



5.8 GEOLOGY AND SOILS

The purpose of this section is to describe the geologic, soil, and seismic setting of Cambria, identify potential impacts associated with the proposed Project, and recommend mitigation measures to avoid or reduce the significance of such impacts.

EXISTING CONDITIONS

This section describes the regulatory setting and existing conditions regarding soils, geology, and erosion in Cambria. Existing conditions were identified through the review and compilation of existing information included in the following reference documents:

- ◆ *Cambria and San Simeon Acres Community Plans of the North Coast Area Plan Draft EIR*, May 18, 2005;
- ◆ *Cambria and San Simeon Acres Community Plans of the North Coast Area Plan Final EIR*, October 6, 2005;
- ◆ *North Coast Area Plan Cambria and San Simeon Acres Portions Updated* (November 6, 2007);
- ◆ *San Luis Obispo County Code*; and
- ◆ *Coastal Zone Land Use Ordinance*.

REGULATORY SETTING

The following local and State regulations apply to projects in Cambria and are designed for the protection of health and safety from geologic hazards.

Public Resources Code, Section 2621, et. seq.

The Alquist-Priolo Special Studies Zone Act of 1972 establishes criteria and policies to assist cities, counties, and State agencies in the exercise of their responsibility to prohibit the location of developments and structures for human occupancy across the trace of active faults, as defined by the State Mining and Geology Board.

Other State Regulatory Requirements

State Government Code Sections 17922, and 179511-17958.7 require cities and counties to adopt and enforce the Uniform Building Code (UBC), including a grading section, providing protection against some geologic hazards. The County of San Luis Obispo implements these provisions.

General Plan Safety Element

Government Code Section 65302.1 requires a Safety Element for the protection of the community from geologic hazards, and must include features designed to minimize risks associated with these hazards. San Luis Obispo County adopted its Safety Element in 1976.



The Safety Element and Seismic Safety Element were combined into the current Safety Element, adopted in 1999.

North Coast Area Plan (NCAP)

COMBINING DESIGNATION OVERLAYS

Combining Designations (CD) are special overlay land use categories applied in areas of the County with potentially hazardous conditions or significant natural resources. In these areas, more detailed project review is needed to avoid or minimize adverse environmental impacts, or effects of hazardous conditions on proposed projects. The following CDs relative to geology and soils have been applied in Cambria:

- CD-1 Geologic Study (GSA). This designation includes moderate to high landslide risk areas and moderate to high liquefaction hazard areas as identified in the Seismic Safety Element. The Geologic Study Area for the Cambria Urban Area, encompasses the entire Cambria Urban Reserve Area. These areas of steep slopes must be evaluated for engineering problems associated with building as well as possible adverse visual impacts caused by hillside grading.
- CD-7 Bluff Erosion (GSA). Portions of the coastline where bluff erosion poses a concern for siting new development have been noted. Development should be located so that it can withstand 100 years of bluff erosion, without the need for a shoreline protection structure that would substantially alter the landform, affect public access, or impact sand movement along the beach.

PLANNING AREA STANDARDS

The NCAP contains special “standards” for the North Coast Planning Area that are mandatory requirements for development, designed to handle identified problems in a particular rural area, or to respond to concerns in an individual community. The criteria for application of the Planning Area standards are discussed in detail in Section 5.1 (Land Use and Planning). The NCAP standards are presented below according to the location in the planning area where they apply (i.e., Cambria Urban or Rural). The NCAP standards¹ regarding geology and soils that are relevant to the proposed Project are:

Cambria Urban Area

Community Wide (CW):

- CW-11 Erosion Control. In addition to other applicable requirements of the Coastal Zone Land Use Ordinance, all runoff from impervious surfaces such as roofs, driveways, walks, patios, and/or decks, shall be collected and retained on-site to the greatest extent possible. Run-off not able to be retained on-site shall be passed through an effective erosion control device or filtration system approved by the Public Works Department. The following guidelines shall be followed to the maximum degree feasible:

¹ It is noted that the sub-sections of the NCAP Standards that are not relevant to this issue area have been presented in summary form; refer to the 2007 NCAP for the text in its entirety.



- A. Impermeable Surfaces. Impermeable surfaces should be minimized in order to maximize the amount of on-site run-off infiltration.
- B. Drainage. Drainage systems should be designated to retain water on-site encourage infiltration when feasible.
- C. Natural Drainage Patterns. Natural drainage patterns should be retained and remediated if retention is infeasible on-site.
- D. Downhill Sites. On downhill sites, encourage drainage easements on lower properties so that drainage can be released on the street or other appropriate land area below.

CW-15 Shoreline Development. New development or expansion of existing uses proposed to be located on or adjacent to a beach or coastal bluff are subject to the following standards:

- A. Application Content. In addition to the application requirements of the CZLUO and other Cambria Urban Area Plan Standards, applications for new development or expansion of existing uses proposed to be located on or adjacent to a beach or coastal bluff shall include the following:
 - 1. An analysis of beach erosion, wave run-up, inundation and flood hazards prepared by a licensed civil engineer with expertise in coastal engineering and a slope stability analysis, prepared by a licensed Certified Engineering Geologist and/or Geotechnical Engineer or Registered Civil Engineer with expertise in soils, in accordance with the procedures detailed by Appendix A1 of this Plan [NCAP]. The report shall include an alternatives analysis to avoid or minimize impacts to public access.

On lots with a legally established shoreline protective device, the analysis shall describe the condition of the existing seawall; identify any impacts it may be having on public access and recreation, scenic views, sand supplies, and other coastal resources; and evaluate opportunities to modify or replace the existing armoring device in a manner that would eliminate or reduce these impacts. The analysis shall also evaluate whether the development, as proposed or modified, could be safely established on the property for a one hundred year period without a shoreline protective device.

