measured by the Richter scale, indicated as a series of Arabic numbers with no theoretical maximum magnitude. The greater the energy released from the fault rupture, the higher the magnitude of earthquake.

Seiche. An inundating wall of water caused by the failure of a dam, levee, or other water storage or transmission facility.

Ultramafic. A class of igneous rocks characterized by its dark color and high concentration of iron and magnesium silicate minerals.

Regulatory Setting

State

California Government Code Section 65302. California Government Code Section 65302 requires that the General Plan must address threats to human and environmental safety in a Safety Element. Hazards from seismic shaking, ground failure, seiche, tsunami, slope instability, and subsidence must be included



in the assessment. Design requirements must be included to safeguard against risk of injury. The California Building Standards Commission is charged with regulating building standards within the state, and typically adopts and amends codes prepared by the International Code Council. No specific federal structural building standards are enforced.

California Building Code. The California Building Code (CBC), revised in 2007, and the Alquist-Priolo Earthquake Fault Zoning Act (1972) (APEFZA) require local planning agencies to include assessments of seismic hazards when considering locations and development of land uses. On January 1, 2008, the State of California adopted the 2007 triennial edition of the CBC (California Code of Regulations [CCR], Title 24). The 2007 CBC provides design criteria for geologically induced loading that govern the sizing and design of engineered structures and buildings.

Alquist-Priolo Earthquake Fault Zoning Act (1972). The APEFZA and the Seismic Hazards Mapping Act (1991) were developed to protect the public against effects of ground shaking and ground failure from earthquakes. Fault Zone Mapping, established by the State Geologist, is used to regulate most development projects within these zones. The California Geological Survey, through Special Publication (SP) No. 117, and the Work Group for California Earthquake Probabilities (WGCEP) address the following generalized topics related to seismic and geologic hazards, in some cases on an annual basis:

- Ground shaking
- Lateral spreading
- Liquefaction
- Regional and site geology
- Seismicity and faulting
- Slope stability
- Soil data
- Surface fault rupture

San Benito County

San Benito County has adopted the 2007 CBC as specified in County Ordinance 822 § 2, and codified in Title 21.01 Building Regulations.

San Benito County General Plan (Existing)

For this section, four County documents have been reviewed to establish the local regulatory background, including three General Plan Elements: the Land Use Element (1992); the Seismic Element (1980); and the Open Space and Conservation Element (1995). Additionally, the County's Environmental Resources and Constraints Inventory (ERCI), completed in 1994, was consulted. The documents served as the starting point for assessing geologic and seismic hazards within the county. This section outlines the policies of the current General Plan, and the specific policies and actions adopted by the County to ensure public safety and to protect infrastructure and the environment from hazards associated with geologic and seismic hazards.

Seismic Safety Element (1980)

Policy 1. In general, urban expansion should be directed to areas of less risk from natural and man-made hazards.

Actions

- a) In areas susceptible to land sliding, the County should adopt a non-residential or very low-density residential land use policy.
- b) Residential development should avoid canyon bottoms, particularly where flanked by high, steep canyon walls.
- c) In hilly terrain, clustering of residential units should be encouraged as an alternative to developing numerous individual lots over a large area.
- d) Clustering should be required when pre-development investigations indicate that a large portion of the site is potentially unstable, and when corrective measures would be geotechnically or economically unfeasible.
- e) Proposed developments sited within larger areas of known or suspected instability should be deferred until detailed areawide studies are completed which evaluate the extent and degree of instability, and its impact on the overall development of the area.
- f) Required setback distances from fault traces should be determined by individual site-specific surface rupture investigations.
- g) The probable performance of structures proposed in those portions of the county with high liquefaction potential is difficult to predict, and should be the subject of detailed site-specific liquefaction studies.
- h) In order to appreciate the risks associated with geologic and seismic activity in San Benito County, it is important to gain an understanding of the physiography and geology of the region. San Benito County is located within the Coastal Range Mountains of California. The Santa Ana, San Juan, and Hollister Valleys within the northern half of the county are important geographic features. To the south the topography is dominated by the Coastal Range Mountains.

Policy 2. Except for utility lines and transportation links, critical facilities and occupancies should not be located in high hazard areas.

Actions

- a) In areas identified as geologic or seismic hazard areas in the Open Space/Conservation Element, development should be permitted only with a Use Permit.
- b) The County should develop standard conditions for Use Permits within high seismic hazard areas which require that site specific geologic, soils, or other investigations be made, and the structures involved be designed and constructed to withstand the "maximum probable" earthquake or other identified potential hazards, with damage limited to an acceptable level.

Policy 3. The diversity of housing types within San Benito County should be evaluated with regard to suitable locations for high-density housing. The location of buildings three stories and higher should be



carefully examined in relation to ground shaking characteristics, potential for ground failure, and other seismic hazards.

Action

- a) For R-3 density or greater within Group 4, or buildings three stories and higher, two physical studies should be undertaken: the first should determine ground shaking characteristics, and the second should evaluate the potential for ground failure, and identify and mitigate any other geologic hazards which may exist on the site.

Policy 4. It is the County's policy that when there is a coincidence of high agricultural productivity and high geologic hazards, the land should be retained in agricultural use to serve dual open space functions (the production of food and fiber and the protection of health and safety) wherever reasonable in relation to parcel size and established use patterns. It is the County's policy to adopt zoning categories and scenic easements for the protection of environmentally hazardous or aesthetically valuable resources.

Action

- a) The County shall establish an Overlay Zoning District for environmentally hazardous areas (an "EH" District), which discourages development in areas geologically hazardous to the health, safety, and welfare of the citizens of the community. The District shall concurrently develop density transfer policies which would allow for transfer of some of the densities, which may have been allowed in hazardous zones.

Policy 5. It will be the County's policy to identify and abate existing structures that will be hazardous during an earthquake. Such structures would include those of high occupancy, public structures, or any structures that could be dangerous to the general public.

Actions

- a) The County will identify those structures and features likely to fail and cause personal injury or death to occupants, or to severely disrupt services vital to the functioning of the community and needed post-disaster recovery. Since a comprehensive survey of all structures and facilities within the county would be time-consuming and costly, it is suggested that priorities be established to enable staff to focus on cost-effective measures, and at the same time provide information needed to significantly reduce risk and identify measures needed to provide reasonable assurance that facilities required for post-disaster response would be operable following a great earthquake.
- b) The County should supplement certain portions of the Uniform Building Code with regulations for dangerous buildings. The Ordinance should be applicable to a large number of older buildings, which do not have earthquake resistant structural systems, as well as to crumbling and dilapidated structures, which are manifestly unsafe. The Ordinance should include reference to parapets, marquees, appendages, and other nonstructural or non-resistive construction, which constitute earthquake hazards.

- c) The County may initiate a long-range program for the elimination of existing hazardous buildings and develop equitable rules, which will eventually eliminate these structures without undue economic hardships and relocation problems.
- d) Historic community values should be reviewed in relation to structural conditions, degree of hazard, and measures needed for safety. The review should involve persons with special knowledge of historic and other community values. Efforts should be made to preserve the essential qualities of the building, while improving structural and fire safety.

Policy 6. It will be the County's goal to explore means of providing additional geotechnical information to both the public and the County staff in an effort to properly assess seismic hazards. In addition, the County desires to maintain and improve the geotechnical database, and will take positive steps to do so.

Actions

- a) The County will explore the possibility of providing more detailed geotechnical information through special grants at both State and Federal levels.
- b) A public file will be kept of all site-specific geotechnical and soils investigations.
- c) A Seismic Hazards Map will be made readily available to the public and will be updated immediately upon receipt of additional information.

Policy 7. It is the County's policy to maintain a reasonable level of disaster preparedness for the protection of the health, safety, and welfare of the citizens of San Benito County.

Actions

- a) Highest priority should be given to investigating the seismic response of emergency facilities, such as fire stations, hospitals, and communications centers which are located in potentially hazardous areas. The County should encourage the agencies involved to investigate these facilities, as well as the adequacy of other facilities, which have low levels of acceptable exposure to risks, such as schools and major utility lines located in potentially hazardous areas.
- b) It will be the County's policy not to approve critical and emergency facilities proposed to be located in hazardous areas unless this is unavoidable. (This may be unavoidable where utility lines must pass through hazardous areas to serve the community, or where emergency facilities must be located in areas which could be isolated from similar facilities in other parts of the county following an earthquake. In all cases the most stringent structural and engineering requirements will be applied in the design of these facilities, as they must remain functional during and after an earthquake).
- c) The San Benito County emergency plan should be updated to include an aerial reconnaissance of rivers, streams, and major tributaries to ascertain whether or not landslides have created artificial dams, which in turn could result in sudden severe flood levels in areas otherwise considered for local residents.



- d) The disaster response plan should take into account seismically related problems such as the inundation of large areas as a result of dam failure and the isolation of sections of the community caused by the collapse of bridges. Evacuating or providing emergency service to these areas is of prime importance.

A biannual disaster simulation exercise should be held for clarifying and testing staff emergency duties.

Land Use Element (1992)

Policy 9. The type of development allowed within the residential areas includes residential, agricultural, and open space. Trails, parks, and public facilities, including schools and churches, may be allowed subject to use permits.

Actions

- a) Incorporate the above list of allowable and conditional uses within the Zoning Ordinance.
- b) Designate the area immediately east of Fairview Road bound by State Route 25 to the south and Mansfield Road to the north as an Area of Special Study.
- c) Designate the area west of Fairview Road, north of Airline Highway, and south of Sunnyslope Road as an Area of Special Study.
- d) The County shall use overlay zoning which establishes development standards in areas of special concern, such as Alquist-Priolo special studies zones, floodplains, and hazardous fire areas.

Policy 32. Specific development sites shall be free from the hazards identified within the Open Space and Conservation Element Maps (e.g., faults, landslides, hillsides over 30 percent slope, floodplains). The site shall also be on soil suitable for building and maintaining well and septic systems (i.e., avoid impervious soils, high percolation or high groundwater areas, setback from creeks). Absent adequate mitigation, development shall not be located on environmentally sensitive lands (wetlands, erodible soil, archeological resources, important plant and animal communities).

Actions

- a) Highest priority should be given to investigating the seismic response of emergency facilities, such as fire stations, hospitals, and communications centers, which are located in potentially hazardous areas. The County should encourage the agencies involved to investigate these facilities as well as the adequacy of other facilities which have low levels of acceptable exposure to risks, such as schools and major utility lines located in potentially hazardous areas.
- b) The County should develop a hillside ordinance which will prohibit the development of hillsides where slopes are 30 percent or greater.
- c) Proposed site plans and tentative or parcel maps shall depict all environmentally sensitive and hazardous areas (e.g., 100-year floodplain, fault zones, 30 percent slopes, severe erosion hazard, fire hazard, wetlands, riparian habitat, etc.).

- d) The base density of a proposed development site should be reduced if a combination of environmental hazards (fire, access, fault, flood, 30 percent slope) and/or natural resources (habitat, wetlands) are on a particular development site.
- e) Incorporate the above concepts into the County's development regulations.

Policy 33. Specific development sites shall avoid, when possible, locating in an environmentally sensitive area (wetlands, erodible soils, important plant and animal communities, archeological resources).

Actions

- a) The County shall utilize the overlay zoning which establishes development standards in areas of special concern, such as Alquist-Priolo special studies zones, floodplains and hazardous fire areas.

Open Space and Conservation Element (1995)

Goal 7 Environmental Hazards. To discourage development in areas that are environmentally hazardous.

Objectives

- 1. To develop methods to avoid development in environmentally hazardous areas.
- 4. To use flood prone areas for open space purposes in order to protect the health and safety of residents and property of the county, to maximize groundwater recharge, and to protect wetland resources.
- 5. Limit development on slopes 30 percent or greater or in severe to very severe erosion hazard areas that would increase erosion or jeopardize the safety of structures.
- 6. Develop standards to reduce erosion resulting from grading or cutting.

Major Findings

- According to the USDA Soil Survey, the county's eleven soil associations fall within two groups: soils of the terrace, alluvial fans, and floodplain, which make up approximately 15 percent of the county and often include areas that are cultivated for agriculture; and soils of the uplands which make up 85 percent of the county, cover steep slopes, and are underlain by igneous and sedimentary rock.
- Several well-known geologic features traverse San Benito County. The most significant is the San Andreas Fault Zone, a principal active fault identified by the Alquist-Priolo Earthquake Fault Zoning Act. The fault is a right lateral strike slip fault and runs the length of the county.
- Other notable faults in San Benito County include the Calaveras (principal active fault), Sargent, Paicines, Bear Valley, Zayante-Vergeles, and Quien-Sabe Faults.



- The 2008 Report by the Working Group on California Earthquake Probabilities (WGCEP) identified a 93 percent probability of a magnitude 6.7 or greater earthquake, and a 16 percent probability of magnitude 7.5 or greater earthquake occurring during the next 30 years in northern California. The San Andreas and Calaveras Faults have the highest earthquake probability within the county. However, a major earthquake in the San Francisco Bay area could also have significant direct impacts in the county including seismic shaking, liquefaction, and ground rupture.
- The Gabilan and Diablo Ranges consist of highly deformed and metamorphosed sedimentary and igneous rocks. These rock formations have been intensely deformed during the collision of the North American Plate and the Pacific Plate, and have undergone low grades of metamorphism. The low-grade metamorphism has resulted in the alteration of ultramafic rocks to asbestos-containing formations.
- Naturally Occurring Asbestos (NOA) is found in the southern part of the county. The Environmental Protection Agency (EPA) issued the Clear Creek Management Area an Asbestos Exposure and Human Health Risk Assessment in 2008, which concluded that adults and children visiting the CCMA more than once per year could be exposed to carcinogens such as asbestos above EPA acceptable levels. Since release of the EPA report, the Bureau of Land Management (BLM) has issued a temporary closure order on 30,000 acres within the Serpentine Area of Critical Environmental Concern (ACEC).
- Ground failure and liquefaction have been reported from historical earthquakes within San Benito County near Hollister and San Juan Bautista. During the 1989 Loma Prieta earthquake, sand boils, lateral spreading, and ground settlement were reported at four locations within San Benito County.
- The risk of liquefaction in the county is considered highest near Quaternary alluvial deposits where soil saturation is close to the land surface. No specific liquefaction hazard areas have been delineated in the county; however, the potential for liquefaction is recognized throughout the Santa Clara Valley and other areas where unconsolidated sediments coincide with a high water table.
- Areas at risk for landslides within San Benito are concentrated along steep topographic slopes. Landslides could also occur near Hollister, Tres Pinos, and Paicines. Existing landslides, earthflows, and other similar features are abundant along the numerous faults throughout the county.
- Several abandoned mines within the county have undergone some remediation, including five abandoned mines within the Clear Creek Management Area. These mines include the Aurora, Alpine, Jade Hill, Xanadu, and Larcious Mines. The California Office of Mine Reclamation (OMR) has identified the New Idria Mine as an abandoned mine. The site is listed by OMR for chemical risk. The New Idria mine is now a Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) site; however, the site is not listed on the National Priorities List (NPL).

Existing Conditions

Physiography and Soils

Soils within San Benito County consist of eleven soil associations classified into two groups: soils of the terrace, alluvial fans, and floodplain; and 2) soils of the uplands. Figure 11-1 depicts the soil associations within the county.

Soils of the terrace, alluvial fans, and floodplains

These soils are generally flat with moderate slopes present along terrace deposits. These soils, composed of alluvium derived from the erosion of sedimentary and igneous rocks, are cultivated in most areas. Elevation ranges from 100 to 2,000 feet. Areas that are not cultivated support annual grasses, forbs, and oak trees. The soil group covers approximately 15 percent of the county. The following five soil associations make up this group:

- **Sorrento-Yolo-Mocho Association.** These soils are nearly flat, well drained, and medium textured; they are found on floodplains and alluvial fans. The soils represent productive agricultural land, and produce irrigated fruits and nuts, row and field crops, alfalfa, and pasture.
- **Clear Lake-Pacheco-Willows Association.** These soils are nearly flat, poorly drained to somewhat poorly drained, and fine and medium textured; they are found on floodplains and basins. The soils are extensively cultivated with row and field crops, alfalfa, and small grains. Fruits and nuts are grown where soils have been drained.
- **Edenvale-Conejo Association.** These soils are nearly level, somewhat poorly drained to well drained, and fine and moderately fine textured; they are found in basins and their rims. Irrigation water supply is limited, and the soils are used mainly for dryland grain and pasture. Within this association Edenvale soils are less fertile due to a high magnesium to calcium ratio.
- **Panoche-Los Banos-Panhill Association.** These soils are nearly flat, well drained, and medium and moderately fine textured; they are found on alluvial fans and terraces. These soils are used for annual grasses, irrigated cotton, alfalfa, safflower, wheat, and barley. Overgrazing has resulted in erosion where soils are sloped.
- **Rincon-Antioch-Cropley Association.** Nearly flat to strongly sloping, well drained and moderately well drained, medium to fine textured soils on terraces and alluvial fans. Soils in this association are used for fruits, nuts, alfalfa, row and field crops, and annual-grass pasture.



FIGURE 11-1 SOIL ASSOCIATIONS IN SAN BENITO COUNTY

SOIL ASSOCIATIONS

SOILS OF THE TERRACES, ALLUVIAL FANS, AND FLOOD PLAINS
 Sorrento-Yolo-Mocho association: Nearly level to sloping, well-drained, medium-textured soils on flood plains and alluvial fans

Clear Lake-Pacheco-Willows association: Nearly level and gently sloping, poorly drained and somewhat poorly drained, fine- and medium-textured soils on flood plains and in basins

Edenville-Ceresio association: Nearly level to sloping, somewhat poorly drained to well-drained, fine- and moderately fine-textured soils in basins and on their rims

Panoche-Los Banos-Panhill association: Nearly level to steep, well-drained, medium- and moderately fine-textured soils on alluvial fans and terraces

Rincon-Antioch-Cropley association: Nearly level to strongly sloping, well-drained and moderately well drained, medium- to fine-textured soils on terraces and alluvial fans

SOILS OF THE UPLANDS
 Diablo-Soper association: Strongly sloping to very steep, well-drained, fine- and moderately coarse-textured soils formed over sandstone and shale or weakly cemented sand and gravel

San Benito-Gazos-Linne association: Rolling to very steep, well-drained and somewhat excessively drained, moderately fine-textured soils formed over sandstone and shale

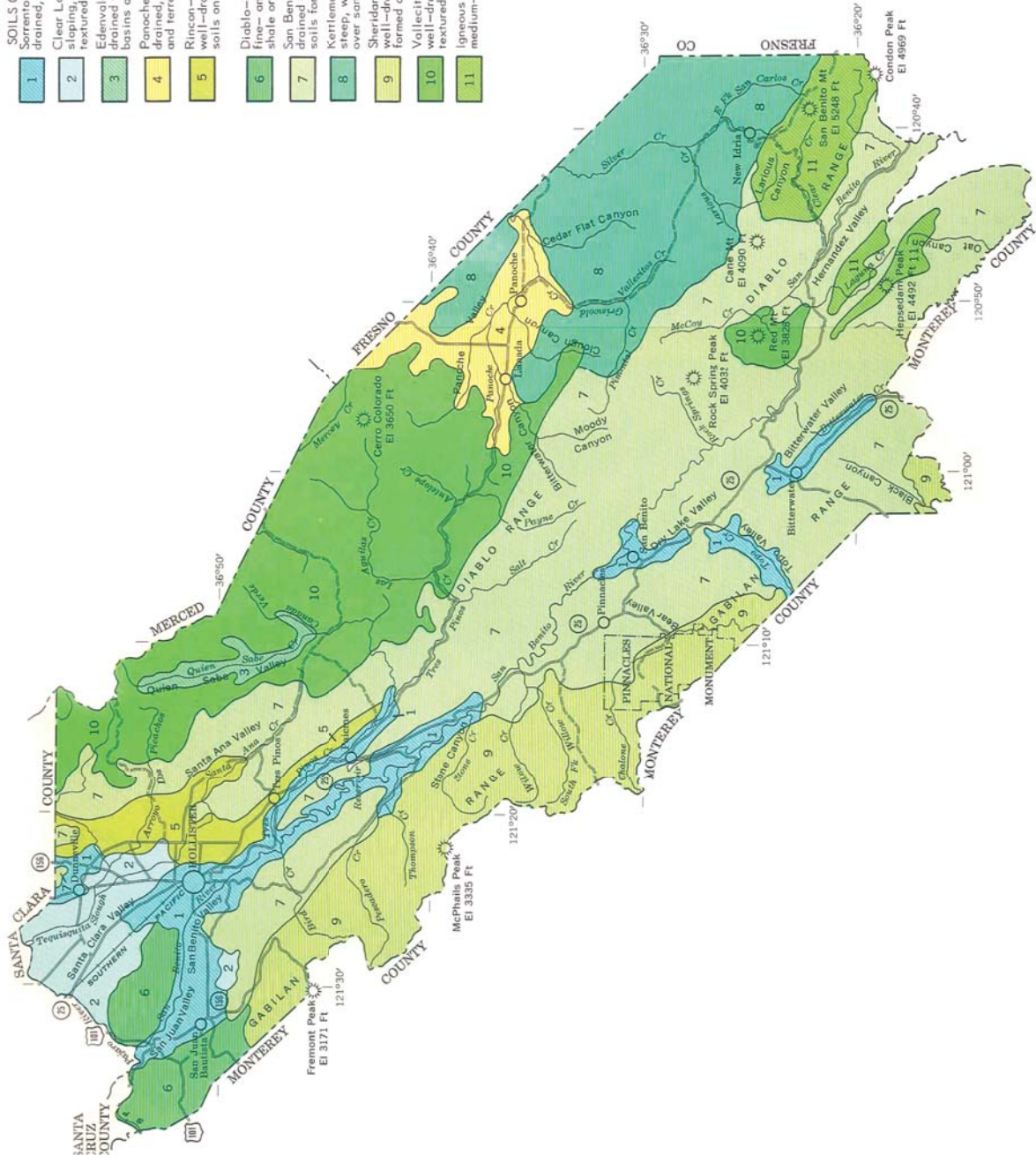
Kettleman-Nacimiento-Linne association: Strongly sloping to very steep, well-drained, medium- to moderately fine-textured soils formed over sandstone and shale

Sheridan-Cierroba-Auberry association: Strongly sloping to very steep, well-drained to excessively drained, moderately coarse-textured soils formed over granite

Vallecitos-Geviota-Cibo association: Strongly sloping to very steep, well-drained and somewhat excessively drained, medium- and fine-textured soils formed over sandstone, shale, or basic igneous rocks

igneous rock land-Henneke association: igneous rock land and shallow, medium-textured soils formed over igneous rock

- 1
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- 11



0 2 4 8 Miles

Source: U.S. Department of Agriculture, Soil Conservation Service, 2010

Soils of the uplands

These soil associations are underlain by igneous and sedimentary rocks. Upland soils cover approximately 85 percent of the county and consist of the following six soil associations:

- **Diablo-Soper Association.** These soils are sloping to very steep, well drained, fine and moderately coarse textured soils over sandstone and shale or poorly cemented sand and gravel. The soil association supports grain, annual-grass pasture, and range. The potential for soil erosion is severe, and landslides occur where underlain by soft sediments.
- **San Benito-Gazos-Linne Association.** These are soils of rolling hills and very steep slopes, well-drained to somewhat excessively drained, moderately fine textured soils over sandstone and shale. The soils are moderately to heavily eroded and used for small grain, annual grass pasture, and range. Overgrazing has resulted in erosion.
- **Kettleman-Nacimiento-Linne Association.** These soils are sloping to very steeply sloping, well-drained, medium to moderately fine textured soils over sandstone and shale. The soils are underlain by calcareous sandstone and shale at depths of 20 to 60 inches. Annual grasses, forbs, and oak trees grow commonly. These soils are used for dry grass pasture; overgrazing has removed vegetation and resulted in heavy soil erosion.
- **Sheridan-Vieneba-Auberry Association.** These soils are sloping to very steep sloping, well drained to excessively drained, moderately coarse textured soils over granite. This soil association is used for pasture, range, watershed, wildlife, and recreation. Overgrazing and wildfires have resulted in severe erosion.
- **Vallecitos-Gaviota-Cibo Association.** These soils are sloping to very steeply sloping, well drained and somewhat excessively drained, medium and fine textured soils over sandstone, shale and igneous rocks. The soils of this association are used for range, watershed, wildlife, and recreation. Where properly managed, the soils support grazing and forage plants.
- **Igneous Rock Land-Henneke Association.** These soils are igneous rock land and shallow, medium textured soils over igneous rock. Soils of this association are used for watershed and recreation. The soils have very low fertility and are severely eroded.

Geology

San Benito County is located within the Coastal Ranges Geomorphic Province. The northern central portion of the county is characterized by the relatively flat San Juan, Hollister, and Santa Ana Valleys that are composed of alluvium. These fertile valleys support extensive agriculture activities and are surrounded by the mountains of the Diablo Range to the east and the Gabilan Range to the west. Active geologic features within the county are well known, including the most significant geologic feature of the San Andreas Fault Zone. The San Andreas Fault is a right lateral strike slip fault and can be traced offshore from near Cape Mendocino in Humboldt County to the Salton Sea in the Imperial Valley. The San Andreas Fault spans the length of San Benito County, stretching 60 miles from the Santa Cruz County line in the north to the Monterey County line in the south. The San Andreas Fault strike is 45 degrees west of north. There are several other known faults exist in the county, including the Calaveras,



Sargent, Paicines, Bear Valley, Zayante-Vergeles, and Quien-Sabe Faults. Figure 11-2 shows known quaternary geologic faults within the county.

The near surface general geologic units within the San Juan and Hollister Valleys consist of Holocene alluvium approximately 10,000 years in age. With depth, the geologic units are the Pliocene/Pleistocene San Benito Gravels and Santa Clara Formation, the Pliocene Purisima Formation, which ranges in age from 24.5 million to 500,000 years before present, and the Mesozoic basement rocks of the Franciscan Formation, which are older than 65 million years. Figure 11-3 depicts the county's geology. Holocene alluvium near-surface deposits within the San Juan Valley are composed of unconsolidated lenticular beds of gravel, sand, silt, and clay deposited by streams as floodplain, alluvial-fan, slope-wash, and terrace deposits. Holocene alluvium deposits can attain thickness of up to 250 feet.

Holocene deposits are underlain deposits of Pliocene and Pleistocene aged San Benito Gravel and the Santa Clara Formation. The San Benito Gravel attains thickness of up to 1,400 feet (Kilburn 1972), and the gravels are recognized only in the Hollister Valley, with surface exposures existing to the east and southwest of Hollister. The Santa Clara Formation underlies the San Benito Gravels and is of undetermined thickness; however, in the San Juan Valley, it is believed that the deposits are less than 300 feet thick. These deposits are exposed along the Calaveras Fault and consist of compact lenticular beds of clay, sand, and gravel.

Powell (1998) describes the Purisima Formation as conglomerate, sandstone, shale, and diatomite with minor ash beds. The Purisima Formation was first described as "extensive series of conglomerates, fine grained sandstones, and shales developed in the vicinity of Purisima Creek, approximately four miles south of Half Moon Bay, some 60 miles northwest of the county." Kilburn (1972) distinguishes three members of the Purisima Formation within the San Juan and Hollister Valleys. These are, from youngest to oldest, the upper member, the middle member, and the lower member. The Lomerias Muertas and Flint Hills to the north are identified as the Purisma Formation, and described as the Sargent Anticline (Ferriz 2001).

The Gabilan and Diablo Ranges consist of highly deformed and metamorphosed sedimentary and igneous rocks. Sedimentary formations consist of marine and fluvial deposits. Deposits of sandstone, conglomerate, chert, and greywacke are known and point to alternating episodes of marine and fluvial (river and stream) deposition. The rock formations have been intensely deformed during the collision of the North American Plate and the Pacific Plate. Formations have undergone low grades of metamorphism. The sedimentary formations have been intruded extensively by Mesozoic age granitic intrusions. Low grade metamorphism has resulted in the alteration of ultramafic rocks to asbestos-containing formations.

Benitoite is a rare blue gemstone. The only known occurrence of Benitoite in gemstone quality is within ultramafic deposits in San Benito County. Benitoite was designated the official gemstone of California in 1985.



