Chapter 13
MARINE ENVIRONMENT (MARINE HYDROLOGY, WATER QUALITY, BIOLOGICAL RESOURCES, NOISE, AND PUBLIC HEALTH)

13.1 Introduction

This chapter describes existing conditions and regulations related to the marine environment within the study area for the Clearwater Program. There are a number of specific topics presented in this chapter that relate to the marine environment including oceanography, which describes physical processes that influence water mixing in the marine environment; water quality, which describes characteristics of the water of the nearshore marine environment; and sediment quality, which describes sediment characteristics and contamination. Local marine communities and the nearshore marine environment are influenced by water and sediment quality. These local and nearshore communities are analyzed to evaluate potential impacts from implementing the project and alternatives on local populations. Finally, public health covers potential human health risks associated with anthropogenic contaminants in local waters.

As discussed in Section 3.6.1, a Preliminary Screening Analysis (Appendix 1-A) was performed to determine impacts associated with the construction and operation of program and project elements by resource area. During preliminary screening, each element was determined to have no impact, a less than significant impact, or a potentially significant impact. Those elements determined to be potentially significant were further analyzed in this environmental impact report/environmental impact statement (EIR/EIS). This EIR/EIS analysis discloses the final impact determination for those elements deemed potentially significant in the Preliminary Screening Analysis. The location of the marine environment impact analysis for each program element is summarized by alternative in Table 13-1. As shown in the table, none of the program-level elements are analyzed in the Preliminary Screening Analysis or this chapter because they are all located outside the marine environment. Therefore, the program is not discussed further in this chapter.

Table 13-1. Impact Analysis Location of Program Elements by Alternative

	Alternative						Analysis Location	
Program Element	**1**	**2**	**3**	**4**	**5**[a]	**6**[b]	**PSA**	**EIR/EIS**
Conveyance System								
Conveyance Improvements	X	X	X	X	X	N/A	N/A	
SJCWRP								
Plant Expansion	X	X	X	X	X	N/A	N/A	
Process Optimization	X	X	X	X	N/A	N/A	N/A	
WRP Effluent Management	X	X	X	X	X	N/A	N/A	

Table 13-1 (Continued)

Program Element	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5[a]	Alternative 6[b]	Analysis Location: PSA	Analysis Location: EIR/EIS
POWRP								
Process Optimization	X	X	X	X	N/A	N/A	N/A	
WRP Effluent Management	X	X	X	X	X	N/A	N/A	
LCWRP								
Process Optimization	X	X	X	X	N/A	N/A	N/A	
WRP Effluent Management	X	X	X	X	X	N/A	N/A	
LBWRP								
Process Optimization	X	X	X	X	N/A	N/A	N/A	
WRP Effluent Management	X	X	X	X	X	N/A	N/A	
WNWRP								
WRP Effluent Management	X	X	X	X	X	N/A	N/A	
JWPCP								
Solids Processing	X	X	X	X	X	N/A	N/A	
Biosolids Management	X	X	X	X	X	N/A	N/A	
JWPCP Effluent Management	X	X	X	X	N/A	N/A	Evaluated at the project level. See Table 13-2.	

[a] See Section 13.4.7 for a discussion of the No-Project Alternative.
[b] See Section 13.4.8 for a discussion of the No-Federal-Action Alternative.
PSA = Preliminary Screening Analysis
N/A = not applicable

As discussed in Section 3.2.2, Joint Water Pollution Control Plant (JWPCP) effluent management was the one program element carried forward as a project. The location of the marine environment impact analysis for each project element is summarized by alternative in Table 13-2. As shown in Table 13-2, construction and operation at the riser/diffuser areas (including the existing ocean outfalls) and the Royal Palms shaft site are analyzed in this chapter. All other project elements would be located on land and would not influence the marine environment; therefore, they are not discussed in the Preliminary Screening Analysis or this chapter.

Table 13-2. Impact Analysis Location of Project Elements by Alternative

Project Element	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5[a]	Alternative 6[b]	Analysis Location: PSA	Analysis Location: EIR/EIS
Tunnel Alignment								
Wilmington to SP Shelf (onshore)	X				N/A	N/A	N/A	
Wilmington to SP Shelf (offshore)	X				N/A	N/A	N/A	
Wilmington to PV Shelf (onshore)		X			N/A	N/A	N/A	
Wilmington to PV Shelf (offshore)		X			N/A	N/A	N/A	
Figueroa/Gaffey to PV Shelf (onshore)			X		N/A	N/A	N/A	
Figueroa/Gaffey to PV Shelf (offshore)			X		N/A	N/A	N/A	
Figueroa/Western to Royal Palms (onshore)				X	N/A	N/A	N/A	

Table 13-2 (Continued)

	Alternative						Analysis Location	
Project Element	**1**	**2**	**3**	**4**	**5[a]**	**6[b]**	**PSA**	**EIR/EIS**
Shaft Sites								
JWPCP East	X	X			N/A	N/A	N/A	
JWPCP West			X	X	N/A	N/A	N/A	
TraPac	X	X			N/A	N/A	N/A	
LAXT	X	X			N/A	N/A	N/A	
Southwest Marine	X	X			N/A	N/A	N/A	
Angels Gate			X		N/A	N/A	N/A	
Royal Palms				X	N/A	N/A	C,O	C,O
Riser/Diffuser Areas								
SP Shelf	X				N/A	N/A	-	C,O
PV Shelf		X	X		N/A	N/A	-	C,O
Existing Ocean Outfalls	X	X	X	X	N/A	N/A	-	C,O

[a] See Section 13.4.7 for a discussion of the No-Project Alternative.
[b] See Section 13.4.8 for a discussion of the No-Federal-Action Alternative.
PSA = Preliminary Screening Analysis
C = construction
O = operation
N/A = not applicable

13.2 Environmental Setting

13.2.1 Regional Setting

The physical and biological environmental characteristics presented in the regional setting are described in varying levels of detail. The regional setting encompasses the entire Southern California Bight (SCB). The SCB features are described in a general, but comprehensive, manner. The regional setting is described in more detail and sometimes summarizes historic and secondary reports because such sources frequently provide background data for the SCB that are not otherwise readily available. Use of this information occasionally results in inconsistent units of measure. These are explained as necessary. Unless otherwise described, the term nearshore environment refers to bottom sediments and marine waters shoreward of the shelf break at about 660 feet (200 meters) depth. Additional detail regarding the regional setting can be found in Appendix 13-A.

13.2.1.1 Location and Geography

The SCB is located in the eastern North Pacific Ocean and includes the area south of Point Conception, California, to north of Cabo Colnett, Baja California, Mexico, and east of the submerged Santa Rosa-Cortez Ridge (Dailey et al. 1993). The location of the SCB is shown on Figure 13-1 with the project area shown in the box inset. The coastline between Point Conception and the Mexican border trends from northwest to southeast and has a predominance of nearshore cliffs broken by coastal plains in the Oxnard-Ventura, Los Angeles, and San Diego areas. The coastline and coastal region are drained via short streams, which normally flow only during rainstorms.

FIGURE 13-1

Southern California Bight

Source: Sanitation Districts of Los Angeles County 2011, CaSIL 2001, Thomas Bros. 2011, ESRI 2011

The nearshore mainland shelf of the SCB is narrow and varies from less than 1 mile to more than 9 miles wide, with an average width of approximately 4 miles. There are 32 submarine canyons (12 are relatively large and named) that intersect the mainland shelf, making the basin and range submarine topography of the SCB relatively unique. The eight offshore islands influence water circulation and oceanographic characteristics along the mainland coast. The shelves of the SCB and submarine canyons are shown on Figure 13-1.

13.2.1.2 Oceanography

The physical processes of circulation that influence mixing in the marine environment include currents, waves, tides, and upwelling. Each is important to the oceanography of the SCB and is described in the following sections.

Currents

The California Current is the main current along the California coast. South of Point Conception it diverges, and one branch turns northward and flows inshore through the Channel Islands. This branch forms the inner edge of the Southern California Countercurrent. Surface speed in the countercurrent averages 2 to 4 inches per second (5 to 10 centimeters per second [cm/s]). The flow pattern is complicated by small eddies within the Channel Islands and fluctuates seasonally. The general pattern of surface water circulation off Southern California is shown on Figure 13-2 (Hickey 1992).

Waves

Waves over the mainland shelf are primarily locally derived and of short period. Although waves in the SCB include swell generated from distant areas, the Southern California coast is generally protected by the Channel Islands from swell generated outside of the coastal area (Hickey 1993; Allan Hancock Foundation 1965:34–41). High waves can form over the shelf when winds greater than approximately 34 knots (63 kilometers per hour) blow from the west, with recorded waves as high as 25 feet (7.6 meters) in the San Pedro Channel (Allan Hancock Foundation 1965).

Tides

Tides along the California coast are mixed semi-diurnal (daily), with two unequal highs and two unequal lows during each 25-hour period. In the eastern North Pacific Ocean, where the SCB is located, the tide wave rotates in a counterclockwise direction. As a result, flood (or rising) tide currents generally flow upcoast, and ebb (or falling) tide currents flow downcoast.

Upwelling

From February to October, northwesterly winds may induce large-scale offshore movement of surface water, resulting in the upward movement of deeper ocean waters near the coast (upwelling). This upwelled water is colder, more saline, lower in oxygen, and higher in nutrient concentrations than surface waters. Episodic upwelling results in a temporary reduction in water column density stratification and brings nutrient-rich water to the surface. Upwelling can change the water quality and biological productivity of the marine environment (described further in Section 13.2.1.3). Phytoplankton blooms are often associated with upwelling events, resulting in increased dissolved oxygen (DO) concentrations in surface waters and reduced DO levels in bottom waters (discussed further in Section 13.2.1.3).

13.2.1.3 Water Quality

Nearshore marine water quality in Southern California is primarily affected by climate, circulation, and biological activity, as well as by coastal effects such as run-off, wash-off of beaches by wave action, and

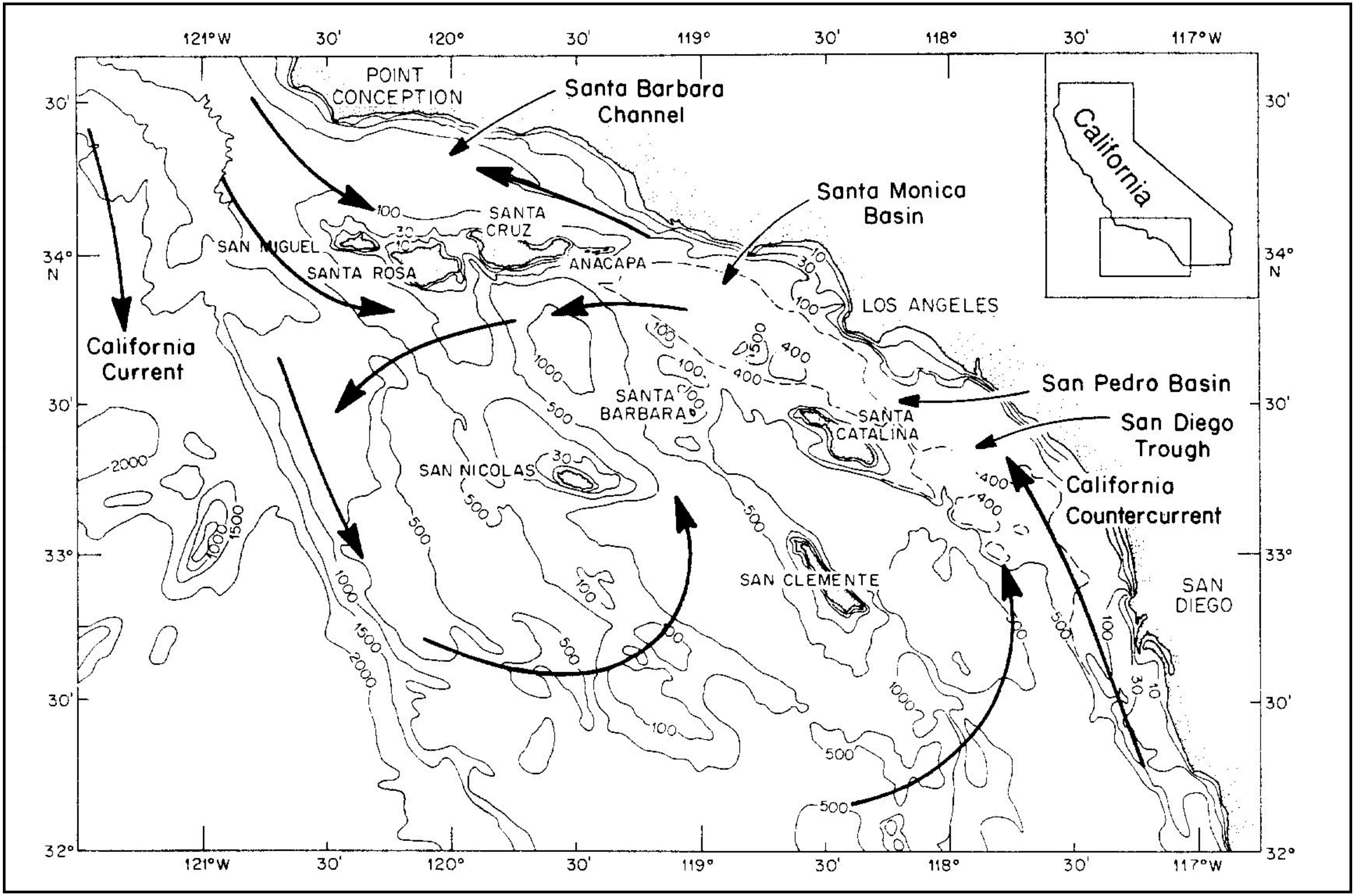

FIGURE 13-2

Circulation of Currents

Source: Hickey, B.M. 1992
Circulation over the Santa Monica San Pedro Basin and Shelf. Progress in Oceanography 30:37 115

resuspension of material from the seafloor by waves and currents. Factors such as temperature; salinity; density; hydrogen ion concentration (pH); and levels of DO, transparency, and nutrients in deeper offshore waters are generally influenced by large-scale oceanographic and meteorological conditions, while transparency, DO, pH, and nutrients in nearshore surface waters can also be influenced by local processes.

Temperature

Natural water temperature is defined by the California State Water Resources Control Board (SWRCB) as "the temperature of the receiving water at locations, depths, and times which represent conditions unaffected by any elevated temperature waste discharge." Natural surface temperatures in the SCB range from a maximum of about 22.6 degrees Celsius (°C) (72.7 degrees Fahrenheit [°F]) to a minimum of about 9.2°C (48.6°F) (Sanitation Districts 2010a:2.7, Table 2.1). On a daily basis, surface temperatures may vary by as much as 2°C (3.6°F) in summer and up to 1°C (1.8°F) in winter.

A thermocline is a layer in the water column where temperature changes more rapidly with depth than it does in the layers above or below. In natural waters, a thermocline is often formed when absorption of solar radiation penetrating the sea surface develops a stable stratification, separating the surface layer from the subsurface layer. In the SCB, reasonably sharp natural thermoclines have been reported in nearshore waters at typical depths of 30 to 49 feet (9 to 15 meters) during the summer months. In the fall, increased wave energy deepens the surface mixed layer, and pushes the thermocline deeper. Thermoclines are generally weaker and sometimes even absent during the winter (Allan Hancock Foundation 1965:40–41). Thermocline structure is highly variable, and the depth range of strongest temperature gradients may move several meters up or down within a few hours in response to tides and changes in wave energy.

Salinity

Salinity is a measure of the concentration of dissolved salts in water, and can be affected by several variables including freshwater runoff, direct rainfall, and evaporation. Throughout the marine waters of the SCB, salinity is fairly uniform, generally ranging from 33 to 34 parts per thousand (Allan Hancock Foundation 1965:56–79). Salinity generally increases with depth, but in the SCB vertical salinity distributions in the upper 33 to 131 feet (10 to 40 meters) are often inverted during summer and fall when temperature dominates the density layering, and surface waters evaporate. Slightly lower surface salinity can be expected near estuaries and embayments receiving freshwater discharges, such as the San Gabriel River Estuary and the Los Angeles-Long Beach Harbor, in the aftermath of rainfall events.

Density

Seawater density (σt) varies inversely with temperature and directly with salinity at a given pressure. Water temperature is the major density-influencing factor because salinity is relatively uniform in the SCB. The pycnocline (a region of rapid density variation within a small range in depth) generally forms in the early spring, with cooler, more saline water found near the bottom. In summer, as surface waters warm, the pycnocline becomes sharper and moves up in the water column, while evaporation leads to slightly higher salinities in surface waters. In fall, reduced solar warming and increased surface mixing push the pycnocline deeper in the water column, with the nearshore pycnocline generally disappearing in winter.

Dissolved Oxygen

The DO concentration of seawater is affected by physical, chemical, and biological variables. DO concentrations in the surface and near surface waters of the SCB range from approximately 5 to 13 milligrams per liter (mg/L) with typical values around 5.5 to 6.0 mg/L (Allan Hancock

Foundation 1965:56–79; Dailey et al. 1993); levels of DO at 330 feet (100 meters) may be as low as 2 to 3 mg/L (Sanitation Districts 2010a:2.7, Table 2.7). High DO concentrations may be the result of cool water temperatures (solubility of oxygen in water increases as temperature decreases), active photosynthesis, and/or mixing at the air-water interface (Sverdrup et al. 1942:189–203). Conversely, low DO concentrations may result from high water temperatures, high rates of organic decomposition, and/or extensive mixing of surface waters with oxygen-poor subsurface waters.

Hydrogen Ion Concentration

The pH of seawater in the SCB varies in response to physical, chemical, and biological influences. The pH of the upper 300 feet (100 meters) of the SCB varies from about 7.5 to 8.5 and decreases slightly with depth (Allan Hancock Foundation 1965:92). The pH of the world's oceans is widely believed to have been reduced by 0.1 pH units since the beginning of the industrial age as a result of anthropogenic carbon dioxide (CO_2) emissions (Doney et al. 2009:169–192). This is because the ocean assimilates the additional CO_2 directly reducing pH (Science 2010:1500–1501). This phenomenon, known as ocean acidification, while locally manifested, is global in nature.

Transparency and Turbidity

Transparency is the depth to which light penetrates water. If the ocean has high transparency it is clear; if it has low transparency it is turbid (cloudy or less clear). Turbidity can be caused by suspended solids from stormwater runoff, sediment resuspension, wastewater effluent discharges, dredging activities, construction activities, and offshore biological processes (e.g., phytoplankton blooms). Transparency of coastal waters is usually lower in spring due to runoff from coastal streams; it is higher (i.e., more clear) in fall when runoff is minimal.

Water transparency in the SCB, as measured by Secchi disk from the surface, typically ranges from 20 to 50 feet (6 to 15 meters) (SCCWRP 1973:128–130). In general there is a band of low transparency water within about 1 mile of the coast, with some variability based on shore features (Conversi and McGowan 1994:632–648).