- 2. Measurements for the form.....
- 3. Surveyed location of all property.....
- 4. A preliminary drainage, erosion, and sedimentation plan which demonstrates that no stockpiling of dirt or construction materials will occur on the beach; erosion, runoff, and sedimentation measures to be implemented at the end of each day's work; all construction debris will be removed from the beach daily and at the completion of development; and no machinery will be allowed in the intertidal zone. If there is no feasible



way to keep machinery out of the intertidal zone, authorization from the Coastal Commission is required.

- B. Bluff Setbacks. The bluff setback is to be determined by the engineering geology analysis required in A.1. above adequate to withstand bluff erosion and wave action for a period of 100 years. In no case shall bluff setbacks be less than 25 feet. Alteration or additions to existing non-conforming development that equals or exceeds 50 percent of the size of the existing structure, on a cumulative basis beginning July 11, 2007, shall not be authorized unless the entire structure is brought into conformance with this setback requirement and all other policies and standards of the LCP. On parcels with legally established shoreline protective devices, the setback distance may account for the additional stability provided by the permitted seawall, based on its existing design, condition, and routine repair and maintenance that maintain the seawall's approved design life. Expansion and/or other alteration to the seawall shall not be factored into setback calculations.....

Title 19 of the San Luis Obispo County Code

In California, construction regulations consist of the California Building Code and any additions or modifications to the State Code implemented by the local government. The Building and Construction Ordinance of the County of San Luis Obispo (Title 19 of the San Luis Obispo County Code) incorporates a few changes to the California Code. It also adopts some of the less familiar codes, such as the Uniform Housing Code and the Dangerous Buildings Code, which deal with standards for existing buildings. The intent of Title 19 is to regulate the design and construction of buildings and structures through basic standards for site preparation, construction activities, quality of materials, occupancy classifications, the location and maintenance of buildings and structures.

Title 23 of the San Luis Obispo County Code

Coastal Zone Land Use Ordinance (CZLUO) Sections 23.05.022 through 23.05.039 establish standards for grading and excavation activities to minimize hazards to life and property, protect against erosion and the sedimentation of watercourses, and protect the safety, use, and stability of public rights-of-way and drainage channels. Additional standards for grading within a sensitive resource area are in Sections 23.07.160 et seq.

According to Section 23.07.080 of the CZLUO (Geology Study Area [GSA]), a GSA combining designation is applied to areas where geologic and soil conditions could present new developments and their users with potential hazards to life and property. These standards are applied where the following conditions exist:

- ◆ Seismic Hazard. Areas of seismic (earthquake) hazard are identified through the application of an earthquake fault zone.
- ◆ Landslide Hazard. Areas within urban and village reserve lines, identified by the Seismic Safety Element, as being subject to moderately high to high landslide risk, and rural areas subject to high landslide risk.



- ◆ Liquefaction Hazard. Areas identified by the Seismic Safety Element, as being subject to soil liquefaction;
- ◆ Erosion and Stability Hazard - Coastal Bluffs. Areas along the coast with coastal bluffs and cliffs greater than ten feet in vertical relief that are identified in the Coastal Erosion Atlas, prepared by the California State Department of Navigation and Ocean Development (1977).

Pursuant to Code Section 23.07.084 (Application Content – Geology and Soils Report Required), all land use permit applications for projects located within a geologic study area (except those exempted) shall be accompanied by a report prepared by a certified engineering geologist and/or registered civil engineer (as to soils engineering), as appropriate. The report shall identify, describe and illustrate, where applicable, potential hazard of surface fault rupture, seismic shaking, liquefaction, or landslide. Additionally, the report is required to recommend building techniques, site preparation measures, or setbacks necessary to reduce risks to life and property from seismic damage, landslide, groundwater, and liquefaction to insignificant levels.

Pursuant to Code Section 23.04.118 (All Blufftop Setbacks), new development or expansion of existing uses proposed to be located adjacent to a beach or coastal bluff shall be located in accordance with the setbacks provided by this section. Based on the Bluff Retreat Setback Method:

- (B) *New development or expansion of existing uses on blufftops shall be designed and set back from the bluff edge a distance sufficient to assure stability and structural integrity and to withstand bluff erosion and wave action for a period of seventy-five years without construction of shoreline protection structures that would in the opinion of the planning director require substantial alterations to the natural landforms along bluffs and cliffs. A site stability evaluation report shall be prepared and submitted by a certified engineering geologist based upon an on-site evaluation that indicates that the bluff setback is adequate to allow for bluff erosion over the seventy-five-year period.*

EXISTING GEOLOGIC CONDITIONS

The North Coast area is a mountainous region bound by a coastal plain of variable width that terminates at the Pacific Ocean coastline. A regional look at geologic conditions is needed in order to understand the geologic context of Cambria.

Regional Geology

San Luis Obispo County is located within the Southern Coast Ranges Province of California, one of the most complex geologic provinces in the State. This province is characterized by several subparallel structural blocks bounded by a number of on- and off-shore faults.

The northern coastal area of San Luis Obispo County is underlain primarily by Jurassic- to Cretaceous-age (approximately 120 to 180 million years old) rocks of the Franciscan complex. The Franciscan complex is a mixture of igneous, metamorphic, and sedimentary rocks. Cretaceous-age (65 to 140 million years old) and Tertiary-age (2 to 65 million years old) sedimentary rocks, including an unnamed Cretaceous sandstone and a relatively small amount



of Lospe, Vaqueros, Rincon, Monterey, and Pismo formations, overlie the Franciscan Formation basement rocks in some parts of the region. Along the coastal plain, and within stream valleys, the older bedrock formations are overlain by recent to Quaternary-age alluvium and terrace deposits.