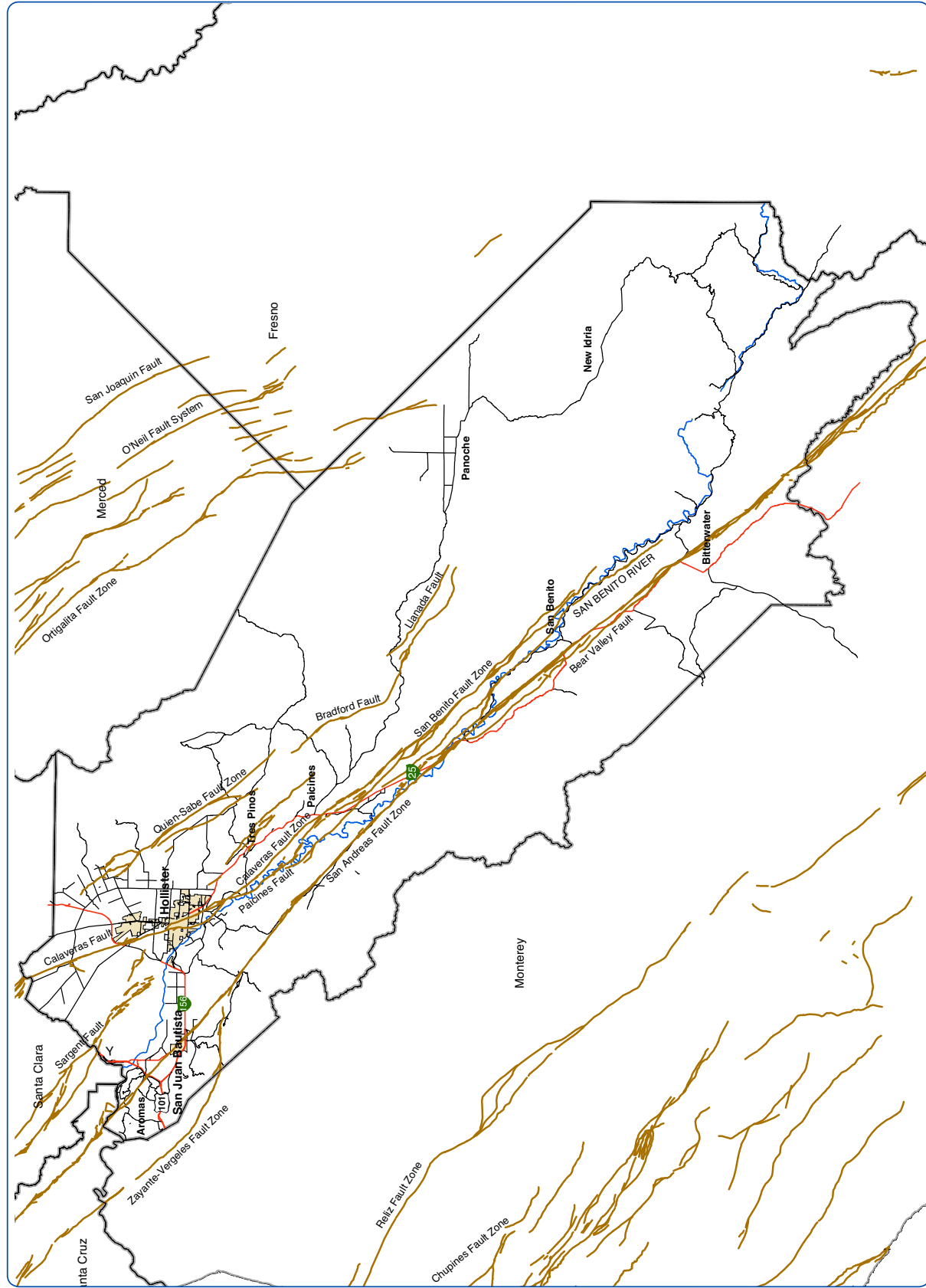
**FIGURE 11-1-2
GEOLOGIC FAULTS
AND HISTORIC
GROUND FAILURES IN
SAN BENITO COUNTY**

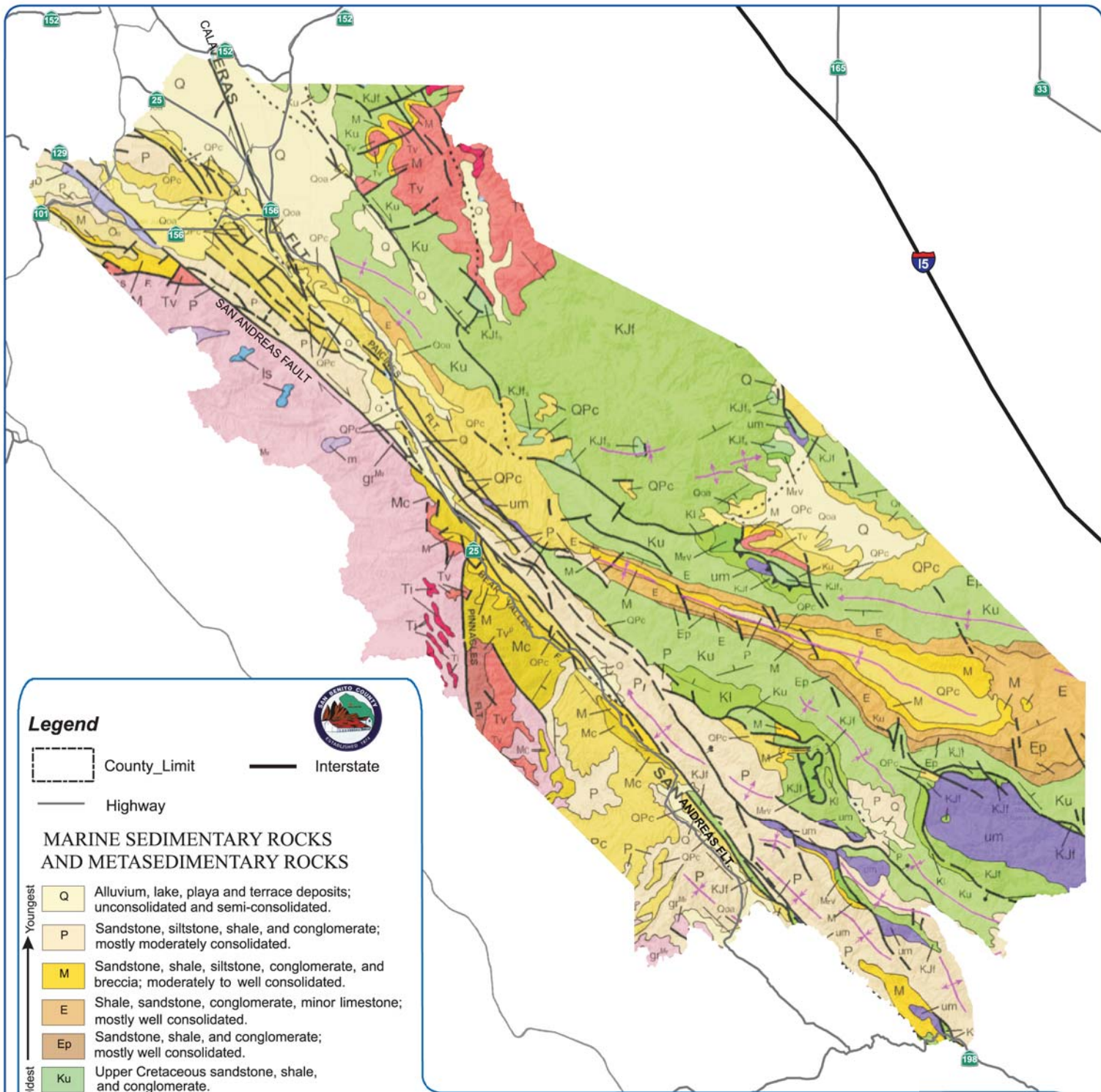
Legend

- Rivers
- San Juan Bautista City Limits
- Hollister City Limits
- County Limits
- Roadways**
- State Highways
- County Roads
- Fault Lines**
- Faults & Fault Zones



Source: San Benito County Planning Department
US Geological Survey, 2010





Legend



- County Limit
- Interstate
- Highway

MARINE SEDIMENTARY ROCKS AND METASEDIMENTARY ROCKS

- | | | | |
|----------|---|----|--|
| Youngest | ↑ | Q | Alluvium, lake, playa and terrace deposits; unconsolidated and semi-consolidated. |
| | | P | Sandstone, siltstone, shale, and conglomerate; mostly moderately consolidated. |
| | | M | Sandstone, shale, siltstone, conglomerate, and breccia; moderately to well consolidated. |
| | | E | Shale, sandstone, conglomerate, minor limestone; mostly well consolidated. |
| | | Ep | Sandstone, shale, and conglomerate; mostly well consolidated. |
| Oldest | ↓ | Ku | Upper Cretaceous sandstone, shale, and conglomerate. |

NONMARINE (CONTINENTAL) SEDIMENTARY ROCKS

- | | | | |
|----------|---|-----|---|
| Youngest | ↑ | Qoa | Older alluvium, lake, playa, and terrace deposits |
| | | QPc | Pliocene and/or Pleistocene sandstone, shale, and gravel deposits; mostly loosely consolidated. |
| | | Mc | Sandstone, shale, conglomerate, and fanglomerate; moderately to well consolidated. |
| | | KJf | Franciscan Complex: Cretaceous and Jurassic sandstone with amounts of shale, chert, limestone, and conglomerate. Includes Franciscan melange. |
| Oldest | ↓ | Is | Limestone, dolomite, and marble whose age is uncertain. |

IGNEOUS ROCKS

- | | | | |
|----------|---|------------------|--|
| Youngest | ↑ | Tv | Tertiary volcanic flow rocks; minor pyroclastic deposits |
| | | Ti | Tertiary intrusive rocks; mostly shallow (hypabyssal) plugs and dikes. |
| | | gr ^{Mz} | Mesozoic granite, quartz monzonite granodiorite, and quartz diorite. |
| | | MzV | Undivided Mesozoic volcanic and metavolcanic rocks. Includes volcanic rocks of the Franciscan Complex. |
| | | um | Ultramafic rocks, mostly serpentine. |
| | | gr | Minor peridotite, gabbro, and diabase; chiefly Mesozoic. |
| Oldest | ↓ | gr | Undated granitic rocks. |

SYMBOLS

- Geologic boundary.
- Fault traces, solid where well located; dashed where approximately located or inferred; and dotted where concealed.
- Ball and bar on downthrown side (relative or apparent).
- Arrows indicate direction of lateral movement (relative or apparent).
- Regional strike and dip of stratified rocks.
- Anticlinal fold.
- Synclinal fold.
- Monoclinical fold.

Source: California Geologic Survey, Geologic Map of California 2010



Figure 11-3
Geologic Map of San Benito County

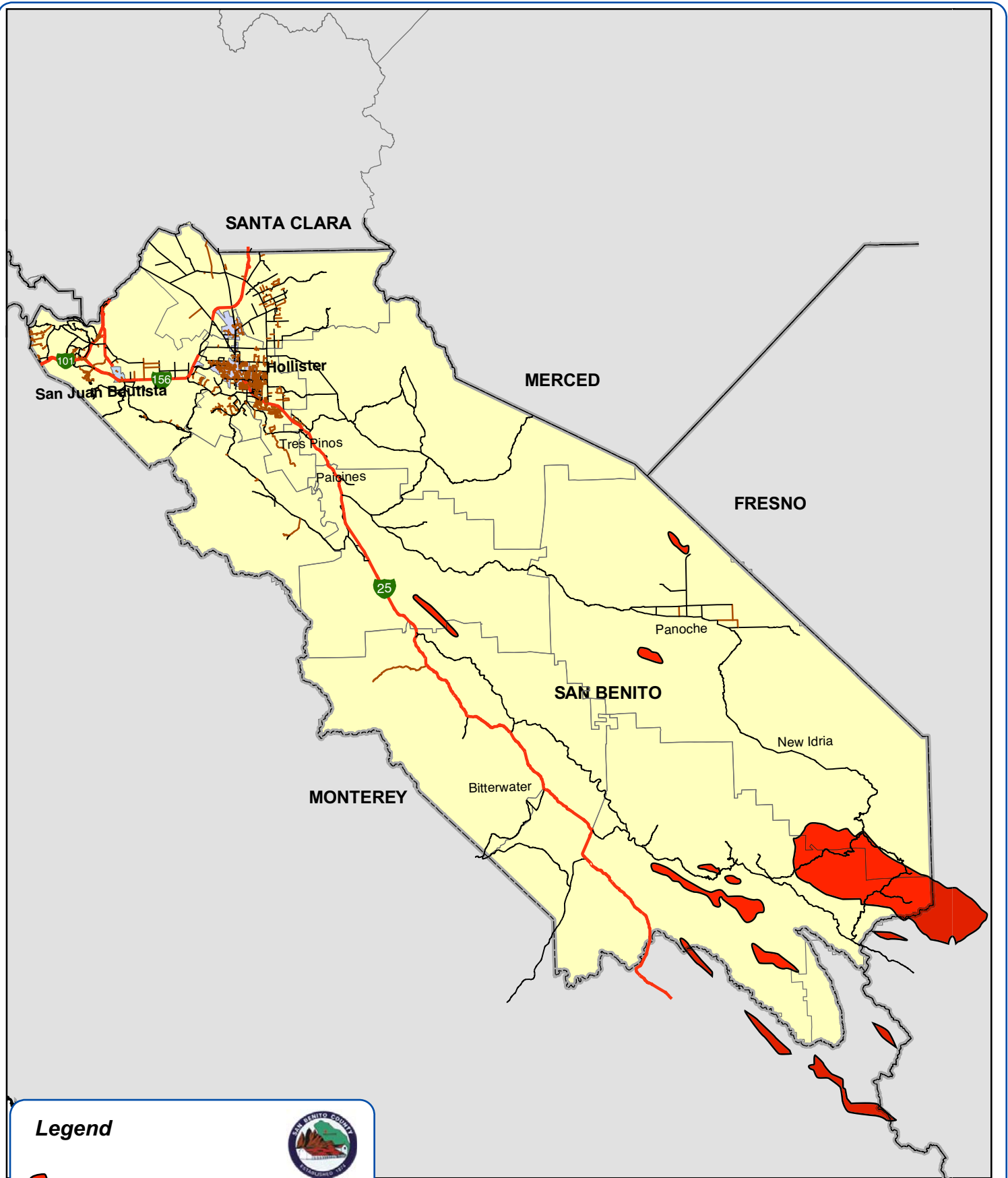
Naturally Occurring Asbestos (NOA) and Minerals as Hazards

Areas likely to contain asbestos have been identified in San Benito County based on the California Geologic Survey (CGS) Open File Report (OFR) 2000-19. Naturally Occurring Asbestos (NOA) is likely to be found in the southern part of the county. Figure 11-4 shows areas likely to contain NOA. On May 1, 2008, the Environmental Protection Agency (EPA) issued the CCMA (Clear Creek Management Area) Asbestos Exposure and Human Health Risk Assessment. The study concluded that adults and children visiting the CCMA more than once per year could be exposed to carcinogens such as asbestos that are above EPA acceptable levels. The Bureau of Land Management (BLM) issued the temporary closure order on May 1, 2008, closing 30,000 acres within the Serpentine Area of Critical Environmental Concern (ACEC). Since the closure order took effect, BLM released a Draft Resources Management Plan & Draft Environmental Impact Statement (RMP/EIS) in November 2009 to develop management alternatives for areas containing asbestos. The public comment period deadline for the RMP/EIS was extended from March 5, 2010, to April 19, 2010. This area of elevated NOA also includes the Union Carbide Joe Pit Mine, a former asbestos surface mine at the southern tip of the county border.

Earthquakes, Active Faulting, Seismic or Ground Shaking

Earthquakes are typically measured using the Richter Scale or the Modified Mercalli Scale. The Richter Scale describes the amplitude of an earthquake using a seismograph. Magnitude (M) is calculated as a logarithmic relationship to amplitude, meaning the amplitude of an M 6.0 earthquake is ten times greater than an M 5.0 earthquake. This relationship means that the energy released by an M 6.0 quake is 32 times greater than an M 5.0 quake. The Mercalli Intensity Scale is based on observable effects of earthquakes. Table 11-1 explains the Richter Scale and the Modified Mercalli Scale.

Faults are surface and subsurface fissures that are located in geologically weak areas and potential displacement areas of the underlying bedrock. As indicated in Figure 11-2, there are several faults of major historical significance in the vicinity of San Benito County. Figure 11-2 shows the Quaternary Fault or believed displacements that have occurred in the last 1.8 million years before the present. The San Andreas Fault and the Calaveras Faults have both experienced movement in modern historic times. Other faults present within the county that have experienced movement in the past 11,000 years (Holocene Period) and are considered active, but for which no historic record of movement exists, are: the Quien Sabe Fault along the foot of the Diablo Range in the northeast of the county; the Sargent Fault north of Hollister; the Paicines Fault near Paicines; and the Bear Valley Fault east of the Pinnacles National Monument. Figure 11-2 depicts the fault locations.



Legend



Areas likely to contain asbestos



Source: Planning Partners, 2010

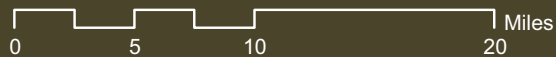


Figure 11-1-4
Areas Likely to Contain Naturally-Occurring Asbestos in San Benito County

TABLE 11-1 EARTHQUAKE MAGNITUDE AND INTENSITY SCALE United States 2010		
Richter Magnitude (M)	Mercalli Intensity	Effects
1.0 – 3.0	I.	I. Not felt except by a very few under especially favorable conditions
3.0 – 3.9	II – III	II. Felt only by a few persons at rest, especially on upper floors of buildings. III. Felt quite noticeably by persons indoors, especially on upper floors of buildings. Many people do not recognize it as an earthquake. Standing motor cars may rock slightly. Vibrations similar to the passing of a truck. Duration estimated.
4.0 -4.9	IV - V	VI. Felt indoors by many, outdoors by few during the day. At night, some awakened. Dishes, windows, doors disturbed; walls make cracking sound. Sensation like heavy truck striking building. Standing motor cars rocked noticeably. V. Felt by nearly everyone; many awakened. Some dishes, windows broken. Unstable objects overturned. Pendulum clocks may stop.
5.0 – 5.9	VI - VII	VI. Felt by all, many frightened. Some heavy furniture moved; a few instances of fallen plaster. Damage slight. VII. Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable damage in poorly built or badly designed structures; some chimneys broken.
6.0 – 6.9	VIII -IX	VIII. Damage slight in specially designed structures; considerable damage in ordinary substantial buildings with partial collapse. Damage great in poorly built structures. Fall of chimneys, factory stacks, columns, monuments, walls. Heavy furniture overturned. IX. Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb. Damage great in substantial buildings, with partial collapse. Buildings shifted off foundations.
7.0 and greater	X or greater	X. Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations. Rails bent. XI. Few, if any (masonry) structures remain standing. Bridges destroyed. Rails bent greatly. XII. Damage total. Lines of sight and level are distorted. Objects thrown into the air.

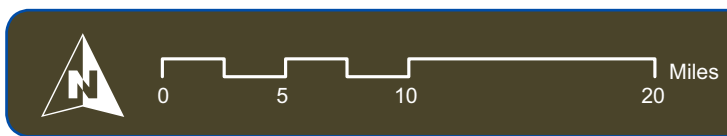
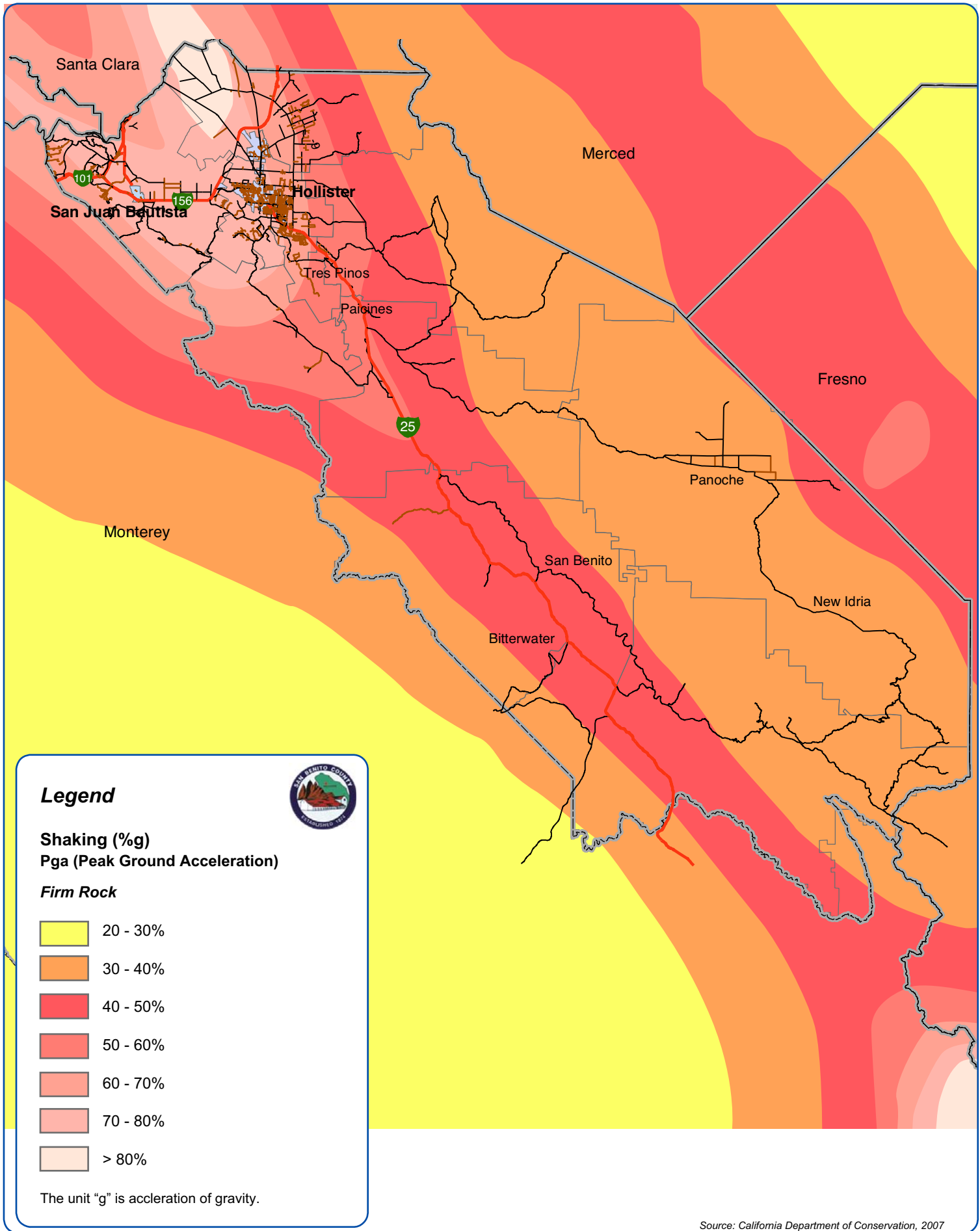
Sources: USGS, Earthquake Hazard Program, 2010.



APEFZA prohibits the construction of structures within 50 feet of an active fault trace as identified by the State Geologist. Active faults as identified by the State Geologist were published in CGS Special Publication 42 in 2007. However, it should be noted that APEFZA deals specifically with surface rupture associated with faulting. Therefore, potentially active faults without a surface expression are not included in this document. The principal active faults identified by APEFZA within San Benito County are the San Andreas Fault and the Calaveras Fault. Based on data collected by the CGS regarding California Historic Earthquakes with a magnitude of over 5.5, in excess of 15 earthquakes have been reported in San Benito County dating back to the beginning of the 19th century. Historic records of these quakes indicate that the San Juan Bautista Mission was damaged during the 1906 San Francisco earthquake, and fault rupture was reported. Reports of damage and evidence of previous historical earthquakes have been documented. Fault rupture along the Calaveras Fault was last reported in 1897 during an M 6.3 earthquake.

The California Geologic Survey Probabilistic Seismic Hazard Assessment (PSHA) calculates earthquake shaking hazards through historic seismic activity and fault slip rates. PSHA considers faults that may result in seismic shaking, including faults that have no clear surface expression or that may not have associated surface rupture. Four PSHA-identified faults are present within San Benito County. These include the San Andreas, Calaveras, Zayante-Vergeles, and Quien-Sabe Faults. Figure 11-5 depicts the location of these identified faults, and Figure 11-5 shows the predicted shaking as a result of ground motion. Shaking is expressed as the Peak Ground Acceleration (PGA) measured as a percentage (or fraction) of acceleration due to gravity (%g) from ground motion that has a 10 percent probability of being exceeded in 50 years. PGA in San Benito County ranges from 30 percent to greater than 80 percent of g (g is acceleration due to gravity, 32.2 ft/s^2). The highest probability of the 80 percent of g acceleration value is located near the northern boundary of the county along the San Andreas Fault, which traverses San Benito County and continues north into the Bay Area and beyond. In comparison, the majority of the Bay Area has a higher likelihood of exceeding 100 percent of g acceleration.

The Working Group on California Earthquake Probabilities (WGCEP) 2008 Report showed there is a 93 percent probability that an M 6.7 or greater earthquake, and a 16 percent probability of M 7.5 or greater earthquake, would occur during the next 30 years in northern California. The WGCEP 2003 Report indicates a 62 percent probability of an M 6.7 or greater earthquake for the San Francisco Bay Area Region. Individual faults within San Benito County with the highest earthquake probabilities cited in the 2008 report were the San Andreas and Calaveras Faults. A major earthquake in the San Francisco Bay Area could have a significant impact in San Benito County related to but not limited to, seismic shaking, liquefaction, and ground rupture.



**Figure 11-1-5
Areas of Ground Motion
in San Benito County**



The USGS measures creep along the San Andreas and Calaveras Faults at five locations in or near San Benito County. Two measuring locations for the Calaveras Fault exist in Hollister, at Wright Road and at Seventh Street. Creep rates are measured at 8.9 and 6.8 millimeters per year (mm/yr) respectively since 1979. Three locations are measured along the San Andreas Fault within the county: creep averaged 11.7 mm/yr since 1990 at the Mission Vineyard in San Juan Bautista, at Searle Road creep averaged 1.2 mm/yr since 1990 and at Cannon Road creep averaged 0.1 mm/yr during the same period.

Design criteria for seismic loading and other geologic hazards are provided generally in the seismic elements of city and county general plans, but more specifically in the building and development regulations of these local governments. These documents typically incorporate CBC design standards and are informed by the APEFZA as described. The CBC provides design criteria for geologically induced loading that govern sizing of structural members. The CBC also provides calculation methods to assist in the design process. City and County building and development regulations incorporate the provisions of the CBC by reference, and add additional safety factors for critical structures and local considerations.

Ground Failure and Liquefaction

Seismic ground shaking can result in a great deal of soil compaction and settlement. If the sediments that compact during an earthquake are saturated, water from voids is forced to the ground surface where it emerges in the form of mud spouts or sand boils. If the soil liquefies in this manner (liquefaction), it loses its supporting structure, resulting in a condition where buildings and other constructed facilities could settle into the ground. The extent of structural damage can range from minor displacement to total collapse. Engineering techniques involving the ground, the structures, or both, can be used to reduce the risk of certain hazards, such as liquefaction. However, these solutions are often temporary and costly. Alternatives to engineering solutions include land use restrictions, or controls through special ordinances. For example, regulating the type or density of developed uses in a given area can be effective in avoiding or reducing potential hazards. Agriculture, recreation, or other open space uses are more acceptable than residential or commercial uses for seismic hazard areas. Similarly, certain low occupancy uses may be acceptable in some risk areas, whereas high occupancy uses or critical facilities (schools, hospitals) may not be.

Ground failure and liquefaction has been reported for historical earthquakes within San Benito County. Ground failures and liquefaction near Hollister and San Juan Bautista have been documented (USGS 1978). During the 1989 Loma Prieta earthquake sand boils, lateral spreading, and ground settlement were reported at four locations within San Benito County (USGS 1998). Liquefaction susceptibility was estimated for the nine counties within the San Francisco Bay Area by USGS OFR 00-444. Although San Benito County is not included in the analysis, some inferences can be made based on the similarity of earthquake risk and soils and geologic conditions between San Benito County and the study area. Risk of liquefaction is considered highest near Quaternary alluvial deposits, where soil saturation is close to the land surface. Although no specific liquefaction hazard areas have been delineated in the county, the potential is recognized throughout the Santa Clara Valley and in most areas where unconsolidated sediments and a high water table coincide. Therefore, due to proximity of San Benito County to the Santa Clara Valley, and the similar geology of the two regions, it is reasonable to assume that liquefaction hazards exist near surface streams and in areas of unconsolidated sediment within San Benito County.

Dam Failure and Lurching

Protection against dam and levee failures is critical to the safety and well-being of San Benito County residents. Three surface reservoirs are located in San Benito County: the Hernandez Reservoir (17,200 ac-ft capacity), the Paicines Reservoir (2,870 ac-ft capacity), and the San Justo Reservoir (7,000 ac-ft capacity). These reservoirs are confined by dams constructed from concrete, rock fill, or a combination of both. Dam and levee failure can occur due to natural and human-made causes. Poor construction, extensive hydraulic head pressure, and earthquakes can also result in the failure of dams. Please see Section 11.2, Flood Hazards, for further discussion related to flood hazards, including those from dam failure.

Lurching is defined as sudden lateral ground movement toward steep, unsupported embankments during seismic shaking. Due to the combination of steep slopes and the proximity of fault zones throughout the county, lurching in populated areas within San Benito County is considered a high risk.

Slope Instability and Subsidence

Slope instability can result in the movement of material down a slope or gradient. Instability can result in a sudden release of material moving rapidly down a hillside. When the moving material consists only of rocks, the phenomenon is known as a rock fall. Slope instability can also result in the gradual movement of a material down a slope in a process known as a landslide. Landslides are usually characterized by little or no deformation of the soil structure associated with the movement. When significant amounts of water are present, the rock and sediment can form a rapidly-moving slurry known as a debris flow. The driving force behind all these occurrences is gravity; slope instability is usually associated with areas of steep topography. Other factors that influence slope instability include the presence of water within the rock or soil mass, the angle of the bedding plane with respect to the ground surface, previous land movement or instability, human modification of the slope, wildland fire history, and ground shaking caused by an earthquake or human activity.

The USGS (OF-71-231) has mapped a relative abundance of landslides in the San Francisco Bay Area. However, the publication evaluates only the northern portion of San Benito County and does not cover the lightly populated central and southern portions of the county. The USGS map rates landslide abundance from one (least abundant) to six (most abundant). For example, flat valley floor areas are rated as least abundant. Areas of steeper topography within the Diablo and Gabilan Ranges are rated to have more abundant (two through five) landslides.

The San Francisco Bay Landslide Team has mapped landslides in the ten counties within the San Francisco Bay Area. This includes Santa Clara County to the north and Santa Cruz County to the west (OF-97-745). The mapping showed that most landslides were reported in areas of steep topography within the Gabilan Range. Due to the geologic and topographic similarities between Santa Cruz and Santa Clara Counties, and in comparison San Benito County, areas at risk from landslides within San Benito County are expected to be concentrated along steep topographic slopes. Landslide hazards could occur in the Hollister area (OFR 94-02), and in the Tres Pinos and Paicines areas (OFR 94-03). Existing landslides, earthflows, and other similar features are also abundant along the numerous faults throughout the county and region. Landslides and related features are also associated with micaceous clay shale found in the area. Refer to OFR 94-02 and OFR 94-03 for the graphical depiction of the specific areas most susceptible to landslides and related features.



Subsidence occurs when a large land area settles due to over-saturation or extensive withdrawal of ground water, oil, or natural gas. Areas susceptible to subsidence are typically composed of open-textured soils that become saturated. These areas are usually composed of soils with high silt or clay content. Subsidence as a result of ground water mining has been well documented in the Santa Clara Valley to the north (USGS Circular 1182). Cases of subsidence within San Benito County have not been well documented. Subsidence in the Santa Clara Valley is mainly due to hydrocompaction from ground water withdrawal. The valley deposits within San Benito County are also at risk for subsidence if ground water overdraft conditions exist.

Expansive Soils

Expansive soils shrink and swell with changes in water content. The shrinking/swelling can adversely impact building structures such as foundations and roads. Shrinking and swelling are related to the clay content of soils, with clay-rich soils being prone to swelling, and sand or gravel soils experiencing very little shrinking and swelling. The USDA Soil Survey (1969) identified soils and their shrink and swell potentials within the county. Soil types with moderate to high shrink and swell potential are listed below (USDA 1969). Figure 11-1 shows the distribution of soil associations.

- Antioch
- Auberry
- Botella–clay loam
- Cibo
- Clear Lake
- Climara
- Cometa – clay
- Cotati – clay loam and sandy loam
- Cropley
- Diablo
- Edenvale
- Gazos
- Lonnes
- Los Banos
- Los Gatos
- Metz–sandy loam, loamy fine sand, loam
- Montana
- Nacimiento
- Pacheco
- Pinnacles–coarse sandy clay
- Pleasanton–clay loam, gravelly clay loam
- Rincon
- Salinas
- San Benito
- Soper
- Shedd–loam
- Sorrento–silt loam, silty clay loam
- Sween–rocky clay loam, clay
- Vallecitos
- Willows
- Yolo

Building Collapse

Unreinforced masonry (URM) buildings and structures located in geologically hazardous areas are subject to structural failure during geologic events such as earthquake fault displacement, landslide, or soil liquefaction. URM buildings are considered the foremost threat to life because of their poor performance during earthquakes. Although not every URM building will collapse in a significant earthquake, a large number of these building types will have some degree of life-threatening failure. For URM buildings identified as critical facilities, such as fire stations and hospitals, this potential threat is more significant as these structures are needed during the response to emergencies. Recognizing the danger posed by a significant number of potentially hazardous buildings in California, the State legislature enacted the Unreinforced Masonry Building Law in 1986 (Senate Bill 547 [Alquist], Government Code Section 8875). The law required cities and counties in Seismic Zone 4 to identify and inventory certain older and potentially hazardous buildings through an earthquake loss reduction

program. This law refers to the 1988 UBC classification map of earthquake intensities from Zone 0 through 4 (USGS OFR 95-596). For example, Zone 4 is the highest risk area, Zone 3 is the next highest risk area, and no earthquake requirements are provided for Zone 0. The majority of San Benito County is located in Seismic Zone 4 and parts of the eastern half of the county are located in Zone 3.

