4.0 ENVIRONMENTAL SETTING

4.1 AESTHETICS

4.1.1 Proposed Projects

The existing visual character of the natural and manmade environment around the vicinity of the DCPP consists of a variety of highly aesthetic coastal settings. Natural elements of water, fog, and the topography are the dominant visual components that make up the site. The edge of the DCPP coastline consists of rocky bluffs that level into gentle terraces at approximately 100 feet above the Pacific Ocean. The primary access road to DCPP is located at this level connecting Avila Beach Gate in the south to the main DCPP complex of facilities in the north. The rugged Irish Hills rise up from this terrace level and connect into the San Luis Mountain Range, which runs along the east edge of the DCPP property from north to south at elevations up to 1,800 feet.

On the DCPP property the majority of the western coastal land is agricultural, which has a gentler slope than the mountains and hills on the eastern edge of the property. The majority of the developed facilities that make up the DCPP complex are nestled into the hillside on a flat terrace that is set back from the sea cliff several hundred feet. The main complex includes the identifiable domes of the Containment Facilities Unit 1 and Unit 2, and other primary power production and auxiliary support facilities. Adjacent terraced areas contain offices, training facilities, and warehouse space. The property slopes down to the ocean along this stretch of coastline to the Intake Cove, approximately 70 feet below. The Intake Cove is a manmade protected area enclosed by large concrete breakwaters that are the most noticeable features that form the landscape in the water. Some smaller facilities are also located in this area. The Intake Cove is one of two areas being considered as an offloading option for the RSGs.

Another prominent visible manmade feature near the main DCPP complex area is the high-voltage overhead wires and towers that step up into the hillside to the 500 kV switchyard and rise sharply beyond into the San Luis Mountains. Storage buildings, maintenance yards and other support facilities are also scattered in a few other areas in the hillside; however, because of their simple form, low profile, and neutral colors these facilities are less noticeable against the backdrop of the hills and mountains when viewed from a distance, such as from the ocean.

Most of the property has not been substantially altered and exists in its original natural state. The facilities are virtually isolated from public view, because of the undulating terrain and high elevations throughout the DCPP property. The only public locations of the land from which a portion of the DCPP property can be viewed are at the Montana de Oro State Park, from the Pecho Coast Trail around San Luis Hill and at the southern end from Port San Luis area just outside the Avila Gate. The only other way to view DCPP is from the air or from the water, because DCPP is on private secluded property with no public access.

Along the southern end of the property is the San Luis Harbor District, which consists of variety of manmade and natural features that serve as visual focal points away from the DCPP entrance. In this area, Point San Luis is the most noticeable landscape that extends out into the ocean in the form of large jagged outcroppings, creating a cove in the foreground. In this same area the landmark Harford Pier and Landing bisects the cove and provides a manmade destination for visitors and local fisherman and recreational users to gather. Several fishermen moor their boats at designated buoys in the water area adjacent to the pier area along with other recreational watercraft. According to the harbor mooring plan, there are approximately 280 mooring spaces with a 100-foot radius, approximately six mooring spaces identified with a 150-foot radius, and approximately 26 mooring spaces identified with a 200-foot radius. The land around the water's edge in this location includes a parking lot for approximately 250 vehicles, boat launch facilities, and several designated RV parking areas located in the northwestern corner, as depicted in Figure 3-7. This area serves as the entry/exit point for the Harford Pier. A portion of the parking lot is one of two areas being proposed for temporary staging, barge offloading and transport of the RSGs to the DCPP replacement steam generator storage facility.

4.1.2 No Project Alternative

In the event that the Proposed Projects are not implemented, power generating facilities would need to be constructed in Kern and Alameda Counties to supply 2,200 MW of energy. The exact locations of these facilities are not known; however, an industrial facility of this type would likely change the visual character of an area.

4.2 AGRICULTURAL RESOURCES

4.2.1 Proposed Projects

Agriculture, including grazing, is a significant land use in San Luis Obispo County. San Luis Obispo County is located within the California Agricultural Statistics Central Coast District (CASS, 2002). The total county agricultural acreage in 2001 was 1,183,107 acres. Table 4.2-1 provides a summary of the top ten leading commodities for gross value of agricultural production for San Luis Obispo County.

Table 4.2-1
Leading Commodities of Agricultural Production
San Luis Obispo County

Crop	Value
Grapes, Wine	$138,054,000.00
Cattle and Calves	$42,697,000.00
Broccoli	$35,911,000.00
Lettuce, Head	$30,481,000.00
Flowers, Foliage Plants	$27,290,000.00
Flower, Cut	$25,144,000.00
Nursery, Veg. Bedding Plants	$21,358,000.00
Berries, Strawberries	$17,707,000.00
Peas, Edible Pod (Snow)	$16,093,000.00
Vegetable Crops	$15,040,000.00

Source: CASS, 2002

The U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) identifies soil suitability for agriculture in San Luis Obispo County as varying from "prime" to "poor." Prime farmland, as defined by USDA, is the land that is best suited to producing food, feed, forage, fiber, and oilseed crops. It must either be used for producing food or fiber or be available for these uses. Approximately 55,770 acres of coastal San Luis Obispo County would meet the requirements for prime farmland if an adequate and dependable supply of irrigation water were available (NRCS, 1984).

Under the California Land Conservation Act of 1968 (California Government Code Section 51238, known as the Williamson Act), the owner of an agricultural parcel may enter into a contract with a county in which the owner agrees to maintain agricultural operations on the parcel for a 10-year period. In exchange, the county assesses the property based solely on the agricultural value of the parcel, lowering the property tax obligation of the property owner. Approximately 818,000 acres in San Luis Obispo County are currently under contract protection with the county (San Luis Obispo County Farm Bureau, 2003).

The project site is located on a 760-acre parcel leased by PG&E. Currently, there are no agricultural activities on the DCPP site and the site has not been used for any form of agriculture (including traditional cattle grazing) since construction of the plant. The nearest ongoing agricultural operations are approximately two miles away on the coastal terrace along the access road. PG&E also has a contract to allow approximately 400 to 700 goats to graze the project site for vegetation management. The goats are used from late spring to summer.

Table 4.2-2 provides a list of the soil types found on the project site. The soils on the project site are not classified as prime farmland (NRCS, 1984 and 1979; CDC, 1995) or farmland of statewide importance (CDC, 1995).

Table 4.2-2
DCPP Project Site Soil Types

Soil Symbol	Soil Name and Description
177	Nacimiento, silty clay loam, 15 to 30 percent slopes
178	Nacimiento, silty clay loam, 30 to 50 percent slopes
182	Nacimiento-Calodo complex, 50 to 75 percent slopes
203	Santa Lucia shaly clay loam, 30 to 50 percent slopes
221	Xererts-Xerolls-Urban land complex, 0 to 15 percent slopes

Source: NRCS, 1984

The project site is not subject to the Williamson Act. No land within the project site is under contract with the county under the Williamson Act (Kelly, 2003).

4.2.2 No Project Alternative

The No Project Alternative assumes that the base load system generation capacity of DCPP would need to be replaced by constructing natural-gas-fired power plants. It is assumed that approximately 1,000 MW would be located in Alameda County and 1,000 MW would be located in Kern County.

Agricultural resources, including prime farmland, farmland of statewide importance, and land subject to the Williamson Act, could be present within the project impact areas in both Alameda and Kern Counties. Project components, including water and natural gas, that are associated with development of natural-gas–fired power plants may be located in an area with agricultural resources.

4.3 AIR QUALITY

4.3.1 Proposed Projects

4.3.1.1 Climate and Topography

The Proposed Projects are located in the central portion of the San Luis Obispo coast. The climate of the area is characterized by small diurnal and seasonal temperature variations and light summer precipitation. The dominant wind direction is from the northwest, with an annual average wind speed of about 10 mph. During the dry season (May through September), moderate to strong sea breezes are common during the afternoon hours, while at night weak offshore drainage winds (land breezes) are prevalent. A high frequency of fog and low stratus clouds during the dry season is associated with a strong low-level temperature inversion.

More than 80 percent of the annual rainfall occurs during the wet season (November through March). Middle and high clouds occur mainly with winter storm activity, and strong winds may be associated with the arrival and passage of storm systems. April and October are considered transitional months separating the dry and wet seasons.

Topography also influences wind conditions that in turn affect air quality. The coastal mountains that extend in a northwest-to-southeast direction along the coastline affect the general circulation patterns. This mountain range is indented by numerous canyons and valleys, each of which has its own land–sea breeze regime. The wind is dispersed inland by the valleys and canyons along the coastal range.

In areas where there are no breaks in the coastal range, the wind speed is increased and the changes in the wind direction decreases as the air is forced along the range. However, because of the irregular terrain profile and increased turbulence from the rough terrain, vertical mixing and lateral meandering of the airflow under the inversion are enhanced. Therefore, emissions released in the coastal regime are dispersed by a complex array of land–sea breezes that lead to rapid dispersion in both the vertical and horizontal planes.

However, pollutant dispersion is also negatively affected by temperature inversions. During the late spring and early summer months, cool air over the ocean can flow under the relatively warmer air over land, causing a marine inversion. These inversions restrict dispersion along the coast, but are typically shallow and will dissipate with surface heating during the mid- or late morning hours. In contrast, the presence of the Pacific high pressure cell in the summer can cause the air mass to sink. The compression within the descending air causes its temperature to be higher than that of the air below. This highly stable atmospheric condition, termed a subsidence inversion, is common to all of coastal California and can act as a nearly impenetrable lid to the vertical mixing of pollutants. The base of the inversion typically ranges from 1,000 to 2,500 feet above sea level; however, levels as low as 250 feet, among the lowest anywhere in the state, have been recorded on the coastal plateau in San Luis Obispo County. These inversions can persist for one day or more, causing air stagnation and the local buildup of pollutants. Highest or worst-case ozone levels in the project area are often associated with the presence of this type of inversion.

4.3.1.2 Air Quality Standards and Regulatory Setting

The federal and California governments have established separate ambient air quality standards. The U.S. Environmental Protection Agency (EPA) has established primary and secondary National Ambient Air Quality Standards (NAAQS) that specify allowable ambient concentrations for criteria pollutants under the provisions of the Clean Air Act. Primary NAAQS are established at levels necessary to protect the public health, with an adequate margin of safety, including the health of sensitive populations such as asthmatics, children, and the elderly. Similarly, secondary NAAQS specify the levels of air quality determined appropriate to protect the public welfare from any known or anticipated adverse effects associated with air contaminants. Allowable ambient concentrations are set for ozone (O_3), respirable particulate matter (PM_{10}), fine particulate matter ($PM_{2.5}$), carbon monoxide (CO), nitrogen dioxide (NO_2), lead (Pb), and sulfur dioxide (SO_2). Table 4.3-1 summarizes the NAAQS for these pollutants. The 8-hour O_3 and $PM_{2.5}$ standards listed in the table were promulgated in 1997; however, they were challenged in the courts. In 2002, the courts upheld these two standards. Now EPA and the states are working together to implement the new standards, including determining the attainment status for regions and developing air quality plans to achieve compliance with the standards, if needed.

In California, the California Air Resources Board (CARB), which is part of the California Environmental Protection Agency, has promulgated more stringent ambient air quality standards (the California Ambient Air Quality Standards or CAAQS) for O_3, PM_{10}, $PM_{2.5}$, CO, NO_2, SO_2, and Pb, as shown in Table 4.3-1. In 2002, CARB revised the state annual PM_{10} standard and established a new annual $PM_{2.5}$ standard. Formal approval of these standards by the Office of Administrative Law is expected in 2003. CARB has also developed standards for sulfates and hydrogen sulfide, which are not addressed in the federal NAAQS.

Table 4.3-1
Federal and California Ambient Air Quality Standards

Pollutant	Averaging Time	Federal[(a)]	State
O_3	1 hour	0.12 ppm	0.09 ppm
	8 hours	0.08 ppm	None
PM_{10}	24 hours	150 μ/m^3	50 μ/m^3
	Annual Average	50 μ/m^3	20 μ/m^3 (b)
$PM_{2.5}$	24 hours	65 $\mu g/m^3$	None
	Annual Average	15 $\mu g/m^3$	12 $\mu g/m^3$ (b)
CO	1 hour	35 ppm	20 ppm
	8 hours	9 ppm	9.0 ppm
	8 hours (Lake Tahoe)	None	6 ppm
NO_2	1 hour	None	0.25 ppm
	Annual Average	0.053 ppm	None
Pb	30 days	None	1.5 $\mu g/m^3$
	Calendar Quarter	1.5 $\mu g/m^3$	None
SO_2	1 hour	None	0.25 ppm
	3 hours	0.5 ppm(c)	NA
	24 hours	0.14 ppm	0.04 ppm
	Annual Average	0.03 ppm	None
Sulfates	24 hours	None	25 $\mu g/m^3$
Hydrogen Sulfide	1 hour	None	0.03 ppm

Source: CARB ADAM website, www.arb.ca.gov/aqs/aaqs2.pdf

Notes:
(a) Primary NAAQS unless otherwise noted.
(b) State PM_{10} and $PM_{2.5}$ standards approved by CARB in 2002 and expected to be formally approved by Office of Administrative Law in 2003.
(c) Secondary NAAQS.

Counties and metropolitan areas are classified as attainment or non-attainment with respect to these federal and state ambient pollutant standards. An area's classification is determined by comparing actual monitored air pollutant concentrations with state and federal standards. More than 200 air quality monitoring stations are located in California and are part of the State and Local Air Monitoring Network. These stations are operated by the California Air Resources Board, local Air Pollution Control Districts (APCDs), or Air Quality Management Districts (AQMDs), private contractors, and the National Park Service (NPS).

Data measured at three stations near the proposed project are presented in Tables 4.3-2, 4.3-3, and 4.3-4. At Morro Bay, the PM_{10} 24-hour average state standard was exceeded in 2002 and the 1-hour average O_3 standard was exceeded in 1999. Maximum recorded values for all other pollutants have been below the federal and state ambient air quality standards at these three monitoring stations.

Based on pollutant concentrations measured at all stations within San Luis Obispo County, the region is in compliance with ambient air quality standards for all pollutants, except the state 1-hour average O_3 standard and the state 24-hour PM_{10} standard. With the new O_3 8-hour standard having been upheld by the courts, final attainment/nonattainment designations are expected in 2004.

At the local level, the San Luis Obispo County Air Pollution Control District (SLOAPCD) regulates air quality by establishing local air quality regulations, permitting stationary sources, and reviewing and planning activities related to air quality. SLOAPCD is also responsible for enforcing and implementing federal and state standards. SLOAPCD has developed significance thresholds for projects that generate air pollutants. These thresholds apply to both short-term and long-term air pollutant emissions. Projects with the potential to generate emissions exceeding the thresholds would be considered to have a significant impact on air quality. These thresholds are discussed in Section 5.3.

4.3.1.3 Existing Emission Sources

The measured pollutant ambient concentrations described above are a result of emissions from anthropogenic and natural sources. Anthropogenic sources of emissions are generally divided into three types: stationary, area-wide, and mobile sources. The contributions of these source categories vary from region to region. CARB maintains an emission inventory to determine the sources and quantities of air pollution generated within the state's counties and air basins. Table 4.3-5 presents a summary of the 2002 pollutant emission data for San Luis Obispo County.

Table 4.3-2
Maximum Measured Pollutant Concentrations
at Grover City-Lesage Drive Monitoring Station

Pollutant	Averaging Time	Units	Standards		Maximum Measured Concentration			
			Federal	State	1999	2000	2001	2002
O_3	1 hour	ppm	0.12	0.09	0.086	0.068	0.067	0.067
	8 hours	ppm	0.08	None	0.069	0.057	0.060	0.058
PM_{10}	24 hours	$\mu g/m^3$	150	50	NA	NA	NA	NA
	Annual Average	$\mu g/m^3$	50	20	NA	NA	NA	NA
$PM_{2.5}$	24 hours	$\mu g/m^3$	65	None	NA	NA	NA	NA
	Annual Average	$\mu g/m^3$	15	12	NA	NA	NA	NA
CO	1 hour	ppm	35	20	NA	NA	NA	NA
	8 hours	ppm	9	9.0	NA	NA	NA	NA
NO_2	1 hour	ppm	None	0.25	0.050	0.050	0.046	0.044
	Annual Average	ppm	0.053	None	0.008	0.008	0.006	0.006

Source for Maximum Measured Concentrations:
CARB ADAM website, **www.arb.ca.gov/adam**, October 15, 2003
EPA AIRData website, http://www.epa.gov/air/data/index.html, October 15, 2003
NA = Data for these pollutants are not available at station.