Much of the northern coastal plain is characterized as a wave cut platform on which Quaternary-age marine terrace deposits overlie the older bedrock. Streams in the region are typically bordered by steep to moderately steep terrain, and the bottoms of stream valleys contain Quaternary- to Recent-age alluvium, which overlies the bedrock. Table 5.8-1 (Geologic Units) describes the geologic units in the planning area. The geologic setting is shown in Exhibit 5.8-1 (Geologic Setting).

The bedrock exposed on the hillsides is locally subject to landslides of recent origin; some large-scale landslides exist in the region developed on Franciscan Formation slopes. Intensive land uses are typically limited to gently sloping coastal plain areas characterized by low landslide risks.

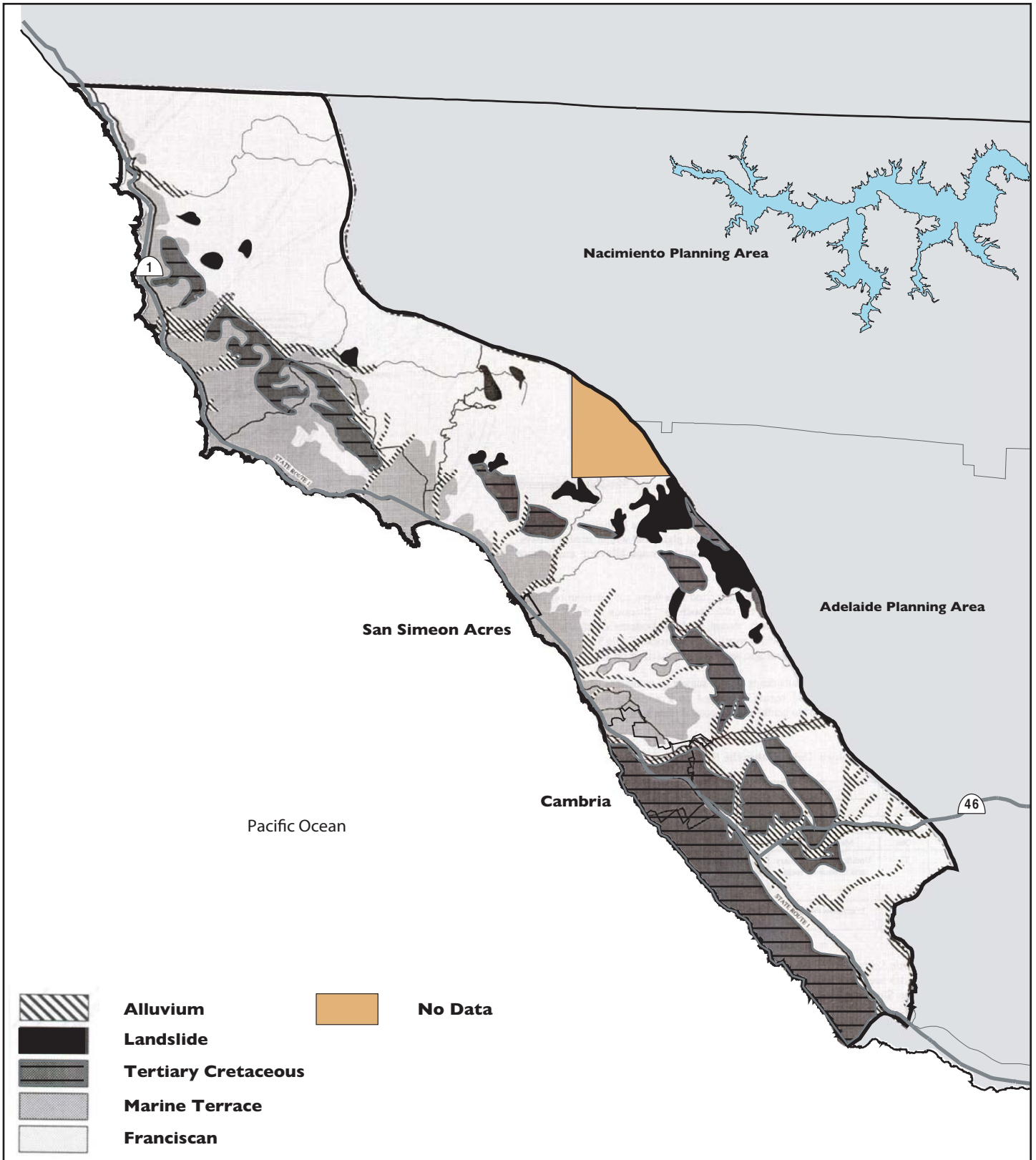
**Table 5.8-1
Geologic Units**

Age	Symbol	Unit	Description
Holocene	Qal	Alluvium	Gravel, sand, silt and clay, unconsolidated.
Holocene	Qls	Landslide	Rock and mudflow debris derived from upslope formations.
Pleistocene	Qtm	Marine Terrace	Conglomerate, sandstone, mudstone, loosely consolidated.
Tertiary	Tk	Undifferentiated Tertiary and Cretaceous rocks	Consolidated sandstone and mudstone including Pismo, Monterey, Obispo, Rincon, Vaqueros and Lospe Formations and unnamed cretaceous sandstone, and pre-Franciscan Formation volcanic rocks.
Cretaceous and Jurassic	Kjf	Franciscan Formation	Metamorphosed graywacke sandstone, chert, shale, schist volcanic rocks and serpentine.

Seismicity

San Luis Obispo County is located in a seismically active region, which includes several active earthquake faults of both local and regional significance. An active fault is defined as a fault that has an historic seismic record or displaces Holocene (11,000 years and younger) deposits.