The State Seismic Safety Commission has stated that jurisdictions that choose to address hazards beyond those of URM buildings will further reduce death, injury, and economic loss; they will help protect California's architectural and historic resources from earthquake hazards. With respect to new construction, the 2007 CBC Section 16–Structural Design requires that construction projects be classified on the basis of the proposed building use and local geologic conditions. Once the classification is completed, the specific building design process related to seismic concerns can be finalized. Based on the risk associated with seismic activity within the county, construction has to meet specific requirements of the CBC.

Abandoned Mines

Several historic subsurface hard rock mines are located within the county. Based on California Office of Mine Reclamation (OMR) estimates, over 47,000 abandoned mines exist in California (OMR April 2010), several of which are located in San Benito County. The Coastal Range Mountains were actively mined for mercury during the gold rush, and mercury was used during amalgamation of gold from lode and placer ore. The hazards associated with abandoned mines include the risk of collapse of old shafts and vent tubes, and the release of hazardous materials into the environment. According to the Office of Mine Reclamation, numerous Topographically Occurring Mine Symbols were identified within San Benito County (OMR 2010). Topographically Occurring means that the mines were mapped via aerial photography or interpretation from topography, but these locations have not been field-verified. Within the Clear Creek Management Area in southeastern San Benito County, five abandoned mines have undergone some measure of remediation; these are the Aurora, Alpine, Jade Hill, Xanadu, and Larcious Mines (BLM RMP/EIS). California's Abandoned Mines Vol. I (2000) identifies one mine site within the county, the New Idria Mine, which is listed by the agency for chemical risk. This mine, as identified by OMR, was the second largest mercury mine in the state. The New Idria mine operated from 1854 to 1974 (BLM CCMA RMP/EIS) and is a CERCLA site; however, the site is not listed on the National Priorities List (NPL). Refer to Section 11.4, *Human-made Hazards*, of this Background Report for more information on this site and the investigation efforts. Refer to the Abandoned Mines discussion in Section 11.4, *Human-made Hazards* for additional discussion on hazards from historic mining activities.

SECTION 11.2 FLOOD HAZARDS

Introduction

This section describes existing (2010) flood hazards within San Benito County. The physical risks associated with potential flooding from various regional and local sources, and regulatory requirements for floodplain management are important aspects of future land use decisions throughout the county, and guide the local and community-level emergency response needs.



Key Terms

Exceedance Probability. The probability that a precipitation or runoff event of a specified size will be equaled or exceeded in any given year.

Federal Emergency Management Agency (FEMA). The agency that oversees floodplain management and the national flood insurance program.

Flood Insurance Rate Map. Prepared by FEMA for flood insurance and floodplain management purposes.

Floodplain. Land adjacent to a stream, slough, or river that is subject to flooding or inundation.

Floodplain Management. The implementation of policies and programs to protect floodplains and maintain their flood control function.

Frequency. How often a streamflow of particular magnitude will occur, expressed as its return period or exceedance probability.

Levee. A dike or embankment that confines flow in a stream channel to protect adjacent land from flood waters. A levee designed to provide 100-year flood protection must meet FEMA standards.

Level of Protection. The degree of protection that a drainage or flood control measure provides, typically expressed as the largest frequency flow event that can occur without flooding.

One Hundred Year (100-year) Flood. The flood magnitude that has a 1 percent chance of occurring in any given year.

Regulatory Floodplain. Typically refers to the floodplain area that would be inundated by the 100-year flood event and is designated by FEMA. It also refers to the floodplain area as determined by a State or local agency as their floodplain management area.

Return Period. The statistical estimate of number of years (#-year) likely between occurrences of a flood event of equal or greater magnitude.

Regulatory Setting

Various Federal, State, and local agencies work to identify and manage lands vulnerable to flooding, and to design, construct, and maintain flood protection facilities. As a result of recent (2005) damaging floods nationwide and concerns over levee safety, extensive legislation has been enacted to improve flood protection.

Federal

Federal Emergency Management Agency (FEMA). FEMA is the Federal agency that oversees floodplains and manages the national flood insurance program. FEMA prepares Flood Insurance Rate Maps (FIRM) for communities participating in the Federal flood insurance program. The FIRM maps indicate the regulatory floodplain to assist communities with land use and floodplain management decisions, so that the requirements of the National Flood Insurance Program (NFIP) are met in the event of damaging

floods. However, FEMA studies and maps are not necessarily an accurate, up-to-date reflection of all physical flood risk or hazards. San Benito County is a participant in the NFIP and must meet FEMA standards for flood protection facilities and floodplain management. FEMA also added new levee certification requirements, including submittals of as-built plans, protection documentation, stability and drainage analyses, and operation and maintenance manuals in order to qualify for NFIP. Only areas behind FEMA certified levees qualify as protected from flooding; otherwise the levee is considered non-existent and the entire area prone to flooding. FIRMs for San Benito County were updated under FEMA's Map Modernization Program, and became effective on April 16, 2009.

U.S. Army Corps of Engineers (USACE). The USACE is the Federal agency that studies, constructs, and operates regional-scale flood protection systems in partnership with State and local agencies. Specific agreements between the USACE and its State and local partners on particular projects are used to define shared financial responsibilities and regulations that affect the local partners. There are no USACE flood protection projects in San Benito County, although the USACE continues to provide technical studies and regulatory oversight (e.g., Clean Water Act, Rivers and Harbors Act). The USACE conducted flood protection project studies on the lower Pajaro River as part of the Pajaro River Watershed Study (Authority 2005).

State

California Department of Water Resources (DWR). DWR is the State agency that studies, constructs, and operates regional-scale flood protection systems, in partnership with Federal and local agencies. DWR also provides technical, financial, and emergency response assistance to local agencies related to flooding.

Several bills were signed by Governor Schwarzenegger in 2007 adding to and amending State flood and land use management laws. The laws contain requirements and considerations that outline a comprehensive approach to improving flood management at the State and local levels (DWR 2010a). Some of the provisions of the 2007 flood risk management legislation apply statewide (including San Benito County), with other provisions that apply only to the Sacramento-San Joaquin Valley, and additional measures specifically for the Sacramento-San Joaquin Drainage District (DWR 2010a).

FloodSAFE California is a strategic multifaceted program initiated by DWR in 2006. FloodSAFE is guiding the development of regional flood management plans, which encourage regional cooperation in identifying and addressing flood hazards. Regional flood plans include flood hazard identification, risk analyses, review of existing measures, and identification of potential projects and funding strategies. The plans emphasize multiple objectives, system resiliency, and compatibility with State goals and Integrated Regional Water Management Plans (IRWMP). DWR has the lead role to implement FloodSAFE, and will work closely with State, Federal, tribal, and local partners to help improve integrated flood management systems statewide. DWR's role is to advise and provide assistance as a resource to local jurisdictions as they pursue compliance (DWR 2010a).

Provisions of the 2007 flood risk management legislation that are related to land use planning relevant to San Benito County are summarized in Table 11-2. The mandates, recommendations, and suggestions reflect changes in California laws and regulations pursuant to Assembly Bill 2140.



**TABLE 11-2
FLOOD RISK MANAGEMENT LEGISLATION
LOCAL JURISDICTION RESPONSIBILITIES**

San Benito County
2007

Planning Document or Tool	State-Wide Requirements ¹
General Plan Land Use Element	Identify and annually review areas subject to flooding (identified by FEMA or DWR); Consider location of natural resources used for groundwater recharge and stormwater management
General Plan Conservation Element	Identify areas that may accommodate floodwater for groundwater recharge and stormwater management; In coordination with agencies, develop water resources section
General Plan Safety Element	Identify and revise, per new flood hazard information; Establish goals, policies (objectives), and mitigation measures to protect from the risk of flooding; Allows information in floodplain management ordinances to be used
General Plan Housing Element & Regional Housing Needs Assessment	Consider and may exclude land that is not adequately protected, to avoid the risk of flooding
Local Hazard Mitigation Plan	May adopt safety element in conjunction with local hazard mitigation plan (financial benefits)

¹ Applies to all cities and counties

Source: California Department of Water Resources June 2010. Implementing California Flood Legislation into Local Land Use Planning: A Handbook for Local Communities (Public Review Draft).

Assembly Bill 2140. Assembly Bill 2140 requires every county and city adopt a local hazard mitigation plan (HMP) as specified in the Federal Disaster Mitigation Act of 2000, as part of their safety elements contained in their respective general plan. The HMP must include an initial earthquake performance evaluation of public facilities that provide basic shelter and critical government functions, an inventory of private facilities that are potentially hazardous, and a plan to reduce the potential risk from private and governmental facilities in the event of a disaster.

At a minimum, the safety element goals, policies, and objectives must include (Government Code Section 65302(g)(2)(B)):

- a. Avoiding or minimizing the risks of flooding to new development.
- b. Evaluating whether new development should be located in flood hazard zones, and identifying construction methods or other methods to minimize damage if new development is located in flood hazard zones.
- c. Maintaining the structural and operational integrity of essential public facilities during flooding.
- d. Locating, when feasible, new essential public facilities outside flood hazard zones, including hospitals and health care facilities, emergency shelters, fire stations, emergency command centers,

and emergency communications facilities; or identifying construction methods or other methods to minimize damage if these facilities are located in flood hazard zones. Establishing cooperative working relationships among public agencies with responsibility for flood protection.

A city or county may qualify for financial benefits associated with the new regulations under Government Code Section 8685.9 by adopting their Local Hazard Mitigation Plan (LHMP) as an annex, by reference, to their safety element consistent with Government Code Section 65302.6.

Regional

The Pajaro River Watershed Flood Prevention Authority (Authority) was established in July 2000 to “identify, evaluate, fund, and implement flood prevention and control strategies in the Pajaro River Watershed, on an intergovernmental basis” (Authority 2005). San Benito County and the San Benito County Water District are members of the Authority Board, along with representatives from three other counties and water districts that have lands within the Pajaro River basin. The flood protection studies have identified Soap Lake (which lies along the northern boundary of San Benito County) as a critical element in reducing peak flood flows from the Upper Pajaro River (Authority 2005), and has moved forward with environmental review and design development for a Soap Lake Floodplain Preservation Project as part of the flood protection system (Authority 2007). Necessary funding, conservation easements, and acquisitions are in progress to achieve the Soap Lake Floodplain Preservation target (Authority 2010).

Local

San Benito County General Plan

As a community participating in the Federal flood insurance program, San Benito County is responsible for implementing FEMA floodplain management regulations. The San Benito County General Plan Land Use Element applies a “Flood” to land within the FEMA-designated high risk floodplains (1 percent or 100-year) on FIRMs adopted by the County. Allowed uses are consistent with potential flooding effects, and include agriculture, grazing, mineral extraction, wildlife refuges, land in its natural state, and selected low-intensity recreation.

Open Space and Conservation Element (1995)

The following goals and polices are from the Open Space and Conservation Element that are applicable to flood safety.

Policy 24. Floodplain and agricultural areas

Where there is a coincidence of high agricultural productivity and 100-year floodplain groundwater recharge area the land should be retained in agriculture to serve dual open space functions.

Policy 42. Flood hazard

One of the County's prime responsibilities is for the health, safety, and welfare of its citizens and property. Because the County recognizes the inherent dangers of construction or development within a flood prone area, it shall be the County's policy to discourage development within areas identified as



potential flood hazard areas. Furthermore, it is the County's policy to protect and preserve the 100-year floodplain on the most recent adopted FEMA maps or other maps as wetland resources, watersheds, and tributaries as natural resources for water supply, groundwater recharge, riparian habitat, and fishes.

Actions

1. The County recognizes that the flood prone areas make up only a small portion of the entire county lands, and therefore significant amounts of developable areas still remain. With this in mind, the County has enacted a Floodplain zoning designation, which will preclude development within areas subject to flooding as identified on the FEMA maps.
2. If a parcel created before January 1994 is located entirely within the flood hazard area, one single-family residence will be allowed. Construction of a single-family residence shall be required to reduce the flow rate of storm water runoff to substantially that of pre-development levels, and to provide necessary measures to avoid impacts to off-site properties pursuant to Ordinance 598 (floodplain).
3. Creation of residential lots within the 100-year floodplain is considered a significant environmental impact and will require an environmental impact report.

Policy 43. Reduce effects of flooding from development. It is the County's policy to take measures to reduce potential effects of flooding from new development and encourage flood control improvements.

Actions

1. Continue to cooperate with the City of Hollister for the collection of fees and development of flood control improvements for tributaries to the San Felipe Lake drainage basin.
2. It is the County's policy to require new development affecting the Enterprise Road drainage area to provide funding and/or physical improvements to reduce flooding.
3. Drainage systems shall be designed to reduce the velocity and volume of storm water runoff off site to predevelopment levels for a 10-year storm interval.

Chapter 19.15, Flood Damage Prevention. The San Benito County Flood Zone Ordinances include measures and methods to minimize potential flood risks to humans and damage to property and economic conditions:

1. Restricting or prohibiting uses which are dangerous to health, safety, and property due to water or erosion hazards, or which result in damaging increases in erosion or flood heights or velocities;
2. Requiring that uses vulnerable to floods, including facilities which serve such uses, be protected against flood damage at the time of initial construction;
3. Controlling the alternation of natural floodplains, stream channels, and natural protective barriers, which help accommodate or channel flood waters;
4. Controlling fill, grading, dredging, and other development which may increase flood damage; and

5. Preventing or regulating the construction of flood barriers which will unnaturally divert flood waters or which may increase flood hazards in other areas.

Major Findings

- Many unincorporated areas in San Benito County are subject to typical rainfall flooding during the winter season, but high risk floodplains are generally confined to narrow corridors along stream channels, except in the most downstream areas surrounding northern Hollister.
- In conjunction with the previous General Plan Update, San Benito County enacted a Floodplain zoning designation, which precluded development within areas subject to flooding as identified on FEMA maps.
- Some flood prone areas in San Benito County are located in remote tributary valleys that may also be affected by landslides and/or combined hazard effects that impair emergency response.
- Land use within floodplains in San Benito County remains largely agricultural with relatively limited residential, commercial, or industrial uses.
- San Benito County is a member of the Pajaro River Watershed Flood Prevention Authority. Large portions of the Parajo River watershed (i.e., San Benito River and Santa Ana Creek) and the Soap Lake Floodplain fall within the county.
- San Benito County could be affected by dam failure inundation from a few, relatively small dams and reservoirs, including the San Justo Reservoir located three miles southwest of Hollister and the Leroy Anderson Dam, which is located in Santa Clara County but has a dam inundation zone that covers a part of San Benito County.

Existing Conditions

Flood hazards in San Benito County are similar in origin and intensity to other portions of the Central Coast Range of California. There are three general origin for flood hazards in the county. The first includes flooding along river and stream floodplains from excess storm runoff. The second includes flooding that might follow landslide blockage of stream canyons. The third is potential flooding of low-lying lands downstream of dams in the event of a dam failure. Possible dam failure mechanisms in this region include the landslide processes that might also produce flooding independently of their potential effect on the structural integrity of dams.

Floodplain Flooding

Flooding along river and stream corridors is a natural occurrence in the major river valleys and tributary basins within San Benito County. The largest low-lying area of the county is at its north end. In this area the topography between the Gabilan Range to the west and the Diablo Range to the east is dominated by two structural basins, the San Juan Valley and the Hollister Valley. The generally level topography on these valley floors contributes to flooding problems, since once water rises above (or flows around) streambanks or levees, it may spread out over very large areas. However, the valley margins have low foothills and sloping alluvial fans. The southern portion of the county has relatively confined valleys and



narrow tributary canyons, with local basins and floodplains at moderate elevations within the watersheds.

Normal flooding processes in San Benito County are driven by rainfall precipitation associated with regional frontal storm systems that occur from November through April. While the surrounding mountain ranges reach relatively high elevations, the regional climate is relatively warm and snowmelt processes are not common. In the headwater areas, steep terrain, narrow canyons, and unstable geologic materials can result in landslides that temporarily block drainage. These temporary blockages can then fail, thereby releasing sediment-laden floodwaters.

Floodplains within San Benito County are generally narrow. In the two northern valleys the floodplains do not cover the entire valley floors, although some of the more densely populated communities and cities have small portions within designated floodplains.

Flood Management

Flood management within San Benito County is primarily a local government function, as there are no major State or Federal flood protection systems or facilities within the county. As such, the County is the responsible local agency for overseeing floodplain land use decisions and for planning emergency preparedness and response measures.

FEMA Floodplains

The Federal Emergency Management Agency (FEMA) determines areas subject to flood hazards and designates these areas by relative risk of flooding on a map for each community on their Flood Insurance Rate Maps (FIRM). The 100-year flood is the base flood event for land use planning and protection of property and human safety. The delineation of areas within the 100-year floodplain represents a statistical probability for the long-term average occurrence of flooding of 1 percent annually. Flooding in a 100-year floodplain can occur more or less frequently than once in a hundred years, and is considered a high-risk area. FEMA also maps lower-risk floodplains that have a 0.2 percent annual chance of flooding (the 500-year event). The boundaries of the floodplains are delineated by FEMA on the basis of hydrology, topography, and modeling of flow during predicted rainstorms. However, FEMA analysis of flooding does not necessarily account for changing local conditions in levee conditions or channel capacities, worsening changes in hydrology due to climate shifts, or effects of groundwater and topographic changes such as land subsidence. Roughly 4 percent of San Benito County is mapped within high-risk (100-year) floodplains on the FEMA effective FIRMs (FEMA 2009). Figure 11-6 depicts the 100-year floodplain areas within the county. Less than 1 percent of the county is within FEMA designated low-risk floodplains (500-year).

As might be expected, the largest continuous area of 100-year floodplain is along the San Benito River corridor. The floodplain is confined through the headwaters, the Hernandez Reservoir, and middle reach of the river. Downstream of Willow Creek the floodplain broadens, and there are contiguous floodplain connections at the Pescadero/Thompson Creek and Tres Pinos Creek confluences. The San Benito River 100-year floodplain skirts the west side of the city of Hollister, and remains moderately broad along the north side of the San Juan Valley until it meets the Pajaro River along the northern edge of the county. A narrow 100-year floodplain is present on several of the tributaries to the San Benito River, including

some isolated valleys with broad floodplains on Quien Sabe Creek and Las Aguilas Creek, both tributaries to Tres Pinos Creek.

There are large areas of 100-year floodplains northeast and north of the city of Hollister, in the Tequisquita Slough watershed. There are active floodplains along Santa Ana Creek, Arroyo Dos Picachos, Arroyo de Los Viboras, and Pacheco Creek, as well as where they converge into the Pajaro River.

In the Panoche and Silver Creek watersheds, which drain east off the Diablo Range into the Central Valley, narrow 100-year floodplains are identified in southeastern San Benito County near the communities of Panoche and New Idria, respectively. Each of the three watersheds of southwestern San Benito County that drain west off the Gabilan Range into the Salinas Valley, Chalone, Topo, and Lewis Creeks, have 100-year floodplains. Floodplains in these dispersed and remote locations, while not affecting large populations, pose risks to rural residential use, agricultural lands, and the transportation networks that provide access to mining and recreation.

DWR Awareness Floodplains

The DWR Awareness Floodplain maps are for areas that are not currently mapped as a regulated floodplain but, based on approximate assessment procedures, are 100-year flood hazard areas and shown simply as flood prone areas, without specific water depths or other flood hazard information (DWR 2010b). The DWR awareness floodplain maps are not FEMA regulatory maps, but may be included on FEMA maps at the request of affected communities. The DWR mapping is overlain on 1:24,000 USGS topographic quadrangles, and nearly all of San Benito County quadrangles are complete. Figure 11-7 depicts the DWR Awareness Floodplain areas within the county. The awareness floodplain areas are generally narrow corridors along stream channels that are connected to, and typically extend up stream/up valley from, the identified FEMA high risk (100-year) floodplains. These DWR mapped floodplains, while developed from approximate methods, are useful indicators of flood-prone areas to be avoided and/or studied in detail prior to potential development.



FIGURE 11-6
SAN BENITO COUNTY
FEMA 100-YEAR
AND 500-YEAR
FLOODPLAINS

Legend

- Rivers
- San Juan Bautista City Limits
- Hollister City Limits
- County Limits

Roadways

- State Highways
- County Roads

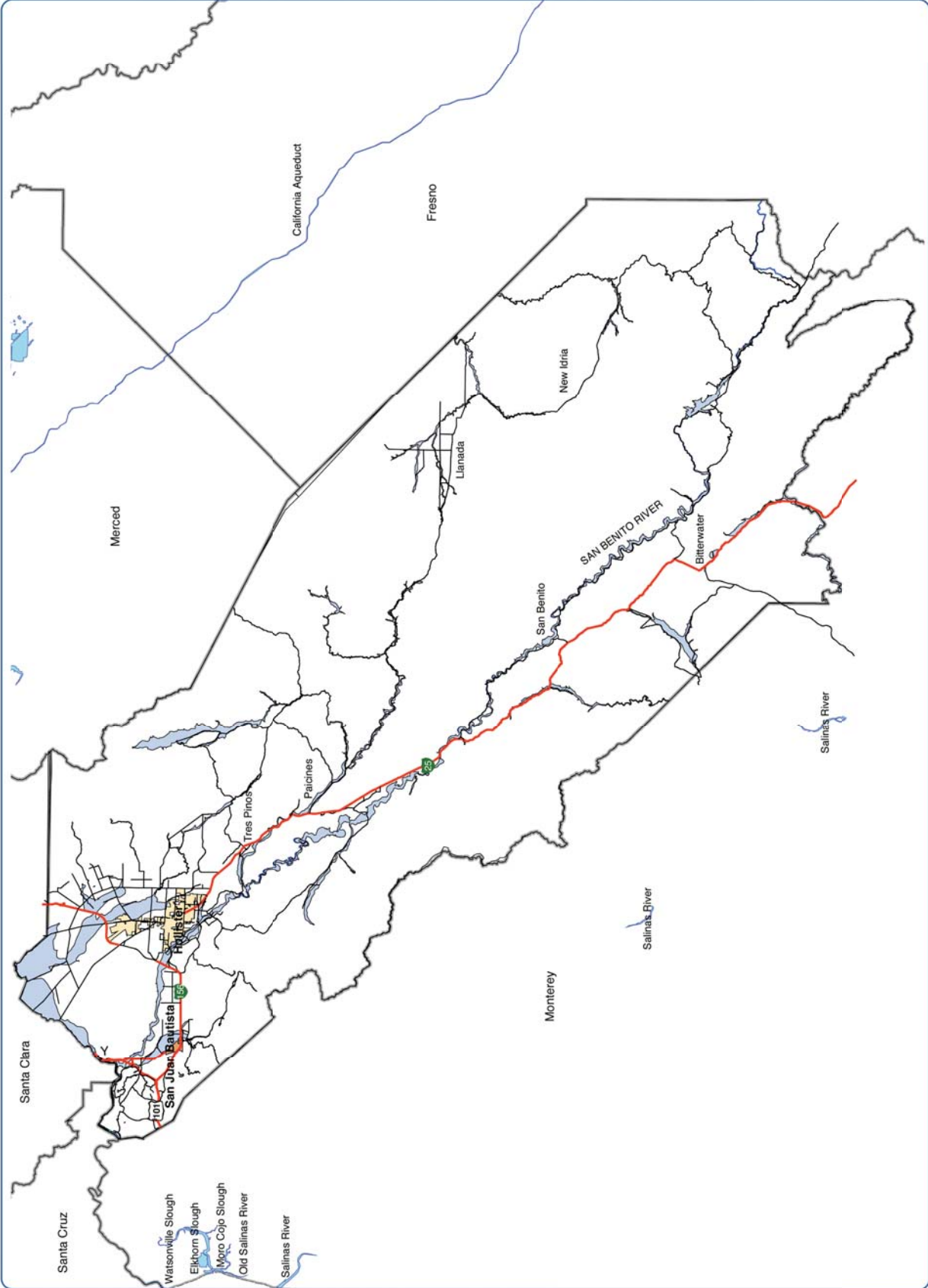
FEMA Floodplain Zones

- Zone A - High Risk Flood Area: 1% annual chance of flooding (100-year floodplain)
- X500 - Moderate Risk Area: 0.2% annual chance of flooding (500-year floodplain)
- Zone X - Low Risk Area (outside the 1% and 0.2% annual flood risk areas)



0 1.5 3 6 Miles

Source: FEMA Flood Insurance Rate Map, 2009
 San Benito County Planning and Building Department, 2010





**FIGURE 11-7
SAN BENITO COUNTY
DWR AWARENESS
FLOODPLAINS**

Legend

- Rivers
- San Juan Bautista City Limits
- Hollister City Limits
- County Limits

Roadways

- State Highways
- County Roads

DWR Awareness Floodplains

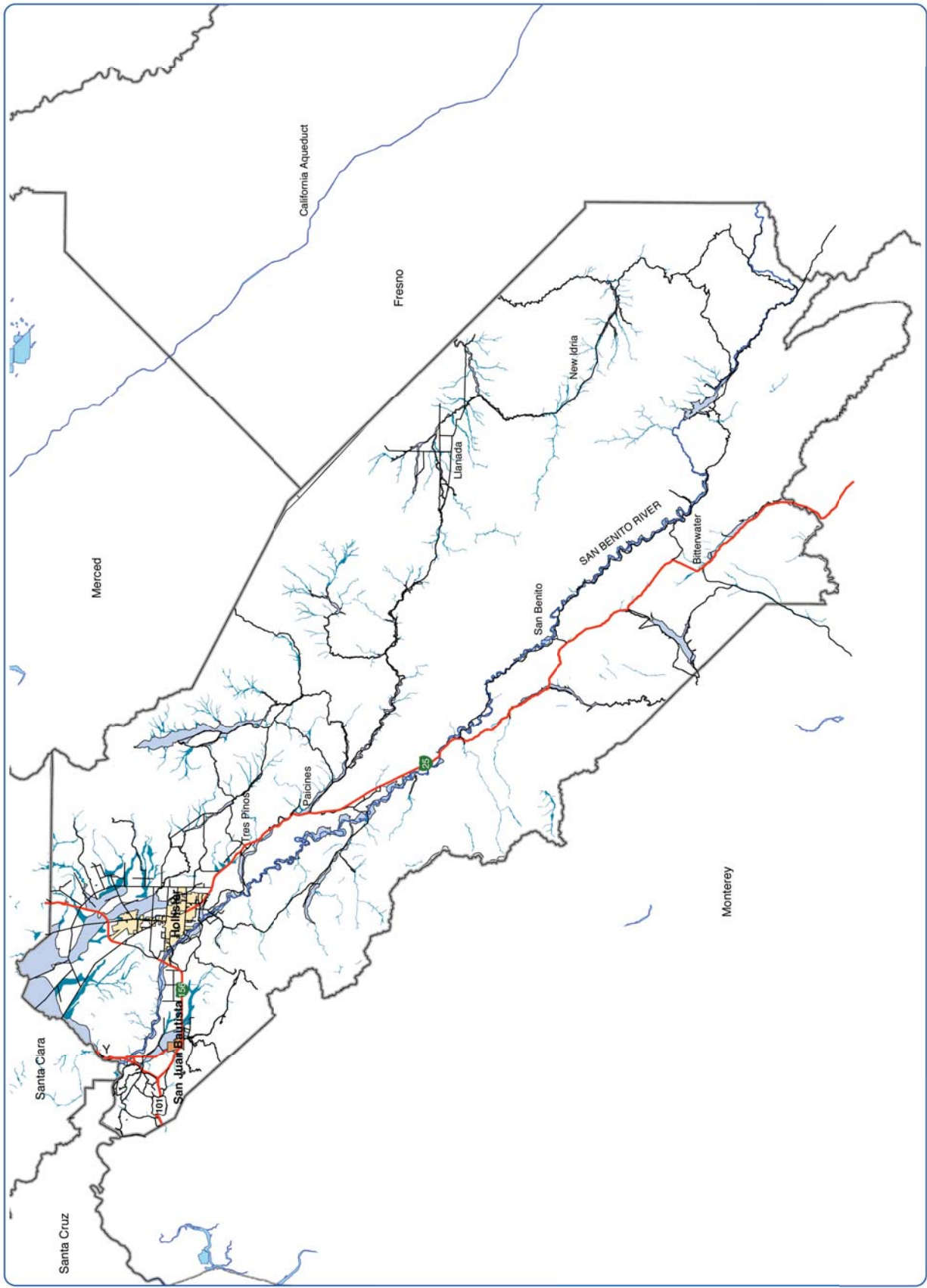
- Awareness Floodplains

FEMA Floodplain Zones

- Zone A - High Risk Flood Area: 1% annual chance of flooding (100-year floodplain)
- X500 - Moderate Risk Area: 0.2% annual chance of flooding (500-year floodplain)
- Zone X - Low Risk Area: (outside the 1% and 0.2% annual flood risk areas)

0 1.5 3 6 Miles

Source: FEMA Flood Insurance Rate Maps, 2009
 DWR Awareness Floodplains
 Map Date: May 2008
 San Benito County Planning and Building Department, 2010





Local Flooding

Some areas of San Benito County that are vulnerable during major floods can also experience damaging flood flows during events smaller than the 100-year event due to channel capacity problems, low topography, or blocked drainage. Localized flooding in the area near Fallon and Fairfiew in the Santa Ana Creek watershed has been the subject of drainage improvement studies that have been adopted and used in project review.

Dam Failure Inundation

Several dams in or adjacent to San Benito County provide beneficial water supply storage and serve irrigation and recreation needs (Table 11-3). However, the reservoirs could inundate portions of the county in the event of a dam failure. Dam failure can occur as a result of various natural or human causes. Dams are evaluated regularly to verify their structural integrity, including additional stresses that may result from local or regional earthquakes.

Flooding associated with dam failure on one of the local or upstream dams has a low probability for occurrence. However, a dam failure can cause loss of life, damage to property, and other related hazards, along with displacement of residents and/or damage to water resource and other infrastructure facilities (e.g., irrigation, electric power generation or transmission, transportation). The dams and reservoirs affecting San Benito County include several that are isolated in remote valleys and two (San Justo and Leroy Anderson Dams) that are larger and close to populated areas. Figure 11-8 shows the locations of each dam within the county.

Emergency planning and preparedness by the San Benito County Emergency Services Department includes consideration of possible dam failure inundation areas. The Emergency Services Department receives updated dam inundation information from the State Office of Emergency Services (OES), and is responsible for identifying evacuation routes and other response measures within the county.

The San Justo Dam and Reservoir is part of the U.S. Bureau of Reclamation's Central Valley Project (CVP) (Reclamation 2010). It is an offstream storage facility constructed in 1987. San Justo Dam, located about three miles southwest of Hollister, is an earthfill structure 151 feet high with a crest length of 1,116 feet. It also includes a dike structure 79 feet high with a crest length of 1,296 feet. These features form a reservoir with 9,785 acre-feet of capacity. CVP water brought into the county is delivered and stored in the San Justo Reservoir; it is used to supplement deliveries during high demand. It is also used to percolate into the groundwater supplies, and for recreation.