Table 4.3-3
Maximum Measured Pollutant Concentrations at Morro Bay Monitoring Station

Pollutant	Averaging Time	Units	Standards		Maximum Measured Concentration			
			Federal	State	1999	2000	2001	2002
O_3	1 hour	ppm	0.12	0.09	**0.096**	0.063	0.074	0.068
	8 hours	ppm	0.08	None	0.071	0.056	0.062	0.062
PM_{10}	24 hours	$\mu g/m^3$	150	50	39.0	47.0	43.0	**52.0**
	Annual Average	$\mu g/m^3$	50	20	14	18	17	16
$PM_{2.5}$	24 hours	$\mu g/m^3$	65	None	NA	NA	NA	NA
	Annual Average	$\mu g/m^3$	15	12	NA	NA	NA	NA
CO	1 hour	ppm	35	20	NA	NA	NA	NA
	8 hours	ppm	9	9.0	NA	NA	NA	NA
NO_2	1 hour	ppm	None	0.25	NA	NA	0.041	0.044
	Annual Average	ppm	0.053	None	NA	NA	NA	0.007

Source of Maximum Measured Concentrations:
CARB ADAM website, **www.arb.ca.gov/adam**, October 15, 2003
EPA AIRData website, http://www.epa.gov/air/data/index.html, October 15, 2003
Notes:
Concentrations in bold exceed either the federal or state standard.
NA = not available

Table 4.3-4
Maximum Measured Pollutant Concentrations
at San Luis Obispo-Marsh Street Monitoring Station

Pollutant	Averaging Time	Units	Standards		Maximum Measured Concentration			
			Federal	State	1999	2000	2001	2002
O_3	1 hour	ppm	0.12	0.09	0.089	0.075	0.078	0.073
	8 hours	ppm	0.08	None	0.069	0.069	0.068	0.063
PM_{10}	24 hours	$\mu g/m^3$	150	50	42.0	44.0	39.0	44.0
	Annual Average	$\mu g/m^3$	50	20	15	17	17	15
$PM_{2.5}$	24 hours	$\mu g/m^3$	65	None	20.0	28.2	25.5	20.1
	Annual Average	$\mu g/m^3$	15	12	8.2	8.3	9.3	8.4
CO	1 hour	ppm	35	20	5.3	3.9	8.3	3.5
	8 hours	ppm	9	9.0	3.13	2.25	2.01	1.65
NO_2	1 hour	ppm	None	0.25	0.064	0.051	0.054	0.057
	Annual Average	ppm	0.053	None	0.013	NA	0.012	0.010

Source for Maximum Measured Concentration:
CARB ADAM website, **www.arb.ca.gov/adam**, October 15, 2003
EPA AIRData website, http://www.epa.gov/air/data/index.html, October 15, 2003
NA = not available

Table 4.3-5
Regional Emissions in the County in 2002 (tons/day)

Types of Sources	ROG	CO	NO_x	SO_x	PM_{10}	$PM_{2.5}$
Stationary	7.81	9.73	6.92	8.16	1.27	0.91
Area	6.77	37.59	0.68	0.04	27.64	9.55
Mobile	13.46	109.28	23.5	0.4	1.07	0.88
Natural	0.79	20.62	0.94	—	4.04	3.59
Total	28.83	177.22	32.04	8.59	34.01	14.93

Emissions from mobile sources constitute the majority of ROG, CO, and NO_x emissions in the county. Area-wide emissions contribute more than 80 percent of the PM_{10} emissions and stationary sources contribute more than 90 percent of the SO_x emissions in the county.

4.3.2 No Project Alternative

New generation would most likely be constructed in Alameda County or Kern County. The specific locations are not known at this time, so the precise air quality conditions cannot be well defined. However, a general description of the climate and air quality within the two counties are provided below.

4.3.2.1 Alameda County

Alameda County is located within the San Francisco Bay Area and covers approximately 738 square miles that run from the bay to the inland valley. Alameda County experiences microclimates within the region that are influenced by the Pacific Ocean. In general, the climate in the region is Mediterranean, characterized by cool, wet winters and hot, dry summers.

The western portion of the county has a distinctly different climate than the eastern portion. The East Bay hills run along the western portion of the county. Marine air enters through the Golden Gate and is blocked by the hills. The air splits to the north and south with the southern flow directed along the hills. Most of the western portion of the county receives winds mainly from the west and northwest except for the northern part of the county where prevailing winds are from the south-southwest. However, in the winter, winds are equally likely to come from the east for the southwest portion of Alameda County. The sea breeze and the air from the bay helps to keep temperatures moderate. During the summer months, average maximum temperatures are in the mid-70s (Fahrenheit [°F]). Average maximum winter temperatures are in the high 50s to low 60s. Average minimum temperatures are in the low 40s in the winter and mid 50s in the summer.

The eastern portion of the county is a sheltered inland valley. Both the western and the eastern sides of the area are bordered by foothills with elevations as high as 1,500 feet. The Black Hills and Mount Diablo (3,800 feet) border the northern end and hills 3,000 to 3,500 feet high run along the southern side. The western border has two gaps: the Hayward Pass and the Niles Canyon. The major passage to the east is the Altamont Pass. A northwest-to-southeast channel penetrates the northern border. During the summer months, air movement can be limited with a strong inversion layer. However, certain conditions in the summer can result in a strong afternoon wind coming from the west. Maximum summer temperatures can range from the high 80s to the 90s, sometimes hitting the 100s. During the winter, under calm and cool conditions, gravity drives the cold air downward. The cold air drains off the hills and can result in winds coming from the north to northeast. Winds are generally light during the late night and early morning hours. Average winter maximum temperature ranges from the high 50s to the low 60s, minimum temperatures are from the mid-to-high 30s. The mean precipitation is 14 inches.

The air pollution potential is lowest for the region of the county closest to the bay due to the good ventilation from upwind sources. However, the eastern portion has a high air pollution potential, especially for ozone precursors in the summer and fall. The valley traps locally generated pollutants and receives pollutants from regions to the west and sometimes from the east. The high temperature characteristic of the eastern portion increases the potential for ozone build-up. During the winter, strong surface-based temperature inversions can trap carbon monoxide and particulate matter. The San Francisco Bay Area is currently in nonattainment of state and federal ozone standards and nonattainment of state PM_{10} standards. The most frequent ozone exceedances typically occur in the eastern portion of Alameda County. PM_{10} exceedances also occur throughout the county, though more predominately in the eastern portion.

4.3.2.2 Kern County

Kern County covers 8,000 square miles and has a wide range of climatic conditions and topography encompassing mountains, deserts, and valleys. The western portion of the county includes the southern Central Valley region and the eastern portion includes the desert region The Coastal Ranges border the west with an average elevation of 3,000 feet and the Tehachapi mountains border the south with elevations varying from 6,000 to 8,000 feet. The Sierra Nevada (with elevations varying from 8,000 to 14,000 feet) cuts through the center of the county, dividing the Central Valley and the desert regions. In the summer, winds from the Pacific Ocean enter through the Bay Area and travel south through Central Valley into Kern County. The summer light winds generally continue though the Tehachapi Pass to the south. In the winter, light winds generally come from the southern end of the valley and flow in a north-northwesterly direction. These wind conditions result in air pollutants generally being transported from the north to the south in the summer and in a reverse direction in the winter. However, during the winter months, low wind speeds from the lack of marine air intrusion, combined with low inversion layers in the winter, create a climate conducive to high CO and PM_{10} concentrations.

Bakersfield is located in the valley portion of the county and experiences average maximum temperatures ranging from 57.4 °F to 98.6 °F. Average minimum temperatures range from 38.3 °F to 68.9 °F. The area, on average, has a yearly rainfall of 6.19 inches. Mojave, which is in the desert region of the county, has similar average temperatures and precipitation. This city has average maximum temperatures ranging from 57.1 °F to 96.8 °F and average minimum temperatures ranging from 32.6 °F to 68.6 °F. However, Mojave experiences days in the winter that are under 32 °F. Average annual precipitation in Mojave is 5.84 inches, which is slightly lower than at Bakersfield.

Light wind conditions in Kern County can result in air pollutants becoming trapped in the region, thereby elevating pollutant concentration levels. As mentioned above, inversion layers in the winter coupled with the light winds can result in high levels of CO and PM_{10} concentrations. High temperatures in the summer can be conducive to high ozone concentrations. The county is currently in nonattainment of the federal and state ozone standards and the state PM_{10} standards. The western portion (the valley) and the northeastern corner of the county are in nonattainment of the federal PM_{10} standards. The county is currently in attainment of all other federal and state standards.

4.4 BIOLOGICAL RESOURCES

4.4.1 Proposed Projects

4.4.1.1 Study Area

The project study area for the Proposed Projects includes the proposed transportation corridors for the replacement steam generators (RSGs), the temporary staging area, the containment structure, and the storage site for the original steam generators (OSGs).

4.4.1.2 Methods

Several extensive environmental studies have been conducted on DCPP property:

- Diablo Canyon Independent Spent Fuel Storage Installation EIR (MRS, 2003);
- Diablo Canyon Property Preliminary Resource Inventory (LSA Associates, Inc., 1998);
- Sensitive Resource Inventory for Diablo Canyon Lands (Biosystems Analysis, 1995).

These studies, as well as other documents, records, and databases, were reviewed to determine what biological resources are present in the project study area. Previous studies, the California Department of Fish and Game Natural Diversity Database (CNDDB) database (see Figure 4.4-1), and the U.S. Fish and Wildlife Service list of special status species that occur in San Luis Obispo County (USFWS, 2003) were reviewed to prepare a list of special status species and sensitive habitats with potential to occur in the project study area (Table 4.4-1 — at the end of Section 4.4).

In addition to the surveys referenced above, a marine biological survey was conducted by Tenera Environmental at the barge landing locations at Port San Luis Transport and the Intake Cove (Figures 3-3 through 3-7) to characterize the associated habitats and biota. The survey was completed during the late afternoon low tide (+1 feet MLLW) on October 9, 2003. The occurrences of predominant organisms were noted along the shore at the two locations. The length of shoreline surveyed at the Intake Cove was approximately 66 feet. The length of shoreline surveyed at the Port San Luis (PSL) location was approximately 164 feet.

4.4.1.3 Description of Biological Resources

Proposed Transportation Corridors

The RSGs will be transported by barge from the Port of Long Beach to either Port San Luis or the Intake Cove (Figure 3-4). At Port San Luis, the RSGs may be offloaded and transported to a temporary staging area along the existing paved 7-mile access road to the project site. At the Intake Cove, the RSGs would be transported on existing paved roads within the project site. The proposed transportation corridors include both terrestrial and marine habitat.

Marine Habitat. The marine habitat along this portion of the coast supports a high diversity of marine plants and animals, including 119 algal taxa and over 300 taxa of invertebrates in the intertidal zone, and 96 taxa of fish from nearshore waters. The fish species in the intertidal zone include pricklebacks (Family Stichaeidae), gunnels (Family Pholidae), clingfish (Family Gobiesocidae), monkeyface eel (*Cebidichthys violaceus*), and sculpins (Family Cottidae) (MRS, 2003). Central California waters support more than 25 species of marine mammals, with only a few being common near DCPP. Gray whales (*Eschrichtius robustus*) pass the area on their migratory route along the coast, and bottlenose dolphins (*Tursiops truncatus*) frequent the area. California sea lions (*Zalophus californianus*), harbor seals (*Phoca vitulina*), northern elephant seals (*Mirounga angustirostris*), and southern sea otters (*Enhydra lutris nereis*) are year-round residents in the area. Harbor seals breed and pup in the DCPP area, including the Intake Cove, and haul out on small beaches or rocks near shore. Elephant seals migrate past DCPP and often are observed in the Intake Cove (MRS, 2003).

The shoreline in each area consists of rock revetment that armors adjoining roads and parking areas that were constructed from landfill. The revetment at the Port San Luis landing area is comprised of 4- to 5-foot-diameter boulders, is very steeply banked, and is near-vertical in some sections. The seafloor at the toe of the Port San Luis revetment is a sand flat that is the predominant subtidal habitat in San Luis Bay. A sand beach (Fisherman's Beach) occurs directly to the east of the revetment (Tenera, 2003).

The Intake Cove is located in the middle portion of a rocky headland at DCPP. The Intake Cove revetment slopes more gradually into the ocean, and includes a greater mixture of rock sizes, from large 4- to 5-foot boulders to smaller cobbles. The toe of the revetment terminates on the sand seafloor base that, unlike Port San Luis, has scattered rocky areas. A large rock that is emergent above the high tide level also occurs in the cove near the proposed landing location (Tenera, 2003).

Vegetation. Vegetation at the two proposed barge landing sites consists of submerged aquatic vegetation composed of several algal species (see Table 4.4-2). Sea lettuce (*Ulva/Enteromorpha* spp.) and grapestone seaweed (*Mastocarpus papillatus*) were the most common algal species at both locations. Angel hair seaweed (*Gracilaria sjoestedii*) was only found at the Port San Luis location, since this species is associated with the sandy areas that occur at the base of the revetment. Surface canopies of giant kelp (*Macrocystis pyrifera*) were present immediately offshore of the DCPP intake cove location, but no giant kelp was present near the Port San Luis location. The emergent rock in immediate proximity to the Intake Cove supported rockweeds. Water turbidity was too great to observe species below the waterline at Port San Luis. However, it is likely that the foliose brown alga (*Desmarestia ligulata*) and additional amounts of sea lettuce were present on the sand base in the Port San Luis area, as they were common drift species on the adjoining beach (Tenera, 2003).

Wildlife. Animal species found at the two landing sites consisted of invertebrates (see Table 4.4-2). The two possible landing locations differed in species composition and abundance. Although limpets (*Lottia* sp.) and barnacles (Order Thoracica) were abundant at both locations, many other species were disproportionate in abundance between locations. Differences were largely due to habitat differences. Greater wave activity may account for the abundance of mussels at Port San Luis, while none were found at the Intake Cove. Similarly, anemones (Order Actinaria) were more common at Port San Luis. In contrast, shore and hermit crabs (Order Decapoda) were only found at the wave-protected Intake Cove where the smaller boulders and cobbles provide shelter for this species. Bat stars (*Patiria miniata*) could also be seen below the waterline at the Intake Cove (Tenera, 2003).

Terrestrial Habitat

The largely undisturbed lands surrounding DCPP include several sensitive natural communities. These include Northern Coastal Bluff Scrub, Central Maritime Chaparral, Central Coast Live Oak Riparian Forest, Central Coast Arroyo Willow Riparian Forest, Coastal Terrace Prairie/Valley Needlegrass Grassland, Southern Bishop Pine Forest, Central Coast Riparian Scrub, and Freshwater Marsh (LSA Associates, Inc., 1998; Biosystems Analysis, 1995). These habitats support diverse populations of plants and animals.

The project site is on developed property, so these sensitive habitats are not present within the project site. Once the RSGs reach land, the proposed transportation routes are along existing, paved roads.

Vegetation. The surrounding habitat is described above. The roads over which the RSGs will travel are unvegetated.

Wildlife. No habitat exists on the paved roads. Wildlife, such as deer, skunks, raccoons, or rabbits may cross the road, but are not expected to be present on the paved road.

4.4.1.4 Temporary Staging Area, Containment Structure, and Temporary Storage Facility

Marine Habitat. There is no marine habitat in these areas.

Terrestrial Habitat The temporary staging area, containment structure, and temporary storage facility are all on the project site, which is developed property. No sensitive habitats are present within the project site. No special status species are expected to occur within the project study area.

4.4.2 No Project Alternative

The No Project Alternative assumes that 2200 MW of base load generating capacity at DCPP would be replaced by constructing natural gas-fired power plants in Alameda County and Kern County. Biological conditions in Alameda or Kern Counties would require further analysis to meet state and federal regulatory requirements.

Table 4.4-1
Special Status or Sensitive Species Potentially Occurring on the Diablo Canyon Property

Scientific Name	Common Name	Status Fed/State/ CNPS	Habitat	Presence/Absence in Project Area[1]
PLANTS				
Arctostaphylos morroensis	Morro manzanita	T/–/1B	Evergreen shrub; blooms December to March; found on sandy loam soils in maritime chaparral, cismontane woodland, pre-Flandrian coastal dunes, and coastal scrub.	Recorded in 1970 along Prefumo Canyon Road. Suitable habitat may be present on PG&E property, but it is not likely to occur within the project area.
Cirsium fontinale var. *obispoense*	Chorro Creek bog thistle	E/E/1B	Perennial herb; blooms February to July; found in serpentinite seeps in chaparral and cismontane woodland.	Closest known location is Prefumo Canyon, off PG&E property. No serpentinite seeps known on PG&E property. Not likely to occur.
Cirsium loncholepis	La Graciosa thistle	E/T/1B	Coastal dunes, Coastal scrub, marshes and swamps (brackish), blooms May to August, mesic.	Reported from vicinity, not likely to occur in project area.
Cirsium rhothophilum	Surf thistle	–/T/1B	Coastal bluff scrub, Coastal dunes, blooms April to June.	Known from vicinity, not likely to occur in project area.
Clarkia speciosa ssp. *immaculata*	Pismo clarkia	E/R/1B	Chaparral margins and openings, cismontane woodland, valley and foothill grassland, blooms May to July, sandy.	Known from vicinity, not likely to occur in project area.
Cordylanthus maritimus ssp. *maritimus*	salt marsh bird's-beak	E/E/1B	Coastal dunes, Marshes and swamps (coastal salt), blooms May to October	Known from vicinity, not likely to occur in project area.
Dithyrea maritima	Beach spectaclepod	–/T/1B	Rhizomatous perennial herb; blooms March to May; located on sandy soils in coastal dunes and coastal scrub communities.	Known from Montana de Oro in sand dunes, north of PG&E property. Coastal dunes are limited on the PG&E property, do not occur in the project area. Not likely to occur.
Eriodictyon altissimum	Indian Knob mountain-balm	E/E/1B	Evergreen shrub; blooms March to June; found on Pismo Formation sandstone soils in maritime chaparral, cismontane woodland and coastal scrub.	Recorded north of the DCPP in Hazard Canyon. Central maritime chaparral on PG&E property is suitable habitat. Not likely to occur in project area
Suaeda californica	California seablite	E/–/1B	Evergreen shrub; blooms July to October; found in coastal salt marshes and swamps.	Closest recorded occurrence is in Morro Bay Estuary. Not likely to occur in the project area.
Arctostaphylos cruzensis	Arroyo de la Cruz manzanita	FSC/–/1B	Evergreen shrub; blooms December to March; sandy soils in broad-leaved upland forest, coastal bluff scrub, closed-cone coniferous forest, chaparral, coastal scrub, and valley and foothill grassland.	This species is known to occur on PG&E property near Coon Creek, as well as near Saddle Peak and Green Peak. Not likely to occur within the project area.
Arctostaphylos pechoensis	Pecho manzanita	FSC/–/1B	Evergreen shrub; blooms November to March; located on siliceous shale in closed cone coniferous forest, chaparral, and coastal scrub.	This species is commonly found within maritime chaparral on PG&E property. Not likely to occur within the project area.