There are three active faults in San Luis Obispo County that are zoned under the State of California Alquist-Priolo Fault Hazards Act: the San Simeon – Hosgri Fault, the San Andreas, and the Los Osos Fault. Other significant faults in the general region include the Nacimiento and the Rinconada Faults. The faults that extend through the North Coast area are the San Simeon – Hosgri Fault, the Cambria Fault, and the Oceanic Fault. The Cambria Fault is the only fault that extends through the urbanized community of Cambria.



SOURCE: San Luis Obispo County Department of Planning and Building.

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PROGRAM ENVIRONMENTAL IMPACT REPORT
 CAMBRIA COMMUNITY SERVICES DISTRICT WATER MASTER PLAN

Geologic Setting

Exhibit 5.8-1



The major faults affecting the Cambria area are illustrated in Exhibit 5.8-2 (Seismic Setting) and are briefly described below.

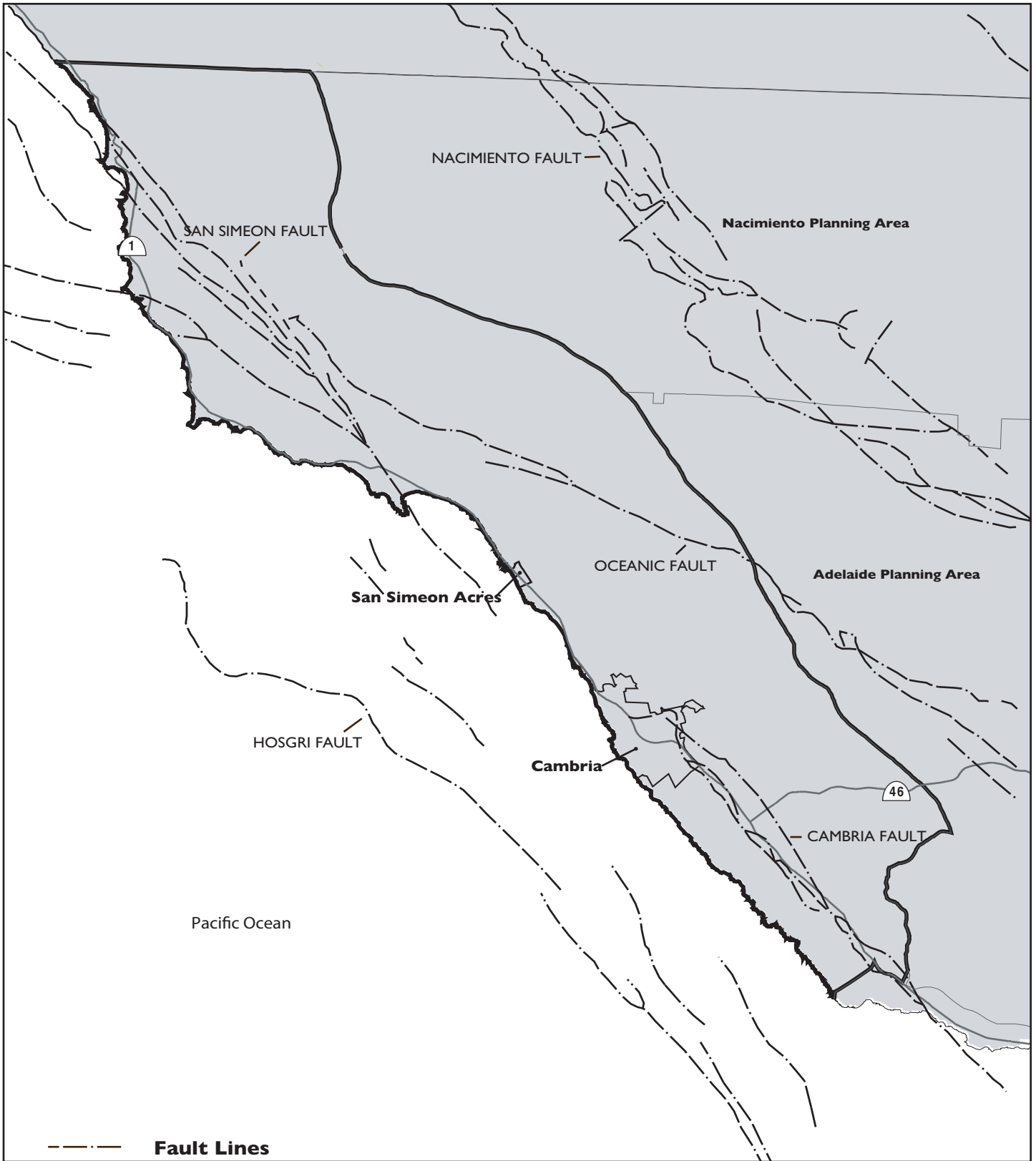
- ◆ *San Simeon – Hosgri Fault and San Simeon Fault Zone.* The San Simeon – Hosgri Fault Zone generally consists of two fault zones, the San Simeon fault zone and the Hosgri Fault zone. These zones are located along the coast within and just offshore of the planning area for approximately 108 miles. The faults in this zone have a characteristic return interval of 646 years, and are believed to have the potential for seismic events of a magnitude as high as 7.3 on the Richter Scale.

The onshore portion of the San Simeon Fault, which extends from San Simeon Point to the north side of the mouth of San Carpoforo Creek, has been identified as a Holocene-age fault. In 1986, the State geologist determined this fault zone to be active and designated it as a special studies zone subject to the Alquist-Priolo Act. Therefore, a detailed geologic report is required when structures for human occupancy are proposed. No such structure may be located within 50 feet of an active fault trace (where the fault intersects the surface of the earth). A seismic event along this fault would pose a substantial risk for Cambria.