Management of water distribution, water systems, and lake levels are under the San Benito County Water District by contract with the Federal Bureau of Reclamation (Clark 2010). The San Benito County Emergency Services Department has a copy of the San Justo Dam Emergency Action Plan (EAP) and its potential inundation area map (Clark 2010). In the event of a complete failure, water from the reservoir behind San Justo Dam could inundate the San Juan Valley and flow across the lower San Benito River floodplain to the Parajo River. While the city of San Juan Bautista would not be expected to experience inundation, unincorporated lands throughout the San Juan Valley could be affected (Reclamation undated).

The Leroy Anderson Dam is located in Santa Clara County; however, its inundation zones could affect San Benito County in the unlikely event of a failure. The San Benito County Office of Emergency Services

(SBOES) has participated in multi-jurisdictional planning with the Santa Clara Valley Water District (SCVWD) for updates to their Anderson Dam EAP, which is maintained by the SCVWD (Santa Clara County 2008).

Little damage would be expected from a complete failure of the Hernandez Reservoir or other remotely located reservoirs in San Benito County in terms of existing developed areas and/or existing infrastructure, but future land use planning decisions should consider the potential risks from dam failure inundation.



CHAPTER 11. SAFETY

San Benito County General Plan

**TABLE 11-3
DAMS AND RESERVOIRS LOCATED IN OR POTENTIALLY AFFECTING SAN BENITO COUNTY
San Benito County
2010**

Dam	Owner	DWR- No.	Year Complete	Stream	Drainage Area (sq. mi.)	Height	Capacity (acre-feet)	Surface Area (acres)	Use(s) ²
Bear Gulch	National Park Service	9000-267	1937	Bear Gulch Creek	0	43	27	0 ³	FC
Hawkins	Hawkins & Ausaymas Cattle Co.	651-000	1928	Arroyo De Las Viboras	4.17	72	575	22	STO, IRR
Hernandez	San Benito County FCWCD	1025-002	1962	San Benito River	85	124	18,000 30,000 ¹	590	STO, IRR, REC
J V De Laveaga	Las Aguilas Corporation	653-000	1940	Quien Sabe Creek	0.15	28	514	29	STO, IRR
Leroy Anderson	Santa Clara Valley WD	72-009	1950	Coyote River	194.3	235	91,280	980	STO, DOM, IRR
Paicines	San Benito County FCWCD	1025-000	1912	Tres Pinos Creek	0.8	29	4,500 3,335 ¹	170	STO, IRR
Percolation Area	Las Aguilas Corporation	653-002	1951	Los Muertos Creek	1	12	430	102	STO, IRR
San Justo	US Bureau of Reclamation	9000-323	1985	Off Stream	0	133	10,300	202	STO
Vessey	C Schroder	654-000	1945	Tequisquita Slough	1.38	20	258	30	STO, DIV, IRR

¹ Alternate capacity as reported by San Benito County Water District.

² Uses: STO=Storage, FC = Flood Control; IRR = Irrigation; DOM=Domestic; DIV=Diversion; REC= Recreation

³ Bear Gulch has no average surface area because it is used for flood control and not water storage.

Sources: California Department of Water Resources. California Dams Database <http://cdec.water.ca.gov/cgi-progs/damSearch>; James, Clark Emergency Services Manager, San Benito County Sheriff's Office, Office of Emergency Services; and San Benito County Water District 2010. "District Profile". Accessed on their web homepage: <http://www.sbcwd.com/district-profile.pdf>.



**FIGURE 11-8
DAMS WITHIN AND/OR
POTENTIALLY
AFFECTING
SAN BENITO COUNTY**

Legend

- Dams and Reservoirs
- Rivers
- San Juan Bautista City Limits
- Hollister City Limits
- County Limits

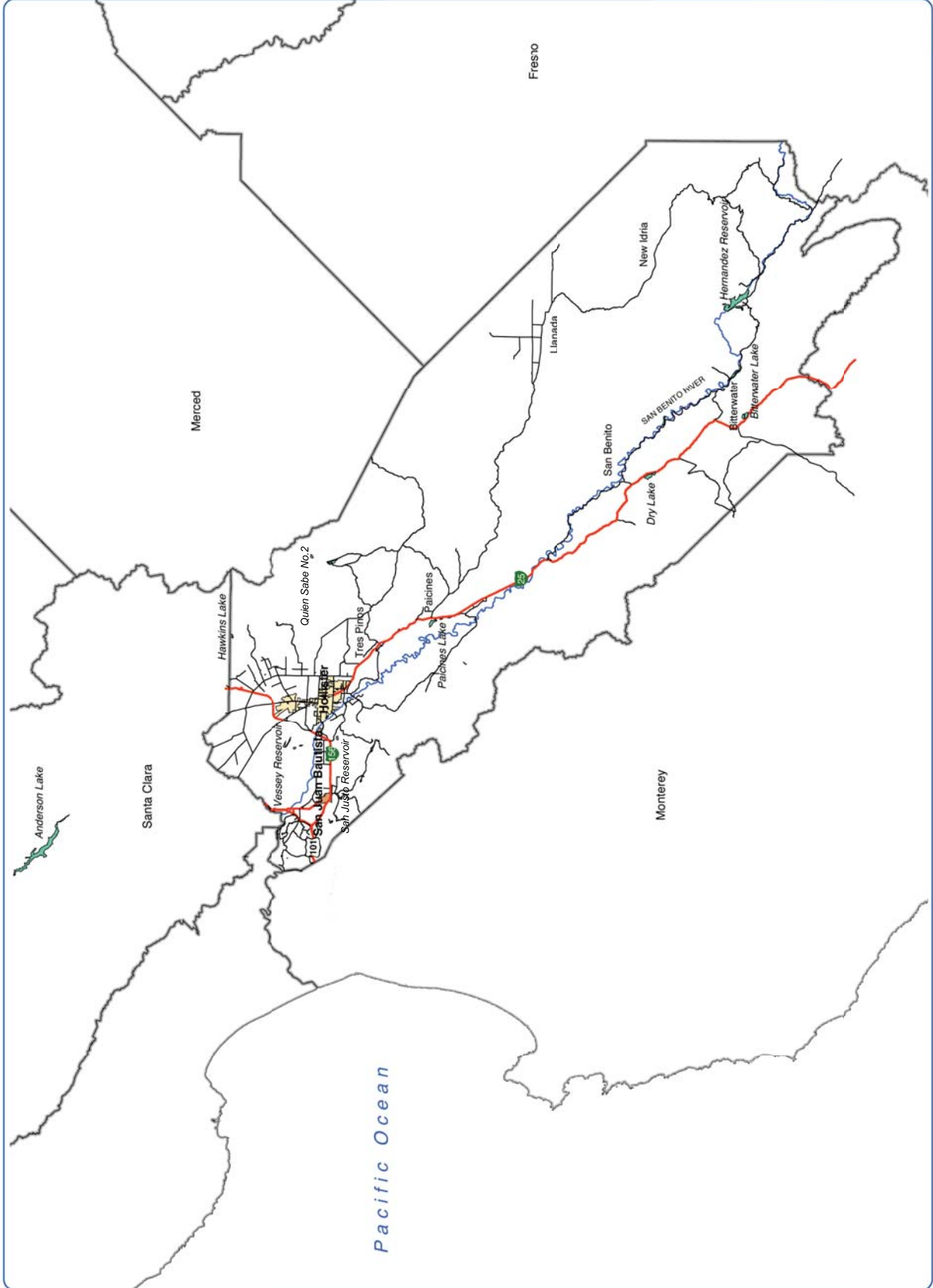
Roadways

- State Highways
- County Roads



0 2 4 8 Miles

Source: DWR, California Dam Inventory, 2010
San Benito County Planning and Building Department, 2010





SECTION 11.3 WILDLAND FIRE HAZARDS

Introduction

This section describes the existing conditions for wildland fire hazards in San Benito County, as well as the responsible agencies and fire prevention measures currently in place.

Key Terms

Assets at Risk. Assets at risk due to wildfires in California include life and safety; timber; range; recreation; water and watershed; plants; air quality; cultural and historical resources; unique scenic areas; buildings; wildlife; and ecosystem health.

At-risk Community. An interface community within the vicinity of Federal lands that is at high risk from wildfire, or a group of homes and other structures with basic infrastructure and services within or adjacent to Federal land where conditions are conducive to large-scale wildland fire disturbance, or where a significant threat to human life or property exists as a result of a wildfire fire disturbance event.

California Department of Forestry and Fire Protection (CAL FIRE). The State department charged with protecting the residents of California from fires, responding to emergencies, and protecting and enhancing forest, range, and watershed values providing social, economic, and environmental benefits to rural and urban citizens.

Defensible Space. The area within the perimeter of a parcel where basic wildfire protection practices are implemented, providing the key point of defense from an approaching wildfire or escaping structure fire. Defensible space is characterized by the establishment and maintenance of emergency vehicle access, emergency water reserves, street names and building identification, and fuel modification measures such as tree trimming and the removal of brush adjacent to residences.

Fire Hazard. A measure of the likelihood of an area burning, and how it burns (e.g., intensity, speed, embers produced), without considering modifications such as fuel reduction efforts. Fire hazard is a way to measure the physical fire behavior so that people can predict the damage a fire is likely to cause.

Fire Hazard Severity Zones (FHSZ). California Public Resources Code Sections 4201-4204 and California Government Code Section 51175-89 direct CAL FIRE to map areas of significant fire hazards based on fuels, terrain, weather, and other relevant factors. These zones, referred to as Fire Hazard Severity Zones (FHSZ) then define the range of various mitigation strategies that could be applied to reduce risk associated with wildland fires.

Fire Risk. A measure of the potential for damage a fire can do to the area under existing conditions, including any modifications such as defensible space, irrigation and sprinklers, and ignition-resistant building construction.

Fire and Resource Assessment Program (FRAP). Fire and Resource Assessment Program, a branch of the California Department of Forestry and Fire Protection.

Fire Threat. Fire threat is a combination of two factors: fire frequency, or the likelihood of a given area burning, and potential fire behavior (hazard). These two factors are combined to create four threat classes ranging from moderate to extreme.

Fuel. Vegetative material, live or dead, which is combustible during normal summer weather.

Fuel Break. Fuel breaks are wide strips of land on which trees and vegetation have been permanently reduced or removed. These areas can slow, and even stop, the spread of a wildland fire because they provide less fuel to carry the flames. They also provide firefighters with safe zones to take a stand against a wildfire, or retreat from flames if the need arises.

Greenbelts. Areas where vegetation is removed around structures and/or replaced with more fire resistant vegetation.

Level of Service (LOS). The Level of Service (LOS) rating is a ratio of successful fire suppression efforts to the total fire starts. It divides the annual number of small fires extinguished by initial attack by the total number of fires. Success is defined as those fires that are controlled before unacceptable damage and cost are incurred. This is a relative system, attempting to measure the relative impact of fire on the various assets at risk. The level of service rating (the score of successes in initial attacks) can be used to compare one area of the state with another, recognizing that the assets at risk may be quite different.

State Responsibility Areas (SRA). Areas classified by the State Board of Forestry and Fire Protection as being the primary financial responsibility of the State for preventing and suppressing fires. These lands include: lands covered wholly or in part by timber, brush, undergrowth or grass, whether of commercial value or not; lands that protect the soil from erosion, retard run-off of water, or accelerated percolation; lands used principally for range or forage purposes; lands not owned by the Federal government; and lands not incorporated. Lands are removed from SRA when housing densities average more than three units per acre over an area of 250 acres.

Wildland Urban Interface. The wildland–urban interface (WUI) is commonly described as the zone where structures and other human development meet and intermingle with undeveloped wildland or vegetative fuels. Often a WUI is an area extending one-half mile to 1 and one-half miles from the boundary of an at-risk community, or an area adjacent to an evacuation route for an at-risk community.

W.A.F.L. Score. A tool that calculates the combination of four fire plan assessment criteria (weather, assets at risk, fuel, and level of service) into an aggregate score, which can be used to help target areas with high fire hazard, and prioritize projects for ground fuel reduction. Theoretically, those areas with the highest W.A.F.L. score would have the first priority for funding of any given project or pre-fire program.

Regulatory Setting

Federal

Healthy Forests Restoration Act (HFRA). Legislation passed in 2003 that gives incentives for communities to engage in comprehensive forest planning and prioritization. It includes statutory incentives for the U.S. Forest Service (USFS) and the Bureau of Land Management (BLM) to give consideration to the priorities of local communities as they develop and implement forest management



and hazardous fuel reduction projects. The Act emphasizes the need for federal agencies to work collaboratively with communities in developing hazardous fuel reduction projects.

State

Sections 700-716, Public Resources Code. Establishes, generally, the authority of the California Department of Forestry and Fire Protection.

Sections 4125-4136, Public Resources Code. Establishes State Responsibility Areas (SRA), requires the development of fire plans to protect them, and places them under the jurisdiction of the California Department of Forestry and Fire Protection.

Section 4290, Public Resources Code. Establishes minimum fire safety standards for development in State Areas of Responsibility (SRA). This includes: 1) road standards for fire equipment access; 2) standards for signs identifying streets, roads, and buildings; 3) minimum private water supply reserves for emergency fire use; and 4) fuel breaks and greenbelts.

Section 4291, Public Resources Code. Requires a minimum of 100 feet of clearance for fire safety surrounding all structures on State responsibility lands in California. The State requirements do not supersede more stringent local regulations.

2007 California Building Code, Chapter 7A, Wildland-Urban Interface Fire Area Building Standards. On September 20, 2007, the Building Standards Commission approved the Office of the State Fire Marshal's emergency regulations amending the California Code of Regulations (CCR), Title 24, Part 2, known as the 2007 California Building Code (CBC). These new codes include provisions for ignition resistant construction standards in the wildland urban interface and require implementation of PRC §4291.

- **701A.3.2 New Buildings Located in Any Fire Hazard Severity Zone.** New buildings located in any Fire Hazard Severity Zone within State Responsibility Areas, any Local Agency Very-High Fire Hazard Severity Zone, or any Wildland-Urban Interface Fire Area for which an application for a building permit is submitted on or after January 1, 2008, shall comply with all sections of this chapter. This includes provisions that the local building official provide certification that the proposed building complies with building standards for materials and construction methods for wildfire exposure prior to construction; that the local building official certify upon completion of construction that the building was constructed in compliance with building standards for materials and construction methods for wildfire exposure; and that prior to building permit final approval, the property is in compliance with vegetation clearance requirements prescribed in PRC §4291.

Section 4740-4741, Public Resources Code. Provides for the California Department of Forestry and Fire Protection to assist local governments in the prevention of wildland fires.

Local

Planning for fire safety in San Benito County incorporates concepts of the National Fire Plan, the California Fire Plan, and individual CAL FIRE Unit Fire Plans, as well as Community Wildfire Protection Plans (CWPP). Fire Plans outline the fire situation within each CAL FIRE Unit. CWPPs do the same for communities. Each identifies vulnerabilities to wildfires, provides prevention measures to reduce risks,

informs and involves the local community or communities in the area, and provides a framework to diminish the potential loss due to wildfire. As of 2009 CWPPs has been prepared for the Hollister and San Juan Bautista communities.

National Fire Plan

The National Fire Plan was developed under Executive Order 11246 in August 2000, following a landmark wildland fire season, with the intent of actively responding to severe wildland fires and their impacts to communities while ensuring sufficient firefighting capacity for the future. The National Fire Plan addresses five key points: firefighting, rehabilitation, hazardous fuels reduction, community assistance, and accountability. The plan is implemented by the USDA Forest Service and the Department of the Interior, and provides assistance to communities that have been or may be threatened by wildland fire. Agencies provide support for educating citizens and offer a variety of grant programs including Rural, State, and Volunteer Fire Assistance and Economic Action Programs. To help protect people and their property from potential catastrophic wildfire, the National Fire Plan directs funding to be provided for projects designed to reduce the fire risks to communities.

California Fire Plan

The California Fire Plan is the State's road map for reducing the risk of wildfire. The Fire Plan is a cooperative effort between the State Board of Forestry and Fire Protection and the California Department of Forestry and Fire Protection. The plan was finalized in March 1996 and directs each CAL FIRE Unit to prepare locally-specific Fire Management Plans.

CAL FIRE Unit and Contract County Fire Plans. In compliance with the California Fire Plan, individual CAL FIRE Units are required to develop Fire Management Plans for their areas of responsibility. These documents assess the fire situation within each of CAL FIRE's 21 Units and six contract counties. The plans include stakeholder contributions and priorities, and identify strategic areas for pre-fire planning and fuel treatment as defined by the people who live and work with the local fire problem. The plans are required to be updated annually.

- **San Benito-Monterey Unit (BEU) Fire Management Plan, 2009.** The goal of the San Benito-Monterey Fire Plan (2009) is to prevent the ignition and spread of unwanted, human-caused fires, with an emphasis on reducing losses as a result of large damaging fires. The action plan for the unit identifies the process that the San Benito-Monterey CAL FIRE Unit will take to achieve this goal. The plan utilizes fire history, fuels data, weather data, and assets at risk to identify and prioritize target areas that will receive the majority of pre-fire management activities. The plan also includes proactive pre-fire suppression activities, and public information and education programs. The Unit encompasses over three million acres, which includes over two million acres within the State Responsibility Area (SRA), representing one of the largest state responsibility jurisdictions in the state. The San Benito-Monterey Fire Plan was adopted in 2009.

San Benito County Community Wildfire Protection Plan (CWPP)

The San Benito County Community Wildfire Protection Plan (CWPP) serves as a fire protection planning document for the County. The CWPP was developed by the San Benito Fire Safe Council (SBFSC), with guidance and support from the California Department of Forestry and Fire Protection, the Bureau of Land Management, San Benito County, and interested community members, property owners, and



consultants. The CWPP presents the county's physical characteristics, landscape-scale fire hazards, rated fire hazard areas, wildland urban interface areas (WUI), and designated fuel reduction projects for the area. The plan itself serves as a mechanism for public input and identification of areas presenting high fire hazard risk. The plan also strongly influences potential projects intended to mitigate wildfire risks. The County's draft plan was available for public review through the end of April 2010.

Bureau of Land Management Hollister Field Office 2008 Fire Management Plan

The BLM Hollister Fire Management Plan (FMP) is a fire management plan for all BLM land within San Benito County. The plan identifies conditions related to fire management, and provides recommendations for wildland fire suppression, prescribed fire and non-fire fuel treatment projects, and community involvement. The guidelines in the FMP prioritize public and firefighter safety, hazardous fuel reduction, and wildlife risk reduction through prevention, mitigation, and education. The FMP also identifies four specific fire management units and associated fire fuel treatment objectives: the Panoche Wilderness Study Area, the San Benito Natural Area, the Clear Creek Serpentine Area of Critical Environmental Concern (also known as the CCMA), and the San Joaquin Valley South Special Management Area.

Bureau of Land Management San Benito Mountain Research Natural Area – Interim Management Plan. The BLM prepared an Interim Management Plan for the San Benito Mountain Research Area, located adjacent to San Benito Mountain in the southeast corner of the county. The plan focuses on fire management objectives that reflect the historical and natural fire regime in the area.

Pinnacles National Monument. The Pinnacles National Monument prepared a Fire Management Plan in 2007 for their land in the south-central portion of the county. The plan includes an operational manual for the Monument's fire management program. It also includes guidelines for fire management and a framework for fire prevention.

San Benito County General Plan

Areas susceptible to fire hazards were identified in the Environmental Resources and Constraints Inventory of the Existing County General Plan. Most of these hazard areas were located in the northern portion of the county. The County also has prepared fire hazard maps available for public review at the County Planning Department. The existing General Plan identifies several fire-related policies and actions intended to safeguard county residents and property from wildfires. Relevant policies from the General Plan's Open Space and Conservation Element and Safety Element are listed below.

Open Space and Conservation Element (1995)

Goal 3. Natural Resources

To provide for the conservation, development, and use of natural resources, including water and its hydraulic force, water quality, forests, soils, rivers and other waters, fisheries, wildlife, minerals, energy, and other natural resources.

Objectives

3. Prevent land use conflicts within the vicinity of open space, mineral, off-road vehicle, fire hazard areas, and agricultural uses.

Goal 7. Environmental Hazards

To discourage development in areas that are environmentally hazardous.

Objectives

3. A response time of five minutes for first-response fire engine in local responsibility areas and a response time of fifteen minutes for first-response fire engine in State responsibility areas.

Policy 37. Development policy for hazardous areas

It will be the policy of the County to limit densities in areas that are environmentally hazardous (fault, landslides/erosion, hillsides over 30 percent slope, floodplains) to levels that are acceptable for public health and safety for citizens and property. It is the County's policy to apply zoning categories and scenic easements for the protection of environmentally hazardous or aesthetically valuable resources.

Actions

1. The County shall adopt an overlay zoning which establishes development standards in areas of special concern, such as the Earthquake Fault Zone maps, floodplains, landslide, severe erosion hazards, slopes 30 percent or greater, and hazardous fire areas. These development standards would be over and above the standards applicable to basic land uses.
2. The County shall establish an overlay zoning district for environmentally hazardous areas (an "EC" environmental constraints land use designation district) which discourages by development standards development in areas hazardous to the health, safety, and welfare of citizens and community.
3. Prohibit creation of parcels by subdivision that will be wholly located within environmentally hazardous areas and/or where developable areas cannot be safely accessed.

Policy 40. Development in State Responsibility Areas

All new development shall be required to conform to the standards and recommendations for applicable fire protection agency to an acceptable fire protection risk level (CDF, County, incorporated city).

Actions

1. New development within the Sphere-of-Influence of an incorporated city shall be designed to conform with fire safety and water supply standards of the city.



2. Subdividers/developers shall be financially responsible for measures to reduce fire hazards for the protection of persons, property, and natural resources.
3. New residential development and additions to existing homes within the SRA shall be required to conform at a minimum to Public Resources Code 4290, San Benito County Code Chapter 17, Uniform Fire Code, Uniform Building Code, and National Fire Codes as applicable.
4. Development within very high or high fire hazard areas shall be required to construct the modification zones that will be financed by a homeowner's association, service district, or other method.
5. Measures to reduce fire hazards for the protection of persons, property, and natural resources for existing and new development (e.g. fuel modification zones) shall provide evidence that they will implement policies for preservation of wildlife, reduction of soil erosion, watershed, and protect natural resources from fire hazards.
6. Major subdivisions approved outside refuse collection boundaries shall be required to provide a plan for disposal of flammable refuse.

Policy 41. New development will not be allowed where access is a fire safety risk. Further, the CWPP states that the County's existing Safety Element incorporates fire safe guides for residential subdivisions. The "Fire Safe Guide" was updated since the Existing General Plan and is now referred to as the "Structural Fire Prevention Field Guide." The guide stresses maintaining defensible space and the necessity of neighborhood and community action in mitigating wildfire risk and creating Fire Safe Councils to ensure community involvement.

Safety Element (1980)

Policy 1. Roads should be of adequate capacity for use in times of emergency.

Action

- a. In accordance with Government Code Section 65302(i), the County hereby establishes a minimum all weather road width for private driveways serving two or more units as 16 feet.

Policy 2. It will be the County's policy to review on a biannual basis the Emergency Plan of San Benito County.

Action

- a. The County will continue its policy of reviewing the disaster plan every two years.

Policy 3. It will be the County's policy to require that lands which are subdivided and developed in the future to residential or commercial uses be designed and constructed in such a manner that levels of "acceptable risk" identified in Appendix A of the Seismic Safety Element are not exceeded.

It will be the County's further policy that these uses will supply adequate water for normal use and fire suppression. Roads which are suitable for safe passage for emergency vehicles, legible street name signs and two means of access to all parcels except on those with cul-de-sacs 600 feet or less.

Actions

- a. The County will adopt minimum street standards in the subdivision ordinance which will provide a 16-foot all weather road width for private driveways.
- b. Adopt and maintain an appropriate fire protection water standard for application to land development.

Policy 4. It will be the County's policy to update periodically information on existing hazards and reduce the risk from them.

Actions

- a. In areas where substandard water supplies exist, the County will take steps to improve the systems.
- b. In areas of existing and new development, the County will review road signs and require the placement of legible road signs.

Policy 5. It will be the County's policy to maintain local police, fire and health forces in a state of readiness to insure adequate protection for the citizens of San Benito County.

Action

- a. The County will continue its policy of training programs, periodic review of organization and the provisions of supplies, equipment and facilities for use in disaster response.

Policy 6. It will be the County's policy to cooperate with other local, State, and Federal agencies in the event of a major disaster.

Action

- a. The County will continue its mutual assistance programs and will work closely with the Cities of San Juan Bautista and Hollister as well as State and Federal authorities in assuring emergency preparedness.

Policy 7. It will be the County's policy to incorporate into subdivision and zoning ordinances those fire safe guides adopted by the Board of Supervisors and entitled "Fire Safe Guides for Residential Development in California (in or near forests, brush, and grassland areas)," revised and printed by the California Department of Forestry, May, 1980.

Actions

- a. The County will continue to improve and provide for the safety of the residents of the county by taking immediate steps to modify the subdivision and other appropriate ordinances within the



county to incorporate fire safe standards as delineated in the California Department of Forestry publication where they apply to San Benito County.

- b. Adopt and maintain a fire protection plan.
- c. Adopt those "Fire Safe Guides" as they relate to San Benito County's land use planning development, open space, conservation, resource management, circulation, and housing.
- d. Actively support and cooperate with the California Department of Forestry's Range Improvement and Vegetation Management Programs, with particular emphasis on their impact on water quality and production, resource management, range management, wildlife habitat management, fire defense improvements, and public safety where determined to be appropriate by the County.

San Benito County Subdivision Ordinance Fire Design Standards

Appendix B of the County's Subdivision Ordinance (XIII) provides standards for roadway widths, turn-arounds, defensible space measures such as setbacks, the height of street signs and addresses to increase visibility for quick accessibility, and general water standards for fire hydrants to ensure adequate fire protection water delivery systems are available.

Major Findings

- CAL FIRE and the Bureau of Land Management have primary wildland fire management responsibilities in the county. The San Benito County Fire Department, Aromas Tri-County Fire Department, Hollister Fire Department, and San Juan Bautista Volunteer Fire Department have lesser responsibilities for wildland fires.
- The expanding wildland urban interface (WUI) area and increasing urban populations create a potential for large, damaging, and costly wildfires. While 56 percent of the county within the San Benito-Monterey Fire Unit has an overall fire hazard rating of high in the State Responsibility Ares (SRA), 30 percent is rated very high and 14 percent is rated moderate. However, the most of these areas fall within Monterey County. The majority of the county's assets at risk are ranked at the bottom 80 percent of the low fire hazard rating.
- Annual grassland, oak woodland, brush, and conifer species are the four most distinct wildland fuel types in the San Benito County portion of the San Benito-Monterey Fire Unit
- There is only one designated "target priority area" within San Benito County. This target priority area is located near the San Juan Canyon within Fremont Peak State Park. This area contains large ranches and some single-family and multi-family residential in remote areas.
- Current (2010) County policy recommends maintaining a response time of five minutes for first-response fire engines in local responsibility areas (LRA) and a response time of fifteen minutes for first-response fire engine in SRAs. However, according to the County Fire Department 2008 Annual Report, the County's fire resources are significantly below response standards.
- According to the San Benito County Community Wildfire Protection Plan (CWPP), the majority of the county falls within a high fire hazard severity zone, but particularly the lands in the

northernmost and eastern portions of the county. Both Hollister and San Juan Bautista fall within urbanized developed areas outside hazard zones. However, the communities of Paicines and Panoche fall within moderate fire hazard severity zones; the communities of Bitterwater and San Benito fall within high fire hazard severity zones; and the community of Idria falls within a very high fire hazard severity zone. The westernmost perimeter of the county, including the Pinnacles National Monument, also falls within very high fire hazard severity zones.

- The California Fire Alliance identifies Aromas and San Juan Bautista as at-risk communities susceptible to wildfire damage. The San Benito County CWPP identifies other communities with priority ratings for also being “at-risk,” including Antelope Valley, Bitterwater, Cienega Canyon, Paicines, Panoche Valley, Ridgemark, San Juan Canyon, and Tres Pinos.

Existing Conditions

Urban and wildland fire hazards in San Benito County create the potential for injury, loss of life, and property damage. Urban fires are discussed in Chapter 7, Public Services, Section 7.7, Fire Protection, of this Background Report. The discussion in Section 7.7 includes a description of each of the fire service providers primarily responsible for such fires, including the San Benito County Fire Department, the Aromas Tri-County Fire Department, the Hollister Fire Department, and the San Juan Bautista Volunteer Fire Department. While these fire agencies provide wildland fire fighting services within their respective jurisdictions and through automatic aid agreements, the following discussion focuses only on those entities primarily responsible for wildland fire suppression and on wildland fire hazard and risk in the county. Figure 11-9 shows the area of responsibility for each agency.

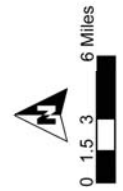
Wildland fires affect grass, forest, and brushlands, as well as any structures on these lands. Such fires can result from either human-made or natural causes. The region’s topography, type, and amount of fuel, climate, and the availability of water for firefighting are the primary factors influencing the degree of fire risk. Vegetation fires comprise the majority of fires in San Benito County according to CAL FIRE. Most of the fires are caused by human activities involving motor vehicles, equipment, arson, and burning of debris.

As San Benito County continues to grow, the potential for wildland fires will increase as more rural lands are developed. Proper land use planning and investment in fire protection resources in both urban and non-urban areas are key steps to reducing the potentially devastating effects of wildland fires, thereby safeguarding the people and property of San Benito County.