Nutrients

The photosynthetic production of organic matter by phytoplankton is influenced by light and by the availability of nitrogen and phosphorus in a biologically usable form, usually ammonia or nitrate and phosphate. Nutrient concentrations change from day to day, with levels generally higher near their sources. The principal nutrient sources are upwelling of cooler, nutrient-rich bottom waters, biological processes that produce ammonium and urea, wastewater effluent disposal, stormwater runoff, and aerial deposition. Nitrogen, phosphorus, and silicates are the most common nutrients that limit phytoplankton growth in the ocean, with nitrogen being the most important in the SCB (Hardy 1993:246–247). The estimated mass emissions in SCB runoff flow of major nutrients for 1994 to 1995 are presented in Table 13-3. The Los Angeles and San Gabriel Rivers are estimated to discharge about one-third of all runoff in the SCB. However, mass emissions of nitrogen from runoff have been estimated to be only about 1 percent of the nitrogen contribution from upwelling (Kleppel 1980:194).

Table 13-3. Estimated Mass Emissions of Major Nutrients in the SCB (1994 to 1995)

Nutrient	SCB (total) (MT; geometric mean)[a,b]	Estimated Mass Emissions From Los Angeles and San Gabriel Rivers (MT; geometric mean)
Ammonia-Nitrogen	406	135
Nitrate-Nitrogen	1,940	647
Phosphate	558	186

[a] The geometric mean (the nth root [n = count of values] of the product of all values) is used to dampen the effect of very high or low values.

[b] Based on Ackermann and Schiff 2003 as cited in Sanitation Districts 2009a. Ackermann and Schiff used 1,000 kg; however, the SCB results were converted to metric tons; geometric mean to be consistent within the table.

MT = metric tons

13.2.1.4 Sediment Quality

Marine sediment characteristics are affected by both natural and anthropogenic influences. Tides, currents, and wave action all influence sediment grain size by suspending and transporting fine-grained material, resulting in coarser sediments in dynamic areas and finer sediments in areas of reduced currents and wave action. Coastal streams and rivers contribute sediments as well as contaminants to the marine environment, with variable influence from year-to-year depending on annual rainfall. In addition to influencing grain size, anthropogenic inputs may contribute contaminants to the environment, which can bind to sediments. Sediment characteristics and contaminants in the SCB are discussed in the following sections.

Sediment Characteristics

In the SCB, approximately 10 percent of the seafloor is composed of rocky substrate, while approximately 90 percent of the bottom is composed of soft sediments (CDFG 2009:9). On mainland shelves, beach sediments continue offshore, generally becoming finer with distance and depth (Emery 1960:198–208). Nearshore wave action and water motion keep fine material from settling. The trend toward finer sediments in the SCB was noted during regional monitoring in 2003, with a mean of 45 percent fine material (clay and silt sized particles) found throughout the SCB at midshelf depths of 100 to 400 feet (30 to 120 meters) (Schiff et al. 2006). However, sediments of different sizes and origins are distributed over the bottom of the shelf, influenced by current direction and velocity, wave exposure, proximity to sediment sources, and local seafloor topography.

Sediment Contaminants

Marine sediment can become contaminated with pollutants from a variety of industrial and domestic sources, including municipal wastewater discharges. Oil and gasoline combustion, for example, releases a variety of pollutants, including polycyclic aromatic hydrocarbons (PAHs), and metals, such as cadmium, copper, chromium, lead, mercury, and zinc. These and other metals are also found in paints, pigments, batteries, manufacturing, and protective coatings. In harbor areas, the use and maintenance of boats; anti-fouling boat paints; protective metal plating; and metal alloys in boats, piers, and docks can release such contaminants. Aerial fallout is also a diffuse and potentially large source of contaminants derived from other sources, and may include metals, chlorinated hydrocarbons, and PAHs (SCCWRP 1973:109–113; SCCWRP 1986). As these contaminants accumulate on the ground, they are washed into rivers by rainfall and are eventually deposited in the ocean. There are known areas of sediment contamination within the SCB. Specifically, chlorinated hydrocarbons, dichlorodiphenyltrichloroethane (DDT), polychlorinated biphenyls (PCBs), and other contaminants have been regularly identified in sediment sample results.

13.2.1.5 Biological Resources

The marine habitats of the SCB support a variety of biological resources and ecosystems. These resources have distinct characteristics including unique lifecycles, migration patterns, and mutual relationships with the physical processes described previously. Because there are large populations and a wide variety of biological resources within the SCB, the discussion that follows is organized around four broad categories: biological communities, protected species, marine migration, and marine habitat.

Biological Communities

Plankton

Plankton are organisms that drift passively with ocean currents or that are weakly motile. Planktonic organisms are divided into two types: phytoplankton (unicellular or colonial algal species) and zooplankton (small animals, up to about 10 centimeters long, that may spend all or some portion of their lives as planktonic organisms).

Phytoplankton

Phytoplankton occur in the upper reaches of the water column where sunlight can penetrate (the photic zone). They are usually most abundant near the bottom of the surface mixed layer, at depths with a favorable balance of light and nutrients.

Planktonic algal blooms may result in the production of toxins at levels that can bioaccumulate and cause illness and death in higher level animals and humans. Over the last two decades there has been growing worldwide concern regarding harmful algal blooms (HABs), which have become more frequent and severe in the SCB and elsewhere in the ocean. In Southern California coastal waters, domoic acid, produced by several species of the phytoplankton *Pseudo-nitzchia*, is the most commonly occurring and most harmful of the HAB-related toxins. *Pseudo-nitzchia* blooms in the SCB are generally seasonal, most often associated with spring upwelling events. Although it is an active research topic, no obvious link has been found between HABs and anthropogenic inputs, including ocean discharges. (Appendix 13-B.)

Zooplankton

Calanoid copepods dominate the nearshore zooplankton fauna of the SCB, with *Acartia*, *Paracalanus*, *Labidocera*, and *Calanus* the most commonly collected zooplankton. The invertebrate zooplankton in the nearshore waters of the SCB show seasonal trends, with highest abundances found between April and June, and the lowest between December and February.

Zooplankton include the planktonic life stages of some fish species, known as ichthyoplankton. Ichthyoplankton include fish eggs and fish larvae. They are generally well studied in the SCB, due in large part to the California Cooperative Oceanic Fisheries Investigations program, which has been investigating oceanic and biological aspects of the California Current system since the late 1940s. More than 150 ichthyoplankton taxa have been identified from within a few kilometers of the coast (Cross and Allen 1993:476–483). Nearshore ichthyoplankton concentrations have been documented around coastal power plant intake and discharges, but generally not in other nearshore areas.

Invertebrates

Invertebrates are those animals lacking vertebrae, or backbones. Marine invertebrates are categorized by their habitat: infauna, epibenthic, and pelagic.

Infauna Invertebrates

Infauna, or benthic invertebrates, are organisms that live within the sediments on the seafloor and include many types of organisms. Annelids, arthropods, and mollusks are the most abundant groups of infauna in the SCB. These organisms constitute prey for other invertebrates and fishes. Benthic organisms are reliable indicators of environmental stress and are used worldwide for assessing marine sediment conditions (Smith et al. 1998). Generally, a greater number of species represents a healthier, more stable environment, and studies suggest that decreasing diversity is one of the first indications of a stressed community.

Epibenthic Invertebrates

Epibenthic invertebrates (epifauna) live on the seafloor and are often larger, generally less common, and are spaced further apart than infaunal species. On the SCB mainland shelves, epifaunal invertebrates include sea stars, sea cucumbers, sand dollars, sea urchins, crabs, snails, and sea slugs. In shallow, sandy areas, Pacific sand dollars (*Dendraster excentricus*) may form dense beds. The white urchin (*Lytechinus pictus*) is the most abundant epifaunal invertebrate species found in SCB soft-bottom sediment at shelf depths (Thompson et al. 1993a; Allen et al. 2007; Thompson et al. 1993b). In rocky or hard-substrate areas different communities of epibenthic invertebrates are found. In relatively shallow depths these communities include sea urchins (*Strongylocentrotus* spp.), which can be found in very dense, single-species patches that limit the abundance of other species. Other species common to hard-substrate areas include sea stars, mussels (*Mytilus* spp.), sea anemones, rock scallops (*Crassadoma gigantea*), sponges, sea fans (*Muricea* spp.), and abalone (*Haliotis* spp.) (Thompson et al. 1993a). The black abalone (*Haliotis cracherodii*) and white abalone (*Haliotis sorenseni*) are two federally endangered invertebrates that live in the SCB; see Table 13-4 for additional information. Populations of other abalone (e.g., red, green pink) are depleted, and no fishery/landings of any abalone are allowed south of San Francisco. Shallow rocks (less than 98 feet) support mixed invertebrate and red, green, and brown algal turfs. Below depths of about 100 feet (30 meters) invertebrates dominate the hard-substrate areas, including encrusting bryozoans, cup corals, and sea fans, though some red algal turfs may still occur.

Pelagic Invertebrates

Pelagic invertebrates are those large or strong enough to swim against prevailing currents. In the SCB, these species include cephalopods such as California market squid (*Doryteuthis opalescens*) and occasionally Humboldt or jumbo squid (*Dosidicus gigas*). Pelagic red crab (*Pleuroncodes planipes*) may be locally abundant during warm water periods. Large medusae also belong in this category, some of which reach 3 feet in diameter.

Fishes

The mainland shelf of the SCB supports both demersal (fish species generally associated with the bottom, including soft- and hard-bottom associated fish) and pelagic (fish species generally associated with the water column) fish habitat. In the SCB, soft-bottom substrate (composed of sand, silt, and clay) is the dominant habitat on the mainland shelf. Bottom trawl surveys at shelf depths in the SCB have historically been dominated by scorpionfishes[1] and rockfishes, perches, and flatfishes (Allen et al. 2006:171–172). However, although hard substrate bottoms are the less abundant, they provide one of the most important habitats for fishes in the SCB (Cross and Allen 1993:506–518). About 30 percent of fish species in the SCB are associated with hard substrate, with more than 125 fish species (including bass, perch, and scorpionfishes) found on shallow reefs and kelp beds, and another 30 species (particularly rockfishes) associated with the deep reefs of slopes and canyon edges. Pelagic fish communities tend to be similar throughout the SCB, characterized by schooling fish species such as

[1] The plural "fishes" is used in this chapter when referring to two or more kinds of fish species, and the term "fish" is used when referring to two or more individual fish of the same species.

northern anchovy (*Engraulis mordax*), Pacific sardine (*Sardinops sagax*), and Pacific bonito (*Sarda chiliensis*) (Cross and Allen 1993:465–470; Allen et al. 2006:329–333).

The SCB supports a wide range of commercial and recreational fisheries for both fishes and invertebrates. Commercial target species include short-lived, fast-growing, and productive species such as northern anchovy, Pacific sardine, Pacific mackerel (*Scomber japonicus*), and jack mackerel (*Trachurus symmetricus*); slow-growing, long-lived demersal species such as flatfishes and rockfishes; and large, fast-growing migratory species such as yellowtail (*Seriola lalandi*), and swordfish (*Xiphias gladius*) (Cross and Allen 1993:463–465). Tunas, mackerel, bonito, and anchovy dominate the commercial fish landings.

Commercial fisheries also target several invertebrate species, including California market squid, California spiny lobster (*Panulirus interruptus*), rock crabs (*Metacarcinus* and *Romaleon* spp.), red sea urchin (*Strongylocentrotus franciscanus*), spot prawn (*Pandalus platyceros*), ridgeback prawn (*Sicyonia ingentis*), and sea cucumber (*Parastichopus* spp.) (Leet et al. 2001). Several other invertebrate species are taken as bycatch in other fisheries or support only a small commercial fishery.

Between 1995 and 2000, the three most numerous fish species taken by recreational shore fishers in Southern California were barred surfperch (*Amphistichus argenteus*), yellowfin croaker (*Umbrina roncador*), and opaleye (*Girella nigricans*) (Allen et al. 2006:580–586). Pier fishing during the same period yielded mostly Pacific mackerel, jacksmelt (*Atherninopsis californiensis*), and Pacific sardine. Species caught by private and party vessels were similar, with the private boat catch dominated by Pacific mackerel, barred sand bass (*Paralabrax nebulifer*), and yellowtail, and the party boat catch dominated by barred sand bass, Pacific mackerel, and kelp bass *(Paralabrax clathratus*). California spiny lobster is also an important recreational catch

Birds

Marine-associated birds within the SCB include a large variety of shorebirds and seabirds. Seabirds are adapted to life within the marine (oceanic) environment and include cormorants (*Phalacrocorax* spp.) and grebes (Podicipedidae). Shorebirds are adapted to life in the coastal (or seashore) environment and include species such as sanderlings (*Calidris alba*) and willets (*Tringa semipalmatus*). For a detailed description of the bird species found in the SCB, see Appendix 13-A. There are a number of federally and state-listed marine-related birds in the SCB including the federally endangered and state species of concern western snowy plover (*Charadrius alexandrinus nivosus*), and the state- and federally listed endangered California least tern (*Sterna antillarum browni*). See Table 13-4 for more information on these birds.

Marine Mammals

Marine mammals known to occur in the SCB include baleen whales, toothed whales (which include dolphins and porpoise), seals, sea lions, and sea otters.

Cetaceans (Whales, Dolphins, and Porpoises)

A variety of whale species are found within the SCB, either seasonally or throughout the year. Mysticeti (baleen) species include the gray whale (*Eschrichtius robustus*); North Pacific right whale *(Eubalaena japonica)*; minke whale (*Balaenoptera acutorostrata*); Bryde’s whale (*Balaenoptera edenii*); and the federally endangered blue whale (*Balaenoptera musculus*), fin whale (*Balaenoptera physalus*), sei whale (*Balaenoptera borealis*), and humpback whale (*Megaptera novaeangliae*). Odontoceti (toothed) species include dwarf sperm whale (*Kogia simus*), pygmy sperm whale (*Kogia breviceps*), pilot whale (*Globicephala macrorhynchus*), killer whale (*Orcinus orca*), false killer whale (*Pseudorca crassidens*), and the federally endangered sperm whale (*Physeter macrocephalus*). There also are a variety of beaked whale species (which are also toothed species) along with common dolphin (*Delphinus delphis*), bottlenose dolphin (*Tursiops truncatus*), northern right-whale dolphin (*Lissodephis borealis*), Risso's dolphin (*Grampus griseus*), pacific white-sided dolphin (*Lagenorhynchus obliquidens*), striped dolphin (*Stenella coeruleoalba*), spinner dolphin (*Stenella longirostris*), spotted dolphin (*Stenella attenuata*), rough-toothed dolphin (*Steno bredanensis*), Dall's porpoise (*Phocoenoides dalli*), and harbor porpoise (*Phocoena phocoena*). (For more information about the life history of these species pertinent to the SCB, see Appendix 13-A.)

Pinnipeds (Seals and Sea Lions)

Two pinnipeds, California sea lion (*Zalophus californianus californianus*) and Pacific harbor seal (*Phoca vitulina richardsi*), are common in the SCB. Other species include northern elephant seal (*Mirounga angustirostris*), found primarily around their rookeries on the California Channel Islands. Less common are northern fur seal (*Callorhinus ursinus*), the state- and federally threatened Guadalupe fur seal (*Arctocephalus townsendi*), and the federally threatened Steller sea lion (*Eumetopias jubatus*). Populations of the California sea lion, Pacific harbor seal, and northern elephant seal increased steadily in California waters throughout the second half of the 20th century, and are now relatively robust.

Fissipeds (Sea Otters)

Federally threatened southern sea otters (*Enhydra lutris nereis*) are occasionally seen in the SCB, and it is unknown if these are wanderers from the Central California population or from the San Nicolas colony. It is unlikely that this species would occur as residents in waters of the San Pedro Shelf (SP Shelf) or Palos Verdes Shelf (PV Shelf).

Reptiles

Reptiles known to occur in the SCB include one species of turtles, the leatherback turtle (*Dermochelys coriacea*), that is federally listed as endangered. There are also three species that are federally listed as threatened: the green turtle (*Chelonia mydas*), loggerhead turtle (*Caretta caretta)*, and olive ridley sea turtle (*Lepidochelys olivacea*) (Eckert 1993). All are known to occur in the nearshore waters off Southern California; however, the green turtle is the most commonly encountered nearshore in the SCB. (Eckert 1993.)

Protected Species[2]

Several species that occur in the SCB are protected by the state of California and/or the federal government through specific designations under the California and/or federal Endangered Species Act (ESA). These designations include sensitive, candidate for threatened or endangered listing, and threatened and/or endangered. State- and federally protected species that could potentially occur in nearshore coastal waters of the SCB are presented in Table 13-4. In addition to those protected species listed in the table, all marine mammals are protected under the Marine Mammal Protection Act (MMPA), and all birds that migrate are protected by the Migratory Bird Treaty Act (MBTA).

[2] For the purpose of brevity, this chapter uses "protected" to mean all species that are federally or state-listed endangered, threatened, rare, protected, candidate, or sensitive plant or animal species or a species of special concern.

Table 13-4. Protected Fish and Wildlife Species in the Southern California Bight

Species	Protected Status	Range	Habitat/Location Found	Comments
Invertebrates				
Black abalone (*Haliotis cracherodii*)	FE	Cabo San Lucas, Mexico, north to Mendocino County, California.	Found in the intertidal zone to less than about 30 feet (9 meters) subtidally.	Overfishing and a fatal wasting disease called “withering syndrome” have caused a decline in the black abalone populations.
White abalone (*Haliotis sorenseni*)	FE	Point Conception in California to Punta Abreojos in Baja California, Mexico.	Found in subtidal rocky reefs at depths between 80 and 196 feet (24 and 60 meters).	Harvested in an intense commercial and recreational fishery that developed during the 1970s, which quickly peaked and crashed, closing in 1996; occasionally observed by recreational divers in deeper depths at the Channel Islands.
Fishes				
Southern steelhead (*Oncorhynchus mykiss irideus)* Southern California ESU	FE, SSC	Migratory, anadromous rainbow trout were historically common in coastal drainages north of San Luis Rey in San Diego County.	Winter-run steelhead occur along the California coast. They enter their home streams from November to April (depending on water flows) to spawn. Juveniles migrate to sea, usually in spring, and spend the next 1 to 3 years feeding. Submarine canyons and other regions of pronounced upwelling are thought to be particularly important for steelhead during El Niño events. (Swift et al.1993:113.)	Streambed modifications and flood control has resulted in habitat loss and the decline in the steelhead population.
Tidewater goby (*Eucyclogobius newberryi*)	FE, SSC	The northern population is found along coastal areas from Del Norte County (Smith River mouth area) to Los Angeles County. The southern population ranges from Los Angeles County to Aqua Hedionda Lagoon.	Small, bottom-dwelling fish endemic to California in some shallow coastal lagoons, stream mouths, and shallow areas of bays with low salinity water. Gobies are able to survive in low salinity waters (preferring approximately 5 parts per trillion salinity) but can tolerate higher salinities when moving between coastal streams and the ocean. They live approximately 3 years and feed on crustaceans and aquatic insects. Although tidewater gobies occur within the SCB, they are not present in the nearshore environment (Swift et al. 1993:129).	Habitat loss has caused the decline of the tidewater goby.