- ◆ *Cambria Fault.* The Cambria Fault is approximately 40 miles long. This is a potentially active fault, consisting of a complex web of thrust faults that trend northwesterly along Highway 1 and into Cambria. A terrace deposit in the Cambria area may have been displaced by this fault. If active, the fault could pose a risk for Cambria, having potential of a magnitude 6.25 seismic event, which is considered a strong earthquake.
- ◆ *Oceanic Fault.* The West Huasna/Oceanic Fault Zone trends north-northwest for approximately 63 miles. The Oceanic Fault section of this zone trends northwest from near San Luis Obispo to San Simeon Acres, and passes approximately five miles northeast of Cambria. This fault is considered to be potentially active and represents a moderate fault rupture hazard to Cambria.
- ◆ *San Andreas Fault.* While not directly in the North Coast area, the San Andreas Fault is within the impact range of the Cambria area. This fault is located approximately 40 miles east of the North Coast area, and is considered to be the most likely source of a future major earthquake in California, with potential seismic events of a magnitude as high as 8.5 on the Richter Scale. A substantial seismic event along this fault could pose a substantial risk for the entire North Coast area.
- ◆ *Nacimiento Fault.* Trending northwest to southeast, the Nacimiento Fault is located just east of the North Coast area, in the Santa Lucia Range. It is 56 miles in length and has a maximum magnitude of 7.5. There is debate whether this is an active or inactive fault, however, a 6.0 earthquake in 1952 is often assigned to this fault. If active, this fault could pose a potential hazard to Cambria.

Geologic Hazards

The North Coast planning area is subject to several types of geologic hazards, including ground shaking, ground rupture, liquefaction, landslides, and tsunamis and seiches. These hazards are described briefly in Table 5.8-2 (Summary of Potential Geologic Hazards). The potential for specific hazards depends on site bedrock, soil, ground water, and slope conditions.



SOURCE: San Luis Obispo County Department of Planning and Building.

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PROGRAM ENVIRONMENTAL IMPACT REPORT
 CAMBRIA COMMUNITY SERVICES DISTRICT WATER MASTER PLAN

Seismic Setting

Exhibit 5.8-2



**Table 5.8-2
Summary of Potential Geologic Hazards**

Geologic Symbol	Geologic Unit	Site Characteristics	Description
Qal	Alluvium	Valley	Ground shaking, liquefaction tsunami (coastal areas)
Qls	Landslide	Slopes	Landslide, ground shaking
Qtm	Marine	Coastal terraces	Ground shaking, bluff retreat
TK	Tertiary and Cretaceous Rocks	Varied slopes	Ground shaking, landslide
Kjf	Franciscan Formation	Varied slopes	Ground shaking, landslide

GROUND SHAKING

Ground shaking refers to the motion that occurs in response to local and regional earthquakes. The historical record of earthquakes from 1830 through 1989 indicates seismic activity in San Luis Obispo County. Significant earthquake activity along the San Andreas Fault and moderate activity in a broad area along sections of the Hosgri, San Simeon, Los Osos, Nacimiento, and possibly the West Huasna/Oceanic fault zones has been recorded. Small to moderate earthquakes (magnitudes less than 5.0 on the Richter Scale) are common in the North Coast area.

An earthquake along the San Simeon Fault Zone occurred in December 2003, which was centered approximately ten miles north of Cambria. This 6.5 magnitude earthquake resulted in two fatalities, injuries to 47 people, and damage to approximately 290 homes and 190 commercial structures in San Luis Obispo and Santa Barbara Counties. Other significant earthquakes affecting the North Coast area during the last century have generally been centered outside the County, and have included events in excess of 7.0 (Lompoc in 1927 and Tehachapi in 1952). Prior major earthquakes within 100 miles of the area include the 6.5 Coalinga temblor of 1983. Although the July 1992 Landers earthquake (7.5) and January 1994 Northridge earthquake (6.6) were felt in the North Coast area, no significant damage was known to occur in the area.

GROUND RUPTURE

Seismically-induced ground rupture is defined as the physical displacement of surface deposits in response to an earthquake's seismic waves. Ground rupture is most likely along active faults, such as the San Simeon fault, and typically occurs during earthquakes of magnitude five or higher. Ground rupture only affects the area immediately adjacent to a fault.

LIQUEFACTION

Liquefaction is a phenomenon in which either unconsolidated, nearly saturated, or loose cohesion soils are converted to a fluid state, as a result of severe vibration. Loose, granular soils are most susceptible to these effects, while more stable silty clay and clay materials are generally somewhat less affected. The potential for liquefaction varies considerably over the North Coast area, depending upon local soil types and conditions. In general, bedrock areas have a very low liquefaction potential and recent alluvium has a moderate to high liquefaction



potential. Most of Cambria has low liquefaction potential except for the East/West Ranch and the Santa Rosa Creek floodplain, which have high and very high liquefaction potential, respectively.

LANDSLIDES

Landslides can occur as a result of wet weather, weak soils, improper grading, improper drainage, steep slopes, adverse geologic structure, earthquakes, or a combination of these factors. The primary factor in determining landslide potential is unstable slope conditions. Slope instability can occur in the form of creep, slumps, large progressive translation or rotational failures, rock fall, debris flows, or erosion. Landslides can be triggered by one or more specific events including development-related construction, seismic activity, soil saturation, loss of vegetative cover, and fires.

Throughout California, several formations are considered prone to landsliding, including the Franciscan Formation, which exists within the North Coast planning area. Numerous landslides have been mapped in the steeper parts of the North Coast area, particularly in areas underlain by the Franciscan Formation. These areas do not include Cambria. However, hillside areas that are considered moderately high and high landslide potential are present in Cambria, such as the eastern residential areas, which are located on moderate to steep slopes.

TSUNAMI AND SEICHES

Tsunamis are seismically-induced ocean waves. Low-lying coastal areas are subject to inundation and damage from tsunamis. The extent of inundation from a tsunami will depend on the location, strength, and sense of motion of the earthquake.