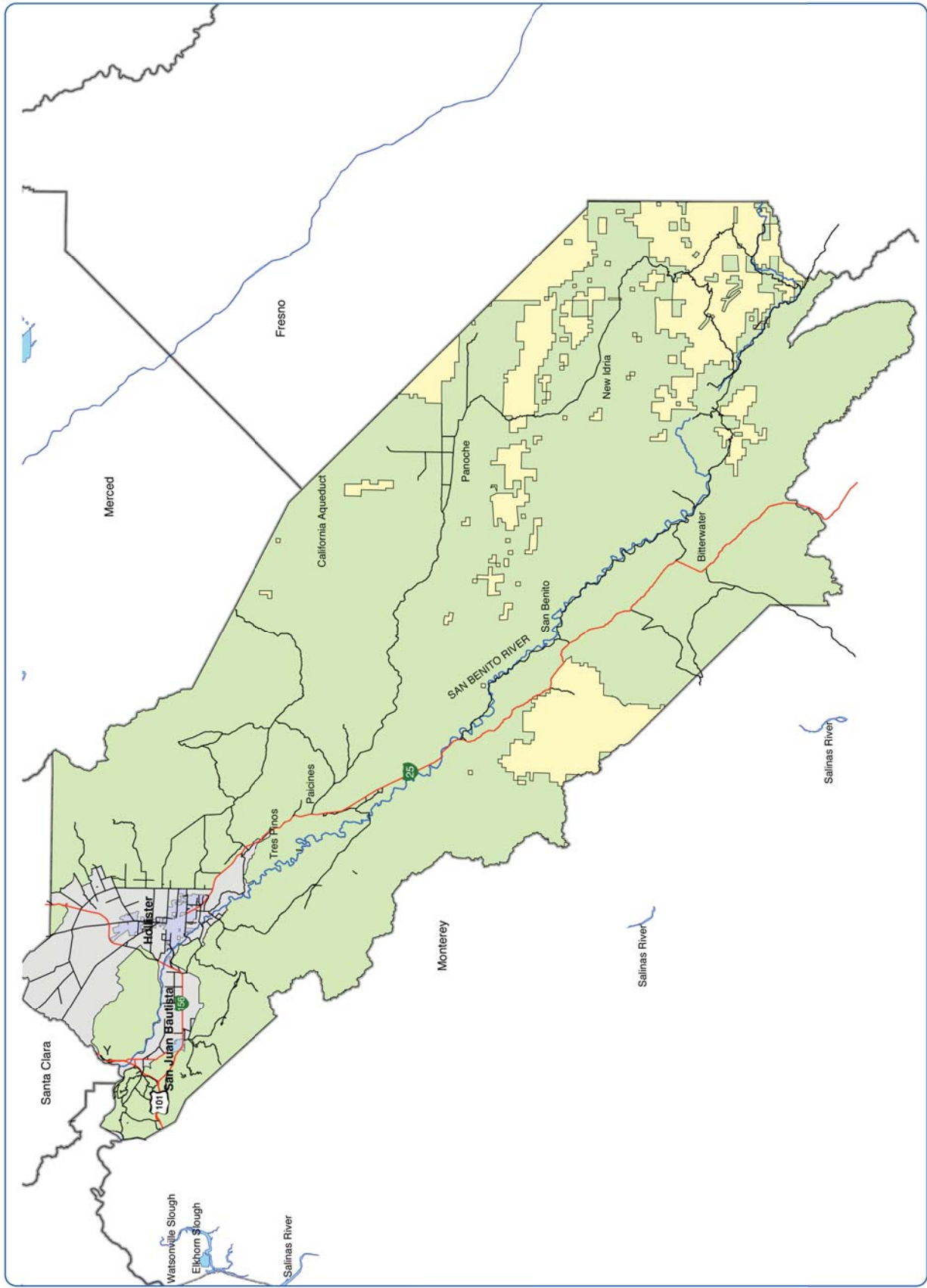


FIGURE 11-9
SAN BENITO COUNTY
STATE AND LOCAL
RESPONSIBILITY
AREAS

- Legend**
- Rivers
 - San Juan Bautista City Limits
 - Hollister City Limits
 - County Limits
- Roadways**
- State Highways
 - County Roads
- State Responsibility Areas**
- Federal Responsibility Area
 - State Responsibility Area
 - Local Responsibility Area



Source: FRAP, 2010
 San Benito County Planning and Building Department, 2010



CAL FIRE

CAL FIRE is the State wildland fire agency designated to protect non-Federal, unincorporated lands within California. When available, CAL FIRE also assists the San Benito County Fire Department with other types of fires within the county. Five CAL FIRE stations and bases are located in San Benito County, and a sixth is located on the San Benito/Santa Clara County border (Pacheco). Stations within San Benito County include the Bear Valley Helitack Base in Bear Valley, the Beaver Dam Station near Bitterwater, the Antelope Station in Antelope Valley, the Hollister Station, and the Hollister Air Attack Base. The Bear Valley, Beaver Dam, Antelope, and Hollister Fire CAL FIRE Stations are all in full operation during the fire season, which runs from May 1st to November 1st. The agency has air tankers housed at the Hollister Airport, a bulldozer housed at Hollister Station, and two battalion chiefs dedicated to the operations within the county. One acts as the County department head and the other acts as an as-needed chief officer for emergency scene management. The Bear Valley and Bitterwater stations both have heliport facilities. Minimum total on-duty staffing at CAL FIRE facilities within the county is 24 firefighters responding on seven fire engines, one fire bulldozer, and two battalion chiefs. Additional CAL FIRE resources available to the county include a helicopter with water dropping capabilities and firefighting crew, air tankers, air tactical coordinator, and inmate hand crews.

Bureau of Land Management

The Bureau of Land Management (BLM) is responsible for fire management and response on its approximately 105,000 acres in San Benito County. BLM staffs a hand crew and bulldozer from May to October each year. BLM has a Direct Protection Agreement (DPA) with CAL FIRE for all BLM lands in San Benito County. CAL FIRE and BLM respond to incidents on BLM property, but CAL FIRE has suppression responsibilities for BLM property for initial attack only. BLM assumes responsibility in the event that a wildland fire goes to extended attack status. The BLM also supports fire protection planning efforts in San Benito County through its involvement in the BFSC, and grant funding for public education or WUI fuel reduction projects.

County Wildland Fire Hazards

Throughout California communities are increasingly concerned about wildfire safety as increased development occurs in the foothills and mountain areas and subsequent fire control measures have affected the natural cycle of the ecosystem. Suppression of natural fires allows the understory to become dense, creating the potential for larger and more intense wildland fires. Wind, weather, climate conditions, steepness of terrain, and naturally volatile or hot-burning vegetation provide fuels that contribute to the potential for wildland fires. In easily accessible wildland areas, such as the foothill areas surrounding the urban areas in the county, the risk of fire increases because of a greater chance for human carelessness and historic/current fire management practices. Human activities such as smoking, debris burning, and equipment operation are often the major causes of wildland fires.

Wildland fire hazards exist in varying degrees over approximately 95 percent of San Benito County on that portion of the county's 890,000 acres not covered by water or urban uses. The fire season extends approximately five to six months, from late Spring to Fall, or May through October, and is influenced by a combination of climatic, vegetative, and physiographic conditions. In general, the county's wildfire hazards are dictated by several factors, including the region's topography, vegetation (surface fuels), climate, fire history. Wildfire hazards are also based on where assets at risk are located, such as



population centers or housing density. The information summarized below is based on the same data provided in the County's CWPP.

Topography

The regional topographic conditions within the county can have a significant effect on wildland fire behavior and the ability of fire fighters to suppress fires. For example, the topography of the county is extremely variable. Relatively flat terrain about 100 to 300 feet above mean sea level characterizes the northern portion of the county, and steep terrain and higher elevations up to 5,200 feet above mean sea level characterize the southern portion of the county. Steep slopes and canyons, predominant geographical features in the southern portions of the county, are conducive to channeling and dispersing winds that can create erratic wildfire conditions. In addition to weather and topography, vegetation also affects fire behavior and fire hazard potential.

Vegetation and Fuels

Vegetation distribution throughout the county varies by location and topography, with most of the major differences observed between the northern agricultural portions of the county and the southern mountainous region. Current land cover/fuels distribution within the county is characterized by eleven different vegetation/surface fuel types mapped by the California Fire Resource and Protection Program (FRAP 2009), as presented in Table 11-4 and shown in Figure 11-10. Dominant vegetative cover within San Benito County consists of herbaceous annual grassland cover (49.5 percent), distributed primarily in the low-lying valley areas and rolling hills south of Hollister. While this fuel type can burn quickly under strong, dry wind patterns, it does not produce the high heat intensity and high flames associated with chaparral fuel types. Other significant vegetative cover types include pine/grass (14.1 percent), light brush (19.7 percent), and tall chaparral (4.8 percent). These vegetation types are primarily associated with the steeper, upland areas in the southern portion of the county. Fire behavior in brush fuel types produces higher flames than those in grassland, although spread rates are typically slower. Fire behavior in woodlands is variable, depending on surface fuel conditions and the presence of ladder fuels.



FIGURE 11-10
SAN BENITO COUNTY
SURFACE
FUEL TYPES

Legend

- Rivers
- San Juan Bautista City Limits
- Hollister City Limits
- County Limits

Roadways

- State Highways
- County Roads

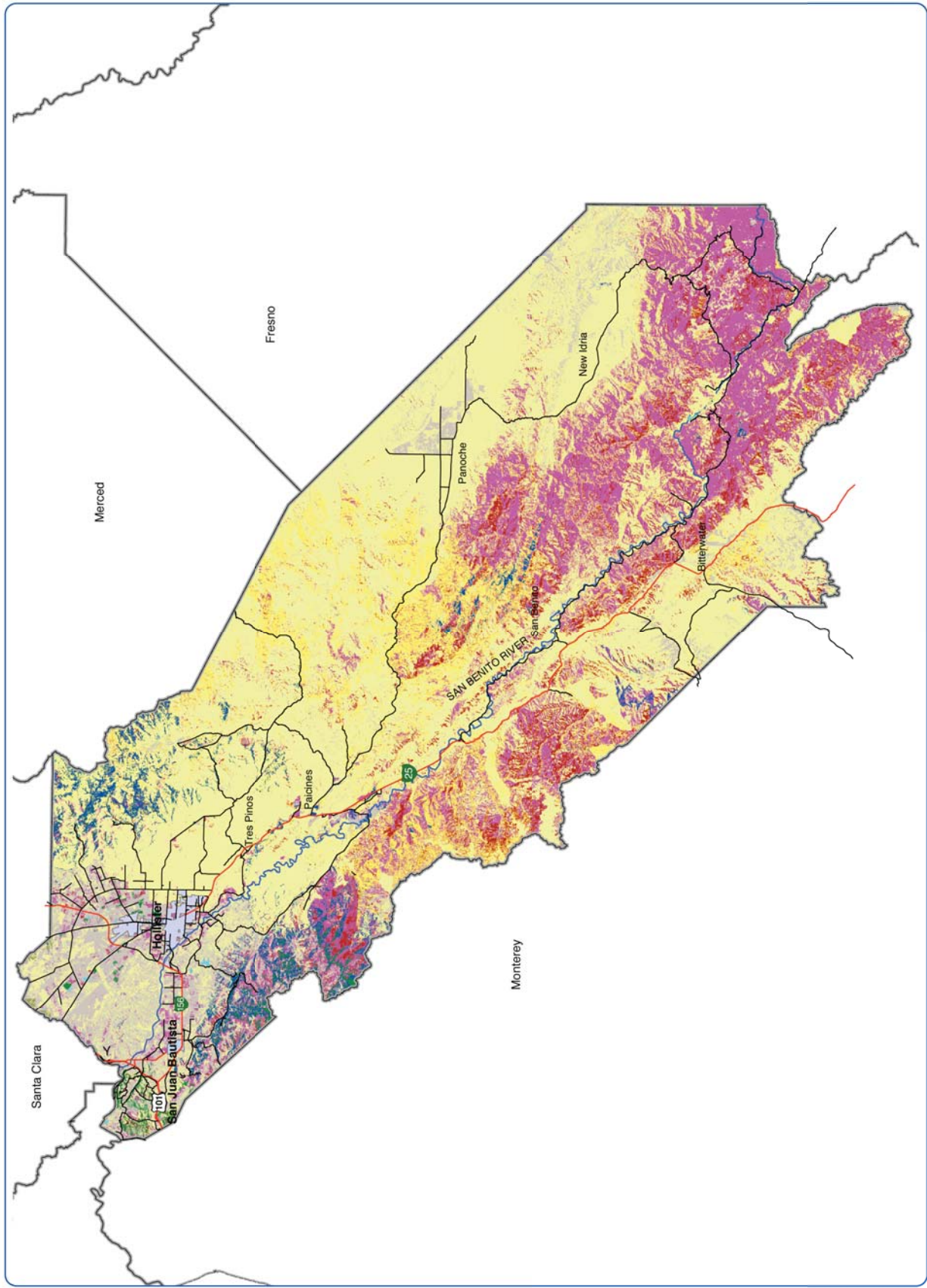
Surface Fuel Model Types

- Grass
- Pine/Grass
- Tall Chaparral
- Brush
- Intermediate Brush
- Timber Litter
- Heavy Conifer
- Urban
- Agriculture
- Water
- Barren



0 1.5 3 6 Miles

Source: San Benito County Planning Department, San Benito County and California Department of Forestry and Fire Protection (CALFIRE) Fire and Resource Protection Program, 2010. Data developed by translating GIS data into fuel model types. Fuel model types are used to predict fire behavior (i.e. flame length, rate of spread).





**TABLE 11-4
VEGETATION LAND COVERAGE**

San Benito County
2010

Fuel Model Number	Description	Approximate Acreage	Percent of Cover
1	Grass	444,315	49.5%
2	Pine/Grass	125,257	14.1%
4	Tall Chaparral	42,404	4.8%
5	Light Brush	175,073	19.7%
6	Intermediate Brush	34	0%
8	Hardwood/Conifer Litter	19,880	2.2%
10	Heavy Conifer Litter with Understory	5,510	0.6%
28	Urban	4,073	0.5%
97	Agriculture	75,763	8.5%
98	Water	365	<0.1%
99	Barren	730	0.1%
Total		889,404	100%

Sources: San Benito County Community Wildlife Protection Plan, 2010, FRAP, 2010 .

The rolling foothills on the county’s east and west sides just outside Hollister and San Juan Bautista, although flatter than the southern portion of the county and well grazed, are not immune to extensive burning. There is some fuel loading in the foothill region, especially in those areas unaffected by fire for many years. In hilltop areas water supplies can be rapidly depleted, hampering fire control efforts. Structures with wood shake roofs, such as many of the older barn structures that dot the county’s foothills, ignite easily and produce embers that contribute to fire spread. There are also certain vegetative types that have increased flammability based on the plant physiology, biological function, and physical structure. For example, the native shrub species that compose much of the chaparral vegetation around the foothills near Hollister and San Juan Bautista present a high fire potential.

The aftermath of wildland fire produces areas of potential landslide because burned and defoliated areas are exposed to winter rains that saturate the soil. San Benito County is fortunate to have relatively few homes built on slopes with substantial vegetation. However, as the county continues to grow and development encroaches further into wildland interface areas, the potential for wildland fires will increase.

Climate

The overall weather patterns in San Benito County are not only affected by topography, but also by the region’s proximity to the Pacific Ocean. While the northwest portion of the county can be influenced by the ocean’s weather patterns and humidity levels, the majority of the county has less cloud cover and fog. Instead, temperatures in the majority of the county typically reach up to 100 degrees Fahrenheit, and the predominant wind direction is from the northwest with average wind speeds between seven and ten miles per hour. Average annual rainfall is approximately 12 inches per year.

Remote Automated Weather Stations (RAWS) are tool used in fire protection planning that provide detailed weather planning data on wind speed, relative humidity, fuel moisture, temperature, and precipitation. There are currently four RAWS reporting stations located in San Benito County.

Fire History

Fire history is an important component in understanding fire frequency, fire type, significant ignition sources, and vulnerable areas/communities. According to the San Benito County CWPP, the topography, vegetation, and climatic conditions associated with San Benito County combine to create a unique situation capable of supporting wildfires. The plan states that relative to other areas in the central coast region of California, San Benito County has not been subject to large-scale conflagrations over the course of recorded fire history. For example, while numerous fires have burned in San Benito County, their sizes remain small relative to other fires in the region (e.g., the Basin Complex Fire in Monterey County in 2008, which burned over 160,000 acres).

Based on historical fire perimeter data (FRAP 2009), repeated burning is not observed within the county and fires are concentrated primarily in the Gabilan Range, with a few burning in the Diablo Range and lower valley floor areas. Fuel type is a likely factor affecting the geographic distribution of fires in San Benito County. For instance, grass-dominated rangelands in the eastern portion of the county exhibit small, well-dispersed burn perimeters, while the heavier chaparral fuels in the western portion of the county (Gabilan Range) exhibit a more concentrated distribution of fire perimeters. Notable large wildfires that have burned primarily outside of San Benito County, but have burned a portion within the county boundary, include the 1950 Mack Fire and the 1979 Ciervo Fire, both in the extreme southwest corner of the county. In general, the average interval between the burning of large wildfires in excess of 2,000 acres within San Benito County is every 5.8 years. Intervals range from one year to 17 years. The last notable fire within the county was the Brown Fire, which in 2008 burned approximately 3,787 acres.

Housing Density

The county's population centers and the distribution of population and housing density are other indicators used in fire planning to help evaluate fire risk, project prioritization, and fire threat ratings. For example, a large proportion of the county lives in low-density housing, with higher-density development concentrated in Hollister, San Juan Bautista, and Aromas. Densities often decrease with increased distance from these three urban centers. As a result, fire prevention projects are more likely to occur where people live, in order to effectively safeguard people and property from wildfire risk and damage.

Fire Hazard Models

To assist State and local entities in assessing the hazards associated with wildland fires, particularly in the wildland urban interface, CAL FIRE's FRAP has developed a series of computer models to assess fire hazard. FRAP's data collection takes into account many of the factors described above that dictate where fires may and may not occur, and models the data in order to provide detailed analysis and mapping of fuels, fire weather, historical fire occurrences, and ignition location and frequency. All of these inputs have been analyzed and modeled to develop fire hazard severity rankings for lands throughout California. Other models used in wildfire planning determine fire threat based on fuel type, calculate all the fire parameters to determine a rank to prioritize fuel reduction projects, and measure the fire protection agencies' level of successful fire suppression. The following summaries describe



wildfire risk in San Benito County based on various combinations of factors that determine risk, such as fire hazard severity zones, fire threat, fuel rank, weather, assets at risk, surface fuels, and level of service for fire protection.

Fire Hazard Severity Zones

Determining wildfire hazards and severity zones in San Benito County involves assessing the presence of fire-prone vegetation, weather, topography, assets at risk, and the fire protection system's ability to deal with the occurrence of wildfire (i.e., levels of service). Each parameter helps determine where a fire is likely to start, and once ignited, the direction fire will spread, the intensity at which it can burn, and how efficiently fire protection services can respond. Identifying fire hazard is a way to measure the physical fire behavior so that people can predict the damage a fire is likely to cause. Fire hazard measurement includes the speed at which a wildfire moves, the amount of heat the fire produces, and the burning fire brands (i.e., sparks/embers) that the fire sends ahead of the flame front. The FRAP fire hazard model considers several parameters to determine wildfire hazard severity zones, including: topography, such as steepness of slopes, since fires burn faster as they burn up-slope; weather (e.g., temperature, humidity, and wind), which has a significant influence on fire behavior; and the surface vegetation fuel coverage, also known as wildland fuels.

California Public Resources Code Sections 4201-4204 and California Government Code Sections 51175-89 direct CAL FIRE to map areas of significant fire hazards based on fuels, terrain, weather, and other relevant factors. These zones, referred to as Fire Hazard Severity Zones (FHSZ), then define the application of various mitigation strategies to reduce risk associated with wildland fires. CAL FIRE completed public hearings for the adoption of FHSZ for SRAs in 2007, and adopted FHSZ maps for SRAs in November 2007 as shown in Figure 11-11. In compliance with consultation requirements, CAL FIRE issued draft maps for Fire Hazard Severity Zones and Fuel Rank in Local Responsibility Areas, and transmitted them to local agencies for input.

High and very high FHSZs cover San Benito County. Both the Hollister and San Juan Bautista fall within non-wildland fuel zones and urbanized/developed areas outside hazard zones. However, the edges of each community abut moderate fire hazard severity zones. For example, the majority of lands to the north and east of Hollister fall within moderate fire hazard severity zones, while the areas to the north, west, and south of both cities fall within high fire hazard severity zones. Other communities such as Paicines and Panoche are within relatively moderate fire hazard severity zones, and Bitterwater and San Benito are within high fire hazard severity zones. The community of Idria is surrounded by very high fire hazard severity zones. Large portions of the western portion of the county, including Pinnacles National Monument, and the area directly north of the monument, fall within very high fire hazard severity zones. The remaining portions of the eastern parts of the county are mainly within high fire hazard severity zones, with some scattered very high fire hazard zones covering various southwest parts of the county.



**FIGURE 11-11
FIRE HAZARD
SEVERITY ZONES IN
SAN BENITO COUNTY**

Legend

- Rivers
- San Juan Bautista City Limits
- Hollister City Limits
- County Limits

Roadways

- State Highways
- County Roads

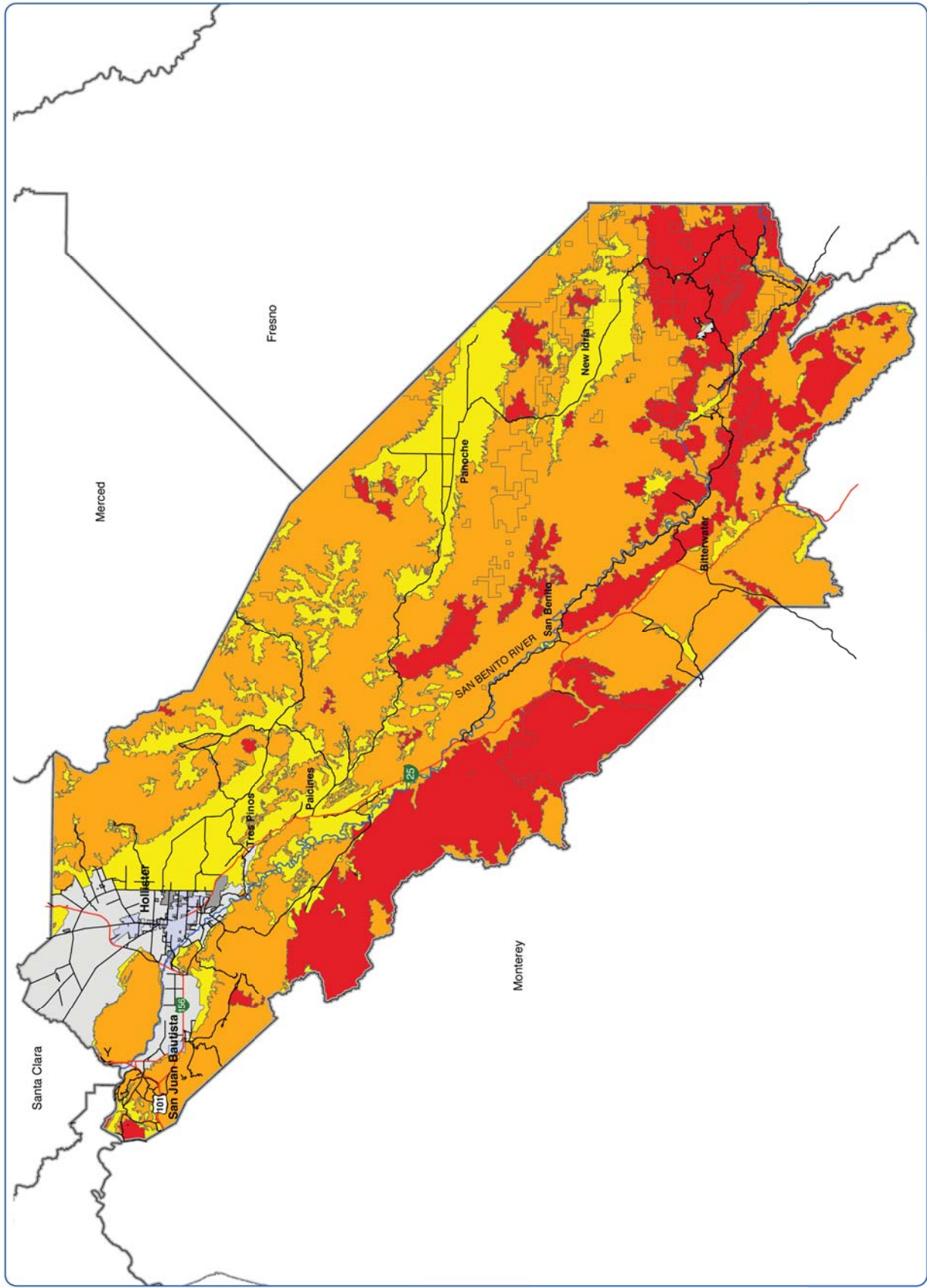
Fire Hazard Zones

- Moderate
- High
- Very High
- Non-Wildland/Non-Urban
- Urban Unzoned



0 1.5 3 6 Miles

Source: San Benito County Planning Department, Planning Division, and the California Department of Forestry and Fire Protection (CalFire). Fire and Resource Protection Program (FRAP).
These zones define the application of various mitigation strategies to reduce risk associated with wildland fires. Specifically, the zones determine the mitigation codes assigned to reduce the ignition potential of structures.





Fire Threat

Fire threat is a combination of two factors: fire frequency (fire rotation) which is the likelihood of a given area burning, and potential fire behavior (fuel rank). These two factors are combined to create four threat classes ranging from moderate to extreme. Fire threat can be used to estimate the potential for impacts on various assets and values susceptible to fire. Impacts are more likely to occur or be more severe for the higher threat classes. Fire threat within San Benito County is classified into five categories: 1) little/none, 2) moderate, 3) high, 4) very high, and 5) extreme. Table 11-5 lists each fire threat category, and the acreages and percentages within the county. Figure 11-12 graphically illustrates the distribution of the fire threat categories within the county. Approximately 38 percent (341,963 acres) of the county is within very high fire threat areas, 38 percent (336,897 acres) of the county is within high fire threat areas, and approximately 15 percent (130,696 acres) is within moderate fire threat areas. The majority of the county within areas that have high to very high fire threat are in the central and southern portion of the county. The area north of Pinnacles National Monument and the area along the western boundary of the county within Monterey County are also within a very high fire threat area.

TABLE 11-5 FIRE THREAT San Benito County 2010		
Fuel Rank	Acreage	Percent
Little/None	70,812	8.0%
Moderate	130,696	14.8%
High	336,897	38.1%
Very High	341,963	38.6%
Extreme	4,426	0.5%
Total	889,402	100%

Sources: San Benito County Community Wildlife Protection Plan, 2010, FRAP, 2010.



**FIGURE 11-12
FIRE THREAT IN
SAN BENITO COUNTY**

Legend

- Rivers
- San Juan Bautista City Limits
- Hollister City Limits
- County Limits

Roadways

- State Highways
- County Roads

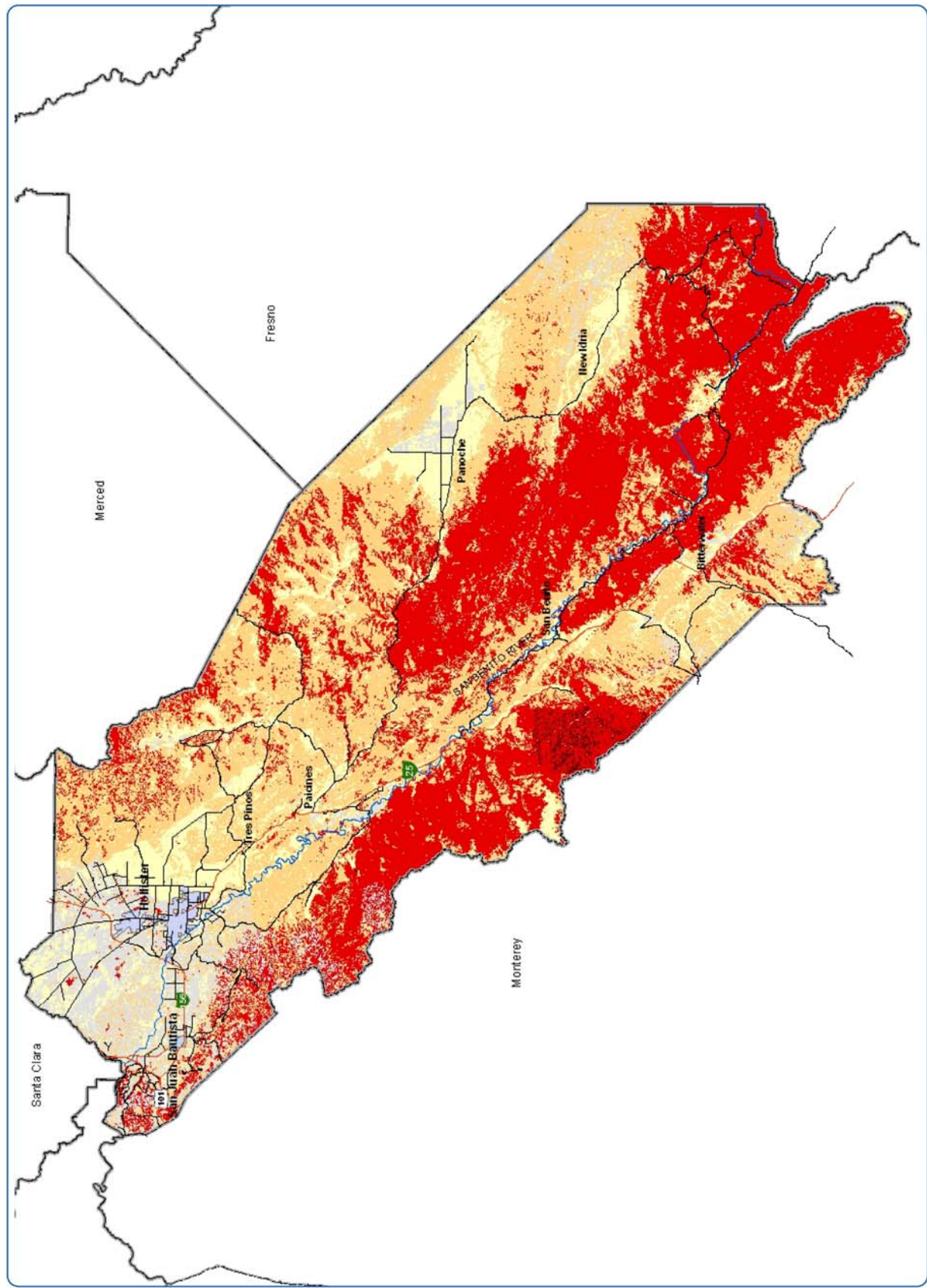
Fire Threat

- Moderate
- High
- Very High
- Extreme
- Non-Fuel



0 1.5 3 6 Miles

Source: San Benito County Planning and Building Department, 2010. Data provided by the California Fire and Resource Protection Program (FRAP), 2010.
Fire threat was developed based on fuel load, wind speed, and fire behavior (Fuel Rank), and expected fire frequency (Fire Rotation) to create a 4-class index for fire threat. The index was then overlaid on a map of San Benito County to show fire threat levels. The index was not developed for areas with no fuel, water, agricultural lands, etc.) were omitted from the calculation.





Fuel Rank

CAL FIRE has developed a Fuel Rank assessment methodology to identify and prioritize pre-fire projects designed to reduce the potential for large catastrophic fire. The fuel ranking methodology assigns ranks based on expected fire behavior for unique combinations of topography and vegetative fuels under a given severe weather condition (wind speed, humidity, temperature, and fuel moistures). This analysis rates areas in the county into four separate categories including non-fuel, moderate, high, or very high, as shown in Table 11-6. As a result of the modeling and consultation, in November 2008 CAL FIRE determined that approximately 65 percent of San Benito County has a high fuel rank, 17 percent has moderate fuel rank, 9 percent has very high fuel rank, and 8 percent has a non-fuel rank. Figure 11-13 depicts the distribution of fuel rankings across the county as modeled by FRAP based on frequency, or likelihood of a fire in a given area and potential fire behavior or hazard. For example, an area may be susceptible to high fire risk and hazards within a location identified as a WUI because the surrounding environment is undeveloped forest, typically on the edge of an urban area containing assets at risk. Most of the high fuel rank areas in the county occur along the Gabilan Range in the western portion of the county, with some high fuel rank areas scattered across the central and southern parts.

TABLE 11-6 COUNTY FUEL RANK San Benito County 2010		
Fuel Rank	Acreage	Percent
Non-Fuel	76,858	8.6%
Moderate	151,480	17%
High	580,850	65.3%
Very High	80,214	9.0%
Total	889,402	100%

Sources: San Benito County Community Wildlife Protection Plan, 2010, FRAP, 2010.