Table 4.4-1 (Continued)
Special Status or Sensitive Species Potentially Occurring on the Diablo Canyon Property

Scientific Name	Common Name	Status Fed/State/ CNPS	Habitat	Presence/Absence in Project Area[1]
PLANTS (Continued)				
Arctostaphylos wellsii	Well's manzanita	–/–/1B	Evergreen shrub; blooms December to April; found on sandstone in closed-cone coniferous forest and chaparral.	Observed on ridge of Point San Luis on Pismo sandstone, may be present in other areas of suitable habitat on PG&E property. Not likely to occur in the project area.
Astragalus nuttallii var. *nuttallii*	Nuttall's milk-vetch	–/–/4	Perennial herb; blooms January to November; occurs in coastal bluff scrub and coastal dunes.	Coastal areas in northern Santa Barbara, San Luis Obispo, and Monterey counties. Common on PG&E property.
Atriplex coulteri	Coulter's saltbush	–/–/1B	Perennial herb; blooms March to October; found on alkaline or clay soils in coastal bluff scrub, coastal dunes, coastal scrub, and valley and foothill grassland.	Observed near Crowbar Peak on an isolated sea stack. Potential for species to be present in suitable habitat on PG&E property, not likely to occur in project area.
Calochortus obispoensis	San Luis mariposa lily	–/–/1B	Perennial herb; blooms May to July; often found on serpentinite soils in chaparral, coastal scrub, and valley and foothill grassland.	Recorded in the Irish hills along Prefumo Canyon Road near the head of Coon Creek. No serpentine soils on PG&E property, not likely to occur in project area.
Castilleja densiflora ssp. *obispoensis*	Obispo Indian paintbrush	–/–/1B	Annual herb; blooms in April; found in valley and foothill grassland.	Recorded in See and Prefumo canyons. Grassland habitat present on PG&E property, not likely to occur in project area.
Calystegia subacaulis ssp. *episcopalis*	San Luis Obispo morning glory	–/–/1B	Rhizomatous perennial herb; blooms April to May; found in chaparral and cismontane woodland.	Known to occur east of Morro Bay, near Black Hill. Suitable habitats for this species on PG&E property, not likely to occur in the project area.
Carex obispoensis	San Luis Obispo sedge	–/–/1B	Rhizomatous perennial herb; blooms April to June; found in serpentinite seeps in closed-cone coniferous forest, chaparral, coastal prairie, coastal scrub, and valley and foothill grassland.	Recorded in Prefumo Canyon. Serpentine soils are not found on the property, not likely to occur in the project area.
Dudleya abramsii ssp. *Bettinae*	San Luis Obispo serpentine dudleya	–/–/1B	Perennial herb; blooms May to July; located on rocky, serpentinite soils in chaparral, coastal scrub and valley and foothill grassland.	Reported from San Bernardo Creek, northeast of Morro Bay. Not known from PG&E property; not likely to occur in project area.
Erigeron blochmaniae	Blochman's leafy daisy	–/–/1B	Rhizomatous perennial herb; blooms July to August; found in coastal dunes and coastal scrub communities.	Many occurrences reported from Montana de Oro and south end of Morro Bay. May be present in suitable habitat within PG&E property, not likely to occur in the project area.

Table 4.4-1 (Continued)
Special Status or Sensitive Species Potentially Occurring on the Diablo Canyon Property

Scientific Name	Common Name	Status Fed/State/ CNPS	Habitat	Presence/Absence in Project Area[1]
PLANTS (Continued)				
Layia jonesii	Jones's layia	FSC/–/1B	Annual herb; blooms March to May; located on clay or serpentinite soils in chaparral and valley and foothill grassland.	Reported from the coastal mesas near Morro Bay; not likely to occur in the project area.
Monardella frutescens	San Luis Obispo monardella	FSC/–/1B	Rhizomatous perennial herb; blooms May to September; found on sandy soils in coastal dunes and coastal scrub communities.	Reported south of Morro Bay; not likely to occur in the project area.
Sanicula maritima	Adobe sanicle	–/R/1B	Chaparral Coastal prairie Meadows and seeps, Valley and foothill grassland, blooms February to May, clay, serpentinite.	Reported from PG&E property; but not likely to occur in the project area.
Scrophularia atrata	Black-flowered figwort	FSC/–/1B	Perennial herb; blooms April to July; found in closed-cone coniferous forest, chaparral, coastal dunes, coastal scrub, and riparian scrub.	Recorded in Price Canyon and east of Avila Beach. Reported from PG&E property; but not likely to occur in the project area.
Perideridia gairdneri ssp. *gairdneri*	Gairdner's yampah	FSC/–/4	Perennial herb; blooms June to October; found in broadleaved upland forest, chaparral, coastal prairie, valley and foothill grassland, and vernal pools.	No records of occurrence in the project vicinity, but may be present in suitable habitat. Not likely to occur in the project area.
INVERTEBRATES				
Helminthoglypta walkeriana	Morro shoulderband snail	E/–	Duff beneath various dune plants in coastal strand and coastal sage scrub.	Not likely to occur in the project area.
Euphilotes enoptes smithi	Smith's blue butterfly	E/–	Coastal dunes and coastal scrub associated with wild buckwheat (*Erigonium latifiolium, E. parvifolium*, and *E. nudum*).	No observations recorded in the vicinity, not likely to occur in project area.
Plebulina emigdionis	San Emigdio blue butterfly	FSC/–	Associated with saltbush (*Atriplex canescens*) and occasionally *Lotus purshianus*.	No observations recorded in the vicinity, not likely to occur in project area.
Danaus plexippus (wintering sites)	Monarch butterfly	–/–	Groves of Monterey pine or eucalyptus along costal strand.	Not likely to occur in project area.
Speyeria adiasste adiaste	Unsilvered fritillary butterfly	FSC/–	Grasslands with food plants such as violets, thistles, mint, and buckeye tree.	Not likely to occur in the project area.
FISH				
Oncorhynchus mykiss	Steelhead – South/Central California Coast ESU	T/CSC	Cool, clear, well-oxygenated coastal streams.	Low to moderate potential to occur in Diablo Creek; historically present. Not likely to occur in project area.
Eucyclogobius newberryi	Tidewater goby	E/CSC	Shallow lagoon, lower stream reaches with fresh to brackish, slow-moving or fairly still, but not stagnant water.	Low potential to occur, limited suitable habitat; historically present at mouth of Diablo Creek. Not likely to occur in project area.

Table 4.4-1 (Continued)
Special Status or Sensitive Species Potentially Occurring on the Diablo Canyon Property

Scientific Name	Common Name	Status Fed/State/ CNPS	Habitat	Presence/Absence in Project Area[1]
AMPHIBIANS				
Taricha torosa torosa	Coast Range newt	–/CSC	Streams, ponds, and any other available surface water.	Monterey County and south only. Not likely to occur in project area.
Scaphiopus (=Spea) hammondii	Western spadefoot toad	FSC/CSC	Prefers relatively open areas in grasslands, chaparral, and pine-oak woodlands, areas of sandy or gravelly soil in alluvial fans, washes, and floodplains.	Not likely to occur in project area.
Rana aurora draytonii	California red-legged frog	T/CSC	Breeds in temporary and permanent water sources with pools and ponds and emergent vegetation	Not likely to occur in project area.
REPTILES				
Clemmys marmorata pallida	Southwestern pond turtle	FSC/CSC	Occupies temporary or permanent water sources with deep pools.	Not likely to occur in project area.
Phrynosoma coronatim frontale	California horned lizard	FSC/CSC	Exposed gravelly, sandy soils with minimal shrubs, riparian woodland clearings, dry chamise chaparral, and annual grasslands with scattered seepweed or saltbush.	Not likely to occur in project area.
Anniella pulchra pulchra	Silvery legless lizard	FSC/CSC	Areas with sandy or loose organic soils or where there is abundant leaf litter; often annual grasslands with rock outcroppings.	Not likely to occur in project area.
Anniella pulchra nigra	Black legless lizard	–/CSC	Sandy soils/dunes with bush lupine and mock heather as dominant plants and moist soils.	Not likely to occur in project area.
Thamnophis hammondii	Two-striped garter snake	–/CSC	Riparian and freshwater marshes with perennial water.	No recorded observations from vicinity; not likely to occur.
Green sea turtle	Chelonia mydas	T/T	Infrequent visitor to nearshore waters.	Low potential to occur due to low frequency of presence in area.
BIRDS				
Pelecanus occidentalis californicus (nesting)	California brown pelican	E/E	Coastal, salt bays, ocean, and beaches.	No nesting colonies present; present in offshore waters and occasional fly overs. Not likely to occur in project area.
Accipiter cooperii (nesting)	Cooper's hawk	–/CSC	Open woodlands, especially riparian woodland.	Observed in project vicinity. Not likely to occur in project area.
Accipiter striatus (nesting)	Sharp-shinned hawk	–/CSC	Open woodlands, especially riparian woodland.	Potential to occur in vicinity; not likely to occur project area.
Aquila chrysaetos (nesting and wintering)	Golden eagle	–/CSC and FP	Mountains, deserts, and open country. Suitable nest habitat is primarily cliffs and rocky ledges, sometimes trees, and occasionally ground and manmade structures.	Nesting unlikely due to limited amount of suitable nesting sites; moderate potential for fly over and infrequent foraging. Not likely to occur in project area.

Table 4.4-1 (Continued)
Special Status or Sensitive Species Potentially Occurring on the Diablo Canyon Property

Scientific Name	Common Name	Status Fed/State/ CNPS	Habitat	Presence/Absence in Project Area[1]
BIRDS (Continued)				
Buteo regalis (wintering)	Ferruginous hawk	FSC/CSC	Rivers, lakes, and coasts; grasslands and agricultural areas during winter; forages in woodlands.	Moderate potential to occur in vicinity. Not likely to occur in project area.
Circus cyaneus (nesting)	Northern harrier	–/CSC	Coastal salt marshes, freshwater marshes, grasslands, and agricultural fields; occasionally forages over open desert and brushlands.	Moderate potential to occur in vicinity. Not likely to occur in project area.
Elanus leucurus (nesting)	White-tailed kite	FSC/FP	Grasslands with scattered trees, near marshes, along highways.	Moderate potential to occur in vicinity. Not likely to occur in project area
Haliaeetus leucocephalus (nesting and wintering)	Bald eagle	T, PD/E	Lakes, reservoirs, rivers, offshore islands, and some rangelands and coastal wetlands in southern California.	No recorded observations from vicinity; not likely to occur.
Pandion haliaetus (nesting)	Osprey	–/CSC	Rivers, lakes, and coasts.	Moderate potential to occur in vicinity. Not likely to occur in project area.
Falco columbarius (nesting)	Merlin	–/CSC	Coastlines, open country, wetlands, woodlands, agricultural fields, and grasslands.	Moderate potential to occur in vicinity. Not likely to occur in project area.
Falco mexicanus (nesting)	Prairie falcon	–/CSC	Grasslands, savannahs, rangeland, agricultural fields, and desert scrub; often uses sheltered cliff ledges for cover.	Not likely to occur in project area.
Falco peregrinus anatum (nesting)	American peregrine falcon	D, FSC/E, and FP	Coastal estuaries, open country, cliffs to coasts.	No recorded observations from vicinity; not likely to occur.
Charadrius alexandrinus nivosus (nesting)	Western snowy plover (coastal population)	T/–	Sandy beaches, salt pond levees, and shores of large alkali lakes. Needs sandy, gravelly, or friable soils for nesting.	Known to occur at Pismo State Beach. Not likely to occur in project area, lack of suitable habitat.
Coccyzus americanus occidentalis (nesting)	Western yellow-billed cuckoo	FC/E	Riverine woodlands, thickets, and farms.	No recorded observations from vicinity; not likely to occur.
Asio flammeus (nesting)	Short-eared owl	–/CSC	Open country, marshes, wet meadows, and fields; nests on ground in grassland.	Not likely to occur in project area, lack of suitable habitat.
Asio otus (nesting)	Long-eared owl	–/CSC	Riparian and live oak woodlands; dense stands of trees.	Moderate potential to occur in vicinity; not likely to occur in project area.

Table 4.4-1 (Continued)
Special Status or Sensitive Species Potentially Occurring on the Diablo Canyon Property

Scientific Name	Common Name	Status Fed/State/ CNPS	Habitat	Presence/Absence in Project Area[1]
BIRDS (Continued)				
Athene cunicularia (burrow sites)	Burrowing owl	FSC/CSC	Open grasslands, deserts, scrublands; low-growing vegetation; small mammal burrows; prefers berms, ditches, and grasslands adjacent to rivers, agricultural, and scrub areas.	Low to moderate potential to occur in vicinity; not likely to occur in project area.
Strix occidentalis occidentalis (nesting)	California spotted owl	FSC/CSC	Mature woodlands with dense canopy cover.	Not likely to occur in project area, lack of suitable habitat.
Empidonax difficilis (nesting)	Pacific slope flycatcher	FSC/–	Woodlands, especially riparian woodland.	Likely to occur in project vicinity. Not likely to occur in project area.
Lanius ludovicianus (nesting)	Loggerhead shrike	FSC/CSC	Grasslands or beach areas with scattered trees or other perch sites, coastal scrub.	Low to moderate potential to occur in vicinity; not likely to occur in project area.
Eremophila alpestris actia	California horned lark	–/CSC	Open habitats, grasslands along the coast, deserts near sea level to alpine dwarf shrub habitat, uncommonly in coniferous and chaparral habitats.	Moderate potential to occur in vicinity; not likely to occur in project area.
Toxostoma redivivum	California thrasher	FSC/–	Chaparral and coastal sage scrub communities.	Likely to occur in project vicinity. Not likely to occur in project area.
Dendroica petechia brewsteri (nesting)	Yellow warbler	–/CSC	Riparian woodlands, montane chaparral, and mixed conifer habitats.	Moderate potential to occur in vicinity; not likely to occur in project area.
Icteria virens (nesting)	Yellow-breasted chat	–/CSC	Dense riparian woodland/thickets along streams, swamps, small ponds.	Moderate potential to occur in vicinity; not likely to occur in project area.
Amphispiza belli belli (nesting)	Bell's sage sparrow	FSC/CSC	Dense, dry chamise chaparral and coastal slopes of coastal sage scrub.	Moderate potential to occur in vicinity; not likely to occur in project area.
Agelaius tricolor (nesting colony)	Tricolored blackbird	FSC/CSC	Inhabits freshwater marshes and riparian scrub.	Nesting colonies unlikely, no records of observation; potential for occasional foraging. Not likely to occur in project area.
MAMMALS				
Antrozous pallidus	Pallid bat	–/CSC	Nests in dry, rocky habitats/caves, crevices in rocks, arid habitats including deserts, chaparral, and scrublands.	Moderate potential to occur in vicinity; not likely to occur in project area.
Corynorhinus townsendii townsendii	Townsend's western bigeared bat	FSC/CSC	Caves, mine tunnels, and buildings.	Moderate potential to occur in vicinity; not likely to occur in project area.
Dipodomys heermanni morroensis	Morro Bay kangaroo rat	E/E	Coastal scrub vegetation on old sand dune substrate.	If it still exists, may inhabit one small privately owned parcel of native vegetation. This species may be extinct.