Table 13-4 (Continued)

Species	Protected Status	Range	Habitat/Location Found	Comments
Reptiles				
Green turtle (*Chelonia mydas*)	FT	Globally distributed in warm water; have been observed as far north as Alaska during warm water periods. Eggs are laid seasonally on tropical sandy beaches on both mainland and island sites. Individuals have high nesting site fidelity.	Most commonly encountered nearshore in the SCB; individuals are known to reside year round in the warm water effluent of the discharge channel of the South Bay Power Plant in San Diego Bay.	Harvesting of turtles and eggs, incidental take in other fisheries, rookery beach habitat loss, and general habitat degradation has caused the decline of the green turtle.
Leatherback turtle (*Dermochelys coriacea*)	FE	Have the most extensive range of all sea turtles; in the eastern Pacific have been reported as far north as Alaska and the Aleutian Islands and as far south as Chile. Nesting occurs on beaches in Mexico and other tropical locations.	Common off Mexico during the winter breeding season, but in the eastern North Pacific migrate north outside of the breeding season. Are most common in Southern California in summer when 18–20°C water moves north from Mexico, and farther north later in the summer.	Harvesting of turtles and eggs, incidental take in other fisheries, rookery beach habitat loss, and general habitat degradation has caused the decline of the Leatherback turtle.
Loggerhead turtle (*Caretta caretta*)	FT	Globally distributed in temperate, subtropical, and tropical waters. Nesting is restricted to warm temperate and subtropical beaches of the western Pacific.	May migrate in patterns related to availability of prey, particularly pelagic crabs in the eastern Pacific. Otherwise, they are found feeding on benthic invertebrates on hard-bottom substrate. Most records off California are of juveniles.	Harvesting of turtles and eggs, incidental take in other fisheries, rookery beach habitat loss, and general habitat degradation has caused the decline of the Loggerhead turtle.
Olive ridley turtle (*Lepidochelys olivacea*)	FT	Globally distributed in tropical waters. A predominantly tropical species, they are occasionally found as far north as Oregon.	Occasional visitors to Southern California, where they have been reported year-round. Migratory in the Pacific, traveling long distances from nesting sites in Mexico and Central America south to feeding grounds off Ecuador.	Harvesting of turtles and eggs, incidental take in other fisheries, rookery beach habitat loss, and general habitat degradation has caused the decline of the olive ridley turtle.

Table 13-4 (Continued)

Species	Protected Status	Range	Habitat/Location Found	Comments
Birds				
California least tern (*Sternula antillarum browni*)	FE, SE	The current breeding range for the species extends along the Pacific coast from the San Francisco Bay area to the tip of the Baja peninsula. Adults migrate south in autumn with winter populations noted along the Pacific coast in Baja California and mainland Mexico and as far south as Costa Rica and Panama.	Forage primarily in the shallow waters adjacent to nesting colonies, feeding exclusively on small fish (Atwood and Kelly 1984). Studies have suggested that they avoid feeding in normally favored locations when dredging operations create turbidity that affects visibility and/or prey availability. In Los Angeles County, least terns nest at Terminal Island and Venice Beach, while in Orange County they nest at Bolsa Chica in Huntington Beach.	Listed as endangered primarily because of human disturbance of its nesting habitat.
Bald eagle (*Haliaeetus leucocephalus*)	SE	Historic range from Alaska and Canada to northern Mexico.	Historically nested on all of the California Channel Islands; however, by 1960 were considered extinct on all of these islands. Between 1980 and 1986, 33 eagles were released from three “hacking” (artificial nest) platforms on Santa Catalina Island. Since 1989, the reintroduced population has been maintained through manipulations of eggs and chicks at each nest site, as well as through additional hacking efforts.	Causes of decline included shooting, egg collection, nest destruction, nest disturbance leading to desertion, removal of young from nests, trapping, and poisoning. As with the California brown pelican, egg-shell thinning from DDT exposure also led to their decline.
Western snowy plover (*Charadrius alexandrinus nivosus*)	FE, SSC	The Pacific Coast population includes both resident and migratory birds. They breed primarily on coastal beaches from southern Washington to southern Baja California, Mexico.	Preferred nesting habitats are sand spits, dune-backed beaches, beaches at creek and river mouths, and saltpans at lagoons and estuaries.	The Pacific Coast breeding population is threatened throughout its range by loss and disturbance of nesting sites. Poor reproductive success, resulting from human disturbance, predation, and inclement weather, combined with permanent or long-term loss of nesting habitat and encroachment of introduced European beachgrass and urban development, has led to a decline in active nesting colonies, as well as an overall decline in breeding and wintering populations.
Marbled murrelet (*Brachyramphus marmoratus*)	SE, FT	Breeding range extends from Bristol Bay, Alaska, to northern Monterey Bay in central California. Birds winter throughout the breeding range and also occur in small numbers off Southern California.	Rare in Southern California. The three areas where this species is concentrated in California are offshore and in the largest remaining blocks of old-growth coastal conifer forests.	Listed because of habitat loss, predation, fishing by catch, oil spills, marine pollution, and disease.

Table 13-4 (Continued)

Species	Protected Status	Range	Habitat/Location Found	Comments
Xantus' murrelet (*Synthliboramphus hypoleucus*)	ST	Historically nested on offshore islands in Southern California and Mexico. Winter distribution is from British Columbia, Canada, to Baja California, Mexico.	Primarily breeds on islands off Baja California, Mexico and is rarely seen in Southern California. The state's entire population is restricted to the Channel Islands area, with 95 percent of the northern race (*S. h. scrippsi*) breeding on Santa Barbara Island.	Listed because of habitat loss.
Mammals				
Guadalupe fur seal (*Arctocephalus townsendi*)	ST, FT	Breed only on Guadalupe Island off central Baja California, Mexico.	Males are now regularly seen on the San Miguel and San Nicolas Islands of Southern California. They are also occasionally sighted at sea in the SCB, and on beaches in central and northern California.	Hunted nearly to extinction in the 19th century.
Steller sea lion (*Eumetopias jubatus*)	FT	Found from central California north to the Bering Sea, the Aleutian Islands, and the Kamchatka Peninsula, and then south to northern Japan.	Historically common in Southern California. They are mainly found in coastal waters to the outer continental shelf; however they occur in deep oceanic waters in some parts of their range.	Historically, sporadically hunted.
Southern sea otter (*Enhydra lutris nereis*)	FT	Historically distributed in a nearly continuous band from Hokkaido, Japan, to central Baja California, Mexico. Four distinct remnants of three subspecies survive, with populations on the Kurile Islands to southeast Kamchatka Peninsula, Commander Islands, Aleutian Islands to Prince William Sound, Alaska, and central California.	Found in shallow, nearshore waters, often in kelp beds, and feed on or near the bottom. Prey includes benthic invertebrates such as abalones and sea urchins, rock crabs, other shellfish, cephalopods, and near-bottom fish.	From 1741 to 1911, hunted commercially, mostly for their pelts. Hunted nearly to extinction.
Blue whale (*Balaenoptera musculus*)	FE	Occur worldwide in circumpolar and temperate waters.	Summer feeding grounds are believed to be in the Gulf of Alaska and off the eastern Aleutian Islands. Blue whales migrate southward in fall, reaching waters off Baja California, Mexico, in October. In recent years blue whales have been becoming increasingly common in the SCB, particularly between June and September, which may reflect a shift in distribution rather than an increase in their population size.	Hunted commercially in the north Pacific until 1965; and as a result were listed as endangered. Ship strikes and increased anthropogenic noise are current concerns.

Table 13-4 (Continued)

Species	Protected Status	Range	Habitat/Location Found	Comments
Fin whale (*Balaenoptera physalus*)	FE	Widely distributed in temperate and subarctic waters.	Migrate northward from subtropical wintering grounds offshore of Mexico to the Gulf of Alaska and adjacent waters. Their summer distribution includes the Santa Rosa-San Nicolas Ridge and inshore waters to Anacapa and Santa Catalina Islands, though year-round aggregations are found along the southern and central California coast. Their migration through the SCB follows the continental slope.	Hunted commercially in the north Pacific until 1987. Ship strikes and increased anthropogenic noise are current concerns.
Humpback whale (*Megaptera novaeangliae*)	FE	Occur worldwide. In the North Pacific, they range in summer from Arctic waters south to Japan and central California; in winter they range from Mexico, Central America, Hawaii, southern Japan, and the Philippines.	Present in the SCB from March through June and from September through December. In these months, however, sightings are uncommon and widespread. Migrants transiting the SCB follow a more inshore corridor than blue, fin, or sei whales.	Hunted commercially in the north Pacific until 1987. Ship strikes, entanglement in fishing gear, and increased anthropogenic noise are current concerns.
North Pacific right whale *(Eubalaena japonica)*	FE	In the eastern North Pacific, range from the Bering Sea south to central Baja California, Mexico. They are likely to be found at latitudes north of 50°N during summer.	Rare in Southern California. Seasonal north–south migrations, but with much less coherence and regularity than some other whale species, such as gray and humpback whales.	Heavily exploited by commercial whalers through the 1960s. Ship strikes and entanglement in fishing gear are current concerns.
Sei whale (*Balaenoptera borealis*)	FE	Occur worldwide, but are considered more boreal (northerly) in distribution than other balaenopterids.	Offshore species that do not appear to be associated with coastal features. Considered rare in California waters.	Hunted commercially in the north Pacific until 1972. Ship strikes and increased anthropogenic noise are current concerns.
Sperm whale (*Physeter macrocephalus*)	FE	Found in temperate and tropical pelagic waters south of about 45°N latitude.	Thought to be abundant in waters directly offshore the SCB. Common year-round off central and northern California.	At least 436,000 were taken in the North Pacific between 1800 and the end of commercial whaling for the species in 1987. Increased anthropogenic noise is a current habitat concern.
Delisted Species				
Birds				
California brown pelican (*Pelecanus occidentalis californicus*)	SE delisted (6/3/09), FE delisted (12/17/09): Recovered	The current breeding distribution of the California subspecies ranges from the Channel Islands of Southern California southward. Between breeding seasons,	Plunge divers, feeding primarily on fish in open waters nearshore and in harbors, with northern anchovy forming a significant portion of their diet. Feeding flocks generally include 10 to 50 birds, and occur within 12 miles) of shore in waters less than 330 feet (100 meters) deep. Feeding	Listed as endangered because of its low reproductive success, attributed to egg-shell thinning as a consequence of pesticide contamination. The population largely recovered following the prohibition on the use of DDT.

Table 13-4 (Continued)

Species	Protected Status	Range	Habitat/Location Found	Comments
		may range from as far north as Vancouver Island, British Columbia, and south to Central America.	pelicans have been sighted at sea off Southern California as far as Cortes Bank (about 80 miles west of San Diego) and 55 miles) offshore off central California. Found along the coast year round, but their numbers increase with the influx of post-breeding birds in summer.	
Bald eagle (*Haliaeetus leucocephalus*)	FT delisted (8/18/07)	Historic range from Alaska and Canada to northern Mexico.	Historically nested on all of the California Channel Islands; however, by 1960 were considered extinct on all of these islands. Between 1980 and 1986, 33 eagles were released from three "hacking" (artificial nest) platforms on Santa Catalina Island. Since 1989, the reintroduced population has been maintained through manipulations of eggs and chicks at each nest site, as well as through additional hacking efforts.	Causes of decline included shooting, egg collection, nest destruction, nest disturbance leading to desertion, removal of young from nests, trapping, and poisoning. As with the California brown pelican, egg-shell thinning from DDT exposure also led to their decline.
Mammals				
Gray whale (*Eschrichtius robustus*)	FE delisted (6/15/94): Recovered	Bering Sea, Alaska, to the Gulf of California, Mexico.	The Eastern Pacific gray whale population migrates from feeding grounds in Arctic seas to mating and calving grounds in coastal lagoons of Baja California and the Gulf of California and back again. Southbound gray whales begin arriving in the SCB in mid-December, and some small portion is known to calve in SCB waters. Calving takes place from January through March, after which the northbound migration begins. Gray whales feed only occasionally during their migration, though observations of nearshore feeding in the SCB during migration have been reported.	Hunted extensively during the 19th century; hunted nearly to extinction. Ship strikes, entanglement in fishing gear, and increased anthropogenic noise are current concerns.

E = Endangered
F = Federal
S = State (California)
SSC = State species of concern
T = Threatened
Source: CDFG 2010a

Marine Migration

A number of marine species migrate within the SCB, with migration patterns varying by species and generally seasonal, driven by lifecycle, availability of food, and reproductive needs. Several notable marine species that migrate through the SCB are gray, blue, and fin whales; sea turtles; and several species of fish.

Gray Whale

Each year the majority of the Eastern Pacific gray whale population migrates from feeding grounds in Arctic seas to mating and calving grounds in the coastal lagoons of Baja California and the Gulf of California and back again. From late fall through winter, gray whales travel south from the Arctic to Mexico, usually leaving the Bering Sea between late October and early January (Bonnell and Dailey 1993). The southbound gray whales begin arriving in the SCB in mid-December, and some small portion is known to calve in SCB waters (Dohl et al. 1981). Off northern and central California, the majority travel within a few kilometers of the shoreline (Bonnell and Dailey 1993; MBC 1989). Calving takes place from January through March, after which the northbound migration begins.

Blue and Fin Whales

The distribution of blue and fin whales in the SCB is similar, as are their seasons of highest abundance. They are most prevalent from June through October (Bonnell and Dailey 1993). Blue whales migrate southward in fall, reaching waters off Baja California in October. Their migration through the SCB follows the continental slope. Their calving grounds are unknown, but calving may occur far offshore or in more southern subtropical waters. In recent years, blue whales have become increasingly common in the SCB, particularly between June and September, which may reflect a shift in distribution rather than an increase in their population size (Barlow 1994; Barlow and Forney 2007). Eastern stock fin whales migrate northward from subtropical wintering grounds (assumed to be offshore Mexico) to the Gulf of Alaska and adjacent waters. Their summer distribution includes the Santa Rosa-San Nicolas Ridge and inshore waters to Anacapa and Santa Catalina Islands, though year-round aggregations are found along the southern and central California coast (Bonnell and Dailey 1993; Carretta et al. 2009). As with the blue whale, the fin whale migration through the SCB follows the continental slope.

Sea Turtles

Green turtle, loggerhead turtle, leatherback turtle, and olive ridley sea turtle all have broad, international geographic ranges and are highly migratory. However, they do not engage in mass migrations and the limited available data on their migratory behavior indicates that migration routes are pelagic, located far offshore. For example, tracking studies indicate that leatherback sea turtles nesting in the western Pacific migrate across the ocean foraging, and some aggregate off the coast of California to forage on jellyfish (NMFS and USFWS 2007). Tracking studies of olive ridley sea turtles in the Pacific Ocean offshore of Central America indicate that they move primarily into the deep offshore waters to forage, and similar results have been obtained for loggerhead turtles in southern Baja California (Sea Turtle Conservancy 2010).

Fishes

Migration in marine fish species is common and usually related to feeding or reproduction (Cross and Allen 1993:462, 474). Dover sole migrate offshore in winter to reproduce and inshore in summer to feed in the SCB. California scorpionfish aggregate offshore to traditional spawning grounds from May to August in the SCB. Pelagic fish species such as albacore migrate into the SCB in spring and summer to feed in productive coastal waters.

Marine Habitat

Marine habitat within the SCB includes that which has regulatory agency designation and biological habitat of importance to the ecosystem. Habitat is either pelagic or can include both the type of substrate (either soft bottom or hard bottom) and the community of species that relies on the type of substrate. The three marine habitats discussed in this section are essential fish habitat (EFH), marine protected areas, and marine vegetation. Marine protected areas, and seabird and shorebird nesting areas and rookeries, are described in more detail in Appendix 13-A.

Essential Fish Habitat

EFH is managed under the Magnuson-Stevens Fishery Conservation and Management Act (MSA). The project is located in waters designated as EFH for two Fishery Management Plans (FMPs): the Coastal Pelagics FMP (6 species), and the Pacific Groundfish FMP (89 species). EFH for coastal pelagics is defined as all marine and estuarine waters from the California, Oregon, and Washington shorelines offshore to the limits of the Exclusive Economic Zone (EEZ), which is 230 miles from shore and above the thermocline. The habitat for coastal pelagics is primarily above the thermocline. For Pacific groundfishes, EFH includes all waters off Southern California between mean higher high water and depths less than or equal to approximately 11,500 feet (3,500 meters). The Pacific Groundfish FMP also considers EFH to include areas where saltwater intrudes into a river. Lastly, specific habitat areas of particular concern for groundfishes have been identified and include estuaries, canopy kelp, seagrass, rocky reefs, and other specific areas (such as seamounts). An EFH assessment is presented in Appendix 13-C.

Marine Protected Areas

A marine protected area (MPA), as defined in Section 2852(c) of the California Fish and Game Code, "means a named, discrete geographic marine or estuarine area seaward of the high tide line or the mouth of a coastal river, including any area of intertidal or subtidal terrain, together with its overlying water and associated flora and fauna that has been designated by law, administrative action, or voter initiative to protect or conserve marine life and habitat." These include state marine reserves, state marine parks, marine conservation areas, ecological reserves, state marine refuges, and state parks. Areas of special biological significance (ASBS) were established with SWRCB Resolution No. 74-28 to provide protection to species or communities in these areas from water quality degradation. The state MPA near the riser and diffuser areas is shown on Figure 13-3.

Marine Vegetation

Marine vegetation varies depending on the depth of water and the nearshore and offshore environments. In nearshore areas, from the shore to the edge of the photic zone, hard-bottom habitats provide substrate for the attachment of marine algae and plants. In shallow rocky areas, green algae (*Chlorophyta*), more common in the intertidal, are mostly small to moderate in size. Subtidally, red algae (*Rhodophyta*) generally form a low turf or understory, whereas brown algae (*Phaeophyta*) are generally larger and form an overstory. Eelgrass (*Zostera* spp.) is found in bays, estuaries, and in sheltered areas along the open coast of Southern California (Dawson and Foster 1982:158), although the majority of eelgrass is found in bays and estuaries (Bernstein et al. 2011:8–15).