CAL FIRE also uses Fire Rotation class intervals, which are calculated based on 50 years of fire history on land areas grouped into “strata” based on fire environment conditions. These strata are defined by climate, vegetation, and land ownership. The Fire Rotation interval is the number of years it would take for past fires to burn an area equivalent to the area of a given stratum. Fire Rotation values are grouped into classes. In the fire threat analysis, more frequent fire is ranked higher to reflect a greater concern for non-fire tolerant assets such as housing. CAL FIRE then calculates a numerical index of fire threat based on the combination of fuel rank and fire rotation, which are grouped into four threat classes. For assessing threat of wildland fire to people, FRAP buffers this Fire Threat attribute depending on whether it is an urban area or an area of little or no threat. This reflects the greater resistance that urban areas and areas of little or no threat (such as agriculture lands) offer to the spread of wildland fire.



**FIGURE 11-13
FUEL RANK IN
SAN BENITO COUNTY**

Legend

- Rivers
- San Juan Bautista City Limits
- Hollister City Limits
- County Limits

Roadways

- State Highways
- County Roads

Surface Fuel Model Types

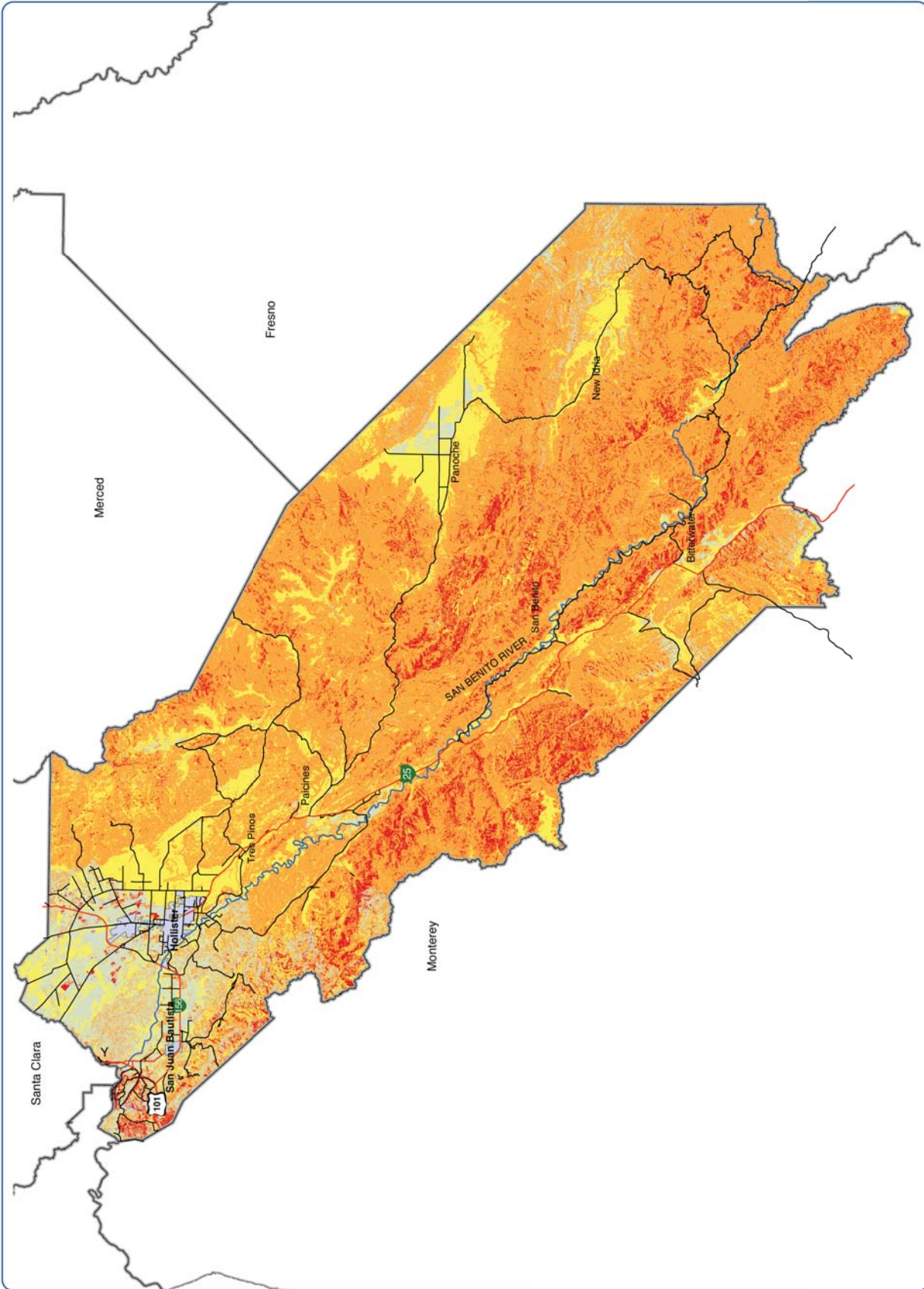
- Non-wildland fuel
- Moderate
- High
- Very High



0 1.5 3 6 Miles

Source: San Benito County Planning and Building Department, 2010
 California Department of Forestry and Fire Protection (CALFIRE), Fire and Resource Protection Program (FRPP), 2010.

The fuel ranking methodology assigns rank based on expected fire behavior for unique combinations of topography, vegetation, and weather conditions (wind speed, humidity and temperature).





The Wildland Urban Interface (WUI) is a potential treatment zone where fuel reduction projects may be conducted to reduce wildland fire threats to communities at risk. The WUI boundary areas within San Benito County were defined based on fire threat data and the FRAP-generated WUI boundaries for the County. The result is a modified boundary used to evaluate WUI fire threat and to help the community prioritize fuel reduction projects. For example, during the preparation of the CWPP, the WUI boundary was modified to better represent the extent of the WUI boundary in the County. Fire threat within the WUI outlines relative risk to populated areas or assets from wildfire and provides a measure for evaluating potential loss of structures and threats to public safety. Based on the fire threat data, described above and the extent of the WUI modified in the CWPP, the San Benito County CCWP outlines the communities at risk and each communities associated priority rating. Table 11-7 lists wildfire risk by each community or area. There are also designated at-risk communities, such as Aromas and San Juan Bautista, which are designated as susceptible to wildfire damage by the California Fire Alliance, as in the Federal Register. However, these communities do not represent the only areas at risk in the county. There are eight additional communities identified in the CWPP with priority ratings, including Antelope Valley, Bitterwater, Cienega Canyon, Paicines, Panoche Valley, Ridgemark, San Juan Canyon, and Tres Pinos.

**TABLE 11-7
 SAN BENITO COUNTY COMMUNITY PRIORITY RATINGS (2010)**

At-Risk Community or Area	California Fire Alliance Community-At-Risk	Overall Risk	Values at Risk
Communities			
Antelope Valley		High	Residences/Structures
Aromas	X ¹	Very High	Residences/Structures
Bitterwater		High	Residences/Structures
Cienega Canyon		High	Residences/Structures
Hollister	X	Moderate	Residences/Structures/ Agricultural Land
Paicines		Moderate	Residences/Structures
Panoche Valley		Moderate	Residences/Structures
Ridgemark		Moderate	Residences/Structures
San Juan Bautista	X	Moderate	Residences/Structures/ Historic Buildings
San Juan Canyon		Very High	Residences/Structures
Tres Pinos		Moderate	Residences/Structures
Significant Areas/Infrastructure			
Communications Facility/ Fremont Peak		Very High	Emergency Services Communications Infrastructure
Indian Canyon		Very High	Residences/Associated Structures/Cultural Heritage Site
New Idria		High	California Historic Landmark/Buildings

¹ Aromas is located in San Benito, Monterey, and Santa Cruz Counties. It is classified as a Community-At-Risk by the California Fire Alliance for Monterey County, but not for San Benito or Santa Cruz Counties.

Sources: San Benito County Community Wildlife Protection Plan, 2010, FRAP, 2010.

W.A.F.L. Score

In order to target critical fire hazard areas and prioritize projects for ground fuel reduction, the fire plan assessment process uses a W.A.F.L. tool to calculate the combination of assessments on (W) weather, (A) assets at risk, (F) fuels, and (L) level of service to provide an aggregate score or ranking. The four components can result in a high, medium, or low ranking. The results are intended to assist fire planning efforts and funding to focus on areas that have high values or high-risk areas with severe fire weather and a demonstrated low LOS. To facilitate the fire assessment process mandated by the California Fire Plan, both the W.A.F.L. Score and the LOS rating are typically shown on an overlay grid system in which U.S. Geological Survey (USGS) 7-1/2 minute quadrangles are divided by nine columns and nine rows, with resulting cells that are approximately 450 acres in size. According to CAL FIRE grid cells of this size give an adequate level of resolution for setting planning unit and statewide priorities. The W.A.F.L. score is not currently available or complete for San Benito County.

Level of Service Rating. As a component to the W.A.F.L. score, the LOS rating is a ratio of successful fire suppression efforts to the total fire starts. Success is defined by fires that are controlled before unacceptable damage and cost are incurred, and where initial attack resources are sufficient to control wildfires. The LOS uses a Geographic Information System (GIS) that overlays a 10-year history of wildfires onto a map and derives the average annual number of fires by size, severity of burning, and assets lost. This data provides a LOS rating, a relative system of evaluation based on a damage-plus-cost analysis of fire protection performance. The LOS rating (the score of successes in initial attacks) can be used to compare one area of the state with another, recognizing that the assets at risk may be quite different. This gives CAL FIRE a powerful tool for setting program priorities and defining the benefits of the programs. The LOS rating also provides a way to integrate the contribution of various program components (fire prevention, fuels management, engineering and suppression) toward the goal of keeping damage and cost within acceptable limits.

Fuel Ranking. Fuel, in the context of wildland fire, refers to all combustible material available to burn on an area of land. Each fuel has its own burning characteristics based on factors such as moisture content, volume, arrangement, crown cover, size, and the plants' genetic composition. In an attempt to predict fire spread, the U.S. Forest Service has developed 13 fuel models that categorize fuels by their burn characteristics. The fuel model characteristics have been used to determine planning belts for certain areas. Knowledge of fire behavior in various fuel types is essential for designing a defensive plan against wildfire.

For example, fires in grass burn rapidly but can be stopped by a roadway or plowed fire break. Fires in brush often burn with an intensity that prevents fire crews from safely applying water to the flame front. Fires in timber can ignite new fires (called spot fires) miles ahead of the main blaze, making control efforts very difficult and dangerous. Therefore, wide-scale pre-fire management programs can help reduce the likelihood of a potential wildfire catastrophe.

Fire Prevention and Suppression

In recognition of the severity of wildland fire hazards in certain areas of California, the State enacted legislation (California Public Resources Code Section 4291) requiring local jurisdictions to adopt minimum recommended standards pertaining to road standards for fire equipment access, standards for identifying streets, roads, and buildings, minimum private water supply reserves for emergency fire use, and fuel breaks and greenbelts to achieve fuel reductions. With certain exceptions, all new



development and construction in SRAs after July 1, 1991, must meet the new standards. The State requirements would not supersede more stringent local regulations should they be developed. As such, the County includes many of these standards in its subdivision ordinance (Appendix B of the ordinance).

Recent changes (2005) to Public Resources Code Section 4291 expand the defensible space clearance requirement maintained around buildings and structures from 30 feet to a distance of 100 feet. These guidelines are intended to provide property owners with examples of fuel modification measures that can be used to create an area around buildings or structures to create defensible space. A defensible space perimeter around buildings and structures provide firefighters a working environment that allows them to protect buildings and structures from encroaching wildfires, and minimize the chance that a structure fire will escape to the surrounding wildland. These guidelines apply to any person who owns, leases, controls, operates, or maintains a building or structure in, upon, or adjoining any mountainous area, forest-covered lands, brush-covered lands, grass-covered lands, or any land that is covered with flammable material, and located within a State Responsibility Area.

Accessibility

While the northern portion of the county is criss-crossed with major traffic arteries that can provide quick response times to urban and wildland fires, the southern portion of the county is more remote. It is mainly accessed along State Route 25; increased fire response times result as the distance to an urban or wildland fire increases and more roadways, including dirt roads, are required to access fire incidents.

Water Supply and Availability

Rural and outlying areas have the added problem of insufficient water supplies for delivery of adequate streams to control the spread of a fire. Water must be delivered to the scene of the emergency through the use of water tenders, one of which is owned by the San Benito County Fire Department. However, if a qualified full-time firefighter/driver is not available for immediate dispatch, the delivery of water to the scene may be delayed due to travel time of the dispatched water tender and the distance required to drive to rural locations.

Wildland Urban Interface Building Standards

In September 2005 emergency regulations amending the California Code of Regulations (CCR), Title 24, Part 2, known as the 2007 California Building Code (CBC), were adopted to bring increased protection to buildings located in WUI areas and reinforce implementation of Public Resource Code Section 4291. The broad objective of the Wildland-Urban Interface Fire Area Building Standards is to establish minimum standards for materials and material assemblies and provide a reasonable level of exterior wildfire exposure protection for buildings in WUI Fire Areas. Protecting a building from wildfire takes a two-pronged approach: removing flammable materials from around the building, and constructing the building of fire-resistant material.

SECTION 11.4 HUMAN-MADE HAZARDS

Introduction

This section describes human-made hazards in the county. This includes an overview of potential hazardous waste sites and activities that may threaten human or environmental health and safety. This section focuses on unregulated spill or release sites that have been recognized in the county. Several other sections within this background report address potential hazards in the county. Section 4.2, Agriculture summarizes agricultural facilities and pesticide use. Section 7.2, Wastewater Collection and Section 7.4, Solid Waste discusses the wastewater collection and solid waste disposal operations in the county. Section 8.1, Energy and Mineral Resources and Section 8.4, Oil and Gas Resources discuss mining operations and oil and gas fields within the county.

Key Terms

Hazardous Materials or Waste. A substance that increases or poses a threat to human health and the environment because of the physical or chemical nature, quantity, or concentration of the substance.

Envirostor and Geotracker. These State databases are used to track hazardous waste sites in California. Information from the San Benito County Department of Environmental Health is used to help document activities and land uses that may contribute to risks associated with hazardous materials or waste.

Regulatory Setting

Federal

U.S. Environmental Protection Agency. EPA is the agency primarily responsible for enforcement and implementation of Federal laws and regulations pertaining to hazardous materials. Applicable Federal regulations pertaining to hazardous materials are contained in the Code of Federal Regulations (CFR) Titles 29, 40, and 49. Hazardous materials, as defined in the CFR, are listed in 49 CFR 172.101. The management of hazardous materials is governed by the following laws:

- Resource Conservation and Recovery Act of 1976 (RCRA) (42 U.S. Code [USC] 6901 et seq.);
- Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA, also called the Superfund Act) (42 USC 9601 et seq.);
- Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) (7 USC 136 et. Seq.); and
- Superfund Amendments and Reauthorization Act (SARA) of 1986 (Public Law 99-499).

These laws and associated regulations include specific requirements for facilities that generate, use, store, treat, and/or dispose of hazardous materials. EPA provides oversight and supervision for Federal Superfund investigation/remediation projects, evaluates remediation technologies, and develops hazardous materials disposal restrictions and treatment standards.



Hazardous Substances

Hazardous substances are a subclass of hazardous materials. They are regulated under CERCLA and SARA. Water resources are regulated under the Federal Clean Water Act; see Section 11.2, *Flood Hazards*). Under CERCLA, EPA has authority to seek the parties responsible for releases of hazardous substances and ensure their cooperation in site remediation. CERCLA also provides Federal funding (the “Superfund”) for remediation.

Comprehensive Environmental Response, Compensation, and Liability Act. CERCLA, commonly known as Superfund, established prohibitions and requirements concerning closed and abandoned hazardous waste sites; provided for liability of persons responsible for releases of hazardous waste at these sites; and established a trust fund to provide for cleanup when no responsible party could be identified. Under CERCLA, EPA has the authority to hold parties responsible for releases of hazardous substances and require their cooperation in site remediation.

SARA Title III, the Emergency Planning and Community Right-to-Know Act. Requires companies to declare potential toxic hazards to ensure that local communities can plan for chemical emergencies. EPA maintains a National Priority List of uncontrolled or abandoned hazardous waste sites identified for priority remediation under the Superfund program. EPA also maintains the CERCLIS database, which contains information on hazardous waste sites, potential hazardous waste sites, and remedial activities across the nation.

Hazardous Waste

Hazardous wastes, although included in the definition of hazardous materials and hazardous substances, are regulated separately under the Resource Conservation and Recovery Act (RCRA). A waste can legally be considered hazardous if it is classified as ignitable, corrosive, reactive, or toxic. Title 22, Section 66261.24 of the California Code of Regulations (CCR) (i.e., 22 CCR 66261.24) defines characteristics of toxicity.

Resource Conservation and Recovery Act. Under RCRA, EPA regulates hazardous waste from the time that the waste is generated until its final disposal. RCRA also gives EPA or an authorized State the authority to conduct inspections to ensure that individual facilities are in compliance with regulations, and to pursue enforcement action if a violation is discovered. EPA can delegate its responsibility to a state if the state's regulations are at least as stringent as the Federal regulations. RCRA was updated in 1984 by the passage of the Federal Hazardous and Solid Waste Amendments, which required phasing out land disposal of hazardous waste. Title 22, Section 66261.24 of the CCR defines characteristics of toxicity, which is used to help guide the Federal Program.

Regulation of Pesticides

The Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) (7 USC 136 et seq.) provides Federal control of pesticide distribution, sale, and use. EPA was given authority under FIFRA not only to study the consequences of pesticide usage, but also to require users (farmers, utility companies, and others) to register when purchasing pesticides. Later amendments to the law required users to take exams for certification as applicators of pesticides. All pesticides used in the United States must be registered (licensed) by EPA. Registration assures that pesticides will be properly labeled and that, if used in accordance with specifications, they will not cause unreasonable harm to the environment.

Regulation of Polychlorinated Biphenyl (PCBs)

The Toxic Substances Control Act of 1976 (15 USC 2605) banned the manufacture, processing, distribution, and use of PCBs in totally enclosed systems. PCBs are considered hazardous materials because of their toxicity; they have been shown to cause cancer in animals, along with effects on the immune, reproductive, nervous, and endocrine systems. Studies have shown evidence of similar effects in humans (EPA 2004). The EPA Region 9 PCB Program regulates remediation of PCBs in several states, including California. 40 CFR Section 761.30(a)(1)(vi)(A) states that all owners of electrical transformers containing PCBs must register their transformers with EPA. Specified electrical equipment manufactured between July 1, 1978, and July 1, 1998 that does not contain PCBs must be marked by the manufacturer with the statement "No PCBs" (Section 761.40[g]). Transformers and other items manufactured before July 1, 1978 containing PCBs must be marked as such.

Occupational Health and Safety Administration

The Occupational Safety and Health Administration (OSHA) of the U.S. Department of Labor is responsible for enforcement and implementation of Federal laws and regulations pertaining to worker health and safety. Workers at hazardous waste sites must receive specialized training and medical supervision according to the Hazardous Waste Operations and Emergency Response (HAZWOPER) regulations (29 CFR 1910.120).

Hazardous Waste Operations and Emergency Response (HAZWOPER). HAZWOPER requirements include Federal regulations that involve procedures for clean-up operations required by a governmental body, whether Federal, State, local, or other involving hazardous substances that are conducted at uncontrolled hazardous waste sites. This includes the EPA's National Priority Site List (NPL), state priority site lists, sites recommended for the EPA NPL, and other initial investigations of government identified sites which are conducted before the presence or absence of hazardous substances has been ascertained. A person who is engaged in work with any potential for exposure to hazardous substances must comply with HAZWOPER regulations.

State

The Department of Toxic Substances Control (DTSC), a division of California Environmental Protection Agency (CalEPA), has primary regulatory responsibility over hazardous materials in California, working in conjunction with the Federal EPA to enforce and implement hazardous materials laws and regulations. DTSC can delegate enforcement responsibilities to local jurisdictions.

The Hazardous Waste Control Act - The hazardous waste management program enforced by DTSC was created by the Hazardous Waste Control Act (California Health and Safety Code Section 25100 et seq.), which is implemented by regulations described in CCR Title 26. The State program is similar to, but more stringent than, the Federal program under RCRA. The regulations list materials that may be hazardous, and establish criteria for their identification, packaging, and disposal.

Environmental health standards for management of hazardous waste are contained in California Code of Regulations (CCR) Title 22, Division 4.5. In addition, as required by California Government Code Section 65962.5, DTSC maintains a Hazardous Waste and Substances Site List for the State called the Cortese List.



Unified Program (CUPA) - California's Secretary for Environmental Protection, a division of CalEPA, has established a unified hazardous waste and hazardous materials management regulatory program (Unified Program) as required by Senate Bill 1082 (1993). The Unified Program consolidates, coordinates, and makes consistent the administrative requirements, permits, inspections, and enforcement activities for the following environmental programs under CalEPA, the State Water Resources Control Board (SWRCB), including the Regional Water Quality Control Boards (RWQCB) within each region of the state, State Office of Emergency Services, and the State Fire Marshal:

- Underground Storage Tank program;
- Hazardous materials release response plans and inventories;
- California Accidental Release Prevention Program (CalARPP);
- Aboveground Petroleum Storage Act requirements for spill prevention, control, and countermeasure plans; and
- California Uniform Fire Code (UFC) hazardous material management plans and inventories. Under this effort, main petroleum and natural gas pipeline locations are considered a source of potential contamination and construction worker hazards. The pipelines are described in Section 8.2, *Energy/Mineral Resources*, of this document.

The six environmental programs within the Unified Program are implemented at the local level by local agencies, known for this purpose as Certified Unified Program Agencies (CUPA). CUPAs carry out the responsibilities previously handled by approximately 1,300 State and local agencies, providing a central permitting and regulatory agency for permits, reporting, and compliance enforcement (CalEPA 2003). The San Benito County Department of Environmental Health (SBDEH) is the designated CUPA in San Benito County. The SBDEH's service area includes not only the unincorporated parts of the county, but incorporated cities as well.

California State Water Resources Control Board

The SWRCB, a division of CalEPA, has primary responsibility to protect water quality and supply. As described in Section 8.1, *Water Resources*, the RWQCB is authorized by the Porter-Cologne Water Quality Control Act of 1969 to protect the waters of the State. The RWQCB provides oversight for sites where the quality of groundwater or surface waters is threatened. Extraction and disposal of contaminated groundwater due to investigation/remediation activities or due to dewatering during construction would require a permit from the RWQCB if the water were discharged to storm drains, surface water, or land.

CCR Title 23, Chapter 15, requires that non-hazardous liquid (>42 gallons) or solid (>10 cubic yards) waste must be reported to the RWQCB. Domestic wastewater and refuse releases are required to be reported under different non-Chapter 15 regulations.

California Department of Pesticide Regulations, Department of Food and Agriculture, and the Department of Public Health

The California Department of Pesticide Regulations (DPR), a division of CalEPA, in coordination with the California Department of Food and Agriculture (CDFA), a division of Measurement Standards and the

California Department of Public Health (CDPH) have the primary responsibility to regulate pesticide use, vector control, food, and drinking water safety. CCR Title 3 requires the coordinated response between the County Agricultural Commissioner and SBDEH to address the use of pesticides used in vector control for animal and human health on a local level. DPR registers pesticides, and pesticide use is tracked by the County. Title 22 is used also to regulate both small (less than 200 connections regulation by the SBC Water District) and large CDPH water systems.

California Department of Industrial Relations, Division of Occupational Health Administration

The California Department of Industrial Relations, Division of Occupational Safety and Health Administration (Cal/OSHA), assumes primary responsibility for developing and enforcing workplace safety regulations within the State. Cal/OSHA standards are more stringent than Federal OSHA regulations, and are presented in CCR Title 8. Standards for workers dealing with hazardous materials include practices for all industries (General Industry Safety Orders); specific practices are described for construction, hazardous waste operations, and emergency response. Cal/OSHA conducts on-site evaluations and issues notices of violation to enforce necessary improvements to health and safety practices.

Local

County of San Benito Enforcement

The San Benito County Department of Environmental Health enforces State regulations governing hazardous substance generators, hazardous substance storage, and the inspection, enforcement, and removal of underground storage tanks (UST) in both the unincorporated area of the county and incorporated cities within the county. The *San Benito County Hazardous Material Response Area Plan* (County of San Benito Department of Environmental Health 2008) was published by the County DEH as required under Chapter 6.95, Section 25500 et seq. of the California Health and Safety Code and the County Code §11.07.020. The CDPH approved the San Benito County Hazardous Waste Management Plan pursuant to authority provided under California Health and Safety Code § 25135.7(a). The area plan details the duties and responsibilities of governmental and other responsible agencies in a hazardous materials incident. In addition, coordinated efforts between the SBDEH and the State Department of Health are used to control insect vectors for such diseases as West Nile virus, avian influenza viruses, rabies. The SBDEH also participates with other local and State agencies in emergency preparedness.

The San Benito County Agricultural Commissioner regulates agricultural uses and issues use permits for pesticides on agricultural land. The commissioner's staff conducts routine inspections to ensure that farm operations are in compliance with the requirements set forth in FIFRA (see "Regulation of Pesticides" in the discussion of Federal regulations above) and by DPR.

Assembly Bill 2140. Assembly Bill 2140 requires every county and city to adopt a local hazard mitigation plan (HMP) as specified in the Federal Disaster Mitigation Act of 2000, as part of the safety elements contained in their respective general plan. The HMP must include an initial earthquake performance evaluation of public facilities that provide basic shelter and critical government functions, an inventory of private facilities that are potentially hazardous, and a plan to reduce the potential risk from private and governmental facilities in the event of a disaster.



At a minimum, the safety element goals, policies, and objectives must include (Government Code Section 65302(g)(2)(B)):

- Avoiding or minimizing the risks of flooding to new development.
- Evaluating whether new development should be located in flood hazard zones, and identifying construction methods or other methods to minimize damage if new development is located in flood hazard zones.
- Maintaining the structural and operational integrity of essential public facilities during flooding.
- Locating, when feasible, new essential public facilities outside of flood hazard zones, including hospitals and health care facilities, emergency shelters, fire stations, emergency command centers, and emergency communications facilities, or identifying construction methods or other methods to minimize damage if these facilities are located in flood hazard zones. Establishing cooperative working relationships among public agencies with responsibility for flood protection.”

A city or county may qualify for financial benefits associated with the new regulations under Government Code Section 8685.9 by adopting their Local Hazard Mitigation Plan (LHMP) as an annex, by reference, to their safety plan consistent with Government Code Section 65302.6.

San Benito County Code

Title 15, Chapter 15.01—Solid Waste Regulations. The San Benito County Code, Chapter 15.0. Solid Waste Regulations, contained within Title 15, Public Works, contains 19 subchapters. Chapter 15 sets forth the regulations for storing solid waste and the processes by which it should be removed. The chapter states that solid waste shall be collected or properly disposed of at such frequency as will prevent the occurrence of a hazard or nuisance condition. A hazard or nuisance is presumed to exist if the frequency of collection or proper disposal exceeds one week and residential accumulation exceeds two cubic yards of solid waste (1966 Code, § 25-9). The regulations also state that no person or entity shall deposit or discharge, or cause to be deposited or discharged, any solid waste in any place other than an approved solid waste facility. Further, no person shall allow or permit the deposit or discharge of solid waste in violation of the chapter on property owned, controlled, or possessed by that person.

San Benito County General Plan

The existing San Benito County General Plan Land Use Element and the Open Space Conservation Element serve as a starting point for regulating human-made hazards within the county. This section outlines the policies of the current plan, and the specific actions identified to ensure public safety and protect the environment from hazards associated with human-made waste.

Land Use Element (1992)

Policy 32. Specific development sites shall be free from the hazards identified within the Open Space and Conservation Element Maps (e.g., faults, landslides, hillsides over 30 percent slope, floodplains). The site shall also be on soil suitable for building and maintaining well and septic systems (i.e., avoid impervious soils, high percolation or high groundwater areas, set back from creeks). Absent adequate

mitigation, development shall not be located on environmentally sensitive lands (wetlands, erodable soil, archaeological resources, important plant and animal communities).

Actions

- a) All hazardous and environmentally sensitive lands as identified in the Open Space and Conservation Elements shall be zoned as restricted development area in the applicable combining district (Seismic Safety Area, Floodplain Area, and Open Space Area). Severe erosion hazard and fire hazard shall also be added to Section 17.1 of the zoning ordinance.

Open Space Conservation Element (1995)

Policy 35. Hazardous waste and waste source reduction

It is the policy of the County to implement the short-, mid-, and long-range goals and objectives outlined in the County of San Benito Final Source Reduction and Recycling Element and Household Hazardous Waste Element of 1992 or any future amendments.

Actions

1. Require that new developments be reviewed for consistency with the Final Source Reduction and Recycling Element and Household Hazardous Waste Element.
2. Encourage the integration of areas for composting yard waste as a part of subdivision design.

Policy 36. Hazardous waste management plan

It is the policy of the County to implement the goals and objectives and policies of the San Benito County Hazardous Waste Management Plan, Volume I, July 1989.

Goal 7

To discourage development in areas that is environmentally hazardous.

Objectives

1. To develop methods to avoid development in environmentally hazardous areas
2. Include landfills and areas contaminated by landfills within the environmental hazards overlay district.
3. A response time of five minutes for first-response fire engines in local responsibility areas and a response time of fifteen minutes for first-response fire engines in State responsibility areas.
4. To use flood prone areas for open space purposes, in order to protect the health and safety of residents and property of the county, to maximize groundwater recharge, and to protect wetland resources.



5. Limit development on slopes 30 percent or greater or in severe to very severe erosion hazard areas that would increase erosion or jeopardize the safety of structures.
6. Develop standards to reduce erosion resulting from grading or cutting.
7. Recognize landfills, areas contaminated by landfills, and existing and abandoned mines as special treatment areas.
8. Pursue funding sources and intergovernmental coordination to reclaim polluted areas.

Major Findings

- The San Benito County Department of Environmental Health (SBDEH) is the designated Certified Unified Program Agency (CUPA) in San Benito County. SBDEH's service area includes the unincorporated parts of the county and incorporated cities.
- SBDEH currently (2010) has an aggressive ordinance for ensuring the safety of the public from hazardous materials generated or used within the county, including an inspection program. As the local enforcement agency, SBDEH helps maintain and update a comprehensive County database that is maintained for tracking purposes by the RWQCB Geotracker Program, the California DTSC Envirostor, and the CalRecycle (formerly California Integrated Waste Management Board), SWIS databases.
- The John Smith Landfill is the only active solid waste disposal site in the county. There are three closed landfill solid waste disposal sites within the county, including Hart's Landfill, Old San Juan Dump, and Teledyne-McCormick-Selph.
- The county contains a total of 101 hazardous waste sites. CalEPA sites include the PG&E gas plant in Hollister, the U.S. Bureau of Land Management Vellecitos Oil Fields approximately 50 miles southeast of Hollister, the former Class I disposal facility adjacent to the John Smith Landfill, and the Joe Asbestos Pit Union Carbide Mine at the southern county boundary.
- There are currently (2010) eight open cleanup program sites countywide, seven of which lie within the city limits of Hollister and one within the unincorporated county. There are also 12 open LUST cleanup sites, ten of which are located in the city of Hollister, and two within the unincorporated county.
- Over the past 20 years less than ten clandestine methamphetamine drug labs have been investigated within San Benito County. The last investigation took place in 2005.