Table 4.4-1 (Continued)
Special Status or Sensitive Species Potentially Occurring on the Diablo Canyon Property

Scientific Name	Common Name	Status Fed/State/ CNPS	Habitat	Presence/Absence in Project Area[1]
MAMMALS (Continued)				
Neotoma lepida intermedia	San Diego desert woodrat	–/CSC	Chaparral, coastal sage scrub, and pinyon-juniper woodland.	Potential to occur in vicinity, not likely to occur in project area.
Taxidea taxus	American badger	–/CSC	Drier open stages of most shrub, forest, and herbaceous habitats with friable soils.	Moderate potential to occur in vicinity; not likely to occur in project area
Enhydra lutris nereis	Southern sea otter	T/T	Nearshore waters usually less than 60 feet deep, especially in rocky areas and kelp beds	Known to occur in project vicinity, low potential to occur in project area.
Eumetopias jubatus	Steller sea lion	T/–	Coastal waters, primarily north of DCPP; haul out and pup onshore.	Not likely to occur; few individuals known from area.
Mirounga angostrirostris	Northern elephant seal	–/–	Coastal waters; haul out on sandy beaches.	Likely to occur in project vicinity, low potential to occur in project area.

Sources: CNDDB (2003); CNPS (2001); USFWS (2003).

Status:

Federal: E = Endangered; T = Threatened; FC = Candidate species; FSC* = Federal Species of Concern; PD = Proposed for de-listing; D = Delisted.

CNPS (California Native Plant Society): E = Endangered; T = Threatened: 1B = Plants considered rare or endangered in California and elsewhere; 4 = Plants of limited distribution – a watch list.

State: E = Endangered; T = Threatened; CSC = California Species of Special Concern; FP = California "Fully Protected Species"

*Species of concern is an informal term used by some, but not all U.S. Fish & Wildlife Service offices. Species of concern receive no legal protection and the use of the term does not necessarily mean that the species will eventually be proposed for listing as a threatened or endangered species (USFWS, 2002)

Note:

1 Project area includes the project site, 7-mile access road, and the Intake Cove and Port San Luis barge loading areas

Table 4.4-2
Predominant Marine Species Observed at the Proposed Offloading Sites

Scientific Name	Common Name or Description	Intake Cove*	Port San Luis*
Invertebrates			
Anthopleura elegantissima	aggregating anemone	-	+
Anthopleura xanthogrammica	green anemone	-	+
Asterina miniata	bat star	+	-
Balanus spp.	barnacle	-	+
Chthamalus fissus	acorn barnacle	+	+
Hemigrapsus nudus	purple shore crab	+	-
Littorina keenae	eroded periwinkle	+	+
Littorina scutulata	checkered periwinkle	+	+
Lottia digitalis	ribbed limpet	-	+
Lottia limatula	file limpet	+	+
Lottia pelta	shield limpet	+	+
Lottia scabra	rough limpet	+	+
Mytilus californianus	California mussel	-	+
Pachygrapsus crassipes	lined shore crab	+	-
Pagurus spp.	hermit crab	+	-
Pollicipes polymerus	leaf barnacle	-	+
Tectura scutum	plate limpet	+	-
Tetraclita rubescens	barnacle	+	+
Algae			
Endocladia muricata	nail brush seaweed	-	+
Fucus gardneri	rockweed	+	-
Gracilaria sjoestedii	angel hair seaweed	-	+
Macrocystis pyrifera	giant kelp	+	-
Mastocarpus papillatus	grapestone seaweed	+	+
Petrocelis franciscanus	crustose algae	+	+
Ulva/Enteromorpha spp.	sea lettuce	+	+

*(+) present, (-) not observed
Source: Tenera Environmental, 2003

Figure 4.4-1. Special Status Species within a 10-Mile Radius
CLICK HERE TO VIEW

[Figure 4.4-1, page 2]

4.5 CULTURAL RESOURCES

4.5.1 Proposed Projects

4.5.1.1 Overview

The creeks, river valleys, and floodplains in the general project area, along with the fringing coastline, have supported a continuous cultural occupation for at least the last 8,000 years. Current archaeological evidence suggests that a relatively small population existed in these areas, until about 2,000 years before present (B.P.), when populations appear to have expanded considerably into resource-rich coastal and near-shore estuarine environments (Dillon, 1990:6). Accounts by Juan Rodríguez Cabrillo (Wagner, 1929:79-93) and Sebastian Vizcaino (Bolton, 1930:52-103), indicated that by the time of European contact to this area of the California coast, some of the large coastal villages had hundreds of occupants and were engaged in both terrestrial and maritime long distance trade.

4.5.1.2 Paleoindian Period

As currently demonstrated by the archaeological record, aboriginal activity during the Paleoindian Period consisted primarily of refining technological practices and the use of native food resources. A growth in population probably led to increased stability of individual communities and a gradual emergence of regional cultures (Wallace, 1978:35). The cultural material that has been documented typifies a hunting economy that also supported fishing, as well as shellfish and plant collecting.

The San Dieguito Complex defines the tool technology used during this period, and is found throughout Southern California (Warren, 1967; Wallace, 1978:27). This Complex includes non-fluted points such as leaf-shaped projectile points, and various leaf-shaped bifacial tools. Unfortunately, there are few reliable published radiometric dates from this period, with most of the artifacts identified as isolated find spots.

4.5.1.3 Milling Stone Period

The Milling Stone Period extends to at least 6000 B.P. and probably as far back to 8500 + B.P. (*cf.* Warren, 1968; Wallace, 1955). Milling Stone Horizon sites are found from Santa Barbara to Los Angeles County, and into San Diego County, in both coastal and inland settings. Hard seed processing was one of the major components of subsistence. The economy was based on plant collecting, but was supplemented by fishing and hunting, and general exploitation of marine and estuarine resources (Wallace, 1955). Large, heavy ground stone milling tools, such as deep basin metates and wedge-shaped manos, and large core/cobble choppers and scrapers typify the Milling Stone Period.

4.5.1.4 Intermediate Period

This period has also been called the "Hunting Period" or "Middle Horizon." About 5,000 years B.P., the Milling Stone traditions, with their heavy reliance on vegetal food sources, began to gravitate more towards animal proteins and marine resources. Procurement of plants for caloric intake was not necessarily replaced in kind by game hunting, but rather the local Milling Stone dietary regimen began to transition towards other resources. Mortars and pestles tend to predominate the tool kit, rather than manos and metates.

4.5.1.5 Late Prehistoric Period

The Late Prehistoric Period probably began sometime around the B.C./A.D. transition, but expanded culturally around 500 A.D. with the introduction of bow and arrow technology (Meighan, 1954). The end of the period is recognized as the end of the eighteenth century, when full implementation of the Spanish mission system took effect on the native populations.

The Late Prehistoric Period Chumash, with a Hokan linguistic stock, lived in large villages along the coastal bight and the wide valleys leading into the California interior. This was an ethnohistoric boundary group situated between the Salinan to the northwest and the Gabrieliño to the south and east. In the archaeological record, the Gabrieliño material culture (Johnston, 1962; Blackburn, 1963; Bean and Smith, 1978) is often (but not always) indistinguishable from the Chumash (Landberg, 1965; Grant, 1965, 1978a, and 1978b).

4.5.1.6 Ethnography: Obispeño Chumash

The project area is located within the ethnographic boundaries of the coastal Obispeño Chumash. The identity reflects this group's association with the Spanish mission of San Luis Obispo de Tolosa, established in 1772. Archaeological and mission records suggest that the Obispeño Chumash had fewer village inhabitants than the Channel Islands area Chumash, although this does not necessarily imply that there were fewer Chumash living in the area. On the contrary, mission records indicate that there were at least 142 rancherias or villages in the Obispeño

Chumash area, while only 93 rancherias were in the Channel Islands (i.e., Barbareño Chumash) area (Greenwood, 1978:520-1).

The material culture of the Obispeño Chumash is very similar to that of groups located throughout the Santa Barbara Channel, though trade relationships with the Yokuts of the San Joaquin Valley set this group apart (Greenwood, 1978:523). Village settlements consisted of small, round, and domed houses by the time of historical contact (Greenwood, 1978:521). Diagnostic Chumash projectile points have been noted in the archaeological record, as well as milling stones and numerous maritime-related tools intended for fishing and harvesting. Coastal subsistence patterns focused on the shallow waters and tidal pools, where exploitation of marine resources occurred. Trade and ceremonial items have also been noted and include shell beads, steatite objects, ornaments, and bone whistles. Accounts also suggest that the Purisimeño and Obispeño Chumash might have relied more on tule reed canoes, rather than the plank canoes of the "southern" Chumash groups.

4.5.1.7 Historic Setting

The first known European entry into the area was the expedition of Juan Cabrillo, who sailed north up the California coast from Mexico in 1542. His two ships reached the Santa Barbara Channel in October 1542 and after several tries, were able to round Point Conception and sail as far north as San Francisco Bay (Chesnut, 1993).

A second Spanish expedition arrived in the area in 1602, which consisted of two ships under the command of Sebastian Vizcaino. His aim was to follow Cabrillo's route and reassert Spanish claims to the area. Naming local landmarks after saint's days on which they were discovered, Vizcaino named the harbor of Santa Barbara on St. Barbara's feast day (December 4), and Point Conception on the Feast of the Immaculate Conception (December 8). Vizcaino sailed as far north as Monterey Bay, eventually returning to Acapulco.

In the 1760s, the Spanish government decided to establish a series of military establishments called presidios along the California coast between the two great natural harbors of San Diego and San Francisco (Weber, 1982 and 1992). Missions were constructed to fulfill the religious component of this expansion, and also served as centers for religious conversion of local Native Americans. These establishments also countered against feared occupation of the coast by Russian or English forces.

In the summer of 1769, Don Gaspar de Portola, the governor of Baja, California, set out to locate an overland route to Monterey Bay and prospect for presidio locations along the route. The expedition passed through the project area on its return to San Diego (Chesnut, 1993). Following Portola's expedition, Spanish visits and activity increased. An expedition led by Juan Bautista de Anza passed through the area in spring of 1776. A presidio was established at Santa Barbara in 1782, to fill the gap between the previously established presidios in Monterey and San Diego. That same year, the Mission San Buenaventura was founded, firmly establishing a permanent European presence in the area. The establishment of the Santa Barbara Mission in 1786 followed shortly thereafter.

It had never been the intention of the Spanish and the successor Mexican government that the missions would remain as permanent entities controlling the economy of the frontier areas (Weber, 1982). With independence, the Mexican government began a process of secularization of mission properties that was concluded in 1833. Missions were turned into parish churches and regional commissions were established to dispose of the properties and resettle the Indians affiliated with the missions. Mexican government policy was to give mission properties and other unclaimed land to prominent citizens who would be required to build homes and facilities and develop the properties. The period of California history known as the Rancho Period began, and ushered in a class of wealthy landowners known as "rancheros," who controlled the state. Approximately 40 of these land grants were made in Santa Barbara County during this period (Tompkins, 1976 and 1987; Chesnut, 1993; Avina, 1973).

4.5.1.8 Previously Conducted Surveys

Bibliographic references, previous survey reports, and archaeological site records were compiled through a records search of the California Historical Resources Information System (CHRIS). The CHRIS records searches and other archival review revealed area-specific survey reports conducted within the area of potential effects (APE), which are described below:

Location	Survey #	Author	Date	Title of Survey Report
Port San Luis	E 16	Environmental Research Archaeologists	1977	Underwater and On-land Culture Resource Survey
Port San Luis	E 77	Stickel, G.	1976	Final Report of a Cultural Resource Survey of Port San Luis, California
Diablo Cove	E 123	Riddell, F.	1966	An Archaeological Reconnaissance of the Diablo Creek vicinity, San Luis Obispo County, CA
Diablo Cove	E 172	Riddell, F.	1968	An Archaeological Reconnaissance of the Access Road to the Diablo Canyon Power Generating Plant, San Luis Obispo County, CA

Location	Survey #	Author	Date	Title of Survey Report
Diablo Cove	E 714	Holson, J.	1986	Archaeological Resources Located on Parcel P, Diablo Canyon, San Luis Obispo County, CA
Port San Luis	E 2219	Davis-King, S. & Williams, S.	1992	Archaeological Survey on Portions of Diablo Canyon Nuclear Power Plant, North Property Coastal Shelf, San Luis Obispo County, California (Second Field Season); and Archaeological Survey on Portions of Diablo Canyon Nuclear Power Plant, South Property, San Luis Obispo
Port San Luis	E 2533	Singer, C.	1993	Subject: Evaluation of potential impacts to cultural resources associated with proposed dredging project at Port San Luis, San Luis Obispo County
Port San Luis	-	Little, A.D.	1998	Unocal Avila Beach Cleanup Project. EIR/EIS Final Report. Prepared for County of San Luis Obispo, CA Regional Water Quality Control Board, U.S. Army Corps of Engineers
Diablo Cove	-	PG&E, Co.	2001	Diablo Canyon, Independent Spent Fuels Storage Installation, Coastal Permit Application
Diablo Cove	-	PG&E, Co.	2002	Diablo Canyon, Independent Spent Fuels Storage Installation, Environmental Report
Diablo Cove	-	URS Corporation	2002	Proposal for PG&E Diablo Canyon Power Plant, Independent Spent Fuels Storage Installation, Environmental Impact Report
Diablo Cove	-	Marine Research Specialists	2003	Diablo Canyon Power Plant, Independent Spent Fuels Storage Installation, Environmental Impact Report

Previously Recorded Cultural Resources Within the Study Area

The CHRIS records searches revealed four archaeological sites and one isolate that have been previously recorded within the Study Area, which are described below:

Location	Site Number	Site Type	Primary Reference(s)/Site Recorder(s)	Type of Investigation
Port San Luis	CA-SLO-iso-29	Historic; Domestic Debris	INFOTEC Research Inc./ Williams, S.A. & Carr, P.	Survey
Diablo Canyon	CA-SLO-61	Prehistoric; Gathering Site	U.C.A.S/Pilling, Arnold R.	Survey
Diablo Canyon	CA-SLO-1159	Prehistoric; Coastal Shell Midden	Riddell, Francis; Caruso, Glenn & Montizambert, Eric	Survey
Diablo Canyon	CA-SLO-1163	Prehistoric; Coastal Shell Midden	Caruso, Glenn, Montizambert, Eric, and Holson, John	Survey
Port San Luis	CA-SLO-1469	Prehistoric; Coastal Shell Midden	INFOTEC Research Inc./ Williams, S.A., Carr, P., McIntosh, D., & Fulton, P.	Survey

Previously Recorded Cultural Resources Adjacent to the Study Area

The CHRIS records search revealed three archaeological sites that have been previously recorded within the adjacent study, which are described below:

Location	Site Number	Site Type	Primary Reference(s)/Site Recorder(s)	Type of Investigation
Diablo Canyon	CA-SLO-2	Prehistoric; Burial/ Occupation Site	U.C.A.S./Pilling, Arnold R.	Survey
Diablo Canyon	CA-SLO-3	Prehistoric; Occupational Site	U.C.A.S./Pilling, Arnold R.	Survey
Diablo Canyon	CA-SLO-1160	Prehistoric; Coastal Shell Midden	Riddell, Francis; Caruso, Glenn & Montizambert, Eric	Survey

Previously Recorded Cultural Resources Within the Project Area of Potential Effects

There are no previously recorded cultural resources within the Proposed Projects APE.

4.5.1.9 California Historical Resource Information System Records Searches

To establish a cultural resources baseline inventory, research was conducted to identify prior archaeological surveys and known cultural resources within or adjacent to the project APE. Bibliographic references, previous survey reports, and archaeological site records were compiled through a records search of the CHRIS. These records searches were conducted at the Central Coast Information Center (CCIC), at the University of California, Department of Anthropology, on October 7, 2003 (Search # 2920) and October 10, 2003 (Search # 2927).

The CHRIS searches included a review of all recorded sites, surveys, historical listings, and historical maps within and immediately adjacent to the APE. According to the Office of Historic Preservation (OHP) listing, four historic properties fall within the APE. Review of the existing archaeological survey information indicated that the APE had previously undergone survey. Seven previous cultural resource surveys had been conducted within the APE, while one isolate and seven archaeological sites are known to exist within or immediately adjacent to the APE.

4.5.1.10 Other Related Results

The CHRIS records searches revealed that four historic properties have been recorded in the Directory of Properties, which are described below:

Location	Description	Location	National Register Status
Port San Luis	Harford Pier	Avila Beach	2 – Determined eligible for listing in the National Register or the California Register
Port San Luis	Harford Pier Warehouse	Avila Beach	3 – Appears eligible for National Register or California Register through survey evaluation
Port San Luis	Point San Luis Obispo Light Station	Avila Beach	3S – Appears eligible for National Register as an individual property through survey evaluation
Port San Luis	BR 49C – 197	Avila Beach	3S – Appears eligible for National Register as an individual property through survey evaluation

4.5.1.11 Summary

Based upon the recommendations of the CCIC, the project study area has a high sensitivity for prehistoric archaeological resources. There are no known cultural resources within the project APE.

4.5.2 No Project Alternative

The No Project Alternative assumes that the 2,200 MW base load system generating capacity at DCPP would need to be replaced by constructing natural gas-fired power plants in Alameda and Kern Counties. Cultural resources may occur at project sites in Alameda County or Kern County or both, and would be subject to state and federal regulations.