In relatively shallow rocky or hard-bottomed areas, feather-boa kelp (*Egregia menziesii*) is dominant nearshore, while giant kelp (*Macrocystis pyrifera*) dominates deeper areas of reefs down to about 66 feet (20 meters). Palm kelp (*Pterygophora californica*) and other large upright kelps increase diversity by attracting and providing habitat for an additional assemblage of organisms. Surfgrass (*Phyllospadix* spp.), a flowering plant, occasionally forms dense beds in rocky areas and, although more common in the low intertidal, can be found to depths of approximately 50 feet (15 meters). In some areas, bull kelp

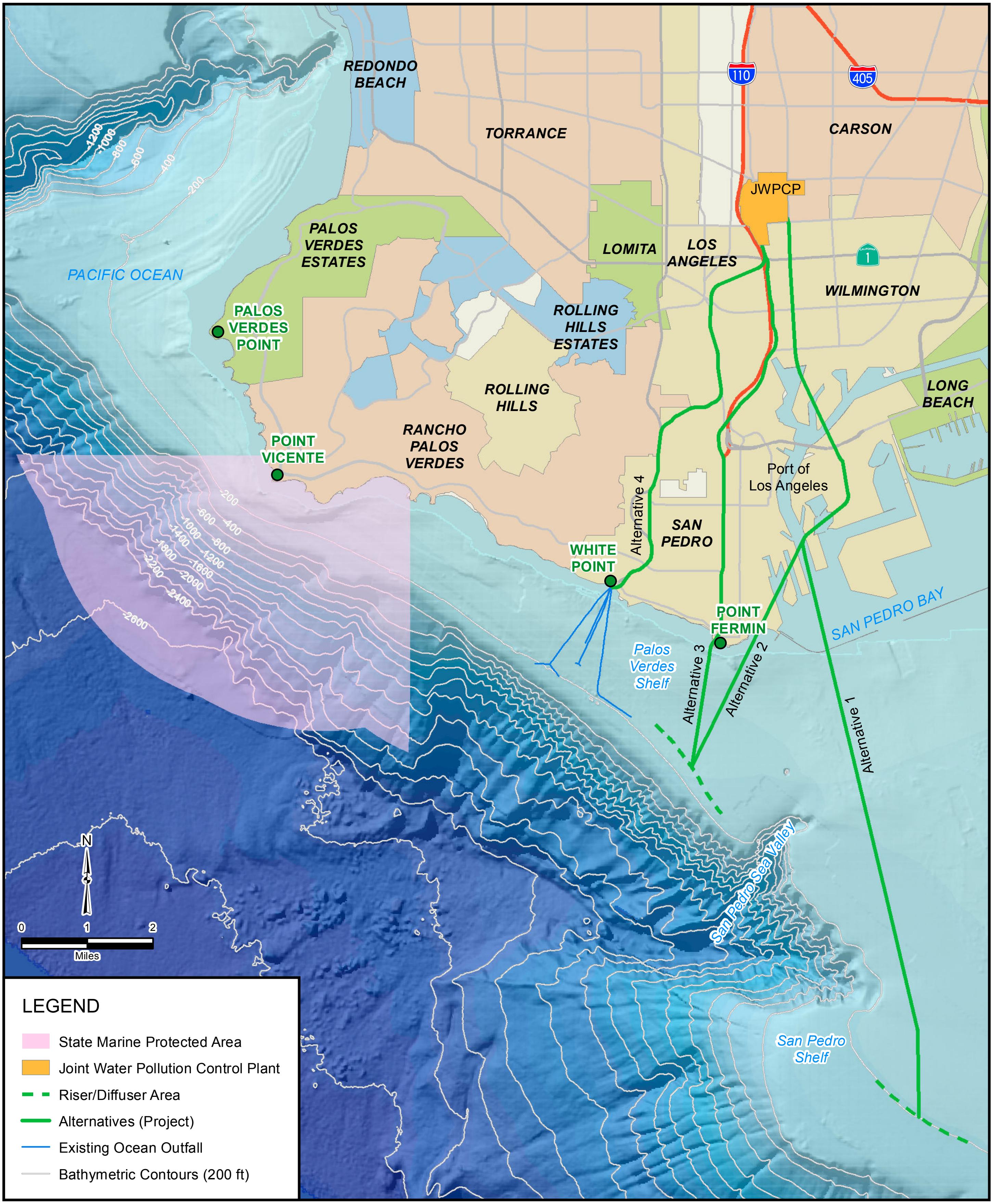

FIGURE 13-3

CLEARWATER Program

State Marine Protected Areas

Source: Sanitation Districts of Los Angeles County 2011, CaSIL 2001, Thomas Bros. 2011

(*Nereocystis luetkeana*) and other upright brown and low-growing red algal turfs may be found on hard bottoms to depths of approximately 100 feet (30 meters). Kelp beds in the SCB are strongly influenced by regional oceanographic conditions and tend to vary in size on both a seasonal and annual basis (MBC 2011).

Marine vegetation adds an additional dimension to the structure of the marine environment that attracts fishes and invertebrates into an area. On shallow reefs, fewer species and numbers of fish are found when kelp is absent. In the SCB, pile perch (*Rhacochilus vacca*), black perch (*Embiotoca jacksoni*), garibaldi (*Hypsypops rubicundus*), treefish (*Sebastes serriceps*), barred sand bass (*Paralabrax nebulifer*), California scorpionfish (*Scorpaena guttata*), and blackeye goby (*Rhinogobiops nicholsii*) are common on shallow reefs. If kelp is present, kelp bass (*Paralabrax clathratus*), blacksmith (*Chromis punctipinnis*), giant kelpfish (*Heterostichus rostratus*), señorita (*Oxyjulis californica*), and California sheephead (*Semicossyphus pulcher*) also occur in the area.

13.2.1.6 Underwater Sound

Natural and anthropogenic sources contribute to the ambient underwater sound level in the SCB. Natural sources of existing underwater sound include turbulence, wind, seismic activity, cetaceans, certain types of fish, and snapping shrimp. Anthropogenic sources include the operation of vessels, geologic profiling, and the use of commercial and military sonar systems. There is a high volume of shipping and other vessel activity in the SCB associated with the Port of Los Angeles and the Port of Long Beach. These activities are the predominant source of underwater sound in the project area. Typical underwater sound levels are measured by decibel reference pressures that are 1 millionth of a Pascal (dB re 1µPa). Those generated by supertankers and container ships are between 180 and 190 at a distance of 1 meter (Richardson et al. 1995).

13.2.1.7 Public Health

Both natural and anthropogenic hazards found in the marine environment can affect public health and lead to illness. Specifically, microorganisms either naturally found or from stormwater runoff or the disposal of waste can cause illness. In addition, the bioaccumulation of persistent chemicals in fish can be transferred and accumulate in people that eat that fish. These issues are discussed in the following sections in the context of public health.

Microorganisms

Microorganisms aid in the decay of naturally occurring vegetation and animal remains, and degrade anthropogenic inputs into the marine environment (Geesey 1993:191). Some microorganisms pose a risk to public health or marine organisms. Because concentrations of pathogens are usually very low, indicator organisms such as coliform bacteria and enterococcus are generally monitored as indicators of fecal pollution (Geesey 1993:222).

Since 1990, bacteria levels at swimming beaches visited by people (the most likely sites of exposure for humans to bacterial contamination in the marine environment) have been monitored and reported by Heal the Bay, an organization that tracks the quality of coastal waters. Levels have been improving annually and, in 2008, were the best overall to date (Heal the Bay 2008). Despite some problem areas, 87 percent of Southern California beaches received water quality ratings of very good to excellent during dry weather. During dry weather, water quality at open ocean beaches was found to be significantly better than at those within enclosed bays or harbors, or those that are located near running storm drains.

During wet weather, 52 percent of Southern California beaches were considered to have fair to poor water quality.

As discussed in Section 13.2.1.5, planktonic algal blooms (e.g., HABs) may result in the production of toxins at levels that can bioaccumulate. The HABs can cause illness and death in higher level animals and humans (Appendix 13-B).

Fish Tissue Bioaccumulation

Historical impacts of contaminants, particularly the chlorinated hydrocarbons DDT and PCBs, have been of regional concern in the SCB since the 1970s (see Section 13.2.1.4). Although sources of contamination have been reduced significantly in the last several decades, many of the chemicals are bound to sediments and are available to organisms through direct uptake or accumulated through ingestion of prey. In the SCB, the most contaminated areas occur in harbors and bays, and offshore of the Palos Verdes Peninsula (Mearns et al. 1991:v–vi; Anderson et al. 1993:682–685). The California Department of Fish and Game (CDFG) has advised the public to not consume or limit consumption of some types of fish caught in the SCB between Point Dume and Dana Point because of the bioaccumulation of contaminants in their tissue. These species are top smelt (*Atherinops affinis*), rockfishes, surf perch, black croaker (*Cheilotrema saturnum*), sculpin (scorpionfish), queenfish (*Seriphus politus*), kelp bass, corbina (*Menticirrhus undulatus*), and white croaker (*Genyonemus lineatus*) (CDFG 2010d). For a detailed description of some regional fish contamination studies, see Appendix 13-A.

13.2.2 Project Setting

The riser and diffuser would be located on either the PV Shelf or the SP Shelf, depending on the selected alternative. Any pertinent distinctions between the two shelves that are not adequately described by the regional setting are described in the project setting. The project setting also includes the physical and biological environments near the existing ocean outfalls. Available data were somewhat limited for the project setting; however, the most accurate and recent information was used. Wherever site-specific data are unavailable, the justification for the data presented is clearly identified. Additional detail regarding the SP Shelf, PV Shelf, and existing ocean outfalls can be found in Appendix 13-A.

A summary of physical, chemical, and biological characteristics of the effluent from the JWPCP from 2008 is shown in Appendix 13-D. The National Pollutant Discharge Elimination System (NPDES) permit for the JWPCP (see Section 13.3.4, Appendix 13-E, and Appendix 13-F) contains approximately 27,000 numeric and qualitative limits that must be met each year based on results of final effluent and receiving water sampling and analysis. During 2008, the JWPCP had no violations. The NPDES permit does not contain numerical discharge limits for constituents when the monitored concentrations are sufficiently below the thresholds necessary to protect the marine environment.

13.2.2.1 Riser/Diffuser Area

The riser and diffuser would be located on either the SP Shelf (for Alternative 1) or the PV Shelf (for Alternatives 2 and 3). A riser and diffuser would not be constructed for Alternative 4. The rehabilitation of the existing ocean outfalls would occur on the PV Shelf for Alternatives 1 through 4.

San Pedro Shelf

In general, characteristics of the SP Shelf are similar to those discussed in the regional setting. This section describes the differences that occur and augments the previous information with site-specific data to facilitate the evaluation of local impacts. A full review of conditions on the SP Shelf is presented in Appendix 13-A.

Location and Geography

The SP Shelf riser and diffuser area would be approximately 7.5 miles from the Port of Los Angeles-Long Beach Breakwater, at a depth of approximately 200 feet (60 meters). It would be located at depths known as midshelf depths. The diffuser area would be on a relatively flat portion of the outer shelf at the southwest edge of the SP Shelf (Figure 13-4). The riser location would be approximately 2 miles southeast of the southern edge of the San Pedro Sea Valley, and approximately 1 mile northwest of the shelf break.

Oceanography

Large-scale, depth-averaged current patterns for the SP and PV Shelves were modeled and calibrated against field measurements to confirm consistency (Parsons 2011). In the vicinity of the SP Shelf riser and diffuser area, average currents throughout the water column in summer were modeled to flow northwest in the direction of the predominant slope flow, with speeds on the flatter area of the shelf in the project area expected at up to 0.1 feet per second (ft/s) (4 cm/s). In winter, average speeds throughout the water column in the project area were modeled to flow west with the predominant cross-slope flow at speeds of up to 0.1 ft/s (4 cm/s), possibly faster. As part of the Palos Verdes Flow Study conducted by the Sanitation Districts of Los Angeles County (Sanitation Districts), currents were measured at Station AG in the vicinity of the SP Shelf riser and diffuser area between 2006 and 2008. Currents were variable in both speed and direction with depth through the water column, though current speeds above 0.5 ft/s (15 cm/s) were common in depths above about 125 feet (38 meters) (Sanitation Districts 2008a). Since Station AG is deeper than the proposed riser site, data from a depth of 194 feet (59 meters) is presented to represent bottom currents in the project area. Over the 3-year study period, currents in the area at the project depth averaged almost 0.4 ft/s (13 cm/s), with a maximum current speed of 1.5 ft/s (47 cm/s) recorded in 2007. Current direction and velocity tendencies through the project area are shown on Figures 13-5 and 13-6, respectively. The figures are based on mooring data from the Palos Verdes Flow Study conducted by the Sanitation Districts from October 2000 through April 2008 (Sanitation Districts 2008a).

Water Quality

As part of the JWPCP receiving water monitoring program, water quality parameters are determined throughout the water column at Station 2706, in the vicinity of the SP Shelf riser and diffuser area, on a quarterly basis (Sanitation Districts 2010a). Data from a depth of 200 feet (61 meters) were used to represent conditions in the project area. Water quality parameters are summarized in Table 13-5.

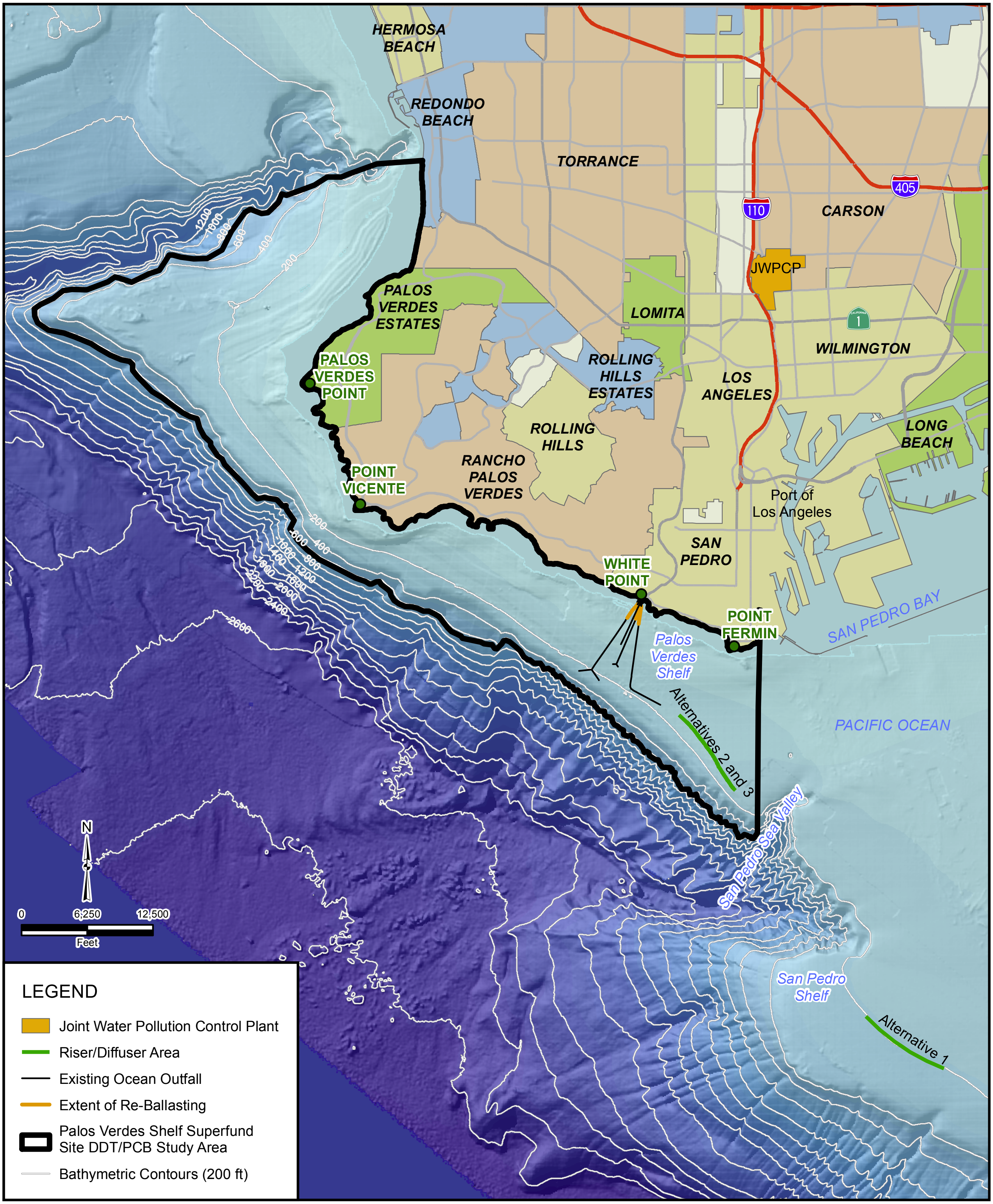

FIGURE 13-4

Location of the Proposed Riser/Diffuser Areas and the Palos Verdes Shelf Superfund Site DDT/PCB Study Area

Source: Sanitation Districts of Los Angeles County 2011, CaSIL 2001, Thomas Bros. 2011