Existing Conditions

SBDEH Hazards Tracking

The San Benito County Code and State law require reporting of an unauthorized discharge of waste that may impact water quality. SBDEH has an aggressive regulatory ordinance and inspection program to protect human health and the environment from hazardous wastes. As the LEA, the SBDEH assists as requested by the State to maintain and update a comprehensive County database that is maintained in

the RWQCB Geotracker Program, and to provide similar assistance to the California DTSC Envirostor and the CalRecycle SWIS databases.

As shown in Table 11-8, there are three closed landfill disposal sites within the county. The active John Smith Landfill and three open compost sites in San Benito County are discussed in detail in Section 7.4, *Solid and Hazardous Waste*, of this Background Report. As shown on the CalRecycle SWIS website, the following landfills are listed as closed in San Benito County. Several additional landfill sites with a regulatory status of open files (indicating a cleanup action) are listed on the RWQCB Geotracker Web Site. The additional landfill sites and their locations are listed in Table 11-9.

As reported on the RWQCB Geotracker website, San Benito County contains a total of 101 hazardous waste sites. The CalEPA/DTSC (listed though Envirostor) sites of interest include both active cleanup or land restriction status sites, the PG&E gas plant in Hollister, the U.S. Bureau of Land Management Vellecitos Oil Fields approximately 50 miles southeast of Hollister, the former Class I – Hazardous Waste Unit at the John Smith Landfill, and the Joe Asbestos Pit Union Carbide Mine at the southern county boundary. The Geotracker website provides additional detail and tracks separate list of facilities as shown in Table 11-10.

TABLE 11-8 CALRECYCLE SWIS LANDFILL SITES San Benito County 2010		
SWIS No.	Name	Type
35-AA-0010	Hart’s Landfill	Solid Waste Disposal
35-CR-0001	Old San Juan Dump	Solid Waste Disposal
35-CR-0050	Teledyne-Mccormick-Selph	Solid Waste Disposal

Source: Solid Waste Information System, California Department of Resources Recycling and Recovery (CalRecycle) formerly California Integrated Waste Board, 2010.



TABLE 11-9 RWQCB GEOTRACKER OPEN STATUS CLEANUP LAND DISPOSAL SITES San Benito County 2010	
Site Name	Location
Futures Foundation Landfill Site (Formerly the New Idria Mine)	Hollister
Hart's Landfill	Hollister
John Smith Solid Waste Site	Hollister
Vallecitos, Ashurst, SE28(B)	South San Benito County
Vallecitos, Ashurst, SW28(A)	South San Benito County
Vallecitos, Ashurst, SEC33	South San Benito County
Vallecitos, Cedar Flat Area	South San Benito County
Vallecitos, F&1-29	South San Benito County
Vallecitos, F&1-29 SE	South San Benito County
Vallecitos, F&1-31 (A)	South San Benito County
Vallecitos, F&1-31 (B)	South San Benito County
Vallecitos, F&1-31, SE	South San Benito County
Vallecitos, F&1-5, NW	South San Benito County

Source: RWQCB Land Disposal Geotracker Search Result, June 2010.

TABLE 11-10 TYPES OF HAZARDOUS SITES IN SAN BENITO COUNTY San Benito County 2010	
Type of Site	Number
Cleanup Program Site - Open	8
Cleanup Program Site - Closed	2
Leaking Underground Storage Tank (LUST) Cleanup Site - Open	12
Leaking Underground Storage Tank (LUST) Cleanup Site - Closed	43
Underground Storage Site (UST) Site	23
Land Disposal Sites	13
CUPA Program Site	200

Source: RWQCB Geotracker Search Results, June 2010; Personal Communications with San Benito County Staff, June 2010.

Based on the Geotracker listed sites, there are eight open cleanup program sites in the county; seven of them lie within the city limits of Hollister. There are two closed cleanup sites, and 12 open LUST cleanup sites, of which 10 are located in the city of Hollister. The active remediation sites include the WFS Hollister cleanup program site, B&K Union Tow Service LUST site, E's Ranch Milk SS LUST site, the Guerra Nut Shelling Co LUST site, Mel's Chevron LUST site, and the Sambrailo Land and Cattle Co LUST site. These sites are all "open status" due to the stage of investigation or remediation. Existing well field and underground oil and gas transmission lines are identified in Section 8.2, *Mineral/Energy Resources*, of this document. Hazards associated with potential leaks have been identified and are tracked by the CEC, SBDEH, and RWQCB. The SBDEH and SBCWD use State and County directed programs to monitor the environmental and water system conditions in the county.

As discussed above, the State takes the lead on many environmental sites that may not be identified in the County inspection and reporting program. County staff indicates that they address over 200 CUPA program sites, which may have over 500 specific waste unit subgroups. Table 11-11 lists the inspection frequency for hazardous waste inspections completed by the SBDEH. The County maintains an active inspection schedule as outlined in Table 11-11. This schedule is often accelerated due to complaint-based site visits. The primary goal of inspections is to assure compliance with local, State, and Federal environmental laws (Stevenson 2010). Of specific importance for SBDEH, and outside the CUPA, Emergency Preparedness, food inspection, septic leachfield installation, and vector control programs, the County tracks four compost sites, three illegal or closed landfills (Hart, Old San Juan Dump, and Futures Foundation or New Idria Mine), and one demolition site.

Mercury in Mining Wastes

Mercury and other heavy metals were used to extract gold from overburden sediments during the dredging process. Residual mercury has been found in fine-grained materials within dredge tailings in mined areas in several areas of central and northern California primarily in placer deposits and alluvial sediments. The New Idria mercury mine in San Benito County, approximately 65 miles southeast of Hollister, produced almost half of the mercury mined in North America up to 1972. The mine was sold to the Futures Foundation in 1991. Envirostar reports that impacts due to acid mine drainage, mercury, iron, nickel, and zinc contamination. The acid mine drainage has been reported to affect creeks in the vicinity of the mine that are part of the San Joaquin River Basin. In May 2003, the San Benito County Board of Supervisors sent a proposal to the Central Valley RWQCB requesting investigation, cleanup, and abatement of the pollutants discharged from New Idria. It does not have an NPL status according to the EPA website, but it is a Superfund and CERCLA site. The closed mine was preliminarily assessed in 1996 and the last site assessment was conducted in 2003. The current status of this mine is unknown. Section 11.1, *Geologic/Seismic Hazards* provides additional information on abandoned mines.



TABLE 11-11 SBDEH INSPECTION FREQUENCY San Benito County 2010	
Inspected Operations	Inspection Guidelines Addressed
Food Programs	
Restaurants	2 year
Bars	2 year
Food Processing Establishment	2 year
Market	1 year
Produce Stand	1 year
Mobile Food Facility	1 year
Food Vending Machine	None
Water Vending Machines	None
Certified Farmers Market	Every week through the season
Housing/Institutions and Vector Control	
Detention Facilities*	1 year
Employee Housing*	complaint based inspections
Organized Camps*	seasonal and complaint based
Septic System Installations	inspection with permit or complaint
Recreational Health and Vector Control	
Public Pools/Spas – Year Around	Unannounced, minimum every 2 years
Public Beaches	None
West Nile, Rabies, Bird Flu	Complaint based inspections
Water	
Small Water System w/o Treatment (20 Systems)	Once every 3 years
Small Water Systems (all other types)*	Once every 2 years
New individual wells	inspection with permit (SBCWD)
Solid Waste	
Active, permitted landfill facilities*	Once a month
Closed Landfill Sites*	1 year
Compost Sites	1 year
Solid Waste vehicles	Inspection for permit renewals

TABLE 11-11 SBDEH INSPECTION FREQUENCY San Benito County 2010	
Inspected Operations	Inspection Guidelines Addressed
Hazardous Materials/Waste	
Hazardous Waste Generators	3 years
Underground Storage Tanks	1 year
Spill Prevention Control (above ground tanks 80-100 sites)	3 years, part of CUPA
Risk Management Sites	5 years

*State Minimum Mandated Inspection Frequencies

Source: Personal Communication, County Staff, SBDEH, Stevenson, 2010.

Residual Agricultural Chemicals

As the County continues to support expansion and intensification of the its agricultural economy, risks associated with agricultural chemical (pesticides and organic /inorganic fertilizers) product, residuals, and waste may increase. However, the increased use of natural organics supplements and best farming practices to control insects and fertilize ranchland may decrease the potential influence from farming. Agricultural crop types and crop patterns are referenced in Section 4.2, *Urbanizaiton and Agricultural Land*, of this Background Report. Pesticide application permits are renewed on an annual basis by the County Agricultural Commissioner. Regulated commercial applications of pesticides are documented only on a monthly basis in an annual report submitted to the County. It is anticipated that pesticide inspections and management will become more responsive to growth and the use of pesticides and other nutrient specific applications by agricultural, residential, and commercial users in the future.

Land Application of Biosolids

Land application of biosolids, composed of treated municipal wastewater sludge, does not occur in San Benito County.

Methamphetamine

Based on conversations with County staff, over the past 20 years less than ten clandestine methamphetamine drug labs have been investigated. This figure is low compared to other nearby counties. The last investigation took place in 2005. Manufacturing or “cooking” of meth generates several different hazardous wastes. Common liquid, solid, and gaseous products (e.g., Drano, fuels, ether, batteries, acids, etc.) are used to make meth, and most are considered hazardous to the environment. These items are often discarded or dumped in the yard, buried, burned, or dumped down a sink or floor drain into septic/sewer systems or natural drainage ways.



SECTION 11.5 AIRPORT SAFETY

Introduction

This section summarizes existing information related to airport safety and operations. The concept of risk is central to the assessment of airport safety, as the location, time, and consequences of an aircraft accident cannot be predicted. The objective of air safety planning is to minimize the risks associated with a potential airport accident that would harm people and property on the ground or the occupants of aircraft.

Regulatory Setting

Federal

Federal Aviation Regulations. Federal Aviation Regulations (FAR) are rules prescribed by the Federal Aviation Administration (FAA) governing all aviation activities in the United States. FARs are part of Title 14 of the Code of Federal Regulations (CFR). A wide variety of activities are regulated, such as airplane design and manufacturing, how aircraft are flown, pilot training activities, hot air ballooning, and obstruction lighting and marking. The rules are designed to promote safe aviation to protecting pilots, passengers, and the general public from unnecessary risk.

Part 77, Federal Aviation Regulation. Part 77 of the FAR, Objects Affecting Navigable Airspace, establishes standards for determining obstructions to navigable airspace, and the effects of such obstructions on the safe and efficient use of that airspace. The regulations require that the FAA be notified of proposed construction or alteration of objects—whether permanent, temporary, or of natural growth—if those objects would be of a height that exceeds the FAR Part 77 criteria. The height limits are defined in terms of imaginary surfaces in the airspace extending from two to three miles around airport runways and approximately 9.5 miles from the ends of runways with a precision instrument approach.

Section 44718(d), 49 United States Government Code. This Federal statute prohibits new “municipal solid waste landfills” within six miles of airports that receive FAA grants, and that primarily serve general aviation aircraft and scheduled air carrier operations using aircraft with less than 60 passenger seats. A landfill can only be built within six miles of this class of airport if the FAA concludes that its construction and operation would have no adverse effect on aviation safety.

Federal Aviation Administration

The FAA’s Airport Safety Program ensures that public-use airports are operated in a safe and efficient manner. The FAA Airport Safety and Operations Division has primary responsibility for the safety and certification of airports and aircraft. The FAA establishes and enforces standards, specifications, and recommendations for the safe operation and design of commercial and general aviation airports. For example, the FAA prepares Advisory Circulars (AC) for airport facilities that provide recommendations for airport design, describe acceptable requirements to develop airports, and establish standards for determining when man-made objects are an obstruction to air navigation. AC applies to all applicants proposing to construct or activate an airport or a heliport.

Land use safety compatibility guidance from the FAA is limited to the immediate vicinity of the runway, the runway protection zones at each end of the runway, and the protection of navigable airspace. Additionally, the FAA criteria apply only to property controlled by the airport proprietor. The FAA has no authority over off-airport land uses; its role focuses on the safety of aircraft operations. The FAA's only leverage in promoting compatible land use planning is through grant assurances, which airport proprietors must sign in order to obtain Federal funding for airport improvements.

The Federal requirement that notification be submitted to the FAA prior to construction is the principal strategy of mitigating hazards within the vicinity of an airport. In accordance with FAR Part 77, the FAA conducts an aeronautical study of proposed construction and determines whether the use would be a hazard to air navigation. The evaluation considers only the height of a proposed structure. The FAA may recommend removal, marking, or lighting the obstruction(s). In addition, FAR Part 157, Notice of Construction, Alteration, Activation and Deactivation of Airports require any entity that intends to construct or establish a new airport or heliport to submit a FAA Form 7480-1 to the FAA at least 90 days prior to construction. This triggers the FAA to issue an "Airspace Determination" based on the safe and efficient use of airspace, existing and contemplated traffic patterns, airspace structure, and effects on man-made objects and terrain within an airport facility.

The FAA also provides advice on avoiding certain land uses on or near an airport that could endanger or interfere with the landing, taking off, or maneuvering of an aircraft at an airport. Specific land use characteristics to be avoided include:

- Attractiveness to birds and other wildlife
- Creation of glare, dust, steam, or smoke which may impair pilot visibility
- Lights that can be mistaken for airport lights
- Production of electronic interference with aircraft communications or navigation

Because the FAA has no authority over local land use, mitigating potential hazards falls within the control of State and local land use authorities, including the Airport Land Use Commission (ALUC).

State

Section 17215, State Education Code. This section requires that, before acquiring title to property for a new school site situated within two miles of an airport runway, a school district must notify the Department of Education (DOE). The DOE then notifies the Department of Transportation, which is required to investigate the site and prepare a written report. If the Department of Transportation report does not favor acquisition of the site for a school, no State or local funds can be used for site acquisition or building construction on that site.

Section 81033, State Education Code. This section establishes the same requirements as Section 17215, but for the acquisition of community college sites.

Section 21001 et seq., State Public Utilities Code, State Aeronautics Act. The State Aeronautics Act provides for the right of flight over private property, unless conducted in a dangerous manner or at altitudes below those prescribed by Federal authority (Section 21403(a)). The act also gives the State Department of Transportation and local governments the authority to protect the airspace defined by



FAR Part 77 criteria. It prohibits any uses in the airspace above a property which would interfere with the right of flight, including established approaches to a runway (Section 21402). The act also prohibits any person from constructing any structure or permitting any natural growth of a height which would constitute a hazard to air navigation as defined in FAR Part 77 unless the department issues a permit (Section 21659). The permit is not required if the FAA has determined that the structure or growth does not constitute a hazard to air navigation or would not create an unsafe condition for air navigation. The act also gives the State Department of Transportation (Caltrans), Division of Aeronautics, the authority to regulate airports and issue airport site approval permits and operating permits to airports meeting airport standards prescribed under California Code of Regulations Title 21, Sections 3525 through 3560, Airports and Heliports.

California Airport Land Use Planning Handbook (2002). The California Airport Land Use Planning Handbook (Handbook) provides examples of safety zones for five types of general aviation runways, an air carrier runway, and a military runway. These safety zones subdivide the airport vicinity into as many as six safety zones. The shapes and sizes of the zones are largely based on the spatial distribution of aircraft accidents. Each safety zone is characterized by a risk level that is distinct from the other zones. The Handbook provides a qualitative description of the land use characteristics considered acceptable or unacceptable within each of the six basic safety zones. The Handbook also presents a set of specific safety compatibility criteria guidelines formulated to limit the number of people residing and working in areas exposed to greater risk of an aircraft accident.

Local Regulations

San Benito County Municipal Code

Airport Safety Overlay Zone (Ordinance NO. 523) (1987). San Benito County adopted an airport safety overlay zone southwest of the Hollister Municipal Airport to assure land use compatibility and safety of persons and property.

San Benito County General Plan (Existing)

The Existing San Benito County General Plan contains several goals, policies, and implementation plans in its Transportation Element that pertain to airport safety.

Transportation Element

Policy 28. Prohibit land use activities within unincorporated areas which interfere with the safe operation of aircraft or that would be subject to hazards from the operation of aircraft.

Actions

- a. Add airport clear zones to the General Plan Land Use Map and Transportation Maps, and Zoning Maps (see Appendix A).
- b. Establish airport clear zones for airports (public or private) that have not developed the zones to date.

- c. The land use map shall be amended, where necessary, to avoid potential land use conflicts with airports.
- d. Coordinate County land use planning around airports with airport land use planning approved by the Airport Land Use Commission.

Policy 29. Restrict new development in existing or planned Airport Clear zones, in concurrence with requirements of the FAA and of the cities operating the facility to land uses such as agriculture, open spaces, parks, and municipal facilities.

Policy 30. Control the location, development, and use of private airstrips and agricultural landing fields.

Actions

- a. New air strips may not intrude upon prime agricultural land.
- b. Sites for proposed air strips must be outside of air traffic control zones and a safe distance from existing airports (generally three miles).
- c. Sites for proposed air strips must be a reasonable distance from residential areas and compatible with the surrounding neighborhood.
- d. The total number of airplanes at any private air strip should be limited to those of the owners.
- e. A drainage plan for the air strip must be approved by the Department of Public Works if significant drainage problems are identified.

San Benito County Comprehensive Airport Land Use Plan (2001)

The 2001 San Benito County Comprehensive Land Use Plans for the Hollister Municipal Airport and the Frazier Lake Airpark establish land use compatibility guidelines, noise restriction areas, height restriction areas, safety restriction areas, and overflight restriction areas for each airport in the plan. The plans are intended to safeguard the safety of the residents and businesses around the airports, and to ensure that future development and land uses do not negatively impact the continued operations of the airports.

The airport land use zones described in the plans are based on Federal Part 77 airspace standards. Within each zone, the airport land use guidelines control both the heights of structures and the type of land uses. The plans also include intensity restrictions which limit the number of people that may congregate within a specific area. These restrictions are meant to reduce risk to people on the ground in the event of an aircraft accident, and to minimize hazards to aircraft flight.

San Benito County Airport Land Use Commission

The San Benito Council of San Benito County Governments serves as the Airport Land Use Commission (ALUC) for San Benito County. The ALUC was established in 1989. It makes recommendations to the City of Hollister and the San Benito County Board of Supervisors regarding any commercial or residential development near public use airports in the county. It also provides for orderly growth of the county's two public airports and any surrounding airports within the jurisdiction of the Commission. The ALUC



ensures compatible land uses around both the Hollister Municipal Airport and the Frazier Lake Airport through the implementation of their respective Comprehensive Land Use Plans (CLUP).

Major Findings

- There are two public-use airports, one permitted private airport, and three heliports in the county.
- The San Benito County Comprehensive Airport Land Use Plan (2001) establishes safety policies for the two public airports in San Benito County.
- Safety zones and information on the county's private-use airports and heliports are not included in the 2001 Comprehensive Airport Land Use Plan. Most of these facilities have few aircraft operations because they are used for emergency purposes. Therefore, the level of risk due to air safety hazards is low.
- There were approximately 145 based aircraft at the Hollister Municipal Airport in 1997, and 204 were expected to be based at the airport in 2010. Forecasts show a maximum of 265 aircraft, including single-engine, multi-engine propeller, multi-engine jet, and helicopters could be based at the airport by 2020. Total operations are also expected to increase from 53,000 operations per year in 1997 to 92,100 in 2010, and to 136,200 by 2020. General operations are forecast to account for the largest share of total operations at the airport through 2020.
- The Frazier Lake Airpark had 79 based aircraft in 1998 and was expected to have 100 in 2010. By 2020 the number of aircraft is expected to increase to 123. There were 9,800 aircraft operations per year in 1998. Annual operations are expected to increase to 15,900 in 2010, and to 23,900 by 2020.

Existing Conditions

There are three main components of aircraft accident risk: the spatial distribution of accidents relative to airport runways; the frequency of accident occurrence; and the potential consequences of an accident. These components vary depending upon the types of aircraft that use a runway, the types of flight procedures available, other airport characteristics, and the nature of land uses surrounding an airport.

The basic strategy for minimizing risks to people on the ground near airports is to limit the number of people who might gather in areas most susceptible to aircraft accidents. For example, certain land uses represent special safety concerns regardless of the number of people associated with those uses. Land uses of particular safety concern are those where the occupants have reduced effective mobility or are unable to respond to emergency situations. These uses include children's schools, hospitals, nursing homes, and other sensitive uses in which the majority of occupants are children, elderly, and/or handicapped or otherwise disabled. Societal views also require a greater degree of protection for residential uses. Other types of land use sensitive to airport risks include an industrial or public use or uses where the consequences of an accident will affect a wide geographical area. The third category of risks sensitive land uses are those that process or store hazardous materials (e.g., oil refineries, chemical plants). Materials that are flammable, explosive, corrosive, or toxic pose special safety compatibility

concerns to the extent that an aircraft accident could cause release of the materials, and thereby pose dangers to people and property in the vicinity.

The principal means of minimizing hazards to occupants of aircraft is to preclude land use features that create physical, visual, or electronic hazards to flight, or cause a loss in airport utility. Airspace protection includes several different land use characteristics, such as limitations on the height of structures, lighting features, smoke or glare generation, attractiveness to birds, adverse effects on runway approach, and other operational restrictions.

San Benito County has two public airports, one private airport, three heliports, and several private landing strips. The majority of the larger and more frequently used airports are located in the northern portion of the county. However, the California Department of Forestry (CDF) operates one heliport at the Bear Valley Station, another heliport in Hollister, and a helitack station in Bitterwater, south of Pinnacles National Monument. The Bear Valley Station and the helitack station in Bitterwater are both in the southern portion of the county.

Public-Use Airports

There are two public-use airports located in San Benito County, the Hollister Municipal Airport and Frazier Lake Airpark, both located near Hollister.

Hollister Municipal Airport

The Hollister Municipal Airport is located in the north central part of the county near the northern edge of the city of Hollister, approximately 45 miles southeast of San Jose and 40 miles northeast of Monterey (Figure 11-14). It is located on approximately 343 acres at 233 feet above mean sea level. The airport is owned and operated by the City of Hollister, and is classified as a General Utility (GU) airport that accommodates all general aviation aircraft except certain business jets. General Aviation airports are often located in communities that do not receive scheduled commercial service, have adequate activity, and are at least 30 minutes from the nearest airport included in the National Plan of Integrated Airport Systems (NPIAS).

The existing airfield consists of two intersecting runways, each equipped with medium-intensity runway lights and runway end identification lights. The main entrance to the airport is on the east side, from San Felipe Road (State Route 156). There are approximately 100 aircraft tiedown spaces and approximately 50 T-hangars in the area. Jet fuel is available 24 hours a day from an automated fueling system. Other services at the airport include aircraft maintenance, pilot supplies, flight instruction, scenic rides, fabric repair, and turbine engine repair. Cropdusting activities serving the surrounding agricultural uses also operate from the airport.

Approximately 145 based aircraft were stationed at the airport in 1997, and 204 are expected to be based at the airport in 2010. Forecasts suggest that there may be as many as 265 aircraft, including single-engine, multi-engine propeller, multi-engine jet, and helicopters based at the airport in 2020. Total operations are also expected to increase from 53,000 operations per year in 1997 to 92,100 in 2010, and to 136,200 by 2020. General operations are forecast to continue to account for the largest share of total operations at the airport through 2020.



The airport property is within the Hollister city limits, and areas to the southwest, southeast, and south of the airport are primarily within the city limits or the city's sphere of influence. Most of the surrounding land uses to the southwest and southeast are reserved for light industrial uses, and the area to the southwest of the airport includes an airport overlay zoning district. The majority of the land to the northwest, north, and northeast of the airport is agricultural rangeland, and the areas directly to the west are zoned for light industrial uses.

Frazier Lake Airpark

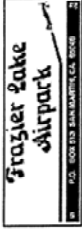
The Frazier Lake Airpark is located in the northwest area of San Benito County, approximately eight miles northwest of Hollister, 40 miles southeast of San Jose, and 40 miles northeast of Monterey (Figure 11-15). The airport is located on 156 acres of land and at an elevation of 153 feet above mean sea level. It is owned and operated by the Frazier Lake Airpark Corporation.

Frazier Lake Airpark is classified as a General Aviation Airport that does not support regularly scheduled commercial air-carrier service. Hollister Municipal Airport, which is located approximately six miles to the southeast, is the nearest NPIAS airport to Frazier Lake Airpark. Other general aviation airports in the region include South County Airport, located 10 miles to the northwest, Watsonville Municipal Airport, located 16 miles to the west, and Salinas Municipal Airport, located 19 miles to the south.

The existing Frazier Lake Airpark consists of two parallel runways. It is unique in that one of the runways contains irrigated turf and the other runway surface consists of water, which often attracts pilots from other airports due to the experience of landing on a grass or a water surface. The grass runway is approximately 2,500 feet long by 100 feet wide, and equipped with low-intensity runway lights. The other runway is the waterway (or seaplane lane) that runs approximately 3,000 feet long by 60 feet wide by 24 inches deep. This runway does not have lights, and is intended for daytime use only. The main entrance to the airpark is on the west side of the airport and the aircraft basing areas are located on the northwest side of the airport. There are 20 aircraft tiedown spaces and hangar space for 89 aircraft.

The number of based aircraft at the airpark is forecast to increase from 79 in 1998 to 100 in 2010, and to 123 by 2020. This equates to a 36 percent increase over the number of aircraft registered at the airpark in 1998. The number of aircraft operations per year was 9,800 in 1998, and annual operations are expected to increase to 15,900 in 2010, and to 23,900 by 2020. The growth in the forecast is due in part to the population increases proposed for the county.

Federal, State, and local regulations and guidance addressing safety compatibility concerns are provided for public-use airports as well as military facilities. Although the San Benito County Airport Land Use Commission provides recommended safety compatibility criteria, and maps both public airports in their respective compatibility plans, implementation of these compatibility measures is the responsibility of the County.



AIRPORT SAFETY ZONES



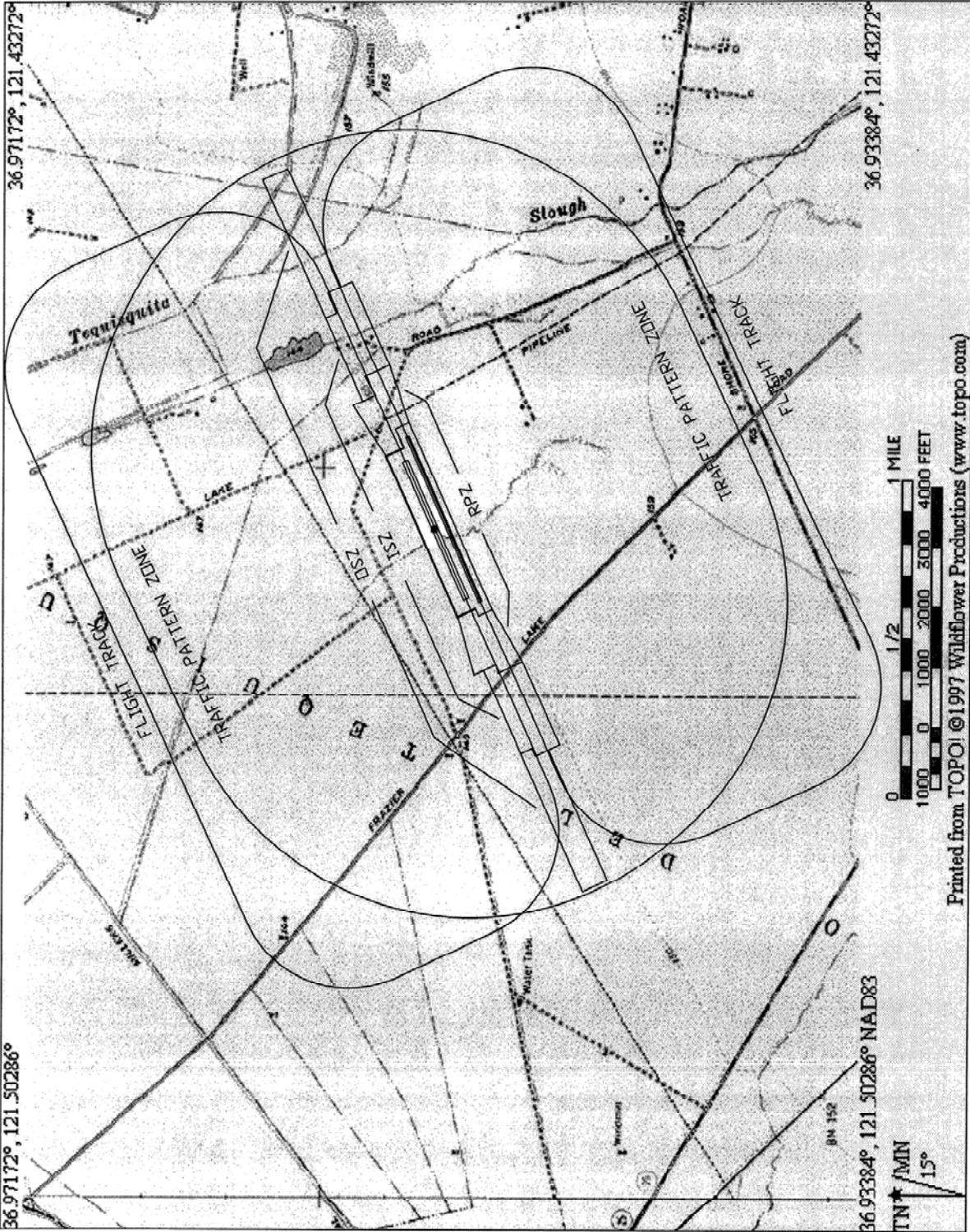
NOTE: THIS DRAWING IS FOR PLANNING PURPOSES ONLY AND IS NOT INTENDED FOR CONSTRUCTION OR NAVIGATIONAL PURPOSES.

NO.	DATE	REVISIONS

AAA APPROVED:
REFER TO LETTER DATED

WALTER WINDUS, PE

FRASER LAKE AIRPARK
SAN BENTO COUNTY, CALIFORNIA
PROJECT 6
7
NAME: W. WINDUS
DATE: 02-26-2011
SCALE: 1"=400' (AS SHOWN)



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Private-Use Airports

Christensen Ranch Airport

There is only one known private-use airport in unincorporated San Benito County, the Christensen Ranch Airport, located approximately three miles northeast of Hollister. This private airport contains one 3,000-foot-long and 50-foot-wide oil-treated runway and two based aircraft. Unlike public-use airports, certain types of private-use facilities (e.g., agricultural and personal-use airports in unincorporated areas) do not need operating permits from the California Department of Transportation. Few safety compatibility guidelines and standards exist for these types of facilities, and safety compatibility concerns are addressed primarily through the County's permit process.

Heliports

The heliports and helitack in the county are primarily used for emergency services. One heliport is located near Hazel Hawkins Memorial Hospital in Hollister. This heliport contains a helipad that is used to provide life-saving flight air travel to larger hospitals in the area. There is also a heliport owned and managed by the California Department of Forestry (CDF) at the Hollister Air Attack Base and another at the Bear Valley Helitack in Paicines.

Other Nearby Airports

South County Airport

South County Airport is located in the southeast area of Santa Clara County along US 101, between the cities of Morgan Hill and Gilroy. It is located on 129 acres of land, and sits at an elevation of 281 feet above mean sea level. The airport is owned by Santa Clara County and it is surrounded by the community of San Martin. It is one of the smallest and least active General Aviation airports in the Santa Clara County.