4.6 GEOLOGY

4.6.1 Proposed Projects

This section describes the baseline geologic conditions of the affected environment in the vicinity of Diablo Canyon. Much of the information contained herein is from the Updated Final Safety Analysis Report (FSAR) prepared by PG&E, which is updated every two years. Additional information is from the Long Term Seismic Program, the Diablo Canyon Independent Spent Fuel Storage Installation Draft EIR (MRS, 2003), and the Unocal Avila Beach Cleanup Final EIR (A.D. Little, 1998).

4.6.1.1 Regional Geology

Diablo Canyon is in the southern Coast Range, which is a part of the California Southern Coast Ranges physiographic and structural province. The region surrounding the power plant site consists of mountains, foothills, marine terraces, and valleys. The dominant features are the San Luis Range adjacent to the site to the northeast and the marine terrace along the coastal margin of the San Luis Range. Except for its narrow fringe of coastal terraces, the range is defined by west-northwesterly-trending ridge and canyon topography. Ridge crest altitudes range from about 800 to 1,800 feet. Nearly all of the slopes are steep, and they are modified locally by extensive slump and earth flow landslides (PG&E, 1996).

Alluvial fans and talus aprons are prominent features along the bases of many slopes and at localities where ravines debouch onto relatively gentle terrace surfaces. The coastal terrace belt extends between a steep mountain-front backscarp and a near-vertical sea cliff 40 to 200 feet in height.

The main terrace along the coastal margin of the San Luis Range is a gently to moderately sloping strip of land as much as 2,000 feet in maximum width. The main terrace represents a series of at least three wave-cut rock benches. The present surface of the main terrace ranges from 70 to more than 200 feet in elevation. Remnants of higher terraces exist at scattered locations along upper slopes and ridge crests.

Structure

The San Luis Range is underlain by a synclinal section of Tertiary sedimentary and volcanic rocks, which have been downfolded into a basement of Mesozoic rocks now exposed along its southwest and northeast sides. Two zones of faulting have been recognized within the range.

The Edna fault zone trends along its northeast side, and the Miguelito fault zone extends into the range from the vicinity of Avila Bay. Minor faults and bedding-plane shears can be seen in the parts of the section that are well exposed along the sea cliff fringing the coastal terrace benches. None of these faults shows evidence of geologically recent activity, and the most recent movements along those in the rocks underlying the youngest coastal terraces can be positively dated as older than 80,000 to 120,000 years. A geologic map of the region surrounding the site is shown in Figure 4.6-1.

The structure of the southern Coast Ranges has evolved during a lengthy history of deformation extending from the time when the ancestral Sur-Nacimiento zone was a site for subduction (a Benioff zone) along the then-existing continental margin, through subsequent parts of Cenozoic time when the San Andreas fault system was the principal expression of the regional stress-strain system. The latest episodes of major deformation involved folding and faulting of Pliocene and older sediments during mid-Pliocene time, and renewed movements along preexisting faults during early or mid-Pliocene time. Current tectonic activity within the region is dominated by interaction between the Pacific and American crustal plates on opposite sides of the San Andreas fault and by continuing vertical uplift of the Coast Ranges. In the regional setting of the DCPP site, the major structural features are the San Andreas, Rinconada-San Marcos-Jolon, Sur-Nacimiento, and Santa Lucia Bank faults. The San Simeon fault may also be included with this group.

Geologic relationships between the major fold and fault structures in the vicinity of Diablo Canyon were described by Hall et al. (1979). The San Luis Ranges-Estero Bay area is characterized structurally by west-northwest-trending folds and faults. These include the San Luis-Pismo syncline and the bordering Los Osos Valley and Point San Luis antiformal highs, and the West Huasna, Edna, and San Miguelito faults. A few miles offshore, the structural features associated with this trend merge into a north-northwest-trending zone of folds and faults that is referred to herein as the offshore Santa Maria Basin East Boundary zone of folding and faulting. The general pattern of structural highs and lows of the onshore area is warped and stepped downward to the west across this boundary zone, to be replaced by more northerly-trending folds in the lower part of the offshore basin section. The overall relationship between the onshore Coast Ranges and the offshore continental margin is one of differential uplift and subsidence. The East Boundary zone represents the structural expression of the zone of inflection between these regions of contrasting vertical movement.

Stratigraphy

The geologic section exposed in the San Luis Range comprises sedimentary, igneous, and tectonically emplaced ultrabasic rocks of Mesozoic age, sedimentary, pyroclastic, and hypabyssal intrusive rocks of Tertiary age, and a variety of surficial deposits of Quaternary age. The lithology, age, and distribution of these rocks were studied by Headlee (1965) and more recently have been mapped in detail by Hall et al. (1979). The geology of the San Luis Range is shown in Figure 4.6-1.

Basement Rocks

An assemblage of rocks typical of the Coast Ranges basement terrane west of the Nacimiento fault zone is exposed along the south and northeast sides of the San Luis Range. As described by Headlee (1965), this assemblage includes quartzose and greywacke sandstone, shale, radiolarian chert, intrusive serpentine and diabase, and pillow basalt. Some of these rocks have been dated as Upper Cretaceous, and Headlee suggested that they may represent dislocated parts of the Great Valley Sequence.

Tertiary Rocks

Five formational units are represented in the Tertiary section of the San Luis Range. The lower part of this section comprises rocks of the Vaqueros, Rincon, and Obispo formations, which range in age from lower Miocene through middle Miocene. The core of the western San Luis Range is underlain by the Upper Miocene Monterey Formation, which constitutes the bulk of the Tertiary section. The Upper Miocene to Lower Pliocene Pismo Formation crops out in a discontinuous band along the southwest flank and across the west end of the range.

The coastal area in the vicinity of Diablo Canyon is underlain by strata that have been variously correlated with the Obispo, Point Sal, and Monterey formations. Headlee (1965), for example, has shown Point Sal as overlying the Obispo, whereas Hall (1973) has considered these two units as different facies of a single time-stratigraphic unit. Whatever the exact stratigraphic relationships of these rocks might prove to be, it is clear that they lie above the main body of tuffaceous sedimentary rocks of the Obispo Formation and below the main part of the Monterey Formation. The strata underlying the power plant site range downward through the Obispo Formation and presumably include a few hundred feet of the Rincon and Vaqueros formations resting upon a basement of Mesozoic rocks. A more detailed description of the rocks exposed at the power plant site is included in Section 4.6.1.2.

Quaternary Deposits

Deposits of Pleistocene and Holocene age are widespread on the coastal terrace benches along the southwest margin of the San Luis Range, and they exist farther onshore as local alluvial and stream-terrace deposits, landslide debris, and various colluvial accumulations. All of the marine deposits and most of the overlying nonmarine accumulations are of Pleistocene age, but some of the uppermost talus and alluvial deposits are Holocene.

The remainder of this section presents a detailed description of site geology, and derives from the September 2003 update to the FSAR (PG&E, 2003a).

4.6.1.2 Site Geology

The area of the project site is a coastal tract in San Luis Obispo County approximately 6.5 miles northwest of Point San Luis. It lies immediately southeast of the mouth of Diablo Canyon. The PG&E property occupies approximately 750 acres and includes an extensive topographic terrace about 1,000 feet in average width. In its pregrading, natural state, the surface ranged in altitude from 65 to 80 feet along the coastline to a maximum of nearly 300 feet along the base of the hillslope to the northeast, but nowhere was its local relief greater than 10 feet. Its only major interruption is the steep-walled 75-foot-deep canyon of lower Diablo Creek.

The entire area is underlain by a complex sequence of stratified marine sedimentary rocks and tuffaceous volcanic rocks, all of Tertiary (Miocene) age. Diabasic intrusive rocks are locally exposed high on the walls of Diablo Canyon at the edge of the area. Both the sedimentary and volcanic rocks have been folded and otherwise disturbed over a considerable range of scales.

Surficial deposits of Quaternary age are widespread. In a few places, they are as thick as 50 feet, but their average thickness is on the order of 20 feet over the terrace areas. The most extensive deposits underlie the main topographic terrace.

The surface of the main terrace is defined mainly by nonmarine deposits that conceal both the older benches of marine erosion and some of the abruptly rising ground that separates them.

Within the subject area the wave-cut benches increase progressively in age with increasing elevation above current sea level. By far the most extensive of these benches slopes gently seaward from a shoreline angle that lies at an elevation of about 100 feet above current sea level.

4.6.1.3 Project Site Stratigraphy

Obispo Tuff

The Obispo Tuff, which has been classified either as a separate formation or as a member of the Miocene Monterey Formation, is the oldest bedrock unit exposed in the site area. Its constituent rocks generally are well exposed, appear extensively in the coastward parts of the area, and form nearly all of the offshore prominences and shoals. They are dense to highly porous, and thinly layered to almost massive. Their color ranges from white to buff in fresh exposures, and from yellowish to reddish brown on weathered surfaces, many of which are variegated in shades of brown. Outcrop surfaces have a characteristic "punky" to crusty appearance, but the rocks in general are tough, cohesive, and relatively resistant to erosion.

The Obispo Tuff is underlain by mudstones of early Miocene (pre-Monterey) age, on which it rests with a highly irregular contact that appears to be in part intrusive. This contact lies offshore in the vicinity of the power plant site, but it is exposed along the seacoast to the southeast.

Monterey Formation

Stratified marine rocks variously correlated with the Monterey Formation, Point Sal Formation, and Obispo Tuff underlie most of the subject area, including all of that portion intended for power plant location. They are almost continuously exposed along the crescentic sea cliff that borders Diablo Cove, and elsewhere they appear in much more localized outcrops. For convenience, they are here assigned to the Monterey Formation in order to delineate them from the adjacent more tuffaceous rocks typical of the Obispo Tuff.

The observed rock types, listed in general order of decreasing abundance, are silty and tuffaceous sandstone, siliceous shale, shaly siltstone and mudstone, diatomaceous shale, sandy to highly tuffaceous shale, calcareous shale and impure limestone, bituminous shale, fine- to coarse-grained sandstone, impure vitric tuff, silicified limestone and shale, and tuff-pellet sandstone. Dark colored and relatively fine-grained strata are most abundant in the lowest part of the section, as exposed along the east side of Diablo Cove, whereas lighter colored sandstones and siliceous shales are dominant at stratigraphically higher levels farther north.

Diabase Intrusive Rocks

Small, irregular bodies of diabasic rocks are poorly exposed high on the walls of Diablo Canyon at and beyond the northeasterly edge of the map area. Contact relationships are readily determined at only a few places where these rocks evidently are intrusive into the Monterey Formation. They are considerably weathered, but an ophitic texture is recognizable. They consist chiefly of calcic plagioclase and augite, with some olivine, opaque minerals, and zeolitic alteration products.

Masses of Brecciated Rocks

Highly irregular masses of coarsely brecciated rocks, a few feet to many tens of feet in maximum dimension, are present in some of the relatively siliceous parts of the Monterey section that adjoin the principal bodies of Obispo Tuff. The fracturing and dislocation are not genetically related to any recognizable faults, but instead seem to have been associated with emplacement of the volcanic rocks; they evidently were accompanied by, or soon followed by, extensive silicification. Many adjacent fragments in the breccias are closely juxtaposed and have matching opposed surfaces, so that they plainly represent no more than coarse crackling of the brittle rocks. Other fragments, though angular or subangular, are not readily matched with adjacent fragments and hence may represent significant translation within the entire rock masses.

Quaternary Surficial Deposits

Coastal Terrace Deposits. The coastal wave-cut benches of Pleistocene age, as described in a foregoing section, are almost continuously blanketed by terrace deposits of several contrasting types and modes of origin. The oldest of these deposits were laid down along and adjacent to ancient beaches during Pleistocene time and are relatively thin and patchy in their occurrence. They are covered by considerably thicker and more extensive nonmarine accumulations of detrital materials derived from various landward sources.

A younger, thicker, and much more continuous nonmarine cover is present over most of the coastal terrace area. It consistently overlies the marine deposits noted above, and, where these are absent, it rests directly upon bedrock. It is composed in part of alluvial detritus contributed during Pleistocene time from Diablo Canyon and several smaller drainage courses, and it thickens markedly as traced sourceward toward these canyons. It is chiefly fine- to moderately-coarse-grained gravel and rubble characterized by tabular fragments of Monterey rocks in a rather abundant silty to clayey matrix.

Slump, creep, and slope-wash deposits, derived from adjacent hillsides by relatively slow downhill movement over long periods of time, also form major parts of the nonmarine terrace cover. All are loose and uncompacted. They comprise fragments of Monterey rocks in dark colored clayey matrices, and their internal structure is essentially chaotic.

Thus, the entire section of terrace deposits that caps the coastal benches of Pleistocene marine erosion is heterogeneous and internally complex; it includes contributions of detritus from contrasting sources, from different directions at different times, and via several basically different modes of transport and deposition.

Stream-Terrace Deposits. Several narrow, irregular benches along the walls of Diablo Canyon are veneered by a few inches to 6 feet of silty gravels that are somewhat coarser but otherwise similar to the alluvial fan deposits described above. These stream-terrace deposits originally occupied the bottom of the canyon at a time when the lower course of Diablo Creek had been cut downward through the alluvial fan sediments of the main terrace and well into the underlying bedrock. Subsequent deepening of the canyon left remnants of the deposits capping scattered small terraces.

Landslide Deposits. The walls of Diablo Canyon also are marked by tongue- and bench-like accumulations of loose, rubbly landslide debris (Qls), consisting mainly of highly broken and jumbled masses of Monterey rocks with abundant silty and soily matrix materials. These landslide bodies represent localized failure on naturally oversteepened slopes, generally confined to fractured bedrock in and immediately beneath the zone of weathering. Individual bodies within the mapped area are small, with probable maximum thicknesses no greater than 20 feet. All of them lie outside the area intended for SGRP on-site activities.

Landslide deposits along the sea cliff have been recognized on the north side of Diablo Cove about 400 feet northwest of the mouth of Diablo Canyon. Here slippage has occurred along bedding and fracture surfaces in siliceous Monterey rocks, and it has been confined essentially to the axial region of a well-defined syncline. Several episodes of sliding are attested by thin, elongate masses of highly broken ground separated from one another by well-defined zones of dislocation. Some of these masses are still capped by terrace deposits. The entire composite accumulation of debris is not more than 35 feet in maximum thickness, and ground failure at this locality does not appear to have resulted in major recession of the cliff. Elsewhere within the mapped area, landsliding along the sea cliff evidently has not been a significant process.

Large landslides, some of them involving substantial thickness of bedrock, are present on both sides of Diablo Canyon not far northeast of the power plant area. These occurrences need not be considered in connection with the plant site, but they have been regarded as significant factors in establishing a satisfactory grading design for the switchyard and other up-canyon installations. They are not discussed in this section.

Slump, Creep, and Slope-Wash Deposits. As noted earlier, slump, creep, and slope-wash deposits form parts of the nonmarine sedimentary blanket on the main terrace. These materials are shown separately on the geologic map only in those limited areas where they have been considerably concentrated along well-defined swales and are readily distinguished from other surficial deposits. Their actual distribution is much wider, and they undoubtedly are present over a large fraction of the areas designated as Qter; their average thickness in such areas, however, is probably less than 5 feet.

Talus and Beach Deposits. Much of the present coastline in the subject area is marked by bare rock, but Diablo Cove and a few other large indentations are fringed by narrow, discontinuous beaches and irregular concentrations of sea cliff talus. These deposits are very coarse grained. Their total volume is small, and they are of interest mainly as modern analogues of much older deposits at higher levels beneath the main terrace surface.

The beach deposits consist chiefly of well-rounded cobbles. They form thin veneers over bedrock, and in Diablo Cove they grade seaward into patches of coarse pebbly sand. The floors of both Diablo Cove and South Cove probably are irregular in detail and are featured by rather hard, fresh bedrock that is discontinuously overlain by irregular thin bodies of sand and gravel. The distribution and abundance of kelp suggest that bedrock crops out over large parts of these cove areas where the sea bottom cannot be observed from onshore points.

Stream-Laid Alluvium. Stream-laid alluvium (Qal) occurs as a strip along the present narrow floor of Diablo Canyon and other streams, where it is only a few feet in average thickness. It is composed of irregularly intertongued silt, sand, gravel, and rubble. It is crudely to sharply stratified, poorly to well sorted, and, in general, somewhat compacted. Most of it is at least moderately porous.

4.6.1.4 Port San Luis Transport Option

Quaternary marine terrace deposits underlie much of the Port San Luis Transport Route, which generally traverses the inland side of the coastal terrace along the coast from the Diablo Canyon facility southeast to Rattlesnake Canyon. The access road trends inland at Rattlesnake Canyon; from this point east to Port San Luis the access road crosses Pliocene to Miocene age sandstone of the Pismo Formation, Unnamed Cretaceous sedimentary rocks, and Cretaceous or Jurassic

Franciscan rocks that are susceptible to landslides. Near Port San Luis the access road also crosses San Miguelito fault zone.

Detailed topographic surveys have not been performed for the Proposed Projects because no grading or modification of natural landforms is required along the Diablo Canyon facility access road for this project. However, the Diablo Canyon facility access road is reportedly in good condition, and was designed and built to accommodate heavy vehicular traffic.