Only small tsunami events have been recorded in San Luis Obispo County. A tsunami generated by the 1964 Alaskan earthquake caused damage in the Crescent City area, and may have been observed in the North Coast area. Previous studies have predicted a maximum tsunami wave "runup" of approximately 9.5 feet above sea level for a 100-year event. Such an event would not affect most of the homes in Cambria, since they are located primarily on cliffs approximately 20 feet high. However, recent emergency planning by San Luis Obispo County has noted that 40 feet above mean sea level (amsl) may be a maximum potential tsunami run up elevation.² The County's Tsunami Emergency Response Plan further recommends an elevation higher than 50 feet amsl for purposes of avoiding potential tsunami run-up areas.

Seiches are waves generated by an earthquake in a lake, reservoir, or harbor. Although faults are near several of the County's reservoirs, seiches are not considered a significant risk in the North Coast area and thus not in Cambria.

Erosion and Sedimentation

Other hazards or potential geologic or soils related problems, such as expansive or collapsible soils, highly erodible soils, and soils that are not suitable for septic systems, must be evaluated on a site-specific basis.

² San Luis Obispo County Office of Emergency Planning, *Tsunami Emergency Response Plan*, October 2005.



EROSION

Erosion is a natural process that occurs over time and can be caused by either wind or water moving over soils. The natural erosion process is an important factor in building up fertile valley soils and beach sand along the coastline. However, soil erosion can become a problem when human activities accelerate the rate at which soils are displaced. Sheet flow drainage, impervious surfaces (e.g., concrete or asphalt paving and structures), unsound farming practices, over-grazing, construction activities, and unpaved roads can all accelerate the rate of which soils are removed from hillsides. Erosion along the coast, called bluff retreat, is of particular concern in Cambria.

SOIL ABSORPTION AND RUNOFF

Development can increase the amount of impervious surface, thus, affecting the rate of soil absorption and the amount or direction of runoff.

EXPANSIVE SOILS

Soils in Cambria are primarily San Simeon-Conception, which are moderately deep to very deep, gently sloping to steep, and moderately well drained soils on old marine terraces. Deep, well-drained soils tend not to be expansive.

SEDIMENTATION

Erosion is a natural process, which occurs at varying rates. However, earth-moving activities caused by improper construction and development practices, which do not include effective erosion and sediment controls, can greatly accelerate the rate of soil loss and therefore sediment build up.

100-YEAR FLOOD ZONE

Flooding generally occurs in response to heavy rainfall events when streams overtop their banks. In Cambria, the West Village has been subject to 100-year flooding, and there is a flood hazard zone along Santa Rosa Creek. Refer to Section 5.9 (Hydrology and Water Quality) for a detailed discussion regarding flooding potential in Cambria.

MINERAL RESOURCES

There are a number of abandoned mines near Cambria, most of which were sand and gravel mines. As of 1992, the mines that previously produced manganese, mercury, and antimony were also abandoned.

SIGNIFICANCE CRITERIA

According to Appendix G of the *CEQA Guidelines* (Initial Study Checklist), a project would typically have a significant impact on geology and soils if it would:

- ◆ Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:



- Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault.
 - Strong seismic ground shaking.
 - Seismic-related ground failure, including liquefaction
 - Landslides.
- ◆ Result in substantial soil erosion or the loss of topsoil.
 - ◆ Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse.
 - ◆ Be located on expansive soils, as defined in Table 18-1 B of the Uniform Building Code (1994), creating substantial risks to life or property; refer to Section 7.0 (Effects Found Not to be Significant).
 - ◆ Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater; refer to Section 7.0 (Effects Found Not To Be Significant).
 - ◆ Expose people or structures to a significant risk of loss, injury, or death from inundation caused by seiche, tsunamis, or mudflow.

IMPACTS AND MITIGATION MEASURES

SEISMIC HAZARDS

- ❖ **IMPLEMENTATION OF THE PROPOSED WATER MASTER PLAN IMPROVEMENTS COULD EXPOSE PEOPLE/STRUCTURES TO POTENTIAL RISKS INVOLVING FAULT RUPTURE, STRONG SEISMIC GROUND SHAKING, GROUND FAILURE/LIQUEFACTION, LANDSLIDES, OR TSUNAMIS. IMPLEMENTATION OF THE RECOMMENDED MITIGATION AND COMPLIANCE WITH STATE AND SAN LUIS OBISPO COUNTY REGULATORY REQUIREMENTS WOULD REDUCE IMPACTS TO A LESS THAN SIGNIFICANT LEVEL.**

Impact Analysis:

Potable and Recycled Water Distribution Systems

Implementation of the proposed potable and recycled water distribution system components could expose people or structures to potential substantial adverse effects involving risks from seismic hazards, based on the following factors:

- ◆ *Fault Rupture.* The potential for impacts associated with fault rupture in Cambria area is considered low, because the only fault zone within the community (i.e., Cambria Fault



zone) is not designated as a special studies zone. However, the Cambria Fault zone has not been extensively examined for activity. Also, the recycled water improvements are proposed in the immediate vicinity of the Cambria Fault zone. Therefore, implementation of the proposed WMP improvements could expose people or structures to potential substantial adverse risk involving fault rupture.