It had approximately 80 based aircraft in 2001, with 240 anticipated by 2012. A maximum of 300 aircraft are expected by 2022. There were a total of 56,000 airport operations in 2001; operations are expected to reach 175,560 by 2022. Because the airport has a full range of aircraft parking, storage facilities, fueling facilities, and support operations, and is currently developing a new master plan involving a significant expansion, it is expected to experience an increase in flight activity. Its latest Comprehensive Land Use Plan (CLUP) was adopted by the ALUC in November 2008.

Watsonville Municipal Airport

The Watsonville Municipal Airport is located on the northwest boundary of the city of Watsonville in the southern portion of Santa Cruz County. It covers approximately 344 acres, including 53 acres of non-contiguous land. The airport is accessible from U.S. Highway 1, and via Airport Boulevard. Residential uses occur to the north and east of the airport, light industrial uses and the Watsonville Community Hospital are located in the southeast, and much of the land uses along the runway approaches to the north, west, and south consist of agricultural uses.

Watsonville Municipal Airport is the only public, general aviation airport in Santa Cruz County. It is owned by the City of Watsonville. It currently has two paved runways serving single and twin-engine



aircraft and helicopters. In 2002 the airport began working on a master plan to lengthen and improve its runways, install new precision instrument landing systems, expand its terminal and hangar facilities, and provide new access to the site.

SECTION 11.6 AIR QUALITY

Introduction

Air quality is an important natural resource that influences public health and welfare, the economy, and quality of life. Air pollutants have the potential to adversely impact public health, the production and quality of agricultural crops, visibility, native vegetation, and buildings and structures. This section describes Federal and State ambient air quality standards, local air quality planning and management, and existing air quality conditions. The information contained in this section was obtained from various sources including the California Air Resources Board (CARB) and the Monterey Bay Unified Air Pollution Control District (MBUAPCD).

Key Terms

Ambient Air Quality Standards. These standards measure outdoor air quality. They identify the maximum acceptable average concentrations of air pollutants during a specified period of time. These standards have been adopted at both State and Federal levels.

Mobile Source. A moving source of air pollution such as on-road or off-road vehicles, boats, airplanes, lawn equipment, and small equipment engines.

Nitrogen Oxides (NO_x). NO_x are composed of nitric oxide (NO), nitrogen dioxide (NO₂) and other oxides of nitrogen. NO_x are primarily created from the combustion process and are a major contributor to smog and acid rain formation.

Ozone Precursors. There are several chemical steps in creating ozone. Ozone precursors are chemicals that lead to the eventual creation of ozone. Ozone precursors occur either naturally, or as a result of human activities such as the use of combustion engines. Ozone is a pungent, colorless, toxic gas created in the atmosphere rather than emitted directly into the air. Ozone is produced in complex atmospheric reactions involving oxides of nitrogen and reactive organic gases, acting with ultraviolet energy from the sun in a photochemical reaction.

PM₁₀. Dust and other particulates exhibit a range of particle sizes. Federal and State air quality regulations reflect the fact that smaller particles are easier to inhale and can be more damaging to health. PM₁₀ refers to dust and particulates that are 10 microns in diameter or smaller.

PM_{2.5}. PM_{2.5} refers to dust and particulates that are 2.5 microns in diameter or smaller.

Reactive Organic Gases (ROG). ROG are photochemically reactive and are composed of non-methane hydrocarbons. These gases contribute to the formation of smog.

North Central Coast Air Basin (NCCAB). An air basin is a geographic area that exhibits similar meteorological and geographic conditions. California is divided into 15 air basins to assist the statewide

regional management of air quality issues. The NCCAB includes San Benito, Santa Cruz, and Monterey Counties.

Sensitive Receptors. Populations or uses that are more susceptible to the effects of air pollution than the general population, such as long-term health care facilities, rehabilitation centers, retirement homes, convalescent homes, residences, schools, childcare centers, and playgrounds.

Stationary Source. A non-mobile source of air pollution such as a power plant, refinery, distribution center, chrome plating facility, dry cleaner, port, rail yard, or manufacturing facility.

Regulatory Setting

Air quality is described for a specific location as the concentration of various pollutants in the atmosphere. Air quality conditions at a particular location are a function of the type and amount of air pollutants emitted into the atmosphere, the size and topography of the regional air basin, and the prevailing meteorological conditions.

Federal and State ambient air quality standards establish acceptable thresholds for several different pollutants. These thresholds are expressed in maximum allowable concentrations, typically in units of parts per million (ppm) or in micrograms per cubic meter ($\mu\text{g}/\text{m}^3$). Generally, these standards have been set to protect public health. A summary of State and Federal ambient air quality standards is shown in Table 11-12.

Federal

Federal Clean Air Act. The 1970 Federal Clean Air Act (CAA) established national health-based air quality standards and set deadlines for their attainment. The Federal Clean Air Act Amendments of 1990 (1990 CAA) made major changes in deadlines for attaining National Ambient Air Quality Standards (NAAQS) and in the actions required of areas that exceeded these standards. Under the CAA, State and local agencies in areas that exceed the NAAQS are required to develop State Implementation Plans (SIP) to show how they will achieve the NAAQS. The United States Environmental Protection Agency (EPA) is responsible for enforcing the NAAQS primarily through reviewing and approving SIPs that are prepared by each State.

Clean Air Ozone Rules. The Clean Air Ozone Rules of the CAA, effective June 15, 2005, replaced the NAAQS 1-hour ozone standard with an 8-hour ozone standard and outlined a process for reducing ground level ozone pollution. This rule also issued new designations on attainment and nonattainment. Major programs that were once in effect under the 1-hour ozone standard but no longer apply include: 1-hour transportation conformity; 1-hour de minimus thresholds for general conformity; Section 185 fees formerly triggered by failure to attain the Federal 1-hour ozone standard; and a requirement to retain a nonattainment New Source Review program in the SIP.

State

California Air Resources Board (CARB). In California, CARB is responsible for preparing and enforcing the Federally-required SIP in an effort to achieve and maintain NAAQS and State Ambient Air Quality Standards (SAAQS), which were developed as part of the California CAA adopted in 1988. SAAQS for criteria pollutants equal or surpass NAAQS, and include other pollutants for which there are no NAAQS.



In addition, CARB is responsible for assigning air basin attainment and nonattainment designations in California. Air basins are designated as being in attainment if the concentrations of a criteria air pollutant meet or are less than the SAAQS for the pollutant. Air basins are designated as being in nonattainment if the level of a criteria air pollutant is higher than the SAAQS. CARB is the oversight agency responsible for regulating statewide air quality, but implementation and administration of SAAQS is delegated to several regional air pollution control districts (APCD) and air quality management district (AQMD). These districts have been created for specific air basins, and have principal responsibility for developing plans to meet SAAQS and NAAQS, developing control measures for non-vehicular sources of air pollution necessary to achieve and maintain SAAQS and NAAQS, implementing permit programs established for the construction, modification, and operation of air pollution sources, enforcing air pollution statutes and regulations governing non-vehicular sources, and developing employer-based trip reduction programs.

TABLE 11-12 AMBIENT AIR QUALITY STANDARDS California 2010			
Pollutant	Averaging Time	California Standards Concentration	National Standards Concentration
Respirable Particulate Matter (PM ₁₀)	24-hour	50 µg/m ³	150 µg/m ³
	Annual Arithmetic Mean	20 µg/m ³	---
Fine Particulate Matter (PM _{2.5})	24-hour	---	35 µg/m ³
	Annual Arithmetic Mean	12 µg/m ³	15.0 µg/m ³
Carbon Monoxide	8-hour	9.0 ppm (10 mg/m ³)	9 ppm (10 mg/m ³)
	1-hour	20 ppm (23 mg/m ³)	35 ppm (40 mg/m ³)
Nitrogen Dioxide	Annual Arithmetic Mean	0.030 ppm (57 µg/m ³)	0.053 ppm (100 µg/m ³)
	1-hour	0.18 ppm (339 µg/m ³)	0.100 ppm
Lead	30 Day Average	1.5 µg/m ³	---
	Calendar Quarter	---	1.5 µg/m ³
Sulfur Dioxide	Annual Arithmetic Mean	---	0.030 ppm (80 µg/m ³)
	24-hour	0.04 ppm (105 µg/m ³)	0.14 ppm (365 µg/m ³)
	3-hour	---	---
	1-hour	0.25 ppm (655 µg/m ³)	---
Sulfates	24-hour	25 µg/m ³	No Federal Standard
Hydrogen Sulfide	1-hour	0.03 ppm (42 µg/m ³)	No Federal Standard

Source: California Air Resources Board, 2010a. Ambient Air Quality Standards. Updated February 16, 2010. Available: <http://www.arb.ca.gov/research/aaqs/aaqs2.pdf>.



Legend



North Central Coast Air Basin



Source: NCCAB, 2010



Figure 11-6-1
North Central Coast Air Basin



North Central Coast Air Basin. To regulate air pollutant emissions within California, the state has been divided into 15 air basins based upon similar meteorological and geographic conditions. San Benito, Monterey, and Santa Cruz Counties are located within the North Central Coast Air Basin. Figure 11-16 shows the location of the county in relation to the air basin.

Local

Monterey Bay Unified Air Pollution Control District. The Monterey Bay Unified Air Pollution Control District (MBUAPCD) is the lead air quality regulatory agency for the NCCAB and has jurisdiction over all point and area sources (except for mobile sources, consumer products, and pesticides). MBUAPCD and CARB have joint responsibility for attaining and maintaining the NAAQS and SAAQS in the Air Basin. MBUAPCD’s primary approach to implementing air quality plans is through adopting rules and regulations. The district has permit authority over jurisdictional stationary sources. The district’s “CEQA Air Quality Guidelines” provides lead agencies, consultants, and project applicants with uniform procedures for addressing air quality impacts in environmental documents.

North Central Coast Air Basin Attainment Status. The Air Basin is in “moderate” nonattainment for the State one-hour ozone standard, nonattainment for the State eight-hour ozone standard, and unclassified/attainment for the Federal eight-hour ozone standard. The Air Basin is also in attainment/classified for the PM₁₀ and PM_{2.5} Federal standards and the PM_{2.5} State standard, but is in nonattainment for the State PM₁₀ standards (Table 11-13). Because of the nonattainment status of the Air Basin for these pollutants, the MBUAPCD is required to prepare ozone and PM₁₀ attainment plans that identify the regulatory framework necessary to bring the NCCAB into compliance with the ozone and PM₁₀ SAAQS. Each plan is described below.

TABLE 11-13 NORTH CENTRAL COAST AIR BASIN ATTAINMENT STATUS		
California 2010		
Pollutant	State of California Attainment Status	Federal Attainment Status
Ozone – 1-hour	Nonattainment/Moderate	No Federal Standard (formerly classified as Extreme)
Ozone – 8-hour	Nonattainment	Unclassified/Attainment
PM10	Nonattainment	Unclassified/Attainment
PM2.5	Attainment	Unclassified/Attainment
Carbon Monoxide	Unclassified	Unclassified/Attainment
Nitrogen Dioxide	Attainment	Unclassified/Attainment
Lead	Attainment	No designation
Sulfur Dioxide	Attainment	Unclassified
Sulfates	Attainment	No Federal Standard
Hydrogen Sulfide	Unclassified	No Federal Standard

Source: California Air Resources Board, 2010b. Area Designations. Updated May 10, 2010. Available: <http://www.arb.ca.gov/desig/desig.htm>.

2008 Ozone Air Quality Management Plan

The MBUAPCD's 2008 ozone Air Quality Management Plan (AQMP) is a transitional plan shifting focus from achieving the 1-hour component of the State AAQS to achieving the 8-hour requirement. The plan includes an updated air quality trends analysis, which now reflects the 1 and 8-hour standards, as well as an updated emission inventory, which includes the latest information on stationary, area, and mobile emission sources.

Although the Air Basin actually achieved the 1-hour standard in 2006, this was the same year the 8-hour standard was introduced. Consequently, in November 2006, the ARB designated the NCCAB as a nonattainment area for the SAAQS for ozone.

The 2008 AQMP includes five control measures from the 2004 AQMP, whose development was put on hold pending progress toward achieving the 1-hour standard. Since the introduction of the 8-hour standard, the area has reverted to nonattainment. Consequently, the 2008 AQMP proposes to follow through on the development and implementation of five previously adopted measures:

- Solvent Cleaning Operations;
- Degreasing Operations;
- Spray Booths - Miscellaneous Coatings and Cleanup Solvents;
- Adhesives and Sealants; and
- Natural Gas-Fired Fan-Type Central Furnaces and Residential Water Heaters (MBUAPCD 2008b).

2007 Federal Ozone Maintenance Plan

The MBUAPCD prepared a Federal ozone maintenance plan for maintaining the national ozone standard in the Monterey Bay Region. The plan was prepared according to the EPA's "Maintenance Plan Guidance Document for Certain 8-Hour Ozone Areas under Section 110(a)(1) of the Clean Air Act," dated May 20, 2005. This guidance established planning requirements for areas such as the NCCAB, which are attainment for the 8-hour NAAQS for ozone and have an approved Federal maintenance plan for the previous 1-hour standard.

2005 Particulate Matter Plan

In 2005 the MBUAPCD prepared a report on achieving attainment of the California particulate matter standards in the Monterey Bay region (MBUAPCD 2005). That report included several measures designed to reduce particulate matter emissions for a wide variety of sources. In addition, the report included contingency measures to be implemented should the proposed measures be insufficient to bring the NCCAB into attainment with the State particulate matter standards.

Air Toxics and Sensitive Receptors. CARB research is substantiating the health risks to sensitive populations from exposure to high levels of air toxics. Air toxics sources include high traffic freeways and roads, distribution centers, rail yards, ports, refineries, chrome plating facilities, dry cleaners, and large gas dispensing facilities. Air toxic sources generate high levels of diesel particulate matter emissions and other cancer causing chemicals. CARB is suggesting local jurisdictions adopt land use policies to separate



sensitive land uses a minimum of 500 to 1,000 feet from air toxic sources. Where this minimum separation is not achievable, CARB is recommending local jurisdictions perform health risk assessments to determine the cancer risk potential of individual land use proposals locating an air toxics source (e.g., high volume freeway) close to a sensitive land use (e.g., residential uses) (CARB 2005).

Major Findings

- San Benito County is within the North Central Coast Air Basin (NCCAB). The basin is currently (2010) listed as follows:
 - State one hour ozone standard = moderate nonattainment
 - State eight hour ozone standard = nonattainment
 - State PM_{2.5} standard = attainment/classified
 - State PM₁₀ standard = nonattainment
 - Federal eight hour ozone standard = unclassified/attainment
 - Federal PM₁₀ and PM_{2.5} standard = attainment/classified
- The basin is currently (2010) has a nonattainment status for ozone and particulate matter pollutants. As a result, MBUAPCD is preparing ozone and PM₁₀ attainment plans that will identify new regulations necessary to bring the basin into compliance.
- Emission sources within the county include major reactive organic gases (ROG), nitrogen oxide (NO_x), fugitive dust (PM₁₀), and fine particulates (PM_{2.5}). The major sources of these emissions include:
 - ROG = solvent evaporation, farming, and managed burning
 - NO_x = motor vehicles
 - PM₁₀ = unpaved roads, wind erosion, and agricultural tillage
 - PM_{2.5} = managed burning and the combustion of fossil fuels
- Emissions data collected between 2005 and 2009 from both the Pinnacles National Monument and the Hollister-Fairfield Road air quality monitoring stations show violations for the Federal eight-hour and State one-hour ozone standards. However, there were no violations of either the Federal or State PM₁₀ and PM_{2.5} standards.

Existing Conditions

Climate and Atmospheric Conditions

San Benito County is located within the North Central Coast Air Basin (NCCAB). The basin covers 5,159 square miles and also covers most of Monterey and Santa Cruz counties (Figure 11-16). The semi-permanent high pressure cell in the eastern Pacific is the basic controlling factor for the basin's climate. In the summer the high pressure cell is dominant and causes persistent west and northwest winds over the entire California coast. Air descends in the Pacific High forming a stable temperature inversion of hot air over a cool coastal layer of air. The onshore air currents pass over cool ocean waters to bring fog and relatively cool air into the coastal valleys. The warmer air aloft acts as a lid to inhibit vertical air movement.

During the summer the generally northwest-southeast orientation of mountainous ranges in the basin tend to restrict and channel onshore air currents. Surface heating in the interior portion of the Salinas and San Benito valleys creates a weak low pressure which intensifies the onshore air flow during the afternoon and evening.

During the Fall surface winds become weak and the marine layer grows shallow, dissipating altogether on some days. The air flow is occasionally reversed in a weak offshore movement and the relatively stationary air mass is held in place by the Pacific High pressure cell. This high pressure cell allows pollutants to build up over a period of a few days. This usually results in north or east winds developing that transport pollutants from either the San Francisco Bay area or the Central Valley into the basin.

During the winter the Pacific High migrates southward and has less influence on the basin. Air frequently flows in a southeasterly direction out of the Salinas and San Benito valleys, especially during night and morning hours. Northwest winds are still dominant in winter, but easterly flow is more frequent. The general absence of deep, persistent inversions and the occasional storm systems usually results in good air quality for the basin as a whole in winter and early spring.

The topography and climate for the basin influences air movement and air quality. The Monterey Bay, a 25-mile wide inlet, channels marine air at low levels towards San Benito County. The prevailing air flow during the summer months originates in the Monterey Bay area and enters the northern end of the San Benito Valley through the gap created by the Pajara River in the Gabilan Range. As a result, Hollister predominantly experiences westerly winds. This air flow pattern also frequently transports pollutants into the San Benito Valley from the Santa Clara Valley.

Existing Emission Sources

Ozone

Ozone (O₃) is a gas that is not emitted directly into the environment. Rather, it is generated from complex chemical reactions between reactive organic gases (ROG), non-methane hydrocarbons, and nitrogen oxides (NO_x) that occur in the presence of sunlight. Major ROG and NO_x generators in the basin include motor vehicles, solvent evaporation, farming, and managed burning. The total 2008 ROG and NO_x emissions in the county were 2,905 and 4,949 tons per year respectively. Figures 11-17 and 11-18 illustrate the 2008 sources of ROG and NO_x in the county.



FIGURE 11-17
2008 SOURCES OF ROG IN SAN BENITO COUNTY

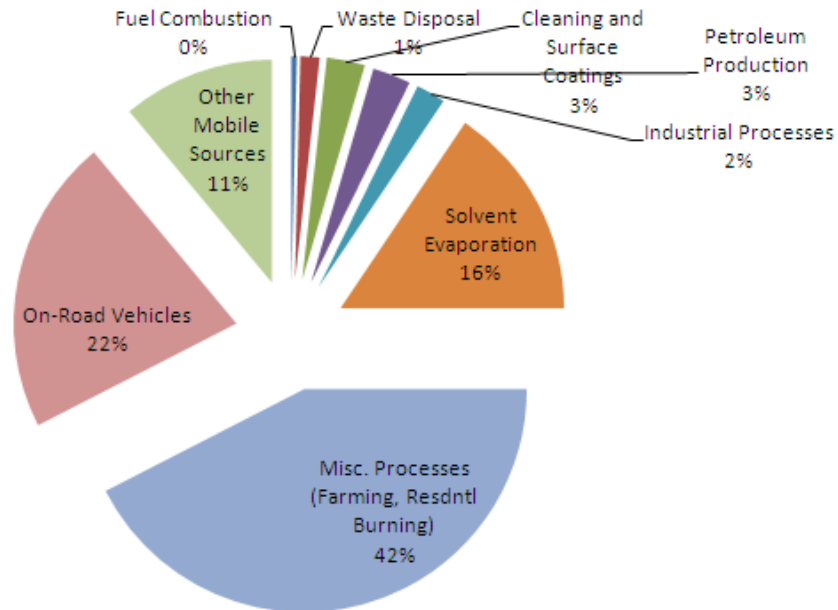
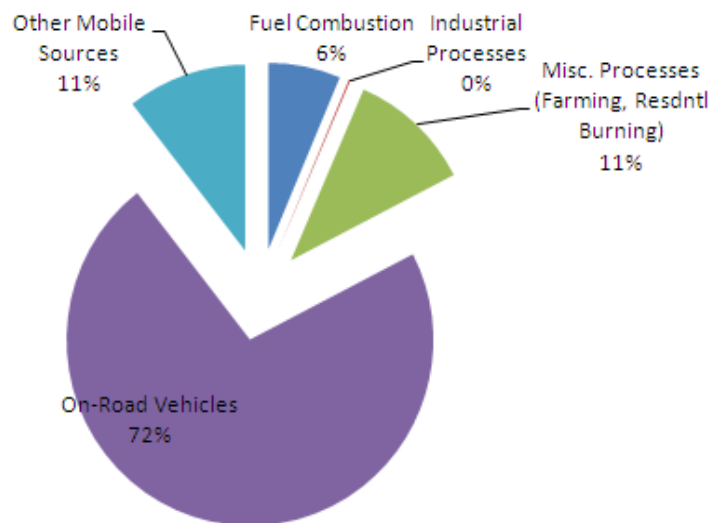


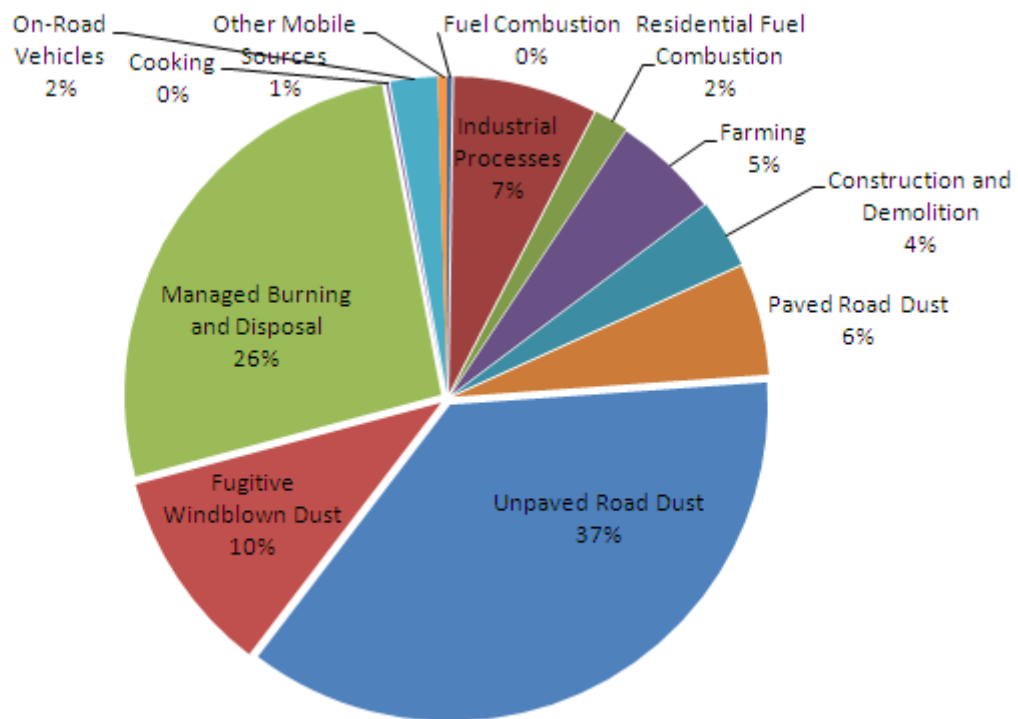
FIGURE 11-18
2008 SOURCES OF NO_x IN SAN BENITO COUNTY



PM₁₀

According to the National Emissions Trends inventory 89 percent of PM₁₀ emissions are due to fugitive dust. Nationally the main sources of fugitive dusts are unpaved roads (33 percent), wind erosion of natural soils (20 percent), tillage associated with agricultural production (17 percent), construction (14 percent), paved roads (9 percent), and other (2 percent). Approximately 80 percent of fugitive dust emissions are greater than 2.5 microns (µm). Major sources of PM₁₀ in the county include unpaved and paved road dust, managed burning and disposal, and windblown dust (Figure 11-19). The total 2008 PM₁₀ emissions in the county were 6,070 tons.

**FIGURE 11-19
2008 SOURCES OF PM₁₀ IN SAN BENITO COUNTY**

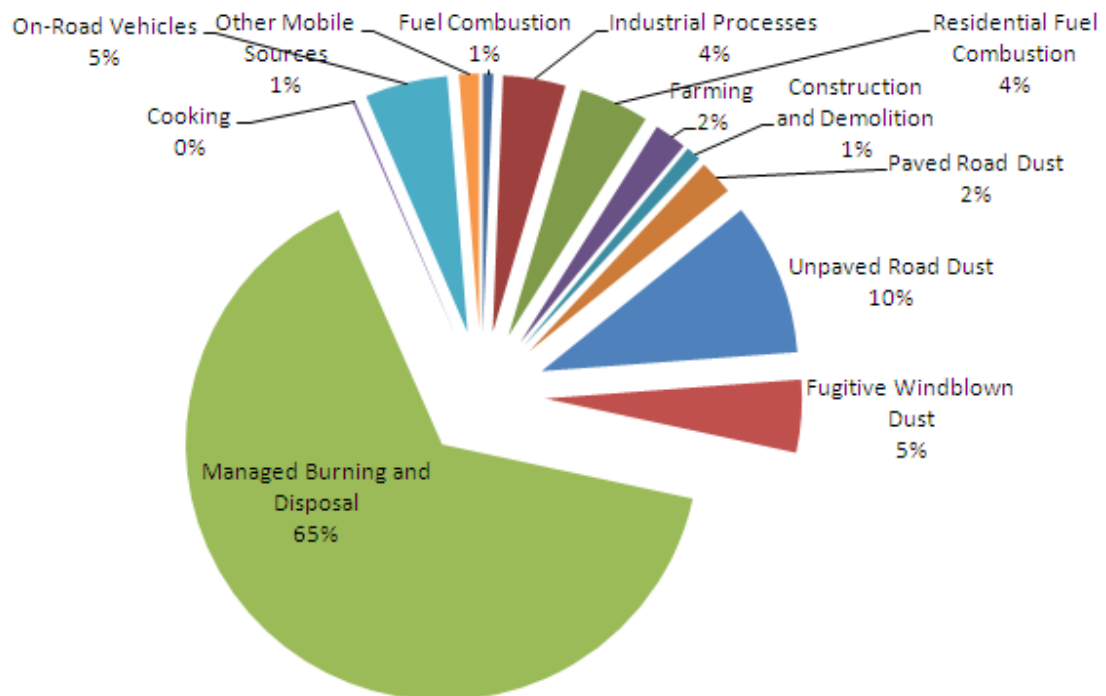




PM_{2.5}

PM_{2.5} is atmospheric particulate matter that has a particle size less than 2.5 μm in diameter. There are three primary origins of PM_{2.5}: primary solid particulate matter that is emitted directly in the solid phase; primary condensable particulate matter that can be emitted at high temperature in the gas phase, but condenses into the solid phase upon dilution and cooling; and secondary particulate matter that is formed through atmospheric reactions of gaseous sulfur dioxide (SO₂) and nitrogen oxide (NO_x) precursor emissions. These small particles can be inhaled into the lungs and have the potential to cause health-related impacts in sensitive persons. Primary solid particulate matter results largely from combustion of fossil fuels, biomass, and industrial processes. Sources of primary particulate also include fugitive dust emissions from paved and unpaved roads, crustal material from construction activities, agricultural tilling, and wind erosion. Primary condensable particulate matter is largely comprised of semi-volatile organic compounds that condense at ambient temperatures to form aerosols. Secondary PM_{2.5} forms through chemical reactions that convert common gaseous pollutants into very small particles. Secondary PM_{2.5} is dominated by sulfur and nitrogen species, but in some locations there can also be significant contributions from secondary organic aerosol. The major sources of PM_{2.5} in San Benito County include managed burning and disposal, unpaved road dust, and fugitive wind dust (Figure 11-20). Total to 2008 PM_{2.5} emissions in the county were 2,134 tons.

**FIGURE 11-20
2008 SOURCES OF PM_{2.5} IN SAN BENITO COUNTY**



Air Quality Monitoring and Existing Emission Levels

The California Air Resources Board (CARB) compiles air quality data from a regional air quality-monitoring network that provides information on ambient air pollutant concentrations of criteria air pollutants. Monitored ambient air pollutant concentrations reflect the number and strength of emission sources and the influence of topographical and meteorological factors. Table 11-14 presents a five-year summary of air pollutant data collected at two monitoring stations in the county. The Hollister-Fairfield Road station collects monitoring data for ozone and particulate matter. The Pinnacles National Monument monitoring station collects monitoring data for ozone.

Emissions during 2005 through 2009 show violations of Federal eight-hour and State one-hour ozone standards, but no violations of the Federal or State PM₁₀ or PM_{2.5} standards.

TABLE 11-14 SUMMARY OF ANNUAL AIR QUALITY DATA FOR SAN BENITO COUNTY AIR QUALITY MONITORING STATIONS California 2010					
Pollutant	2005	2006	2007	2008	2009
Ozone (O₃): Hollister-Fairfield Road					
Federal 8-hour Ozone Standard (0.075ppm)					
Maximum Concentration	0.070	0.087	0.074	0.072	0.073
Number of Days Federal Standard Exceeded	0	1	0	0	0
State 8-hour Ozone Standard (0.070 ppm)					
Maximum Concentration	0.071	0.088	0.074	0.073	0.074
Number of Days State Standard Exceeded	1	5	2	2	2
State 1-hour Ozone Standard (0.09 ppm)					
Maximum Concentration	0.087	0.099	0.087	0.090	0.093
Number of Days State Standard Exceeded	0	1	0	0	0
Ozone (O₃): Pinnacles National Monument					
Federal 8-hour Ozone Standard (0.075ppm)					
Maximum Concentration	0.085	0.088	0.083	0.094	0.073
Number of Days Federal Standard Exceeded	2	6	3	12	0
State 8-hour Ozone Standard (0.070 ppm)					
Maximum Concentration	0.085	0.089	0.084	0.095	0.073
Number of Days State Standard Exceeded	6	18	17	26	6
State 1-hour Ozone Standard (0.09 ppm)					
Maximum Concentration	0.107	0.105	0.100	0.102	0.088
Number of Days State Standard Exceeded	2	2	1	4	0



**TABLE 11-14
 SUMMARY OF ANNUAL AIR QUALITY DATA FOR SAN BENITO COUNTY
 AIR QUALITY MONITORING STATIONS**

California
 2010

Pollutant	2005	2006	2007	2008	2009
Suspended Particulates (PM₁₀): Hollister- Fairview Road					
State Standard (24-hr avg. 50 µg/m ³)					
Federal Standard (24-hr avg. 150 µg/m ³)					
Maximum 24-hr Concentration	36.0	45.0	40.0	39.0	35.0
Days Exceeding State Standards	0	0	0	0	0
Suspended Particulates (PM_{2.5}): Hollister- Fairview Road					
Federal Standard (24-hr avg. 35 µg/m ³)					
Maximum 24-hr Concentration	N/D	N/D	20.9	22.7	17.3
Days Exceeding Federal Standards	N/D	N/D	0	0	0

¹Underlined values in excess of applicable standard
 N/D = no data

Source: California Air Resources Board, 2010d. ADAM Air Quality Data Statistics. Top 4 Summary for San Benito County.
 Available: <http://www.arb.ca.gov/adam/index.html>