4.6.1.5 Intake Cove Transport Option

The transport route from the Intake Cove goes north on Marina Drive to Breakwater Boulevard, then east on Shore Cliff Road to the TSA. Shore Cliff Road passes immediately north of Patton Cove. The Patton Cove landslide is reportedly affecting the road, suggesting that it is actively moving. This portion of Shore Cliff Road is planned to be moved and reconstructed slightly to the north of its current location (Patton Cove Bypass) as part of the planned Diablo Canyon Independent Spent Fuel Storage Installation Draft EIR (Spent Fuel Storage Draft EIR) project to avoid the area affected by the Patton Cove landslide. The movement of the Original and Replacement Steam Generators would take advantage of this roadway re-alignment to avoid this area as well.

4.6.1.6 Replacement Steam Generator Staging Facility

Several potential TSA locations are available as shown in Figure 1-2. No new grading activities involving cut and fill are proposed in this area. Cut and fill placement are being proposed as part of the proposed Spent Fuel Storage project, and some of the fill may be placed in the vicinity of parking lots 1 and 7 as part of the Patton Cove Bypass (MRS, 2003). Parking Lot 1 is currently unpaved, and the soils in this area have never been compacted, however, this area has been used in the past for the staging of heavy components and equipment (Original Steam Generators, Main Bank Transformers, Main Turbine Generator and Rotors, etc.). Temporary buildings for Replacement Steam Generator staging, warehouse and material storage, mock-up facilities, fabrication and weld test shops, and replacement team offices may (see options in Section 3) be constructed in this area.

4.6.1.7 Original Steam Generator Removal, Transportation, and Storage

The OSGs would be removed from DCPP Units 1 and 2 and transported to an OSG Storage Facility (OSGSF) for storage. The OSGSF location options are located near the 500 kV switchyard. Construction of a new approximately 10,000-square-foot building is planned for the OSGSF.

4.6.2 No Project Alternative

The No Project Alternative assumes that 2200 MW of base load generating capacity at DCPP would be replaced by constructing natural gas-fired power plants in Alameda County and Kern County. Geological conditions in Alameda or Kern Counties, such as nearby faults or expansive soils, would require further analysis to meet state and federal regulatory requirements.

Figure 4.6-1. Diablo Canyon Regional Geologic Map

CLICK HERE TO VIEW

[Figure 4.6-1, page 2]

4.7 HAZARDS AND HAZARDOUS MATERIALS

4.7.1 Proposed Projects

The Proposed Projects consist of the project site as it is currently used as a nuclear-fueled power plant. In addition, there are two transport options for transporting the RSGs to the TSA. The Port San Luis Transport Route consists of an approximately 7-mile-long access road to the Project Site. The Intake Cove Transport Route consists primarily of existing facility access roads located within the project site. These routes are not known to contain hazardous materials or other risks to human health and safety.

The DCPP security programs, procedures, and plans have been established to meet all applicable NRC security requirements. The facility maintains a Physical Security Plan managed and implemented by the Security Services Organization. Trained personnel are dedicated to maintaining the highest level of security to meet and exceed these requirements.

DCPP currently uses and stores a variety of hazardous materials on site. These materials are stored and used according to applicable regulations. DCPP maintains a Hazardous Materials Business Plan with the San Luis Obispo County Public Health Department. This plan addresses storage use and emergency response procedures. Spill control and management procedures are included in the emergency response procedures. DCPP currently generates hazardous wastes in accordance with state and federal regulations. A Hazardous Waste Management Program has also been developed to minimize hazardous waste generation, properly store wastes, prevent releases, and ensure safe disposal of all wastes that are generated on site. The plant also has a Hazardous Waste Facility Permit for the storage of hazardous waste on site. DCPP employees receive hazardous materials training and are trained in hazardous waste procedures, spill contingencies, waste minimization procedures, and treatment, storage, and disposal facility (TSDF) training in accordance with the Occupation Safety and Health Administration (OSHA) Hazard Communication Standard and 22 California Code of Regulations (CCR). A comprehensive Worker Health and Safety Program has been developed to adhere to applicable OSHA and NRC standards.

A Radiation Protection Program that meets the requirements of 10 Code of Federal Regulations (CFR) Part 50 covers the following:

- As Low as Reasonably Achievable (ALARA) Programs – Ensures that doses are maintained as low as is reasonably achievable. These programs include routine job dose analysis, job pre-planning, job in-progress assessment, and post-job review.

- Radiological Condition Assessment – A program of routine surveillance to characterize the radiological conditions, a program to survey conditions as they might change, a program for documenting these activities, a program for posting and labeling all hazards and conditions, and a program for issuing radiation work permits. These permits communicate the specific job controls and conditions and provide authorization to enter radiological areas of the plant.

- Radioactive Materials Controls – A program to inventory and manage the safe use of radioactive materials and the secure storage of radioactive materials not in use.

- Radioactive Waste Processing and Disposal – A program to minimize the production of wastes, manage the storage, characterization, classification, processing, containerization, manifesting, labeling, and transport of radioactive wastes; and to document compliance with 10 CFR § 20, 10 CFR § 71 and 10 CFR § 61, as well as state and disposal site criteria.

- Emergency Response – Radiation protection personnel form the backbone of on-shift on-site and off-site emergency response. Programs are in place to mitigate, characterize and respond to radiological emergencies as well as calculate dose effects and deposition and formulate protective action guidance to San Luis Obispo County emergency response command and control officers.

- Internal and External Dose Determination – DCPP has an accredited laboratory for the processing of dosimetry. These programs characterize, quantify, and record official personnel exposure to ionizing radiation. This program makes official reports to the NRC and required reports to individuals.

- Radiological Monitoring Program – This program provides ongoing collection and analysis of environmental samples for the purpose of detecting the presence of licensed radioactive materials to determine and quantify any potential environmental effects due to operation.

- Instrumentation – This program evaluates, calibrates and maintains radiation protection instrumentation to implement many of the programs listed above.

4.7.2 No Project Alternative

Based on current generator proposals and demand, approximately 1,000 MW could be located in Alameda and Kern Counties. A variety of hazardous materials would be used and stored by the construction and operation of CCGT power plants in the Northern and Southern California service areas of PG&E. Applicable regulatory requirements would apply to the use, generation, and storage of these materials. More detailed analyses would be conducted at such time as specific sites are known and needed.

4.8 HYDROLOGY/WATER QUALITY

4.8.1 Proposed Projects

The project site is located on the western side of the San Luis Mountain Range and is within a few hundred feet of the Pacific Ocean (Figure 1-1). The western edge of the Irish Hills form the eastern edge of the property. Although the property boundary extends considerably farther south along the coast, as shown on Figure 3-3, all work for the Proposed Projects will occur at the project site. This section focuses on discussion of the project site and associated access roads.

DCPP uses water for operation, including ocean water for cooling. However, as water usage would not change as a result of the Proposed Projects, it is not addressed in this section. The following sections describe surface water and groundwater hydrology in the area of the Proposed Projects. The descriptions are largely based on the Spent Fuel Storage Draft EIR (MRS, 2003).

4.8.1.1 Surface Water Hydrology

The only surface water in the vicinity of the Project Site is Diablo Creek, which flows through the site to the Pacific Ocean. Portions of the creek within the Project Site have been re-located underground.

Beneficial uses listed in the Basin Plan for Diablo Creek include municipal, domestic, agricultural, and industrial water supply, groundwater recharge, recreation, freshwater replenishment, navigation, commercial, and sport fishing, cold freshwater habitat, estuarine habitat, wildlife habitat, rare, threatened, or endangered species, and spawning, reproduction, and/or early development (RWQCB, 2001). Although most of these uses are in the Basin Plan, they are not present on or near the DCPP property.

Precipitation in the area flows into the Diablo Canyon Drainage system or directly into Diablo Creek (PG&E, 2001). Based on the Federal Emergency Management Agency (FEMA) flood maps, a 100-year floodplain has not been designated for Diablo Creek (ESRI, 2003). This is likely a result of the very steep creek banks, which would likely confine 100-year storm flows. Creek flow varies significantly from 0.01 cubic meters per second (m^3/s) during the dry season (December through March) to 197 m^3/s during the rainy season (November through April) (PG&E, 2002a). During the dry season, flow in the creek results from groundwater seepage (MRS, 2003).

The DCPP property is located partly within the Diablo Creek watershed and partly within other unnamed small coastal watersheds. As shown on Figure 4.8-1, the Diablo Creek watershed encompasses approximately 13 square kilometers (km^2) and includes a series of steep canyons draining into the creek (MRS, 2003). The figure also shows small, unnamed coastal watersheds to the north and south. The watersheds are underlain by siliceous shales and cherts of the Miocene Monterey Formation (PG&E, 2001).

4.8.1.2 Groundwater Hydrology

The project site is located in the Estero Bay Hydrologic Unit within the Central Coast Hydrologic Region (DWR, 2003). Within the region, the predominant water use is for agriculture (75 percent), followed by recreation, and energy production (DWR, 2003). There are no significant aquifer systems in the area (USGS, 1995).

The project site is located at elevations ranging from 80 to 200 feet above mean sea level. Groundwater elevations are generally at the level of Diablo Creek, 40 to more than 250 feet below ground surface (PG&E, 2001).

DCPP is underlain by a thin discontinuous layer of marine sand and silty sand over nonmarine rocky sand and sandy clay alluvium. These deposits range from 3 to 35 feet thick and overlie Miocene stratified marine sedimentary rocks of the Monterey Formation and volcanics (PG&E, 2003a).

In the Central Coast area, limited surface supply to recharge groundwater and increasing volumes of extraction has led to seawater intrusion into some coastal aquifers. Groundwater in the region is generally of sufficiently high quality for urban and agricultural use, but there are localized water quality problems, including contamination by nutrients, pathogens, and pesticides, and seawater intrusion (DWR, 2003).

Groundwater in the site area is generally found in the alluvial deposits of Diablo Creek and occasional seeps and springs. Groundwater in the region surrounding the site is not used because of its poor quality and insufficient volume (PG&E, 2003a).

4.8.2 No Project Alternative

While the exact locations of the new replacement generation facilities under the No Project Alternative are not known, likely locations are Alameda and Kern Counties. New generation facilities in these locations may result in a range of water demands, including those to surface water and groundwater sources. Typical water demands at generation facilities include industrial or river/bay water for cooling towers, potable or treated reclaimed water for steam make-up water, potable water for personnel use, and equipment wash water. The largest volume of water is associated with cooling towers. The amount of water needed to operate the new facilities would vary depending on the type of tower cooling (once-through, wet or dry cooling). New sources of water may be required which would be investigated for each location.

Figure 4.8-1. Diablo Creek Watershed

CLICK HERE TO VIEW

[Figure 4.8-1, page 2]

4.9 LAND USE AND PLANNING

4.9.1 Proposed Projects

The DCPP property and project site are located within unincorporated San Luis Obispo County. The San Luis Range dominates the region between the property and U.S. Route 101. This area supports grazing beef cattle to a limited extent, and, to a lesser extent, dairy cattle. The terrain east of U.S. Route 101, lying in the mostly inaccessible Santa Lucia Mountains, is sparsely populated with little development. A large portion of this area is included within the Los Padres National Forest. The community of Avila Beach is located southeast of DCPP. Point San Luis is located at the southerly end of DCPP property. The Pacific Ocean lies on the southern boundary of the DCPP. The DCPP property consists of approximately 760 acres of land located near the mouth of Diablo Creek in unincorporated San Luis Obispo County. Approximately 170 acres are used by PG&E. The remaining 590 acres are located adjacent to and south of Diablo Creek. These remaining lands were purchased in 1995 by Eureka Energy Company (Eureka), a wholly owned subsidiary of PG&E, and leased by PG&E. Coastal properties located south of Diablo Creek reaching inland approximately 0.5 mile have been owned by Eureka since 1995.The site boundary and the location of principal features are shown in Figure 4.9-1.

All coastal properties located north of Diablo Creek, extending north to the southerly boundary of Montana de Oro State Park and reaching inland approximately 0.5 mile have been used by PG&E since 1988. In 1988, PG&E purchased approximately 4,500 acres located north of the project site which are encumbered by a grazing lease. This section of land consists of approximately 5 miles of coastline and reaches inland approximately 0.5 mile from the Pacific Ocean.

The nearest residential community to the plant is Los Osos, approximately 8 miles north of the Proposed Projects. This community is located in a mountainous area adjacent to Montana de Oro State Park. The township of Avila Beach is located approximately 6 miles southeast of the Proposed Projects and adjacent to the DCPP entrance gate. Morro Bay is located approximately 10 miles northwest of the Proposed Projects. A number of other cities, as well as some unincorporated residential areas, exist along the coast and inland. However, these are more than 8 miles from the project area.

DCPP lies within the planning/development jurisdiction of San Luis Obispo County. San Luis Obispo County establishes relevant land use policy for property by means of the Coastal Plan Policies (CPP), Land Use Element/Local Coastal Plan (LUE/LCP), and the San Luis Bay Area Plan. The CPP provides general land use policies for all coastal areas in the county. The

LUE/LCP establishes specific land use goals for county coastal areas. The San Luis Bay Area Plan for coastal and inland areas defines policies and goals for specific areas, which include Diablo Canyon Lands. The County Coastal Zone Land Use Ordinance implements the LUE/LCP policies. Specifically, Section 23.08.3000 provides the applicable regulations and guidelines for the construction of generating plants and ancillary facilities.

The LUE/LCP is an extension of the CPP, providing programs, standards, and specific actions required for the implementation of these policies. The LUE/LCP provides policies and standards for the county's coastal areas. It refines the broad policies and guidelines provided by the CPP into workable objectives.

There is a degree of overlap between the LUE/LCP and the Coastal Plan. The LUE/LCP satisfies the State Government Code requirement of providing a Land Use Element as part of the county's General Plan. The LUE/LCP addresses land use issues, time frames for policies and proposals, development standards, permitted land uses and intensities, land use patterns and implementation measures to achieve objectives. Chapter 6 of the LUE/LCP describes the land use categories and allowable uses. In addition, it includes density formulas, overlays and combining districts. A total of 13 separate land use categories are established to respond to the variety of natural and man-made features of the landscape, population growth trends and projections, existing county policies as represented by general plans and zoning documents.

The LUE/LCP states that the purpose of the public facilities designation is to identify lands and structures that benefit the public, provide public facilities to meet public needs, identify facility locations that satisfy both community and regional needs, and identify public facility sites that are consistent with the areas being served and accompanying policy plans. The land use category prescribed to the PG&E property under the LUE/LCP includes agriculture, recreation and public facilities with a combining designation for energy and extractive areas (EX). The public facilities designation acknowledges the power plant. The approximately 1,120-acre DCPP Plant Site is designated as public facilities. The Proposed Projects are within the public facilities designation, as shown in Figure 4.9-2. The County Land Use maps do not provide precise boundaries for the EX Combining Designation, but rather identifies DCPP as the general area for this designation.

Approximately 4,700 acres of the Diablo Canyon property are within the California Coastal Zone, as shown in Figure 4.9-2. The CPP are intended to reflect the county's adherence to the California Coastal Act of 1976, linking the Coastal Act to other applicable county policies and regulations related to land use in the coastal areas.

Development plans within San Luis Obispo County are subject to approval by a discretionary land use permitting process. In 1988 the San Luis Obispo County Planning Department was given authority by the California Coastal Commission to interpret the Act and incorporate it into the County of San Luis Obispo's General Plan, which included the right to issue coastal land use permits. Because the permitting process is discretionary, the County of San Luis Obispo has the authority to require development projects to be approved by the California Coastal Commission rather than obtaining final approval by the County of San Luis Obispo, Board of Supervisors.

The San Luis Bay Area Coastal Plan (SLBCAP) and the San Luis Bay Inland Plan contain specific policies and objectives for the San Luis Bay Area. The coastal section covers an area extending from Point Buchon to the north to the Nipomo Mesa at the south (89 square miles), while the Inland area covers an area from Montana de Oro to the north to Arroyo Grande and the inland portion of Oceano to the south (approximately 95 square miles). As in the LUE/LCP, the SLBCAP also designates DCPP as public facilities with a combined designation of energy/extractive (EX) area. The EX designation includes the location of DCPP and the surrounding buffer area of the PG&E lease site. The SLBCAP states that DCPP should not be expanded beyond its existing property nor should future development of adjacent lands encroach into this area so as to hinder the operating capabilities of the plant.

The Port San Luis Harbor District Master Plan was adopted in March 1984 and is currently being updated. The purposed of the Master Plan is to provide an overall management framework for the port and related facilities and to help resolve certain issues related to the use of port facilities, the capacity of port services and the expected demand for new services, and the preservation of the unique character of the District's waterfront and beach resources. The Plan contains policies intended to achieve these objectives, including goals and policies. One of the five planning areas in the Master Plan is the Harford Pier and related land area. These areas are designated as public facilities.

In addition, portions of the coastal property have been listed in the National Register of Historic Places pursuant to the "National Historic Preservation Act of 1966" as a place of historic significance because of the presence of numerous Native American remains and scientific data potential (see Section 4.5).