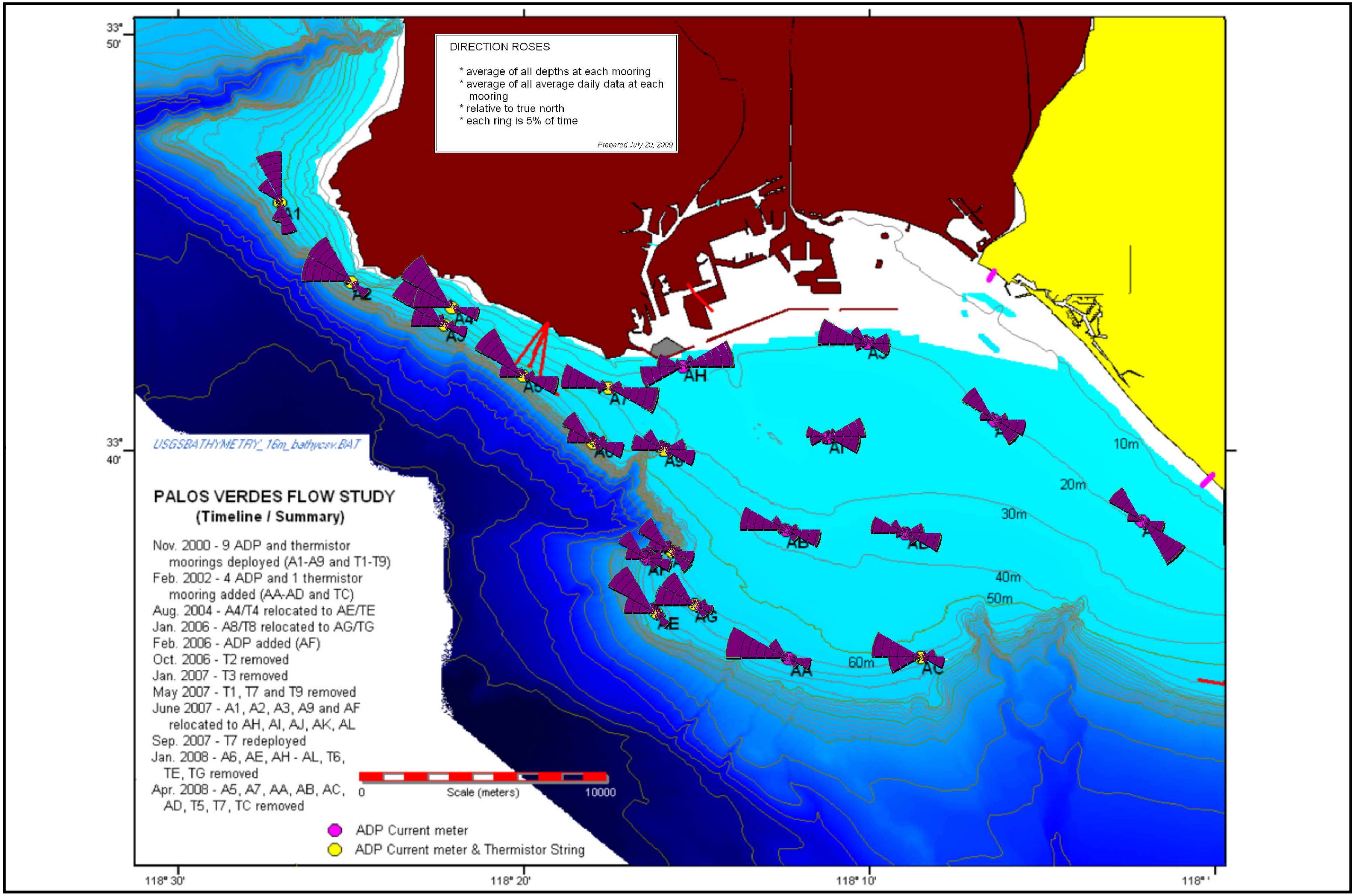

FIGURE 13-5

CLEARWATER Program

Palos Verdes Flow Study Current Direction Rose

Source: Sanitation Districts of Los Angeles 2009

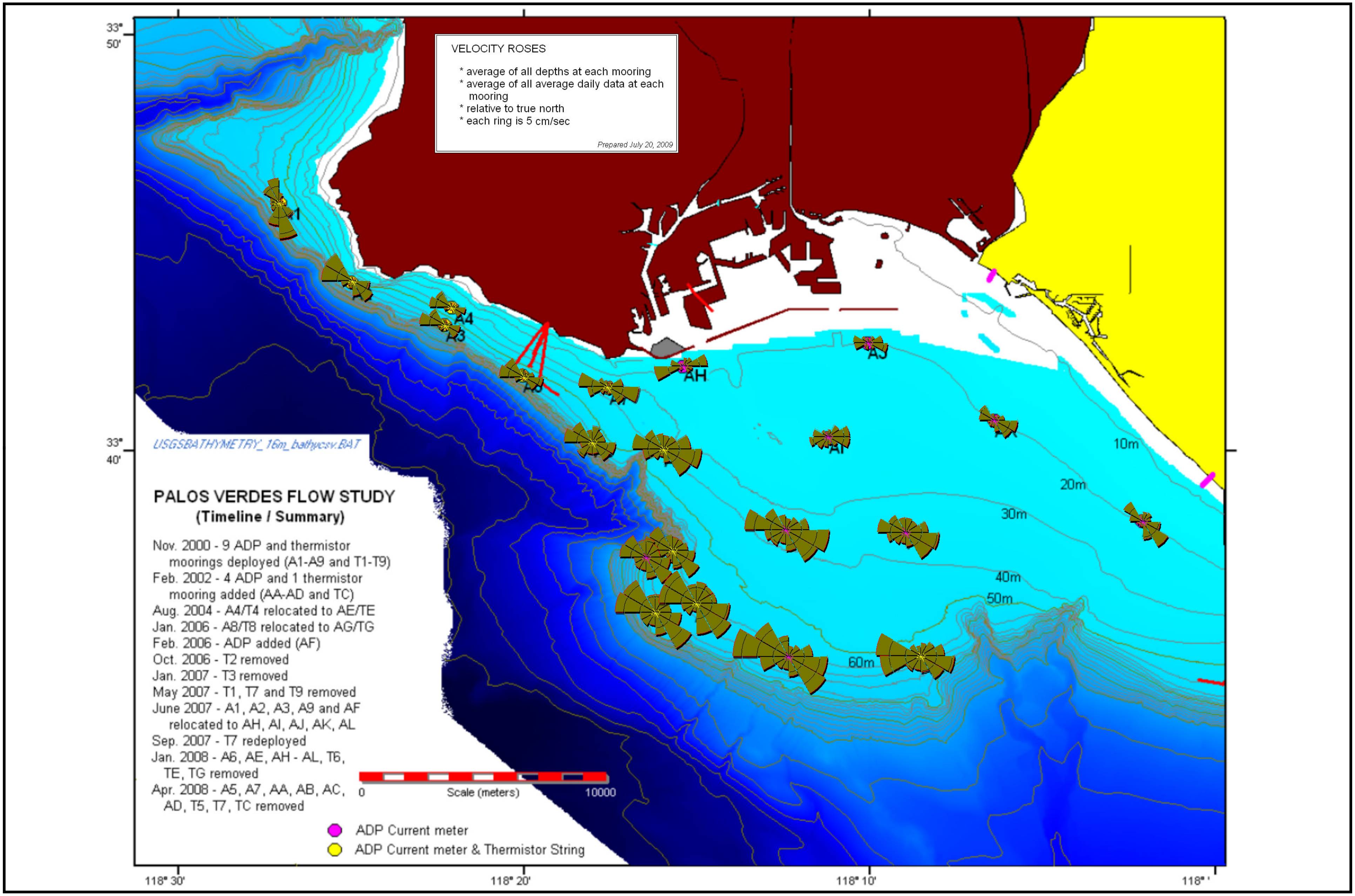

FIGURE 13-6

Palos Verdes Flow Study Current Velocity Rose

Source: Sanitation Districts of Los Angeles 2009

Table 13-5. Water Quality Parameters in the Vicinity of the SP Shelf Riser and Diffuser Area (Station 2706 at 200-Foot [61-Meter] Depth)

Parameters	Results[a]
Temperature (°C) – 2008	9.9 (50 °F) – 13.1 (56 °F) (11.5 [53 °F])
Temperature (°C) – 2009	10.0 (50 °F) – 12.2 (54 °F) (11.1 [52 °F])
Salinity (psu) – 2008	33.33 – 33.96 (33.61)
Salinity (psu) – 2009	33.26 – 33.89 (33.59)
Density (σt) – 2008	25.09 – 26.15 (25.59)
Density (σt) – 2009	25.21 – 26.09 (25.67)
Dissolved Oxygen (mg/L) – 2008	2.7 – 7.1 (5.0)
Dissolved Oxygen (mg/L) – 2009	3.2 – 6.2 (4.6)
Hydrogen Ion Concentration (pH) – 2008	7.8 – 8.2 (8.0)
Hydrogen Ion Concentration (pH) – 2009	7.8 – 8.0 (7.8)
Transmissivity (%) – 2008	87.1 – 90.5 (88.3)
Transmissivity (%) – 2009	87.9 – 88.8 (88.2)

[a] Average is shown in parentheses.
psu = practical salinity units
Source: Sanitation Districts 2009b, 2010b

The Sanitation Districts are required to test for water quality parameters on the SP Shelf, including the parameters described in Table 13-5 per the NPDES permits.

Sediment Quality

The SP Shelf covers over 68,000 acres between the depths of 100 and 400 feet (30 to 120 meters), generally considered midshelf depths. Soft-bottom sediments (primarily bioturbated muddy sand) are approximately 88 percent of the midshelf depths. Other sediment consists of sand or alternating sand and subsurface fine clay sediment layers. Approximately 12 percent of the SP Shelf at midshelf depths is hard surface (coarse sediment to larger rocks and substrate).

The SP Shelf diffuser area is not located within the boundaries of the United States (U.S.) Environmental Protection Agency (EPA)-designated DDT/PCB contaminated sediment study area, which is shown on Figure 13-4. DDT and PCBs have been reported in sediments from the SP Shelf, with higher levels of DDT and PCB found closer to the Palos Verdes Peninsula (Eganhouse and Venkatesan 1993; Schiff et al. 2006). In regional sampling conducted in 2003, DDT was detected in sediments of three midshelf depth stations on the SP Shelf, Stations 4026, 4058, and 4122 (Schiff et al. 2006). At the two stations closer to the PV Shelf (Stations 4026 and 4122), DDT levels exceeded the ERL[3] value, but were below the ERM[4] value for total DDT, a range in which effects on biota could occasionally occur. At those same two stations, PCBs were also detected in the sediments, though levels did not exceed ERL values.

In addition to the organic chlorinated hydrocarbons, samples were analyzed for concentrations of trace metals as well as other contaminants during the 2003 regional survey. Eleven trace metals were reported as enriched at one or more of the three midshelf depth stations on the SP Shelf (Schiff et al. 2006). Metal levels reported for the survey were below ERL values for the respective metals with the exception of

[3] ERL – Effects Range Low; concentrations equal to and above the ERL but below the ERM represent possible effects range within which effects to biota could occasionally occur.
[4] ERM – Effects Range Median; concentrations above the ERM represent a probable effects range within which effects could frequently occur.

mercury, which was reported at a value between the ERL and ERM levels at one of the three stations. Other contaminants levels considered enriched were not found at the three stations during the survey.

Biological Resources

Biological Communities

The SP Shelf riser and diffuser area is in Catch Block 740, which supports an active commercial and recreational fishing industry.[5] In 2006, six methods of commercial take were reported for fishes in Catch Block 740, including collection by various traps and nets, hook and line, longlines, harpoon and spear, set and drift gill nets, purse seines, and trawls (CDFG 2007). For a detailed description of catch in Catch Block 740 in 2006, see Appendix 13-A.

Because the SP Shelf riser and diffuser area is 7.5 miles from the shore, it is unlikely that shorebirds would use this area for feeding and foraging. Seabirds that feed near their nesting sites (such as California least tern and skimmers) are also unlikely to use the area. Other seabirds such as the California brown pelican, western grebe (*Aechmophorus occidentalis*), common murre (*Uria aalge*), and sooty shearwater (*Puffinus griseus*) may feed and forage in the area (Briggs et al. 1981:63–76).

Marine Habitat

The SP Shelf primarily consists of soft-bottom habitat (approximately 59,650 acres between 100- and 400-foot [30- and 120-meter] depth), which consists of bioturbated sand and fine sediment. Hard-bottom habitat of the shelf is primarily found in an area identified as Horseshoe Kelp, although there is no longer any kelp in this area. The hard-bottom habitat is a mixture of bottom rocks and coarse sediment.

Underwater Sound

The riser and diffuser area on the SP Shelf would be located offshore of the Ports of Los Angeles and Long Beach – the busiest port complex in the United States. In 2008, approximately 21,600 combined inbound/outbound vessel trips were recorded at the Port of Los Angeles, and approximately 48,570 inbound/outbound vessel trips were recorded at the Port of Long Beach (Corps 2010). Therefore, a total of approximately 70,000 inbound/outbound vessel trips occurred in 2008 for the entire port complex (Corps 2010). (See Chapter 19 for additional information regarding the existing setting of the types and quantities of ships using the Ports of Los Angeles and Long Beach.) These types of ships generate relatively loud underwater sounds. As identified in Section 13.2.1.6, these activities are the predominant source of underwater sound in the project area. Those generated by supertankers and container ships are between 180 and 190 at a distance of 1 meter (Richardson et al. 1995). A recent underwater noise study conducted in the Cerritos Channel to characterize underwater ambient noise conditions provides underwater noise levels typical of a busy shipping channel (Tetra Tech 2011). Principal ambient contributors within the Cerritos Channel include shipping traffic, port and intermodal facilities operating along the channel shore, wind and waves, precipitation, biological noise, and flow current and tidal current, which can create turbulence. Shipping traffic typically dominates the ambient environment for frequencies between 10 and 1000 hertz. The sum of anthropogenic and natural noise depends on source levels and the propagation conditions including water depth and bottom conditions. Ambient noise measurements were conducted at several locations throughout the channel. The following is a summary of measured sound levels (Tetra Tech 2011):

- Range of sound levels exceeded 5 percent of the time: 132 to 147 decibel (dB)
- Range of sound levels exceeded 10 percent of the time: 131 to 143 dB

[5] Catch blocks are 10- by 10- nautical mile areas delineated to track commercial fishery catches by the CDFG.

- Range of sound levels exceeded 50 percent of the time: 124 to 136 dB
- Range of sound levels exceeded 90 percent of the time: 120 to 132 dB

In recent years, larger cargo volumes have been accommodated primarily by using larger vessels rather than adding to their numbers. Container ships as long as 1,000 feet and weighing over 100,000 tons have visited the Port of Los Angeles. In addition to this commercial cargo traffic, the Port of Los Angeles also serves a small fishing fleet based in Fish Harbor and a wide variety of commercial passenger vessels, including cruise ships, passenger ferries to Catalina Island, sport fishing tour boats, whale watching boats, and harbor cruisers, as well as private recreational vessels. Passenger ferry traffic to Catalina Island varies seasonally with approximately 10 to 15 weekly round-trips to the island during the spring (Catalina Express 2010). These types of smaller vessels also generate underwater sound, although typically not within the ranges of larger supertankers. However, the commercial and recreational vessel traffic of the Ports of Los Angeles and Long Beach generally results in a higher ambient level of underwater sound than other locations not within the shipping lanes or in proximity to the largest port complex on the west coast. There are several ambient underwater noise levels documented at various locations in the western U.S. (Caltrans 2009), which account for a mix of vessel traffic including larger shipping vessels and recreational vessels. These include:

- 120 to 155 decibels peak (dB_{PEAK}) (133 decibels root mean square [dB_{RMS}]) for heavy industrial use and boat traffic in San Francisco Bay and Oakland outer harbor
- 113 dB_{PEAK} for the nearshore heavy commercial and recreational boat traffic in Monterey Bay
- 116 dB_{PEAK} for the offshore heavy commercial and recreational boat traffic in Monterey Bay

Palos Verdes Shelf

Although the general characteristics of the PV Shelf are similar to those discussed for the regional setting and for the SP Shelf, one of the major differences is that the PV Shelf riser and diffuser area is within the boundaries of the EPA-designated DDT/PCB study area. This section describes the differences that occur between the SP and PV Shelves and augments the previous information with site-specific data on the PV Shelf to facilitate the evaluation of local impacts. A full review of conditions on the PV Shelf is presented in Appendix 13-A.

Location and Geography

The PV Shelf covers approximately 19,900 acres between the San Pedro Sea Valley and Redondo Canyon in Santa Monica Bay at depths of approximately 100 to 400 feet (30 to 120 meters). The PV Shelf riser and diffuser area would be located approximately 2 miles from Point Fermin, at a depth of approximately 175 feet (53 meters). This depth is known as midshelf. The PV Shelf riser and diffuser area would be on a relatively flat section of the outer shelf at the southeast edge of the PV Shelf. The location of the PV Shelf riser and diffuser area is identified on Figure 13-4. The riser location would be approximately 1.4 miles northwest of the northern edge of the San Pedro Sea Valley and approximately 0.5 mile northeast of the shelf break.

Oceanography

Large-scale, depth-averaged current patterns for the SP and PV Shelves were modeled and calibrated against field measurements to confirm consistency (Parsons 2011). In the vicinity of the PV Shelf riser and diffuser area, average currents throughout the water column in summer were modeled to flow northeast across the San Pedro Sea Valley, then flow easterly and southeasterly in the project area on the shelf at speeds of about 0.1 ft/s (3 cm/s). In winter, average speeds throughout the water column in the project area were modeled to be potentially variable, with both upslope and cross-shelf westerly currents and southeast countercurrent flow indicated for the area at speeds of about 0.06 ft/s (2 cm/s). As part of the Palos Verdes Flow Study conducted by the Sanitation Districts, currents were measured at Station A6 in the vicinity of the PV Shelf riser and diffuser area between 2000 and 2008. Daily currents were variable in both speed and direction with depth through the water column, though current speeds above 0.5 ft/s (15 cm/s) were common in depths above about 46 feet (14 meters) (Sanitation Districts 2008a). Since Station A6 is deeper than the riser site, data from a depth of 175 feet (53 meters) is presented to represent bottom currents in the project area. Over the 9-year study period, currents in the area at the project depth averaged almost 0.3 ft/s (10 cm/s), with a maximum current speed of 2.3 ft/s (69 cm/s) recorded in 2001. Current direction and velocity tendencies through the project area are shown on Figures 13-5 and 13-6, respectively. The figures are based on mooring data from the Palos Verdes Flow Study conducted by the Sanitation Districts from October 2000 through April 2008 (Sanitation Districts 2008a).

Water Quality

As part of the JWPCP receiving water monitoring program, water quality parameters are measured quarterly throughout the water column at Station 2803, in the vicinity of PV Shelf riser and diffuser area (Sanitation Districts 2010a). Although the bottom depth at the station location is 196 feet (60 meters), data collected at a depth of 175 feet (53 meters) at the station were used to represent bottom conditions because the proposed riser and diffuser would be located at a depth of 175 feet (53 meters). Water quality parameters are summarized in Table 13-6.

Table 13-6. Water Quality Parameters in the Vicinity of the PV Shelf Riser and Diffuser Area (Station 2803 at 175-Foot [53-Meter] Depth)

Parameters	Results[a]
Temperature (°C) – 2008	9.9 – 13.1 (11.6)
Temperature (°C) – 2009	9.9 – 12.3 (11.4)
Salinity (psu) – 2008	33.32 – 33.94 (33.60)
Salinity (psu) – 2009	33.28 – 33.90 (33.53)
Density (σt) – 2008	25.08 – 26.14 (25.57)
Density (σt) – 2009	25.28 – 26.11 (25.56)
Dissolved Oxygen (mg/L) – 2008	2.9 – 7.6 (4.9)
Dissolved Oxygen (mg/L) – 2009	3.2 – 6.1 (4.9)
Hydrogen Ion Concentration (pH) – 2008	7.8 – 8.1 (8.0)
Hydrogen Ion Concentration (pH) – 2009	7.7 – 8.0 (7.8)
Transmissivity (%) – 2008	83.5 – 90.1 (86.8)
Transmissivity (%)– 2009	86.8 – 89.4 (88.1)

[a] Average is shown in parentheses.
psu = practical salinity units
Source: Sanitation Districts 2009b, 2010b

Sediment Quality

The PV Shelf includes 19,895 acres between the depths of 100 and 400 feet (30 and 120 meters), generally considered midshelf depths. Soft-bottom sediments are approximately 97 percent of the midshelf depths. The PV Shelf riser and diffuser area is within the boundaries of the EPA-designated Palos Verdes Shelf Superfund Site. The location of the DDT/PCB study area is depicted on Figure 13-4. The extent of the DDT contamination within the PV Shelf Superfund Site Study Area (EPA 2009a:27–28) and the proposed riser/diffuser and re-ballasting locations are shown on Figure 13-7. The extent of the PCB contamination within the PV Shelf Superfund Site Study Area (EPA 2009a:27–28) and the proposed riser/diffuser and re-ballasting locations are shown on Figure 13-8. See the discussion under Existing