- ◆ Groundshaking. Because Cambria is located in a seismically active region, implementation of the proposed improvements could expose people or structures to potential substantial adverse risk involving strong seismic ground shaking.
- ◆ Liquefaction. The potential for liquefaction triggered by a seismic event exists in portions of Cambria. More specifically, areas that overlie deposits of saturated recent alluvium, such as the East/West Ranch and the Santa Rosa Creek floodplain, have high and very high liquefaction potential, respectively. The potable water distribution system includes existing pipelines connecting to wells located within the San Simeon well field, which is located adjacent to Santa Rosa Creek. Although no improvements are proposed for either the pipelines or wells, continued maintenance of these existing facilities would occur under the proposed WMP. Therefore, these existing water facilities would continue to be exposed to potential substantial adverse risk involving liquefaction.
- ◆ Landslides. Portions of Cambria, particularly in the eastern residential areas, are located on moderate to steep slopes. These areas are designated in the County's Safety Element as having moderately high risk with regard to landslides. The potable and recycled water improvements are proposed in these areas. Therefore, the potable and recycled water distribution systems improvements could be located on a geologic unit that is unstable, potentially resulting in landslides. Additionally, Project implementation could expose people or structures to potential substantial adverse risk involving seismically induced landslides.
- ◆ Tsunamis and Seiche. Although the majority of the Cambria urban area is protected by coastal bluffs, low lying areas along Santa Rosa Creek and San Simeon Creeks could potentially be impacted in the event of a tsunami. Although, the potential for tsunami damage is considered low, as no tsunami events have been recorded within Cambria, the proposed improvements could be exposed to potential risk involving tsunamis. The County's Tsunami Emergency Response Plan further recommends an elevation higher than 50 feet amsl for purposes of avoiding potential tsunami run-up areas. Compliance with the County's Tsunami Emergency Response Plan, which recommends an elevation higher than 50 feet amsl for purposes of avoiding potential tsunami run-up areas, would be required. It is noted that Cambria does not contain surface water reservoirs large enough to generate significant impacts associated with a seismic-generated seiche.

Overall, implementation of the proposed potable and recycled water distribution system components could expose people or structures to potential substantial adverse risks involving seismic hazards, unless mitigated. Through the County's development review process, future WMP improvements would be evaluated to determine the appropriate permits for authorizing their use and the conditions for their establishment and operation. Compliance with standards contained within the County's Building and Construction Ordinance (Title 19) regarding site preparation, construction activities, quality of materials, occupancy classifications, the location and maintenance of buildings and structures, and within the Tsunamis Emergency Response Plan regarding tsunamis run-up areas, would be required. Excluding those exempted by Code,



all proposed improvements would be required to prepare a geologic study (Code Section 23.07.084), which recommends building techniques, site preparation measures, or setbacks necessary to reduce risks to life and property from seismic hazards to less than significant levels. The proposed improvements would also be subject to compliance with NCAP Standard CW-15 (Shoreline Development). Compliance with these standards would mitigate potential impacts associated with seismic hazards to a less than significant level.

Water Demand Management

The water demand management component involves improvements to the current conservation program and regulations, which would not expose life or property to risks involving seismic hazards. No impact would occur in this regard.

Seawater Desalination

Potential impacts associated with the exposure of life or property to risks involving seismic hazards from implementation of the seawater desalination plant would be similar to those identified for the potable and recycled water system improvements. The proposed seawater desalination facility improvements would be subject to compliance with the County's Building and Construction Ordinance, CZLUO Section 23.07.080, and relevant NCAP Standards. A future project-specific EIR/EIS would need to further determine the potential exposure of life or property to risks involving seismic hazards after more details become known regarding the desalination facility. Additionally, the EIR/EIS would analyze alternative desalination facility sites.

Mitigation Measures:

GEO-1 The CCSD shall comply with San Luis Obispo County's Building and Construction Ordinance (Title 19) regarding site preparation, construction activities, quality of materials, occupancy classifications, and the location and maintenance of buildings and structures. All future water facility improvements shall also comply and Coastal Zone Land Use Ordinance Section 23.07.080, requiring preparation of a geotechnical study for projects within a Geology Study Area.

GEO-2 Compliance with the following North Coast Area Plan Standards shall be required:

Cambria Urban Area

Community Wide (CW):
CW-15 (Shoreline Development)

Category Specific (CS):

The CS Standards that are specific to each land use category; refer to Chapter 7 (Planning Area Standards) of the NCAP.

Rural Area Standards

Category Specific (CS):

The CS Standards that are specific to each land use category; refer to Chapter 7 (Planning Area Standards) of the NCAP.

Level of Significance: Less Than Significant With Mitigation Incorporated.



EROSION AND SEDIMENTATION

- ❖ **IMPLEMENTATION OF THE PROPOSED WATER MASTER PLAN IMPROVEMENTS COULD RESULT IN SOIL EROSION OR SEDIMENTATION IMPACTS. ANALYSIS HAS CONCLUDED THAT IMPACTS WOULD BE LESS THAN SIGNIFICANT FOLLOWING COMPLIANCE WITH NPDES REGULATORY REQUIREMENTS, THE SAN LUIS OBISPO COUNTY STORMWATER POLLUTION PREVENTION PLAN, AND COASTAL ZONE LAND USE ORDINANCE AND NORTH COAST AREA PLAN STANDARDS.**

Impact Analysis:

Potable and Recycled Water Distribution Systems

As discussed in Section 5.9 (Hydrology and Water Quality), grading, excavation, and construction activities associated with implementation of the proposed potable and recycled water distribution system components (e.g., distribution pipelines, storage reservoirs, pump stations, and evaporative control system (ECS)), may cause erosion of exposed soils and subsequent deposition of particles in drainage areas. Potential impacts could occur where Project components cross or are located within the drainage courses and boundaries of a floodplain. Without mitigation, the significance of these potential construction-related impacts would vary depending upon the level of construction activity, weather conditions, soil conditions, and the increased sedimentation of drainage systems within the local area of the development site.

The impervious area of the development sites could be increased with implementation of the proposed storage reservoirs and pump stations, potentially altering the rate/amount of surface runoff, and erosion and sedimentation rates. The significance of these potential impacts would vary depending upon the size, location, and topography. The increased amounts of impervious surfaces could have significant erosion and sedimentation impacts to Cambria's watercourses.