PG&E has complete authority to determine all activities within the site boundary and this authority extends to the mean high water line along the ocean. On land this includes, the site boundary, the boundary of the exclusion area (as defined in 10 CFR § 100), and the boundary of the unrestricted area (as defined in 10 CFR § 20).

4.9.2 No Project Alternative

Land uses for areas considered for CCGT generation in Alameda and Kern Counties could range from compatible industrial to open space. The project area would fall within the jurisdiction of various federal, state, and local agencies. Land uses are regulated using a complex system of plans, policies, and ordinances adopted by various jurisdictions with authority over land use within the project area. Other regulations governing development include grading ordinances, building codes, and a variety of other regulations, that control development on parcels of land under the applicable jurisdiction.

Figure 4.9-1. Diablo Canyon Property Map

Not available online

[Figure 4.9-1, page 2]

Figure 4.9-2. Land Use Designations

Not available online

[Figure 4.9-2, page 2]

4.10 MINERAL RESOURCES

4.10.1 Proposed Projects

PG&E owns the mineral rights within the DCPP property; however, there is no information suggesting that the land may contain commercially valuable minerals (PG&E, 2003a). No historic or active gold mines are located on DCPP property (CDC, 1998).

No oil wells are located on the PG&E property. Several exploratory wells have been drilled for petroleum within the San Luis Mountain Range; however, no production was achieved and the wells were abandoned. No active exploration or production are taking place within the area of the project site. The nearest oil-producing area is located approximately 15 miles to the southeast at the Arroyo Grande field (PG&E, 2003a).

4.10.2 No Project Alternative

The No Project Alternative assumes that the base load system generation capacity of DCPP would need to be replaced by construction of natural gas–fired power plants. It is assumed that facilities would be located in Alameda County and Kern County to provide approximately 1,000 MW each. It is possible that mineral resources could exist within the project area for new generation facilities in both Alameda and Kern Counties. The existing environment of the project area would be reviewed for mineral resources, once chosen.

4.11 NOISE

4.11.1 Proposed Projects

This section describes the existing noise environment on site and near the DCPP property, the location of noise sensitive receptors, and applicable noise control criteria.

4.11.1.1 Fundamentals of Acoustics

Noise is generally defined as loud, unpleasant, unexpected, or undesired sound that is typically associated with human activity and that interferes with or disrupts normal activities (Harris, 1998). Although exposure to high noise levels has been demonstrated to cause hearing loss, the principal human response to environmental noise is annoyance. The response of individuals to similar noise events is diverse and is influenced by the type of noise, the perceived importance of the noise, and its appropriateness in the setting, time of day, and type of activity during which the noise occurs, and sensitivity of the individual.

Sound is a physical phenomenon consisting of minute vibrations that travel through a medium, such as air, and are sensed by the human ear. Sound is generally characterized by several variables, including frequency and intensity. Frequency describes the sound's pitch and is measured in Hertz (Hz), while intensity describes the sound's loudness and is measured in decibels (dB). Decibels are measured using a logarithmic scale. A sound level of 0 dB is approximately the threshold of human hearing and is barely audible under extremely quiet listening conditions. Normal speech has a sound level of approximately 60 dB. Sound levels above about 120 dB begin to be felt inside the human ear as discomfort and eventually as pain at still higher levels. The minimum change in the sound level of individual events that an average human ear can detect is about 3 dB. A change in sound level of about 10 dB is usually perceived by the average person as a doubling (or halving) of the sound's loudness, and this relation holds true for loud sounds and quieter sounds.

Because of the logarithmic nature of the decibel unit, sound levels cannot be added or subtracted directly and are somewhat cumbersome to handle mathematically. However, some simple rules are useful in dealing with sound levels. First, if a sound's intensity is doubled, the sound level increases by 3 dB, regardless of the initial sound level. Therefore, for example, 60 dB + 60 dB = 63 dB, and 80 dB + 80 dB = 83 dB.

Sound from a tuning fork (a pure tone) contains a single frequency, but most sounds one hears in the environment do not consist of a single frequency, but rather a broad band of frequencies differing in sound level. The method commonly used to quantify environmental sounds consists of evaluating all frequencies of a sound according to a weighting system that reflects that human hearing is less sensitive at low frequencies and extremely high frequencies than at mid-range frequencies. This is called "A" weighting, and the decibel level measured is called the A-weighted sound level (dBA). In practice, the level of a noise source is conveniently measured using a sound level meter that includes a filter corresponding to the dBA curve.

Although the A-weighted sound level may adequately indicate the level of environmental noise at any instant in time, community noise levels vary continuously. Most environmental noise includes a conglomeration of noise from distant sources that creates a relatively steady background noise in which no particular source is identifiable. A single descriptor called the L_{eq} (equivalent sound level) is used. L_{eq} is the energy-mean A-weighted sound level during a measured time interval. It is the "equivalent" constant sound level that would have to be produced by a given source to equal the fluctuating level measured. Sound levels of typical noise sources and environments are provided in Table 4.11-1 to provide a frame of reference.

4.11.1.2 Project Site Conditions

The Proposed Projects are located in a remote, rural, coastal area. Noise sources in that area consist of noise associated with the DCPP and surf noise. Typical sound levels would range from 50 to 65 dBA; however, sound levels at 3 feet from some DCPP equipment may exceed 80 dBA.

Some land uses are considered sensitive to noise. Noise-sensitive receptors are land uses associated with indoor and outdoor activities that may be subject to stress or significant interference from noise. They often include residential dwellings, mobile homes, hotels, motels, hospitals, nursing homes, educational facilities, libraries, and cemeteries. The closest sensitive receptors are the residential communities of Los Osos approximately 8 miles to the north, Avila Beach approximately 6 miles to the southeast, and Morro Bay approximately 10 miles to the northwest. There is also significant intervening topography in between the DCPP complex and the sensitive receptors. Noise from the DCPP is not audible at the closest noise sensitive receptors because of the substantial distance and topography.

The land use on the San Luis Port access road is primarily agricultural and there are no sensitive receptors along the access road. Existing sound levels would be typical of remote agricultural

Table 4.11-1
Sound Levels of Typical Noise Sources and Noise Environments
(A-Weighted Sound Levels)

Example Noise Source (at a Given Distance)	Scale of A-Weighted Sound Level in Decibels	Example Noise Environment	Human Judgment of Noise Loudness (Relative to a Reference Loudness of 70 Decibels*)
Military Jet Take-off with			
After-burner (50 ft)	140	Carrier Flight Deck	
Civil Defense Siren (100 ft)	130		
Commercial Jet Take-off (200 ft)	120		Threshold of Pain
			*32 times as loud
Pile Driver (50 ft)	110	Rock Music Concert	*16 times as loud
Ambulance Siren (100 ft)	100		Very Loud
Newspaper Press (5 ft)			*8 times as loud
Power Lawn Mower (3 ft)			
Motorcycle (25 ft)	90	Boiler Room	*4 times as loud
Propeller Plane Flyover (1,000 ft)		Printing Press Plant	
Diesel Truck, 40 mph (50 ft			
Garbage Disposal (3 ft)	80	High Urban Ambient Sound	*2 times as loud
Passenger Car, 65 mph (25 ft)			Moderately Loud
Living Room Stereo (15 ft)			*70 decibels
Vacuum Cleaner (3 ft)	70		(Reference Loudness)
Electronic Typewriter (10 ft)			
Normal Conversation (5 ft)	60	Data Processing Center	*1/2 as loud
Air Conditioning Unit (100 ft)		Department Store	
Light Traffic (100 ft)	50	Private Business Office	*1/4 as loud
Bird Calls (distant)	40	Lower Limit of Urban	Quiet
		Ambient Sound	*1/8 as loud
Soft Whisper (5 ft)	30	Quiet Bedroom	
	20	Recording Studio	Just Audible
	10		Threshold of Hearing

Source: Compiled by URS Corporation

lands and would range from 40 to 50 dBA. Noise at Port San Luis and the Intake Cove would be primarily from surf noise. Additionally, there would be noise associated with boat operations and related vessel activities at Port San Luis.

4.11.1.3 Applicable Noise Regulations

San Luis Obispo County Noise Ordinance

The County of San Luis Obispo (County) Noise Ordinance Section 22.10.120 has established noise standards for acceptable exterior noise levels. The following exceptions to the standards apply:

> "*Noise sources associated with construction, provided such activities do not take place before 7 a.m. or after 9 p.m. on any day except Saturday or Sunday, or before 8 a.m. or after 5 p.m. on Saturday or Sunday,*" and

> "*Noise sources associated with work performed by private or public utilities in the maintenance or modification of its facilities.*"

The County Noise Ordinance does not apply to the Proposed Projects because the DCPP is a facility that supplies utilities.

San Luis Obispo County Noise Element of the General Plan

The Noise Element of the County General Plan regulates noise from stationary noise sources, but does not address construction noise. The Element states:

> "*Noise created by new proposed stationary sources or existing stationary noise sources which undergo modifications that may increase noise levels shall be mitigated as follows and shall be the responsibility of the developer of the stationary noise source:*

> *b) Noise levels shall be reduced to or below the noise level standards in Table 3-2 where the stationary noise source will expose an existing noise-sensitive land use to noise levels which exceed the standards in Table 3-2.*

> *c) Noise levels shall be reduce to or below the noise level standards in Table 3-2 where the stationary noise source will expose vacant land in the Agriculture,*

Rural Lands, Residential Rural, Residential Suburban, Residential Single-Family, Residential Multi-Family, Recreation, Office and Professional, and Commercial Retail land use categories to noise levels which exceed the standards in Table 3-2."

Table 4.11-2 (Table 3-2 from the Noise Element) summarizes the maximum allowable noise exposure for stationary noise sources. Existing conditions currently comply with these standards.

Table 4.11-2
San Luis Obispo County
Maximum Allowable Noise Exposure Stationary Noise Sources[1]

	Daytime (7 a.m. to 10 p.m.)	Nighttime[2] (10 p.m. to 7 a.m.)
Hourly L_{eq}, dB	50	45
Maximum Level, dB	70	65
Maximum Level, dB-Impulsive Noise	65	60

Notes:
1 As determined at the property line of the receiving land use. When determining the effectiveness of noise mitigation measures, the standards may be applied on the receptor side of noise barriers or other property line noise mitigation measures.
2 Applies only where the receiving land use operates or is occupied during nighttime hours.

4.11.2 No Project Alternative

The exact locations of the new replacement generation facilities in Alameda and Kern Counties are not known. The noise receptors in any new project site would need to be evaluated in order locate the new facilities in an area that would minimize potential impacts. A separate analysis would be performed to evaluate the existing noise conditions and potential sensitive receptors.

4.12 POPULATION AND HOUSING

4.12.1 Proposed Projects

Approximately 424,013 people live within a 50-mile radius of DCPP according to the Year 2000 Census (Census Bureau, 2001), while only approximately 23,661 people live within a 10-mile radius. The majority of this area is sparsely populated, with nearby population concentrations located in the communities of San Luis Obispo, Avila Beach, Shell Beach, Pismo Beach, and Grover City. Approximately 17 residents are located in nine dwellings located within 5 miles of DCPP property. The dwelling unit closest to DCPP property is located approximately 1.5 miles north-northwest of the project site and is inhabited by 2 people. Future projected population increases for the project vicinity are anticipated to occur near the established communities listed above over the next 25 years according to the California Department of Finance. Population growth within 10 miles of DCPP is expected to be proportional with San Luis Obispo County as a whole (PG&E, 2003a).

The population within the 6-mile radius of the DCPP Emergency Plan Area is estimated at 100, as derived from a survey of dwelling units in the area. The Los Osos community is located at the northern edge of the 6-mile radius and is the closest residential community. The City of Avila Beach is located approximately 7 miles from DCPP on the southern edge. It is assumed that no major population growth would occur inside the 6-mile radius for the foreseeable future because of the mountainous conditions surrounding DCPP, which make it inaccessible (PG&E, 2003a).

The number of transient visitors (vacation and weekend visitors) to the project vicinity is largest from the City of Avila Beach and to the south of the DCPP main complex, especially during the summer months. Usually the heaviest influx of transient visitors occurs during the month of August, when the maximum overnight population in local motels and state parks can reach 100,000 persons. The maximum daytime transient population within the 6-mile Emergency Plan Area was estimated at approximately 5,000, while the maximum nighttime transient population was calculated at 400 according to Montana de Oro State Park officials. This figure was derived from State Department of Parks and Recreation (PG&E, 2003a).

No permanent increase in population or housing is expected with the proposed project area. However, construction activities during the removal/installation process of the steam generators would require an increase in temporary workers at DCPP. The project vicinity has an adequate supply of lodging within a 25-mile radius to support this temporary increase. The City of San Luis Obispo is located approximately 12 miles to the north of DCPP, while the cities of Avila

Beach, Shell Beach, and Pismo Beach are located approximately 1, 5, and 7 miles to the southeast, respectively. In addition, Montana de Oro State Park is located on the north side of the DCPP property and contains campsites for rent. Other parks near DCPP with campsites for rent include El Chorro Regional Park, which is 14 miles to the northeast, Pismo Beach State Park, 7 miles to the southeast, and Oceano Memorial Park and Campground, 10 miles to the southeast. Furthermore, recreational vehicle parks are scattered throughout the project vicinity that could be used during the temporary construction period.

4.12.2 No Project Alternative

No permanent increase in population and/or housing is expected with the No Project Alternative. However, construction activities in Alameda and Kern Counties associated with the two new power generation facilities would require an increase in temporary workers commensurate with the size of the project.

4.13 PUBLIC SERVICES

4.13.1 Proposed Projects

The Proposed Projects would be served by a number of local and county services and programs. The following section would address the existing public services within the area of potential impact of the DCPP. Public services include fire protection, law enforcement, schools, recreation and parks, and emergency medical services.

4.13.1.1 Port San Luis

The Port San Luis Harbor District owns or controls real properties immediately adjacent to the eastern boundary of the Diablo Canyon property. As such, the Harbor District has jurisdiction over lands closest to and most directly impacted by the operations and the events of the DCPP. The Harbor District is responsible for maintaining and operating Harford Pier, Port San Luis, Old Port Beach, Harbor Terrace, the beach at Avila Beach, and Avila Beach Pier.

The Port San Luis Harbor District is located within the emergency planning zone and Protective Action Zone 3 of the San Luis Obispo County Emergency Response Plan. The Harbor District is also a governmental agency with assigned responsibilities in the event of an emergency on the DCPP property.

Early Warning System

The San Luis Obispo Nuclear Power Plant Emergency Response system is in place throughout the county. The emergency alert system consists of more than 100 sirens set to inform the population of any type of emergency. The San Luis Obispo County Office of Emergency Services operates the system. DCPP is included in the county's Alert System. An area-wide siren system designated as the Early Warning System (EWS) would alert the general public to tune their radios to the Emergency Broadcast Systems (EBS) stations to receive emergency instructions.

Fire Protection Services

The DCPP Fire Department provides the on-site primary fire protection to the property. The California Department of Forestry (CDF) provides backup fire protection service if the DCPP Fire Department requests it. The CDF fire station (Avila Beach Fire Station) is located in Avila

Beach approximately 5 minutes response time from the entrance to the plant. CDF's territory includes unincorporated areas of San Luis Obispo. CDF provides fire protection for the County of San Luis Obispo, the City of Pismo Beach, and the Avila Beach Community Services District by cooperative agreements. The CDF and the County of San Luis Obispo have had cooperative fire protection since 1929.

The location of the main DCPP complex and related facilities are adjacent to the wildlife vegetation of Diablo Creek Watershed, which has necessitated development of a fuel management program on watershed lands (PG&E, 1999). A wildland fuel management area is located within the Diablo Creek watershed (east of the proposed project area). The program goals are protection of the power plant site, transmission lines, and employees from wildfire. Controlled burns, brush clearing, controlled grazing and selective herbicides application is used to manage fuels within the watershed. Approximately 400 acres of the Diablo Creek watershed are actively managed using integrated vegetation management techniques to reduce fuel volume and the risk of fire damage to utility structures.

Police Services

PG&E maintains its own on-site armed security on the DCPP property. One control point is at Avila Gate, which controls the entry of all persons. The second control point is at the entrance to the radiation controls area (RCA), where identification is checked again. San Luis Obispo County Sheriff's Department provides back-up police protection for DCPP, since it is located within an unincorporated area of the county. City police departments exist in each city within the county. California Highway Patrol provides police protection on highways within the county and at the gate 24 hrs/day. The police station closest to DCPP is located in Pismo Beach.

Schools

In San Luis Obispo County, there are 78 public and private schools serving kindergarten through 12th grade. The DCPP falls within the San Luis Coastal Unified School District. Adjacent areas are in the Lucia Mar Unified School District. Between these two districts, several elementary schools are located within 10 miles of the site, near Los Osos and Avila Beach. These serve the local community and do not draw from outlying areas.

California Polytechnic State University and Cuesta College are located in San Luis Obispo County. Neither is located within 5 miles of DCPP. California Polytechnic State University is 12 miles north-northeast of the DCPP site and has an enrollment of approximately 16,000 students. Cuesta College is located 10 miles northeast of the DCPP site and has an enrollment of approximately 7,000.