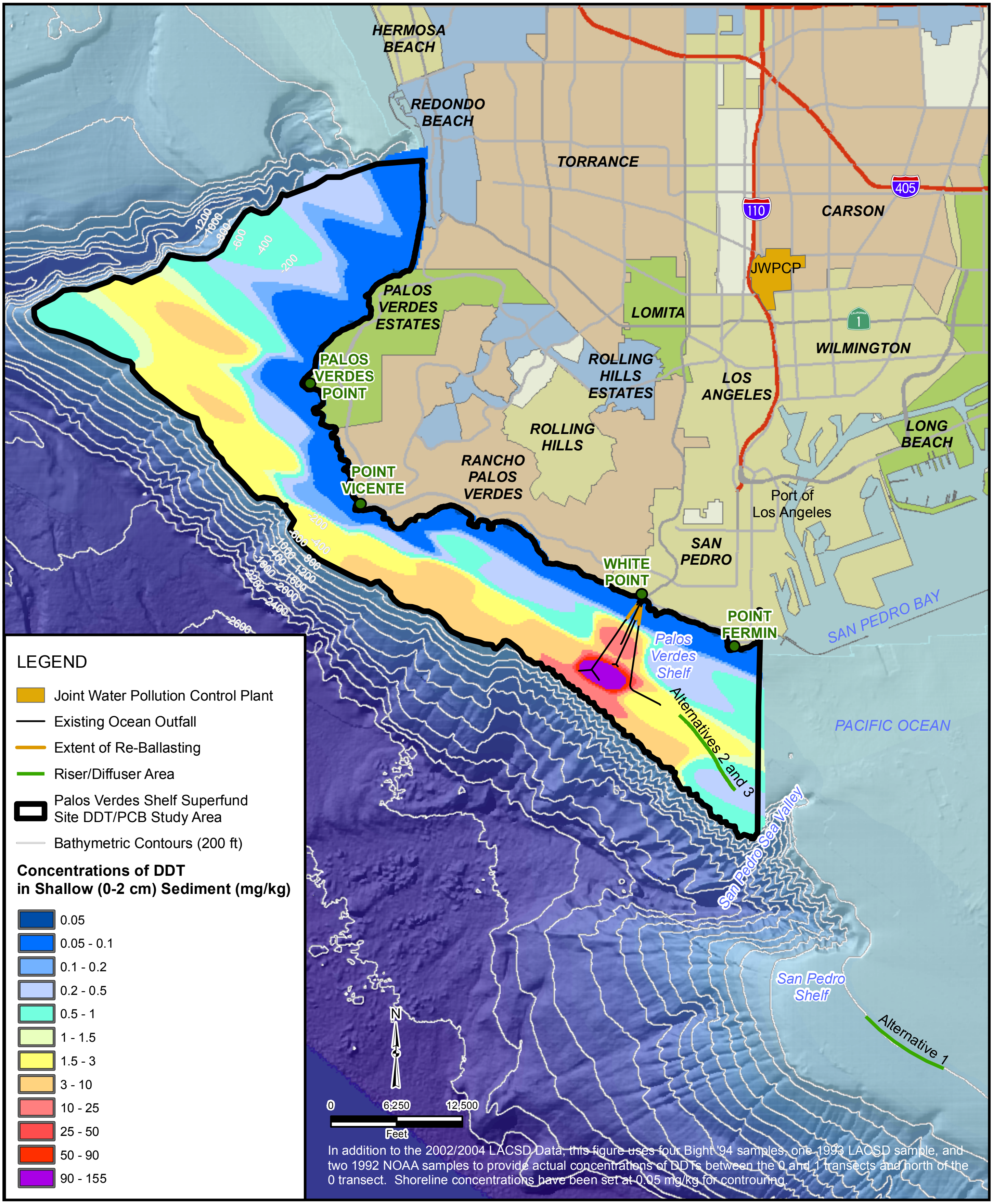

FIGURE 13-7

CLEARWATER Program

Interpretive DDT Concentrations on the Palos Verdes Shelf

Source: Sanitation Districts of Los Angeles County 2011, CaSIL 2001, Thomas Bros. 2011, EPA 2009

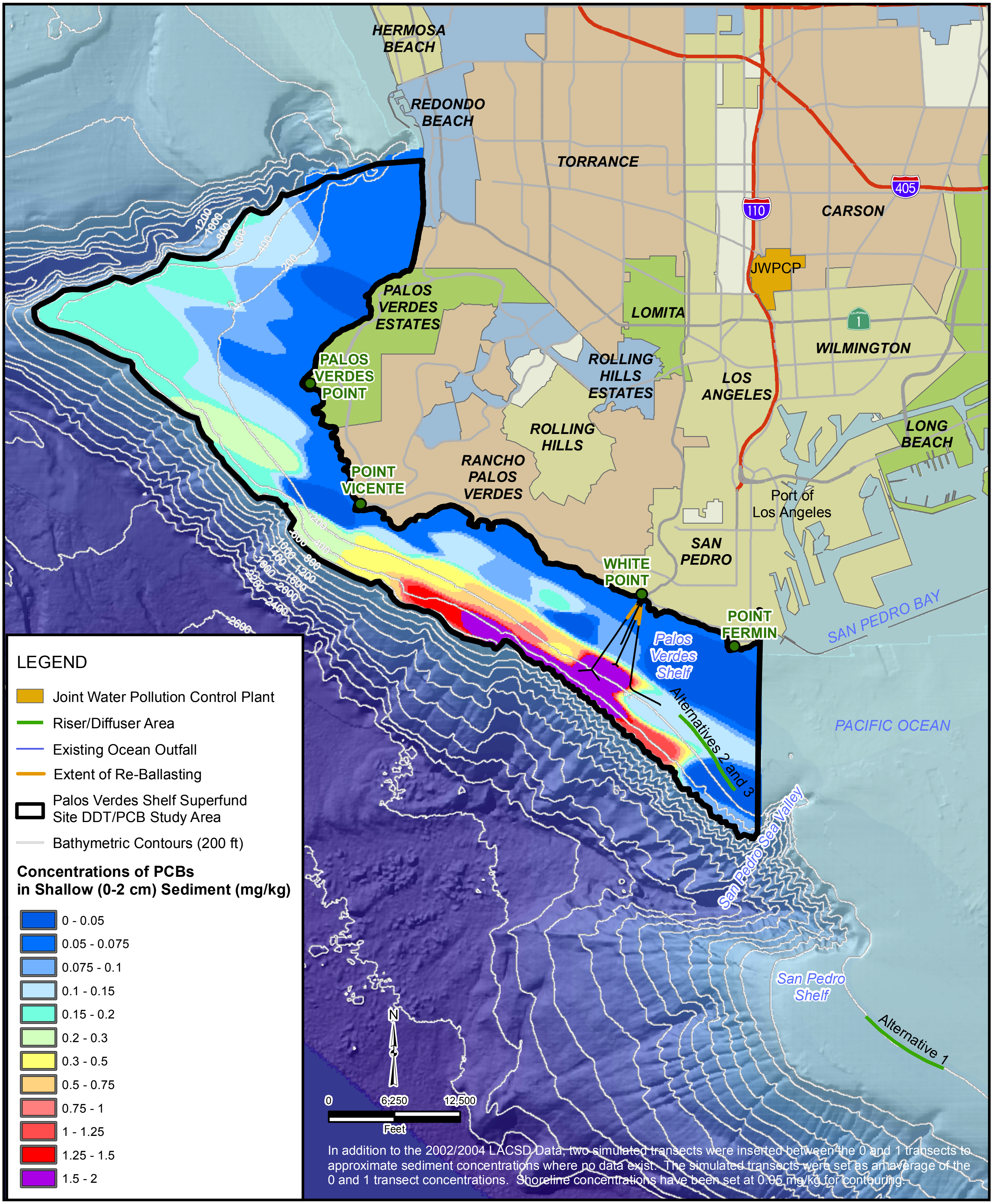

FIGURE 13-8

CLEARWATER Program

Interpretive PCB Concentrations on the Palos Verdes Shelf

Source: Sanitation Districts of Los Angeles County 2011, CaSIL 2001, Thomas Bros. 2011, EPA 2009

Ocean Outfalls for more details regarding the DDT/PCB on the PV Shelf, and refer to Appendix 13-A for levels of sediment contamination.

Biological Resources

Biological Communities

The PV Shelf riser and diffuser area is in Catch Block 719[6]. In 2006, eight methods of commercial take were reported in Catch Block 719 including collection by diver, fish trap, hook and line, set and drift gill nets, purse and drum seines, and brail (CDFG 2007). For a detailed description of catch in Catch Block 719 in 2006, see Appendix 13-A.

Because the PV Shelf riser and diffuser area is approximately 2 miles from shore, mainland nesting seabirds including the California least tern, other terns, and skimmers may use this area for feeding and foraging. Other seabirds, such as the brown pelican and cormorants, also likely use this location for feeding and foraging.

Marine Habitat

The PV Shelf is primarily soft-bottom habitat. There are approximately 19,335 acres of soft-bottom habitat, consisting of bioturbated sand and fine sediment, and 560 acres of hard-bottom habitat on the PV Shelf, located at midshelf depths (between 100 and 400 feet [30 and 120 meters]).

Underwater Sound

The underwater sound environment at the PV Shelf riser and diffuser area would be similar to that of the SP Shelf riser and diffuser area and the SCB, except that the PV Shelf riser and diffuser area is further removed from the shipping lanes. Therefore, it would likely receive less vessel traffic and less noise associated with vessel traffic, thus resulting in a lower ambient underwater noise level when compared to the SP Shelf.

Existing Ocean Outfalls

The existing ocean outfalls are within the boundaries of the EPA-designated DDT/PCB study area. Although characteristics in the vicinity of the existing ocean outfalls are generally similar to those discussed for the regional setting and the PV Shelf, additional data are presented in this section that augments the information with site-specific data to facilitate the evaluation of local impacts. A full review of conditions near the existing ocean outfalls is presented in Appendix 13-A.

Location and Geography

The existing ocean outfalls extend from the existing manifold structure at Royal Palms Beach and terminate at a depth of approximately 200 feet (60 meters) as described in Section 2.2.4.3. The proposed re-ballasting would occur along the existing ocean outfalls at depths of 20 to 50 feet as shown on Figures 13-4, 13-7, and 13-8.

Oceanography

Currents of the SCB are presented in Section 13.2.1.2. Large-scale, depth-averaged current patterns for the SP and PV Shelves were modeled and calibrated against field measurements to confirm consistency (Parsons 2011). In both winter and summer, northerly current flowing over the SP Shelf cross over the base of the San Pedro Sea Valley, and then predominantly turn to the west to follow the slope on the PV Shelf at speeds up to 0.2 ft/s (6 cm/s). In the area of the existing ocean outfalls, studies show that

[6] Catch blocks are 10-by 10-nautical-mile areas delineated to track commercial fishery catches by the CDFG.

current speeds of 9 to 15 cm/s are common, while net, long-term current speed averaged about 4 cm/s (Sanitation Districts 2008b).

Water Quality

As part of the JWPCP receiving water monitoring program, water quality parameters are determined on a quarterly basis throughout the water column. Three stations adjacent to the existing ocean outfalls pipelines (Stations 2903, 2902, and 2901), on the 197-foot (60-meter), 98-foot (30-meter), and 33-foot (10-meter) isobaths, respectively (Sanitation Districts 2010a) are summarized in Table 13-7. Station 2903 is nearest the existing ocean outfall discharges, and Stations 2902 and 2901 are nearest the location of the rehabilitation work.

Table 13-7. Near-Bottom Water Quality Parameters at Three Stations of Differing Depths Along the Existing Ocean Outfalls

Parameters	197 Feet (60 Meters)[a]	98 Feet (30 Meters)[a]	33 Feet (10 Meters)[a]
Temperature (°C) – 2008	10.0 (50 °F) – 13.6 (56°F) (11.6 [53 °F])	11.4 (53°F) – 14.9 (59°F) (13.3 [56°F])	12.2 (54°F) – 19.5 (67°F) (15.2 [59°F])
Temperature (°C) – 2009	9.8 (50 °F) – 12.1 (54°F) (11.3[52 °F])	10.8 (51°F) – 12.7 (55°F) (12.1 [54°F])[b]	13.0 (55°F) – 15.5 (60°F) (14.6 [58°F])
Salinity (psu) – 2008	33.25 – 33.93 (33.58)	33.22 – 33.72 (33.49)	33.26 – 33.73 (33.47)
Salinity (psu) – 2009	33.20 – 33.93 (33.51)	33.16 – 33.66 (33.36)[b]	33.24 – 33.56 (33.37)
Density (σt) – 2008	24.93 – 26.11 (25.55)	24.74 – 25.63 (25.16)	23.74 – 25.31 (24.72)
Density (σt) – 2009	25.18 – 26.15 (25.56)	25. 04 – 26.76 (25.29)[b]	24.60 – 25.11 (24.80)
Dissolved Oxygen (mg/L) – 2008	2.6 – 7.0 (4.8)	4.0 – 8.4 (6.1)	5.4 – 8.0 (6.9)
Dissolved Oxygen (mg/L) – 2009	3.1 – 6.4 (4.8)	3.8 – 6.5 (5.4)[b]	6.7 – 9.4 (7.6)
Hydrogen Ion Concentration (pH) – 2008	7.8 – 8.2 (7.9)	7.8 – 8.2 (8.1)	8.0 – 8.2 (8.1)
Hydrogen Ion Concentration (pH) – 2009	7.6 – 8.0 (7.8)	7.7 – 8.0 (7.8)[b]	7.8 – 8.3 (8.1)
Transmissivity (%) – 2008	80.1 – 88.0 (82.9)	72.0 – 83.0 (78.1)	70.3 – 77.3 (74.3)
Transmissivity (%) – 2009	79.8 – 86.8 (84.8)	78.8 – 84.2 (81.8)[b]	71.2 – 82.0 (75.7)

[a] Average is shown in parentheses.
[b] No sample was collected for 30-meter depth in Quarter 1; data from deepest depth sampled (29 meters) was used in table to show seasonal ranges.
psu = practical salinity units
Source: Sanitation Districts 2009b, 2010b

Levels of ammonia-N, organic nitrogen, nitrate, nitrite, and phosphate have routinely been monitored in the JWPCP discharge since the 1970s (Sanitation Districts 2008b, 2009b). Discharge volume does not vary significantly through the year, and effluent nutrient concentrations are relatively constant; therefore, the mass loading of nutrients stays fairly constant year-round. Within the zone of initial dilution (ZID[7]), ammonia is diluted to about 250 micrograms per liter (µg/L) in waters where the ambient concentration is below 20 µg/L, with further dilution to background levels happening as the effluent field is advected within a mixing zone that occurs below the trapping depth. In 2008, total nitrogen was discharged at an average concentration of 39.4 mg/L, ammonia-N at 36.7 mg/L, organic nitrogen at 2.5 mg/L, nitrate-N at 0.05 mg/L, nitrite-N at 0.14 mg/L, total phosphate at 0.73 mg/L, and silicon (based on a single study conducted in early 2009) at 22.0 mg/L. As shown in Table 13-8, the JWPCP nutrient contribution, while

[7] The zone of initial dilution is described geographically as the volume of water encompassed by a line drawn around the diffuser at a distance equivalent to the water depth at the diffuser and extending from the sea bottom to the surface. The initial dilution zone is also described as extending to the point where effluent dilution due to jet momentum from the outfall ports and buoyancy momentum through the water column is complete.

greater than runoff and aerial deposition, is still far below estimates of the contribution from upwelling. Nutrients released from the JWPCP are small when compared to those released during upwelling.

Table 13-8. Estimated Annual Nutrient Mass Emissions in the Vicinity of the Existing Ocean Outfalls

Parameter	JWPCP (MT)	Runoff (MT)	Aerial Deposition (MT)	Upwelling (MT)
Total Nitrogen	16,495	782	70	431,374
Ammonia Nitrogen	15,365	135	N/A	N/A
Organic Nitrogen	1,047	N/A	N/A	N/A
Nitrate Nitrogen	21	647	N/A	431,000
Nitrite Nitrogen	59	N/A	N/A	374
Total Phosphate	306	186	N/A	76,100
Silicate	9,210	N/A	N/A	333,000

MT= metric tons

N/A = not analyzed

Source: Sanitation Districts 2009a. This data, and information on regional inputs (see Section 13.2.1) adjusted for the project area, were used to calculate annual mass emissions to the local environment, as presented in this table. Although the discharge of nutrients from the JWPCP far exceeds estimated input from local runoff and aerial deposition for most nutrients, nutrient input from upwelling events considerably surpasses annual emissions from the JWPCP discharge.

Sediment Quality

Sediment on the PV Shelf differs from sediment in the rest of the SCB because it contains the settled particulates associated with the ocean outfall discharges and known DDT and PCB sediment contamination.

Sediments were sampled at and inshore of the existing ocean outfalls at Stations 8C (depth of 200 feet [61 meters]) and 8D (depth of 98 feet [30 meters]) as part of the JWPCP receiving water monitoring program in 2008 and 2009. Mean sediment grain size at outfall depth is medium silt; at the shallower stations, mean sediment grain size is fine sand. Fine silt and very fine silt were reported at deeper stations offshore of the outfalls (depths greater than 200 feet [61 meters]). (Sanitation Districts 2010a.)

An estimated 1,800 metric tons (MT) of DDT was discharged onto the PV Shelf between the 1940s and 1971 (Sanitation Districts 2008b). Between 1971 and 1985, nearly 56 MT of PCBs were estimated to have been released from seven Southern California municipal dischargers (SCCWRP 1987). Because PCBs were so widely used, however, sources to the environment were widespread and variable, with discharges onto the PV Shelf only partly contributing to total inputs in Southern California. In 1971, for example, of the 44 MT estimated to enter the SCB, 57 percent (28 MT) was from ocean dumping, 23 percent (10 MT) from wastewater discharges, 9 percent (4 MT) from vessel coating, 4.5 percent (2 MT) from direct rainfall, and 0.5 percent from surface runoff (NOAA/NOS 1991:15-1–15-2).

Sediments at Stations 8C and 8D were analyzed for sediment contamination in 2008 and 2009. At Station 8C near the outfalls at 200 feet, total DDT was found at concentrations of 144 mg/dry kilogram (kg) in 2008 and 129 mg/dry kg in 2009 (Sanitation Districts 2010a). Inshore along the outfall pipeline at a 100-foot depth, DDT levels at Station 8D were reported at 0.27 mg/dry kg in 2008 and 0.40 mg/dry kg in 2009, approximately 300 to 500 times lower than the values at the discharge. Despite these differences, levels at both stations during both years exceeded the ERM value for total DDT. Total PCBs were found at a level of 4.85 mg/dry kg and 3.56 mg/dry kg at the outfall depth in 2008 and 2009, respectively. Both reported values exceed the ERM level for total PCBs. At Station 8D, PCB levels were below detection limits in 2008, and found at a level of 0.03 mg/dry kg in 2009, which exceeded the ERL concentration for total PCBs.

Biological Resources

Biological Communities

The local biological communities that differ from those found in the SP Shelf and PV Shelf riser and diffuser areas include plankton, invertebrates, and fishes. Each of these is discussed in detail as it relates to the existing ocean outfalls.

Plankton. Dissolved oxygen and chlorophyll-a levels, the main indicators of phytoplankton productivity, are monitored quarterly at 48 stations in the vicinity of the existing ocean outfalls. The 2008 and 2009 results for chlorophyll-a near bottom at a depth of 197 feet (60 meters), mid-depth at 100 feet (30 meters), and in the upper water column at 33 feet (10 meters) for Station 2903, adjacent to the discharge of the outfall pipelines, are presented in Table 13-9.

Table 13-9. Chlorophyll-a Monitoring (2008/2009) in the Vicinity of the Existing Ocean Outfalls Discharge at Various Depths in the Water Column

Parameter (Year)	197 Feet (60 meters)[a] (μg/L)	100 Feet (30 meters)[a] (μg/L)	33 Feet (10 meters)[a] (μg/L)
Chlorophyll-a Concentrations (2008)	0.4 – 2.3 (1.4)	0.5 – 6.1 (3.1)	0.7 – 7.5 (3.6)
Chlorophyll-a Concentrations (2009)	0.6 – 6.6 (2.3)	0.6 – 5.0 (2.2)	3.1 – 25.3 (10.6)

[a] Yearly average is shown in parentheses.
μg/L = micrograms per liter
Source: Sanitation Districts 2009b; Sanitation Districts 2010b

The data confirm that the majority of phytoplankton is typically found in the upper water column, while the existing effluent plume is usually trapped below a density stratification layer at deeper depths. In general, no increase in phytoplankton levels is associated with the existing effluent plume. In addition, no association between the JWPCP discharge and HABs has been detected.