Overall, the potential erosion and sedimentation impacts from implementation of the proposed WMP improvements are considered potentially significant. Through the County's development review process, future improvements would be evaluated to determine the appropriate land use permit for authorizing their use and the conditions for their establishment and operation. Future improvements would be subject to compliance with NCAP Standard CW-11 (Erosion Control) and Standard CW-15 (Shoreline Development). Following compliance with the NPDES regulatory requirements, the County's Storm Water Pollution Prevention Plan (SWPPP) and CZLUO, NCAP Standards, and implementation of BMPs, the proposed potable and recycled water system improvements would result in less than significant erosion and sedimentation impacts.

Water Demand Management

The water demand management component involves improvements to the current conservation program and regulations, which would not result in erosion or sedimentation impacts. No impact would occur in this regard.

Seawater Desalination

Potential erosion and sedimentation impacts resulting from implementation of the seawater desalination system improvements would be similar to those identified for the potable and



recycled water distribution system. Discharges from the proposed improvements could increase erosion and sedimentation rates if the facilities are not properly designed or are not equipped with storm water management structures.

Depending upon the proximity to the cliff face, erosion may impact the proposed seawater intake and seawater concentrate return systems. Retreat rates of two to ten inches are average rates for the previous 100 years and do not reflect the episodic nature of sea cliff retreat. The Franciscan Melange Formation erodes and retreats primarily from wave action. This bedrock unit should add durability to the toe of the sea cliff. Compliance with Code Section 23.04.118 (All Blufftop Setbacks), which specifies setback requirements, would be required to reduce potential long-term erosional impacts to the intake vault.

The seawater desalination improvements would be required to comply with NPDES regulatory requirements, the County's SWPPP and CZLUO, and implementation of BMPs. A future project-specific EIR/EIS would need to further determine the potential erosion and sedimentation impacts after more details become known regarding the desalination facility.

Mitigation Measures:

- GEO-3 The CCSD shall comply with the NPDES regulatory requirements, and San Luis Obispo County's SWPPP (including implementation of BMPs) and Coastal Zone Land Use Ordinance Sections 23.05.022 through 23.05.039, which establish standards for grading and excavation activities to minimize hazards to life and property, protect against erosion and the sedimentation of watercourses, and protect the safety, use, and stability of public rights-of-way and drainage channels. All future water facility improvements shall also comply with Coastal Zone Land Use Ordinance Sections 23.07.160 et. seq., which establish additional standards for grading within a sensitive resource area.
- GEO-4 Pursuant to Code Section 23.04.118 (All Blufftop Setbacks), new development or expansion of existing uses proposed to be located adjacent to a beach or coastal bluff shall be located in accordance with the setbacks provided by this section.
- GEO-5 Compliance with the following North Coast Area Plan Standards shall be required:

Cambria Urban Area

Community Wide (CW):

CW-11 (Erosion Control)

CW-15 (Shoreline Development)

Category Specific (CS):

The CS Standards that are specific to each land use category; refer to Chapter 7 (Planning Area Standards) of the NCAP.

Rural Area Standards

Category Specific (CS):

The CS Standards that are specific to each land use category; refer to Chapter 7 (Planning Area Standards) of the NCAP.

Level of Significance: Less Than Significant With Mitigation Incorporated.



CUMULATIVE IMPACTS

- ❖ **THE WATER MASTER PLAN PROJECT, COMBINED WITH FUTURE DEVELOPMENT WITHIN THE NORTH COAST AREA, COULD EXPOSE PEOPLE OR STRUCTURES TO POTENTIAL ADVERSE EFFECTS INVOLVING SEISMIC HAZARDS, AND COULD RESULT IN SUBSTANTIAL SOIL EROSION. CUMULATIVE IMPACTS WOULD BE LESS THAN SIGNIFICANT FOLLOWING COMPLIANCE WITH FEDERAL, STATE, AND SAN LUIS OBISPO COUNTY REGULATORY REQUIREMENTS, AND IMPLEMENTATION OF RECOMMENDED MITIGATION ON A PROJECT-BY-PROJECT BASIS.**

Impact Analysis: The cumulative effects resulting from implementation of the proposed WMP and other development in the North Coast Area could expose a greater number of people and structures to potential substantial adverse effects involving seismic hazards. Additionally, the cumulative effects of development could result in substantial soil erosion. The cumulative effects of exposure to potential seismic hazards would be reduced to a less than significant level following compliance with Federal, State, and San Luis Obispo County regulatory requirements (i.e., National Pollutant Discharge Elimination System, Building and Construction Ordinance, North Coast Area Plan standards, Coastal Zone Land Use Ordinance, and Stormwater Pollution Prevention Plan), and implementation of recommended mitigation on a project-by-project basis. In addition, erosional and sedimentation impacts would be mitigated on a project-by-project basis. The 2005 NCAP Update concluded that implementation of the Community Plans Update would not result in significant impacts to soils, geology, or erosion.³ Therefore, the cumulative effects associated with geology and soils resulting from development within the North Coast Area would be mitigated to a less than significant level.

Mitigation Measures: No mitigation measures are recommended beyond compliance with the established regulatory requirements on a project-by-project basis.

Level of Significance: Less Than Significant Impact.

LEVEL OF SIGNIFICANCE AFTER MITIGATION

Analysis has concluded that following implementation of the recommended mitigation measures requiring compliance with San Luis Obispo County, State, and Federal regulatory policies and requirements, geology and soil impacts would be reduced to a less than significant level.

³ Design, Community & Environment, *Cambria and San Simeon Acres Community Plans of the North Coast Area Plan Draft EIR*, May 18, 2005, Page 4.12-22.