Parks

There are 66 parks within San Luis Obispo County. Avila Beach and Avila Beach Community Park are the closest county recreational areas or parks adjacent to the DCPP property. Avila Beach Community Park is located at Avila Beach Drive and First Street, at the south end of Avila Beach, where the beach meets San Luis Creek. Much of the Avila Beach area has been restored as part of the Unocal restoration project.

Montana de Oro State Park is the primary recreational area within the vicinity of DCPP. The state park is located approximately 4 miles northwest of the plant site and adjacent to the Diablo Canyon north and northeast property line. The maximum recorded number of persons visiting the site at any single time is 5,000. The maximum overnight use is considerably less—an estimated 400. The total number of visitors during a 12-month period over the last 5 years averaged 680,000 (according to the State Department of Parks and Recreation and DCPP Coastal Permit Application).

Emergency Medical Services

Five hospitals or medical centers are within close proximity of DCPP. The following hospitals serve San Luis Obispo County:

- Arroyo Grande Community Hospital
- French Hospital Medical Center
- General Hospital
- Sierra Vista Regional Medical Center
- Twin Cities Community Hospital

Each hospital provides medical services such as surgery, emergency, laboratory, and special medical care and testing. A number of nursing homes and home health centers are available throughout the county. No public medical facilities are within 5 miles of DCPP.

Emergency medical services that would respond to DCPP would likely come from the Arroyo Grande Community Hospital, which is closest to the plant entrance. Several companies within

San Luis Obispo County provide ambulance services. In addition, DCPP has personnel trained in first aid procedures and has medical on-site staff at the plant.

4.13.2 No Project Alternative

While the exact locations of the new replacement generation facilities under the No Project Alternative are not known, likely locations are Alameda and Kern Counties. It is assumed that the two new power generation facilities would be located in areas with adequate public services to support temporary construction and long-term operation. An analysis of the existing public services would be required once a site was chosen.

4.14 RECREATION

4.14.1 Proposed Projects

State, regional, and local parks provide opportunities for camping, surfing, beach access, nature viewing, and other various activities. The largest recreation area in proximity to DCPP is Montana de Oro State Park, which is approximately 8,000 acres of rugged cliffs, secluded sandy beaches, coastal plains, streams, canyons, and hills. Other activities as this state park include mountain biking, equestrian trails, fishing, and campsites for rent. Montana de Oro State Park borders the northwest DCPP property line.

Another public recreational amenity is the Pecho Coast Trail, which is adjacent to the Avila Gate entrance at the southwestern edge of the DCPP property. The Pecho Trail traverses around Point San Luis by looping around San Luis Hill, connecting to the coast guard lighthouse. While there is restricted access to this area, an Accessway Management Plan is in place that provides docent-led tours through a reservation system on a regular basis.

Additional state park facilities in the project vicinity include Avila State Beach in the City of Avila Beach (approximately 1 mile from the DCPP Avila Gate), which has access for swimming and a fishing pier, as well as Pismo State Beach in the City of Pismo Beach (approximately 7 miles from the DCPP Avila Gate), with swimming, surfing, fishing, equestrian trails, bird watching, campsites for rent, and a public pier (California State Parks, 2003).

The San Luis Obispo County Parks Department maintains several regional recreational facilities in the project vicinity, including the Los Osos Community Park located in the unincorporated area of Los Osos, which is approximately 6 miles north of DCPP with tennis courts, a playground, and picnic shelters. El Chorro Regional Park is located approximately 14 miles northeast of DCPP in the City of San Luis Obispo and has campsites, a playground, sports fields, picnic shelters, and a botanical gardens area. Cuesta Park is located approximately 12 miles northeast of DCPP in the City of San Luis Obispo and contains sports fields, picnic shelters, and a playground area. Avila Beach Community Park is located approximately 1 mile southeast of DCPP and has a playground and sports field. This park is located adjacent to Avila State Beach. Oceano Memorial Park and Campground is located approximately 10 miles southeast of DCPP in the City of Oceano and contains sports fields, picnic shelters, a playground area, and campsite amenities. The Bob Jones Bike Trail is located approximately 2 miles northeast of DCPP near the City of Avila Beach and is approximately 1 mile long, from Ontario Road to San Luis Bay Drive. In addition, the San Luis Obispo County Parks Department maintains two public golf courses north of DCPP, the Morro Bay Golf Course and the Dairy Creek Golf Course. Both golf courses are within 15 miles of DCPP (San Luis Obispo County Parks, 2003).

Local recreational facilities include small neighborhood and city parks in the Cities of Shell Beach, Pismo Beach, and San Luis Obispo. The City of Shell Beach is located on the Pacific Ocean, adjacent to Route 101, and is approximately 5 miles from DCPP. Recreational facilities in this area include limited beach access, playgrounds, and picnic shelters. The City of Pismo Beach is another community that is located on the Pacific Ocean, adjacent to Route 101, and is approximately 7 miles from DCPP. Recreational facilities in this community include community pools, playgrounds, sports fields, picnic shelters, and municipal golf courses. The City of San Luis Obispo is located approximately 12 miles north of DCPP, adjacent to Route 101, and has numerous recreational facilities including community pools, playgrounds, sports fields, picnic shelters, a skatepark, and municipal golf courses.

4.14.2 No Project Alternative

The No Project Alternative is not anticipated to interfere with the maintenance and/or operation of state, regional, or local recreational facilities. However, additional workers associated with the two new power generation facilities may contribute to an increased use of local recreational facilities during the temporary construction and long-term operation in both Alameda and Kern Counties. The two new power generation facilities may be located in areas adjacent to state, regional, or local recreational facilities. The existing conditions and potential impacts would be analyzed in a separate report.

4.15 TRANSPORTATION/TRAFFIC

4.15.1 Proposed Projects

Roadways

The existing and future degrees of congestion experienced on roadways and intersections in project vicinity were recently evaluated in the Diablo Canyon Spent Fuel Storage Draft EIR released in September (MRS, 2003). Much of the following information was derived from that document.

The existing circulation system for the project vicinity is shown on Figure 4.15-1. Local access to DCPP consists of a single private two-lane roadway (Diablo Canyon Road) that is accessed from Avila Beach Drive. The roadway's secure private entry prevents public access to DCPP and routinely accommodates approximately 1,400 employee or visitor vehicles per day. Also, several unpaved roads extend throughout the DCPP property, but are not are not regularly used for normal day-to-day plant operations (MRS, 2003). Congestion on Diablo Canyon Road is not considered to be major problem as only DCPP employees or visitors are allowed.

Regional access to DCPP is through the City of Avila Beach and occurs on only two arterial type roadways that connect to Route 101, Avila Beach Drive and San Luis Bay Drive. A relatively sparse network of two-lane roadways and local city streets access these facilities to bring traffic to and from Route 101 and DCPP. As seen on Figure 4.15-1, San Luis Bay Drive connects to Avila Beach Drive approximately 3 miles from the DCPP Avila Security Gate. Avila Beach Drive is a two-lane roadway that extends in an east/west direction and connects Route 101 with Port San Luis. Generally, Avila Beach Drive is constrained by minimal shoulder widths, steep rocky slopes, and San Luis Obispo Creek along its 4.5-mile length.

San Luis Bay Drive is also a two-lane roadway that extends in an east/west direction and connects Route 101 with Avila Beach Drive. San Luis Drive is also constrained by minimal shoulder widths and steep rocky slopes. San Luis Bay Drive terminates with a stop-sign–controlled intersection with Avila Beach Drive. Route 101 is a four-lane divided controlled-access freeway in this portion of project vicinity. Access to/from Route 101 is provided via specified interchange locations. Parking in this area is concentrated in the City of Avila Beach, with limited other opportunities between the city and Route 101 (MRS, 2003). Generally, congestion on Avila Beach Drive and San Luis Bay Drive is not considered to be a major problem, except when heightened security measures are implemented at the DCPP Avila Gate.

When heightened security measures are implemented, significant delay can be experienced on Avila Beach Drive entering DCPP. Because Route 101 is a significant roadway in the project vicinity, congestion is isolated at certain locations that are described in further detail below.

Avila Beach Drive normally experiences heavy weekend traffic during the summer months, with August being the busiest. Summer weekend traffic can be nearly 200 percent higher than summer weekday traffic on Avila Beach Drive. The portion of Avila Beach Drive between San Luis Bay Drive and San Luis Street in the City of Avila Beach typically carries 12,800 vehicles per day during the summer weekdays and 6,600 vehicles per day during the non-summer weekdays. Non-summer weekday traffic volumes are consistent with typical weekend traffic volumes, but are consistently lower than summer weekday traffic volumes. Generally, traffic to Route 101 is evenly split between Avila Beach Drive and San Luis Bay Drive. Bicycle traffic on Avila Beach Drive has recently increased, which has created potential conflicts with motorists and safety hazards (MRS, 2003).

The degree of congestion has been developed in analytical terms by relating traffic volumes to the capacity of a road or intersection. This is the standard volume-to-capacity (v/c) analysis and is rated at various levels of service (LOS). Many factors contribute to the capacity of a roadway or intersection, including number or lanes, lane widths, shoulder widths, speed, grades, percentage of no passing zones, percentage of heavy trucks, directional distribution of traffic, and roadside obstacles. Many times capacity is controlled by signalized or stop-controlled intersections on roadways with closely spaced side streets. The Transportation Research Board has developed the Highway Capacity Manual, which details the methods for calculating LOS. For congestion, v/c ratios are ranked from LOS A to LOS F. LOS A is the best operating condition, where traffic has no conflicts and complete freedom of movement. LOS F is the worst operating condition, where traffic demand is greater than the capacity of a facility. For LOS F, stop-and-go conditions occur on road segments and long backups exist at all approaches of signalized or unsignalized intersections, resulting in significant travel delay.

As a part of the Spent Fuel Storage Draft EIR, current roadway conditions were analyzed for the project vicinity. Average daily traffic numbers and peak hour traffic flows were used to calculate LOS as shown on Table 4.15-1. Information pertaining to Route 101 was obtained from the California Department of Transportation, while data for Avila Beach Drive, San Luis Bay Drive, and Diablo Canyon Road were obtained from San Luis Obispo County Public Works and Engineering Departments. San Luis Obispo County bases its LOS calculations on non-summer weekday traffic volumes. In areas where peak hour traffic flow was not available, 10 percent of the average daily traffic was assumed (MRS, 2003).

Table 4.15-1
Current Level of Service Classifications

Roadway	Current		
	ADT	LOS*	Peak Hour
Avila Beach Drive	10,157	C	1,396
San Luis Bay Drive	6,532	A	625
Diablo Canyon Road	-	A	-
Route 101 at Oak Park Road (in Pismo Beach)	51,000	C	6,400
Route 101 at Pismo Oaks Road (in Pismo Beach)	58,000	C	7,400
Route 101 at Villa Clark Road (in Pismo Beach)	66,000	D	8,400
Route 101 at Jct. Route 1 South (in Pismo Beach)	55,000	C	8,400
Route 101 at North Shell Beach Road	55,000	C	4,750
Route 101 at Avila Beach Drive	62,000	D	7,800
Route 101 at San Luis Bay Drive	58,000	C	6,900
Route 101 at Santa Fe Road (in San Luis Obispo)	69,000	E	8,300
Route 101 at Los Osos Road (in San Luis Obispo)	69,000	E	8,000
Route 101 at Madonna Road (in San Luis Obispo)	54,000	C	5,500

Sources: Route 101 – Caltrans, 2001. Avila Beach Roads – San Luis Obispo County Traffic Volumes 2002, which include data from 1993.

Notes: * LOS calculated using Santa Barbara County thresholds or Highway Capacity Software. ADT = Average Daily Traffic. LOS = Level of Service.

According to Table 4.15-1, portions of Route 101 currently experience congestion at certain locations with poor LOS levels. One stretch of Route 101 experiences LOS E, which indicates that roadway capacity is nearing its maximum with closely spaced vehicles during the peak operating hours. LOS D conditions are present on Route 101 at two separate locations and coincide with reduced vehicle speeds and diminished maneuverability. Currently, the arterial roads in the Avila Beach area do not approach adverse congested levels under normal operating conditions.

Other Transportation

Union Pacific Railroad tracks run from northwest to southeast through the central portion of San Luis Obispo County, including through the City of San Luis Obispo. This rail line, which is located approximately 13 miles north of DCPP, carries both passenger and freight traffic. This rail line roughly parallels Route 101, and no rail spur leads to DCPP.

San Luis Obispo County Airport is located northeast of DCPP, about 12 miles away on the east side of Route 101 and off State Route 227. The airport handles both small commercial commuter flights as well as private aviation traffic. The much smaller Oceano Airport is located approximately 10 miles southeast of DCPP in the City of Oceano and accommodates only private planes. Typically, air traffic does not directly fly over DCPP.

Coastal shipping lanes are located approximately 20 miles west of DCPP in the Pacific Ocean. Generally, shipping does not approach within 5 miles of DCPP (MRS, 2003).

Port San Luis is located in San Luis Obispo Bay and has an active harbor area with permanent, seasonal, and guest moorings. Channel markers outline the most desirable entryway into the port for larger vessels. Currently, approximately 280 mooring spaces are identified with a 100-foot radius, approximately 6 mooring spaces are identified with a 150-foot radius, and approximately 26 mooring spaces are identified with a 200-foot radius. A majority of the mooring spaces are located between Avila Pier and the Unocal Pier.

The U.S. Coast Guard operates the Port San Luis light station on Point San Luis, adjacent to the southwestern edge of the DCPP property. Currently, the light station is used for shipping navigation, and no boats are stationed there.

4.15.2 No Project Alternative

The No Project Alternative is not anticipated to adversely affect the traffic/transportation systems in Alameda and Kern Counties. However, additional workers associated with the two new power generation facilities may contribute to increased traffic on area roadways during the temporary construction and long-term operation in both Alameda and Kern Counties.

Figure 4.15-1. Existing Circulation System
CLICK HERE TO VIEW

[Figure 4.15-1, page 2]

4.16 UTILITIES AND SERVICES

4.16.1 Proposed Projects

The Proposed Projects would be served by a number of local and public utilities. The following section addresses the existing utilities within the area of potential impact from the Proposed Projects. Utilities include water, wastewater, and solid waste disposal services as well as electricity and natural gas. Other services include solid waste disposal, road repair and maintenance, and telephone service.

Water and Wastewater

The majority of drinking water available in the county originates from groundwater wells and some spring sources. In addition, the county is served by two reservoirs: Lake Naciamento and Lake Santa Margarita. Most of the incorporated cities provide central water systems and operate groundwater well systems. These systems provide water for potable uses as well as fire protection. No central water systems are located within the Project Area. DCPP derives all of its water from on-site wells, Diablo Creek, and a reserve osmosis system that converts ocean water. Currently, DCPP's water demand is 470 acre-feet per year. The total supply available through existing on-site systems is 1,370 acre-feet per year.

A number of wastewater systems are located throughout both the unincorporated and incorporated areas of the county, although none are located within the vicinity of the Proposed Projects. DCPP operates its own wastewater treatment system at the plant, which provides a three-step waste treatment program, including aeration, sedimentation, and decant. The system is licensed by the Regional Water Quality Control Board (RWQCB) for generated domestic wastewater. DCPP's wastewater treatment plant is an Austgen Biojet System designed for a normal operating flow of 40,000 gallons/day. With DCPP's current normal staffing of 1,000 to 1,500 people, the plant receives a flow rate of approximately 15,000 gallons/day. In the past, the plant has been able to handle short-term rates of approximately 60,000 gallons/day with no system upsets.

Solid Waste Disposal

The management and disposal of solid waste are services available in unincorporated and incorporated areas throughout the county operated by the San Luis Obispo County Integrated Waste Management Authority. Currently, the following landfills and transfer stations are operating within the county:

- Chicago Grade Landfill – located 4 miles northeast of Atascadero off of Highway 41
- Cold Canyon Landfill – located about 6 miles south of the City of San Luis Obispo on Highway 227
- Nipomo Transfer Station – located one-half mile west of Highway 101, at 325 Cuyama Lane (Highway 166) in Nipomo
- Paso Robles Landfill – located 8.5 miles east of Paso Robles off of Highway 46 East

All landfills provide waste recycling, composting, and conditioning services that comply with all applicable regulations. The existing landfills are located more than 5 miles from the project area and DCPP. DCPP is served by the South County Sanitation Service, which is a division of the County's Public Works Department.

Electricity

Electrical service in the county is provided by PG&E. PG&E also serves the DCPP. Electricity requirements for the Proposed Projects would be provided by the existing utility system on the plant site.

Telephone

Telephone service in the county is primarily provided by SBC. SBC also provides telephone service to the DCPP through overland telephone lines.

Road Maintenance

The San Luis Obispo County Department of Public Works maintains public roadways within the county, with the exception of highways, which are maintained by Caltrans. DCPP maintains its own roads from the plant entrance to the plant site.

4.16.2 No Project Alternative

While the exact locations of the new replacement generation facilities under the No Project Alternative are not known, likely locations are Alameda and Kern Counties. It is assumed that the siting of a power generating facility would take into consideration the availability of utility supply and related services.