Invertebrates. The invertebrate community assemblages found on the PV Shelf are similar to those found throughout the SCB. On the PV Shelf, assemblages are typical of soft bottoms throughout Southern California. These assemblages are dominated primarily by polychaete annelids, arthropods, and mollusks (Sanitation Districts 2010a). Results from the Benthic Response Index (BRI) indicate that benthic assemblages continue to improve and recover from the pollutants discharged on the shelf between the 1940s and 1971. The BRI is an index of infaunal community response to environmental disturbance. The BRI is the abundance weighted average pollution tolerance of species within a sample, and is used in Southern California to classify the degree to which coastal habitats are impacted. In 1972, the PV Shelf (between the 30-meter and 305-meter isobaths) was classified as *defaunated* or exhibited loss of community function (Sanitation Districts 2010a:5.15). By 2009, the benthic community in large portions of the area monitored by the Sanitation Districts was considered to be in *reference* condition. Reference condition means that the community is similar to other community assemblages in Southern California. However, some communities near the discharge exhibited variation from reference condition, indicating they may still be affected by legacy contaminants.

Fishes. Some species of fish are likely attracted to the artificial hard-bottom substrate provided by the existing ocean outfall structures, including the existing ocean outfall pipelines and nearshore reefs. Hard-bottom associated fish species included California scorpionfish, blackeye goby, shiner perch

(*Cymatogaster aggregata*), and ocean whitefish (*Caulolatilus princeps*); all have been taken in low numbers during trawl surveys (Sanitation Districts 2008b).

Protected Species

Black abalone, which is a federally endangered species designated by the ESA as previously described in Table 13-4, have been known to occur to depths of about 30 feet (9 meters), inshore of the existing diffusers. The presence of black abalone has not been identified during previously conducted surveys of the existing ocean outfalls (Sanitation Districts 2011a).

The CDFG has identified areas off Palos Verdes near the JWPCP outfalls as key locations for the recovery of black abalone (CDFG 2005:6–7). Additionally, the National Marine Fisheries Service (NMFS) recently designated the rocky interidal and subtidal habitats surrounding the Palos Verdes Peninsula and existing from the Palos Verdes/Torrance border to the Los Angeles Harbor as critical habitat for black abalone (NMFS 2011).

Marine Vegetation

Giant kelp beds occur inshore of the existing ocean outfalls, though the sizes of the beds have changed over time. Historic trends for kelp beds in the area of the existing ocean outfalls are presented in Appendix 13-A. In 2008, approximately 150 acres of kelp were reported in the White Point area at water depths ranging from approximately 40 to 70 feet. Areas shoreward of 40-foot depths do not support kelp due to wave action, sea urchin grazing, and the absence of hard substrate. There is no eelgrass located at the existing ocean outfalls or within the general vicinity of the existing ocean outfalls. Eelgrass is usually found at depths between +6.0 and -22.0 feet mean lower low water level (MLLW) (+2.4 and -6.6 meter MLLW) (Phillips 1984:4).

Underwater Sound

The underwater sound environment at the existing ocean outfalls would be similar to, but generally quieter than, the sound environment of the PV Shelf riser and diffuser area. The existing ocean outfalls are close to shore and outside the existing shipping lanes. Therefore, this area would likely receive less vessel traffic and experience less noise associated with vessel traffic.

Public Health

Microorganisms

As part of the monitoring requirements for the JWPCP discharge, eight shoreline sites on the Palos Verdes Peninsula are sampled weekly, and the results are provided to public health officials (Sanitation Districts 2010a). In addition, surface and near-bottom samples are collected at six inshore sites five times per month to assess compliance with human health risk water contact and shellfish harvesting standards, and three surface samples are collected monthly at offshore stations near the outfalls, with the results also used to assess compliance with water contact requirements. Results of sampling during 2008 and 2009 are summarized in Table 13-10.

Table 13-10. Microbiology Sampling (2008 and 2009) in the Vicinity of the Existing Ocean Outfalls

Station	Total Coliform (CFU/mL)	Fecal Coliform (CFU/mL)	Enterococcus (CFU/mL)
Shoreline	<1 to 4,200	<1 to 800	<1 to 2,600
Inshore	<1 to 300	<1 to 210	<1 to 19
Offshore	<1 to 40	<1 to 7	<1 to 8

CFU = colony forming units
mL = milligrams/liter
Source: Sanitation Districts 2010a

During the monitoring period, the JWPCP was found to be in compliance with water contact and shellfish harvesting microbiological standards. Lower values near the discharge and higher shoreline and, to a lesser extent, inshore values, suggested a shoreline source of bacteria related to local human and wildlife use and stormwater runoff. Furthermore, daily microbiological samples are also collected at the manifold. These samples show compliance with California Ocean Plan standards before discharge and dilution by the ocean, thus providing additional evidence of a shore-based source of bacteria related to local use and stormwater runoff.

Fish Tissue Bioaccumulation

Bioaccumulated contaminants in fishes have been studied in the area since the 1970s, and despite reductions in levels by the 1990s, growing concerns about human consumption resulted in the commercial closure of white croaker fishing offshore of Palos Verdes (Sanitation Districts 2010a). Within the Palos Verdes Peninsula area, which includes the existing ocean outfalls, the Office of Environmental Health Hazard Assessment recommends that locally caught white croaker not be consumed; for women (age 18 to 45) and children (age 1 to 17), consumption of California scorpionfish, rockfishes, and kelp bass be limited to one serving per week; and for women (over age 45) and men (over age 17), consumption of California scorpionfish and kelp bass be limited to one serving per week and rockfishes be limited to two servings per week (California EPA 2009b). The following contaminants have been regularly found in these types of fish: PCBs, DDT, arsenic, and mercury. For a detailed discussion of the quantities and levels of contamination found in various fish tissue sampled near the existing ocean outfalls, refer to Appendix 13-A.

13.3 Regulatory Setting

13.3.1 Federal

13.3.1.1 Clean Water Act of 1972

In 1948, the United States Congress enacted the original Federal Water Pollution Control Act (FWPCA). Since its passage, the FWPCA has been amended several times, most extensively in 1977 as the Clean Water Act of 1977 (CWA). The objective of the CWA is “to restore and maintain the chemical, physical, and biological integrity of the Nation’s waters” (U.S. Code [USC], Title 33, Section 1251[a]).

A program to regulate the discharge of dredged or fill materials in U.S. waters was established by CWA Section 404. Under CWA Section 404, the U.S. Army Corps of Engineers (Corps) can issue two types of permits: a general permit or an individual permit. The general permit is issued to the public at large on a regional or national basis, and is issued when the activities would cause only minimal direct or cumulative impacts. An individual permit is required for an activity not already authorized under a general permit; would exceed impact thresholds under a general permit; or could result in impacts that are more than minimal.

Under CWA Section 303(c), the states are primarily responsible for the adoption and periodic review of water quality standards for all waters within their boundaries. The California SWRCB is designated as the state water pollution control agency for all purposes under the CWA. The California Water Code (CWC), Article 4 (commencing with Section 13160) of Chapter 3 of Division 7, requires the SWRCB to formulate and adopt a Water Quality Control Plan for Ocean Waters of the State (California Ocean Plan). The SWRCB and the six coastal regional water quality control boards (RWQCB) implement and interpret the California Ocean Plan (refer to Section 13.3.2.4 for additional information about the California Ocean Plan).

In addition to the California Ocean Plan, the CWA outlines a nationwide permit system to regulate point source discharges (CWA Section 401). This is the basic regulatory and enforcement mechanism for the CWA. The EPA has the nationwide authority to implement the CWA. However, states may be authorized to administer various aspects of the NPDES and pretreatment programs and to carry out other important CWA program implementation functions. California is authorized to administer the EPA's NPDES permit program. The SWRCB is responsible for implementing this authority and issuing NPDES permits. NPDES permits are issued and administered through the state's RWQCBs. The ultimate goal of the NPDES program is to ensure water quality standards. The NPDES program was expanded in 1987 to regulate stormwater discharges (runoff) originating from municipal and industrial sources.

13.3.1.2 Marine Protection, Research and Sanctuaries Act of 1972

The Marine Protection, Research and Sanctuaries Act (MPRSA) regulates the transportation and ultimate disposal of material in the ocean, prohibits ocean disposal of certain wastes without a permit, and prohibits the disposal of certain materials entirely. Prohibited materials include those that contain radiological, chemical, or biological warfare agents; high-level radioactive wastes; and industrial waste. The MPRSA has jurisdiction over all U.S. ocean waters in and beyond the territorial sea, vessels flying the U.S. flag, and vessels leaving U.S. ports. The territorial sea is defined as water extending 22 kilometers (12 nautical miles [nm]) seaward of the nearest shoreline.

With respect to the transportation and disposal of dredged materials, the EPA designates ocean disposal sites and develops the environmental criteria used in reviewing permit applications pursuant to Section 102 of the MPRSA; the Corps has permitting authority for the transportation and disposal of dredged material (subject to EPA review and concurrence that the material meets applicable ocean disposal criteria) pursuant to Section 103 of the MPRSA.

The Evaluation of Dredged Material Proposed for Ocean Disposal (EPA 1991) outlines the decision-making process regarding the suitability of sediments for disposal in marine environments, which was developed in support of mandates under the MPRSA. Four tiers are used to determine if sediment is acceptable for ocean disposal. Tier I requires evaluation of existing/historical information; however, Tiers II, III, and IV require more information gained from testing for chemicals (site-specific chemistry), sediment bioassays (grain size), water bioassays, and tissue bioaccumulation testing (site-specific chemistry, grain size, and three or four bioassay tests). Based on the characteristics of the site and the levels of information needed and obtained, state and federal agencies with permitting authority over the transport and disposal of dredged materials make the decisions as to whether the sediments are suitable for ocean disposal.

13.3.1.3 Rivers and Harbors Act of 1899

The Rivers and Harbors Act of 1899 (RHA) authorizes the Corps to maintain the capacity of navigable waters of the United States (waters of the U.S.). Section 10 of the RHA requires authorization from the Corps for work in, under, or over any navigable water of the United States including dredging and construction of structures.

13.3.1.4 Magnuson-Stevens Fishery Conservation and Management Act

The MSA was authorized in 1996 and requires the NMFS to identify, conserve, and enhance EFH for those species regulated under a federal fisheries management plan. EFH is defined as the waters and substrate necessary for fishes to spawn, breed, feed, or grow to maturity. Specifically, the MSA requires:

(1) federal agencies to consult with the NMFS on all actions or proposed actions authorized, funded, or undertaken by the agency that could adversely affect EFH; (2) the NMFS to provide conservation recommendations for any federal or state action that could adversely affect EFH; and (3) federal agencies to provide a detailed response in writing to the NMFS within 30 days of receiving EFH conservation recommendations.

The NMFS (2004) defines specific EFH terms as follows (Code of Federal Regulations [CFR], Title 50, Section 600.10):

- *Waters* include aquatic areas and their associated physical, chemical, and biological properties that are used by fish and may include aquatic areas historically used by fish where appropriate
- *Substrate* includes sediment, hard bottom, structures underlying the waters, and associated biological communities
- *Necessary* means the habitat required to support a sustainable fishery and the managed species' contribution to a healthy ecosystem
- *Spawning, breeding, feeding, or growth to maturity* covers a species' full life cycle.

Under the MSA, the federal government has jurisdiction to manage fisheries in the U.S. EEZ, which extends from the outer boundary of state waters (3 nm from shore) to a distance of 200 nm from shore.

FMPs are extensive documents that are constantly revised and updated. The goals of the management plans include, but are not limited to, the promotion of an efficient and profitable fishery, achievement of optimal yield, provision of adequate forage for dependent species, prevention of overfishing, and development of long-term research plans (PFMC 1998, 2008).

13.3.1.5 Marine Mammal Protection Act of 1972

The MMPA (as amended in 2007) is designed to reduce injury and mortality to marine mammals, including seals, sea lions, whales, and dolphins, caused by interaction with humans. The term *take* means to harass, hunt, capture, or kill, or attempt to harass, hunt, capture, or kill any marine mammal. The NMFS is the agency responsible for implementation of the MMPA. The NMFS is also responsible for providing stock assessment reports for all marine mammal stocks within the U.S. EEZ and for estimating the potential biological removal (PBR) level for each stock of each species. The PBR is the maximum number of marine mammals, excluding natural mortalities that may be removed from a marine mammal stock while allowing that stock to reach or maintain its optimum sustainable population. When the PBR is exceeded, the stock is listed as "strategic," and additional conservation strategies are employed.

Under the MMPA, harassment is statutorily defined as any act of pursuit, torment, or annoyance that:

- (Level A Harassment) has the potential to injure a marine mammal or marine mammal stock in the wild; or,
- (Level B Harassment) has the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering.

For activities with no potential for mortality or serious injury (or for which mitigation can negate the serious injury or mortality), responsible parties must submit an application for an Incidental Harassment Authorization (IHA). For activities that could result in incidental take, and for which the take would result in a negligible impact, the NMFS requires an incidental take authorization, also known as a Letter of Authorization (LOA). Both applications must be sent to the NMFS Office of Protected Resources and the applicable NMFS regional office.

A federal authorizing or action agency is required by Section 7 of the federal ESA to consult with the NMFS on any actions that might affect listed species. If the agency or the NMFS determines an action is likely to adversely affect a species (this would include any taking actions under the MMPA), formal consultation is required. The NMFS prepares a Biological Opinion (BO), which assesses whether the action is likely to jeopardize the existence of the species. The BO may include binding and/or discretionary recommendations to reduce impacts. An Incidental Take Statement (ITS) is attached to the BO as an appendix, and it is this statement that allows the incidental take. An ITS cannot be authorized for a listed marine mammal until the MMPA authorization is completed.

13.3.1.6 Endangered Species Act of 1973

The federal ESA prohibits direct harm to species that have been designated by the EPA as threatened or endangered. The federal ESA provides protection to protected species as well as their habitats. Consultation regarding protection of such species is required by Section 7 of the federal ESA to be conducted with the U.S. Fish and Wildlife Service (USFWS) and/or the NMFS prior to project implementation. If either service determines an action is likely to adversely affect a species (this would include any taking actions under the MMPA), formal consultation is required. The determination of species listed as threatened or endangered under the federal ESA is governed by Section 4 of the act. The import, take, possession, transportation, and sale of listed species are prohibited under Section 9 of the federal ESA (except as provided in Sections 6 and 10).

13.3.1.7 The Bald and Golden Eagle Protection Act

The Bald and Golden Eagle Protection Act (BGEPA) (16 U.S.C 668-668d) prohibits anyone, without a permit issued by the Secretary of Interior, from taking bald eagles, including their parts, nests, or eggs. The BGEPA defines *take* as “pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest, or disturb.”

13.3.1.8 Migratory Bird Treaty Act of 1918

The MBTA of 1918 (16 U.S.C. 703-712) prohibits take of migratory birds, their eggs, feathers or nets. The term *take* is defined in the MBTA to include by any means or in any manner, any attempt at hunting, pursuing, wounding, killing, possessing, or transporting any migratory bird, nest, egg or part thereof. The MBTA implements the conventions between the U.S. and Great Britain (1916), Mexico (1936), Japan (1972), and Russia (1976) for the protection of migratory birds and birds in danger of extinction (USFWS 2011).

13.3.1.9 National Invasive Species Act of 1996

The National Invasive Species Act authorized the Secretary of Transportation to develop national guidelines to prevent the introduction and spread of non-indigenous species into U.S. waters via ballast water of commercial vessels. It also allows states to prepare invasive species management plans and to receive federal funding for their implementation.

13.3.1.10 Coastal Zone Management Act of 1972 and Reauthorization of 1990

The Coastal Zone Management Act (CZMA) is a federal and state partnership for management of coastal resources that encourages states to develop coastal management programs through, among other means, the federal consistency procedures of the CZMA. Upon certification of a state's coastal management program, a federal agency must conduct its activities (including federal development projects, permits and licenses, and assistance to state and local governments) in a manner consistent with the state's certified program. The federal government certified the California Coastal Management Program (CCMP) in 1977. The enforceable policies of that document are in Chapter 3 of the California Coastal Act of 1976.

The reauthorization of the CZMA in 1990 identifies nonpoint source pollution as a major factor in the continuing degradation of coastal waters. Therefore, in the Coastal Zone Act Reauthorization Amendments of 1990 (CZARA) Section 6217 was added, which calls upon states/tribes with federally approved coastal zone management programs to develop and implement coastal nonpoint pollution control programs. The Section 6217 program is administered at the federal level jointly by the EPA and the National Oceanic and Atmospheric Administration (NOAA). (EPA 2010.)

13.3.2 State

13.3.2.1 California Fish and Game Code, Section 1700

The conservation, utilization, and maintenance of oceanic biological resources for the benefit of the public are encouraged under Section 1700. The state must promote the development of local and distant-water fisheries in California under international law. Objectives include the maintenance of populations of all species of aquatic organisms to ensure their continued existence and support reasonable use.

13.3.2.2 California Endangered Species Act of 1984

Similar to the federal ESA, the California ESA provides protection to species considered threatened or endangered by the state of California. The California ESA recognizes the importance of threatened and endangered fishes, wildlife, and plant species and their habitats, and prohibits the taking of any endangered, threatened, or rare plant and/or animal species unless specifically permitted for education or management purposes. The term *take* is defined in Section 86 of the California Fish and Game Code as hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill.

13.3.2.3 California Marine Invasive Species Act (Ballast Water Management for Control of Nonindigenous Species Act)

The California Ballast Water Management for Control of Nonindigenous Species Act was established by Assembly Bill 703 in 1999. This act went into effect on January 1, 2004, and has been amended annually since 2006. The intent of the act is to limit the introduction of nonnative species into coastal areas of the state through ballast water management. The act also requires an analysis of other vectors for release of nonnative species from vessels.

13.3.2.4 California Ocean Plan

The SWRCB adopted the first California Ocean Plan in 1972 and has since periodically revised it. The California Ocean Plan was most recently updated and adopted by the SWRCB on September 15, 2009. The revised 2009 California Ocean Plan was approved by the Office of Administrative Law on

March 10, 2010. The purpose of the plan is to protect the quality of the ocean waters for use and enjoyment of the people of the state. The plan is applicable, in its entirety, to point source discharges to the ocean, including all existing and planned wastewater treatment plant ocean outfalls. The California Ocean Plan provides for the attainment and maintenance of the water quality standards for ocean waters. This water quality control plan for the ocean waters of California regulates discharge of waste to the ocean by setting limits or levels for water quality parameters to provide reasonable protection of beneficial uses. The discharger of waste to ocean waters of California must not cause a violation of these objectives. The California Ocean Plan includes the following water quality objectives:

- Bacterial Characteristics – standards to protect water-contact recreation in coastal waters and shellfish that may be harvested for human consumption from bacterial contamination
- Physical Characteristics – standards and numerical limiting concentrations for floating particulates, grease and oil, aesthetically undesirable discoloration of the ocean surface, reduction in natural lighting (turbidity), and solids deposition
- Chemical Characteristics – standards and numerical limiting concentrations for DO and hydrogen ion concentrations; water and sediment dissolved sulfide concentrations; water and sediment concentrations for chemical substances set forth in Table B of the California Ocean Plan, including carcinogens and non-carcinogens for the protection of human health; concentrations of organic materials in marine sediments; and concentrations of nutrient materials that could cause objectionable aquatic growth or degrade indigenous biota
- Biological Characteristics – standards to protect marine communities, including vertebrate, invertebrate, and plant species; to ensure the natural taste, odor, and color of fish and shellfish, or other resources used for human consumption; and to ensure that the concentration of organic materials in fish and shellfish or other marine resources used for human consumption do not bioaccumulate to levels that are harmful to human health
- Radioactivity – standards to ensure that radioactive waste does not degrade marine life

The water quality objectives apply to areas within the waste plume where initial dilution has occurred. Methods for implementing the program are also described. Discharges to inland waters and enclosed bays and estuaries are not covered, nor are vessel wastes or dredged material. The California Ocean Plan contains specific criteria for the management of waste discharged to the ocean and for monitoring outfall compliance with California Ocean Plan standards.

13.3.2.5 Porter-Cologne Water Quality Control Act (California Water Code, Section 13000 et seq.; California Code of Regulations, Title 23, Chapters 3 and 15)

Since 1973, the California SWRCB and its nine RWQCBs have been delegated the responsibility for administering permitted discharges into the coastal marine waters of California. The Porter-Cologne Water Quality Act (Porter-Cologne) provides a comprehensive water-quality management system for the protection of California waters and regulates the discharge of oil into navigable waters by imposing civil penalties and damages for negligent or intentional oil spills. Under the act "any person discharging waste, or proposing to discharge waste, within any region that could affect the quality of the waters of the state" must file a report of the discharge with the appropriate RWQCB. Pursuant to the act, the regional board may then prescribe waste discharge requirements (WDRs) that add conditions related to control of the discharge. Porter-Cologne defines *waste* broadly, and the term has been applied to a diverse array of materials, including non-point source pollution. Any activity that results or may result in a discharge that directly or indirectly impacts waters of the state or the beneficial uses of those waters are subject to

WDRs, while CWA Section 404 permits and CWA Section 401 certifications are only required when the activity results in fill or discharge directly below the ordinary high water line of waters of the U.S. When regulating discharges that are included in the federal CWA, the state essentially treats WDRs and NPDES permits as a single permitting vehicle, and rely on the 401 certification process. In April 1991, the SWRCB and other state environmental agencies were incorporated into the California EPA.

13.3.2.6 California Coastal Act of 1976

The California Coastal Act declares that the California Coastal Zone is a distinct and valuable resource of vital interest to all the people and exists as a balanced ecosystem. It created the California Coastal Commission and requires local governments to prepare a local coastal program (LCP) for those parts of the coastal zone within local government jurisdictions. The California Coastal Commission retains permanent coastal permit jurisdiction over development proposed on tidelands, submerged lands, and public trust lands, and also acts on appeals from certain local government coastal permit decisions. The Commission reviews and approves any amendments to previously certified local coastal programs (CCC 2010).

Additionally, the act identifies the enforceable policies of the CCMP in Chapter 3 of the California Coastal Act. The CCMP is a combination of federal, state, and local planning and the regulatory authorities for controlling the uses of land, air, and water resources along the coast (CCC no date).

13.3.2.7 California Toxics Rule 2000

The California Toxics Rule establishes numeric criteria for priority toxic pollutants in inland waters as well as enclosed bays and estuaries to protect ambient aquatic life (23 priority toxics) and human health (57 priority toxics). The rule also includes provisions for compliance schedules to be issued for new or revised NPDES permit limits when certain conditions are met. The numeric criteria are the same as those recommended by the federal EPA in CWA Section 304(a).

13.3.2.8 California Construction General Permit

The SWRCB has developed a construction stormwater program that requires dischargers whose projects disturb one or more acres of soil or whose projects disturb less than one acre but are part of a larger common plan of development that in total disturbs one or more acres, to obtain a general permit (Construction General Permit Order 2009-0009-DWQ) for construction activities (SWRCB 2011, SWRCB 2009). The Construction General Permit requires the development and implementation of a Stormwater Pollution Prevention Plan (SWPPP) that specifies best management practices (BMPs) to prevent or minimize all construction pollutants from contacting stormwater with the intent of keeping all products from moving off site into receiving waters. The BMPs are also designed to eliminate or reduce non-stormwater discharges to storm sewer systems and other waters of the U.S. Monitoring is performed to determine the effectiveness of BMPs in reducing or preventing pollutants (including non-visible pollutants) in stormwater discharges from causing or contributing to exceedances of water quality objectives. The requirements for the Industrial General Permit are similar to those for construction.

The EPA defines BMPs as “schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the U.S. BMPs include treatment requirements, operating procedures, and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage” (40 CFR Section 122.2).

13.3.2.9 Oil Spill Prevention and Response (California Code of Regulations, Title 14, Division 1, Subdivision 4, Chapter 3)

The California Office of Spill Prevention and Response (OSPR) is a multi-agency effort including the U.S. Coast Guard, the California State Lands Commission, and the CDFG's Marine Safety Branch (MSB, the lead agency). OSPR requires all marine facilities and tank vessels carrying petroleum products as cargo, and all non-tank vessels over 300 gross tons, to have a California approved oil spill contingency plan.

13.3.2.10 Marine Life Management Act and Marine Life Protection Act

The Marine Life Management Act of 1998 (MLMA) created a broad, programmatic framework for managing fisheries in California state waters through a variety of conservation measures, including MPAs. The Marine Life Protection Act of 1999 (MLPA) established a programmatic framework for designating such MPAs in the form of a statewide network. The overriding goal of these acts is to ensure the conservation, sustainable use, and restoration of California's marine resources. Unlike previous laws, which focused on individual species, these acts focus on maintaining the health of marine ecosystems and biodiversity in order to sustain resources. These laws are administered by the CDFG. MPAs are areas of the ocean set aside to protect and restore habitats; conserve biodiversity; provide a refuge for marine species; develop recreational, scientific, and educational opportunities; and reestablish fisheries.

There are three levels of MPAs, each with its varying levels of protection: state marine reserves, marine conservation areas, and state marine parks. State marine reserves prohibit the take of all living, geological, and cultural resources. Marine conservation areas prohibit specific commercial and/or recreational take of living, geological, and cultural resources on a case-by-case basis. Finally, state marine parks prohibit commercial take of living, geological, and cultural resources but allow recreational fishing, although restrictions may apply. *Take*, as applied to MPAs, can be direct or indirect, and is defined as to hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill.

On December 15, 2010, the California Fish and Game Commission adopted regulations to create a new suite of 36 MPAs encompassing 187 square miles (8 percent) of state waters in Southern California (excluding the northern Channel Islands). Following this approval, the MPA regulations are anticipated to go into effect in mid-2011, after review by the Office of Administrative Law and the Secretary of State. (CDFG 2010b, 2010c)

13.3.3 Regional

13.3.3.1 Water Quality Control Plan, Los Angeles Region

The Water Quality Control Plan, Los Angeles Region (Basin Plan) (LARWQCB 1994) is designed to preserve and enhance water quality and to protect beneficial uses of regional waters (inland surface waters, groundwater, and coastal waters such as bays and estuaries). The Basin Plan designates beneficial uses of surface water and groundwater, such as contact recreation or municipal drinking water supply. The Basin Plan also establishes *water quality objectives*, which are defined as "the allowable limits or levels of water quality constituents or characteristics that are established for the reasonable protection of beneficial uses of water or the prevention of nuisance in a specific area."

The Basin Plan specifies water quality objectives for a number of constituents/characteristics that could be affected by the project or its alternatives. The constituents include: bioaccumulation, biostimulatory substances, chemical constituents, DO, oil and grease, pesticides, pH, PCBs, suspended solids, toxicity, and turbidity. With the exceptions of DO and pH, water quality objectives for most of these constituents are expressed as descriptive rather than numerical limits. For example, the Basin Plan defines limits for chemical contaminants in terms of bioaccumulation, chemical constituents, pesticides, PCBs, and toxicity as follows:

- Toxic pollutants shall not be present at levels that bioaccumulate in aquatic life to levels that are harmful to aquatic life or human health.
- Surface waters shall not contain concentrations of chemical constituents in amounts that adversely affect any designated beneficial use.
- No individual pesticide or combination of pesticides shall be present in concentrations that adversely affect beneficial uses. There shall be no increase in pesticide concentrations found in bottom sediments or aquatic life.
- All waters shall be maintained free of toxic substances in concentrations that are toxic to, or produce detrimental physiological responses in, human, plant, animal, or aquatic life. There shall be no chronic toxicity in ambient waters outside mixing zones.

The Basin Plan also specifies water quality objectives for other constituents, including ammonia, bacteria, total chlorine residual, and radioactive substances.

13.3.3.2 Los Angeles Regional Contaminated Sediment Task Force

The Los Angeles Regional Contaminated Sediment Task Force (CSTF) is a multi-agency task force established by the state of California to assist in the preparation of a long-term management plan for dredging and disposal of contaminated sediments in the Los Angeles Area. The CSTF includes representatives from the Corps, EPA, California Coastal Commission, Los Angeles Regional Water Quality Control Board (LARWQCB), CDFG, Port of Long Beach, Port of Los Angeles, city of Long Beach, Los Angeles County Department of Beaches and Harbors, Heal the Bay, and other interested parties. The CSTF consists of an Executive Committee, a Management Committee, five Strategy Development Committees, a Technical Advisory Committee, and an Interim Disposal Advisory Committee (CCC 2011; Los Angeles Basin CSTF 2011). The Executive Committee of the CSTF consists of the head of the four regulatory agencies responsible for managing dredging activities in the region (Corps, EPA, LARWQCB, and California Coastal Commission). The advisory Committee of the CSTF is made up of various other member agencies and is responsible for evaluating and resolving issues related to specific contaminated sediment dredging projects. The CSTF was responsible for developing and now implementing the Long Term Management Strategy (May 2005) for the disposal of sediment in the region. The strategy considers both aquatic and upland disposal alternatives, treatment, beneficial re-use, and other management techniques. Additionally, the plan focuses on the reduction of contaminants at their source.

13.3.3.3 Public Trust Doctrine and the California Tidelands Trust Act

The state of California acquired sovereign ownership of all tidelands and submerged lands and beds of navigable waterways upon admittance into the U.S. in 1850. The California State Lands Commission retains residual and review authority for tide and submerged lands legislatively granted in trust to local jurisdictions. All tide and submerged lands, granted or ungranted, as well as navigable rivers, sloughs, etc., are governed by the Common Law Public Trust. The public trust is a sovereign public property right held by the state or delegated trustee for the benefit of all the people.

The sovereign tide and submerged lands of the Port of Los Angeles were legislative granted, in trust, to the city of Los Angeles pursuant to the 1911 California Tidelands Trust Act. The city, acting by and through the Port as a trustee of the legislatively granted sovereign trust lands, must ensure that the specific uses proposed on these trust lands are consistent with the provisions of the relevant granting status and the Public Trust Doctrine. Submerged lands and tidelands within the Port of Los Angeles and administered by the Los Angeles Harbor Department to promote and develop commerce, navigation, and fisheries, and other uses of statewide interest and benefit, including commercial, industrial, and transportation uses; public buildings and public recreational facilities; wildlife habitat; and open space.

13.3.4 Local

The discharge of treated effluent from the JWPCP is regulated by requirements established by the state, legislation for implementing those requirements, and specific discharge limitations.

An NPDES permit authorizes a facility to discharge flow into receiving waters. The NPDES permit provides limitations on the discharge to ensure that beneficial uses of the receiving waters are protected (EPA 1996). In California, NPDES permits are issued by the RWQCB for discharges to waters within each of nine major regions. The JWPCP discharge occurs within the Los Angeles Region and is regulated by the LARWQCB and the EPA. The NPDES permit is renewed every 5 years, and the 2006 permit for the JWPCP was recently renewed in 2011. These permits are included as Appendix 13-E and Appendix 13-F, respectively. The requirements of the 2011 permit are similar to those of the 2006 permit (Sanitation Districts 2011b).

Water quality objectives and effluent limits in the NPDES permit are based on the plans, policies, and water quality standards in the Basin Plan and the California Ocean Plan. The permit establishes effluent limitations that incorporate various CWA requirements designed to protect and enhance water quality.

The EPA or states within an approved NPDES program are authorized under CWA Section 402 to issue NPDES permits. These state and federal laws and policies are designed to ensure that receiving waters would not be degraded by permitted discharge, except under the conditions established in the state antidegradation policy and the federal regulation. The provisions of the JWPCP NPDES permit are consistent with the antidegradation policies.

Also, the RWQCB has been implementing a watershed management approach to address water quality protection in Los Angeles and Ventura counties. The objective is to provide a comprehensive and integrated strategy resulting in water resource protection, enhancement, and restoration, while balancing economic and environmental impacts within a hydrologically defined drainage basin or watershed. The Watershed Management Approach emphasizes cooperative relationships between regulatory agencies, the regulated community, environmental groups, and other stakeholders in the watershed to achieve the greatest environmental improvements with the resources available.

The JWPCP NPDES permit includes comprehensive monitoring and reporting (Appendix 13-E; Appendix 13-F). The permit also incorporates standard provisions and monitoring and reporting requirements applicable to permittees, including a monitoring program. Among other things, a discharger covered by the permit must comply with all conditions in the permit, and any instance of noncompliance is deemed to constitute a violation of the CWA and the CWC. Violators are subject to fines and other penalties that may include permit termination, revocation and reissuance, and modification or denial of a permit renewal.

For a major discharge, such as the discharge from the JWPCP, a variety of NPDES permit requirements are employed, including both effluent and receiving water limits and requirements for certain treatment processes (Appendix 13-E; Appendix 13-F). Effluent limitations are required for pollutants that are determined by the RWQCB to be discharged at a level that may cause or contribute to an excursion above a water quality standard (SWRCB 2005). The RWQCB conducts a statistical analysis using historical monitoring data to determine which pollutants in a discharge have the "reasonable potential" to cause or contribute to an exceedance of a water quality objective, and develops numeric effluent limitations for those pollutants based on applicable water quality standards (SWRCB 2005). For constituents that have not been determined to have "reasonable potential," narrative statements are included in the NPDES permit requiring that the discharge comply with applicable water quality requirements based on the California Ocean Plan requirements (Appendix 13-E; Appendix 13-F).

For NPDES regulatory purposes, pollutants discharged from the JWPCP are grouped into three general categories: conventional, toxic, and non-conventional (Appendix 13-E; Appendix 13-F). Effluent limitations for all three categories of pollutants are set based on specifications in the California Ocean Plan (SWRCB 2005) and secondary treatment standards outlined in 40 CFR Section 133.102. The discharge requirements set forth in the JWPCP NPDES permit consist of the following:

- Limitations on the types of materials to be discharged from each outfall
- Effluent limitations and performance goals for each outfall
- Mass emissions caps
- Receiving water limitations

13.4 Environmental Impacts and Mitigation Measures

13.4.1 Methodology and Assumptions

This section evaluates environmental impacts resulting from both the construction and operation of the project for each alternative. The primary project activities that could potentially affect the marine environment are:

- Construction of a riser
- Construction of a diffuser
- Improvements to existing ocean outfalls
- Operation of the new ocean discharge system

All of the program elements are located outside the marine environment; some of the project elements are located within the marine environment. Only the project elements within the marine environment are discussed in the analysis.

The methodology and assumptions associated with the construction and operation of the project elements are described in detail in the following sections. Data provided in this chapter has been updated to include the latest available information and supplements Appendix 13-A.

13.4.1.1 Construction Methodology and Assumptions

The project area analyzed for construction impacts associated with the offshore risers, diffusers, and existing ocean outfalls is defined as the area of direct and indirect marine impacts of all construction activities (including dredging and rock placement). Construction impacts on biota were assessed by (1) reviewing the water quality and sediment analyses presented in the regional and project settings and Appendix 13-A, (2) reviewing existing studies of sediment and water quality in Southern California, (3) estimating the amount and type of habitat that would be disturbed, (4) determining the biological resources that may be present or may use the affected habitats, and (5) drawing on expertise and judgment.

The construction impacts associated with underwater sound were analyzed using methods for evaluating underwater sound from pile driving developed by the California Department of Transportation (Caltrans) and the NMFS. Impact criteria used in the analysis come from a summary of thresholds published by the Washington State Department of Transportation (Caltrans 2009; NMFS 2009; WSDOT 2009). Because of the large size of the steel tubes and the location of the installation (several miles offshore), the riser driving does not fall within the range of projects that have been previously analyzed. Accordingly, some degree of extrapolation and estimation was used for the riser construction assumptions. See Appendix 13-G for a discussion of the assumptions. Although sound volume produced depends on local conditions, impact distances were estimated for cetaceans, pinnipeds, diving seabirds (using levels determined for the marbled murrelet, which are used as a surrogate for all diving birds), and fishes. The analysis assesses three possible construction activities associated with the generation of underwater sound that are described in detail in the analysis section: jack-up barge pile driving, inner riser pile driving, and outer riser pile driving. Underwater sound impacts are estimated at specific distances from the sound source within which an animal is likely to be injured or is potentially startled or harassed.

Construction impacts associated with beneficial uses were assessed using qualitative means by relying on the construction activities and impacts related to those activities and determining whether the beneficial use actually existed at the construction area or if the activities have the potential to have an impact on an existing beneficial use outside of the construction area.

The impact assessment for construction activities assumes the following requirements would be followed:

Table 13-11. Assumptions and Requirements for Marine Construction Activities

Project Element	Construction Activity Subject to Regulation	Applicable Environmental Regulation	Responsible Agency	Purpose
Riser/Diffuser – SP Shelf PV Shelf	Dredging and placement of riser/diffuser structures within waters of the U.S. (i.e., discharge of fill in waters of the U.S.)	Section 401 of the CWA	LARWQCB[a]	Section 401 of the CWA, Water Quality Certification ensures that discharge of dredge or fill materials in waters of the U.S. is in compliance with state water quality standards.
Riser/Diffuser – SP Shelf PV Shelf	Dredging and placement of riser/diffuser structures within waters of the U.S. (i.e., discharge of fill in waters of the U.S.)	Section 404 of the CWA	Corps	Section 404 of the CWA regulates discharge of dredge or fill materials in order to minimize impacts to the physical, chemical, and biological environment through avoidance, minimization, and compensation measures that are incorporated as permit conditions.

Table 13-11 (Continued)

Project Element	Construction Activity Subject to Regulation	Applicable Environmental Regulation	Responsible Agency	Purpose
Riser/Diffuser – SP Shelf PV Shelf	Transport of materials in navigable waters of the U.S.	Oil Spill Prevention and Response	CDFG (California Office of Spill Prevention and Response)	A spill prevention and control plan would be required for marine vessels carrying petroleum and nontank vessels over 300 gross tons. The plan would detail and implement spill prevention and control measures.
Riser/Diffuser – SP Shelf PV Shelf	Work and placement of structures in navigable waters of the U.S.	Section 10 of the RHA	Corps	Section 10 of the RHA protects navigation channels and lanes through regulation of work and structures in navigable waters of the U.S.
Riser/Diffuser – SP Shelf PV Shelf	Transport and disposal of dredge material	Section 103 of the MPRSA	Corps	Section 103 of the MPRSA regulates the transport and ocean disposal of dredge material in order to protect human health and the health of the marine environment.
Riser/Diffuser – SP Shelf PV Shelf	Pile driving of inner and outer riser casings	MMPA	NMFS	The MMPA protects marine mammals through regulation of activities that could result in the take or harassment of marine mammals.
Riser/Diffuser – SP Shelf PV Shelf	Dredging and pile driving of inner and outer riser casings	Magnuson-Stevens Fishery Act	NMFS	The MSA protects EFH.
Rehabilitation of the Existing Ocean Outfalls	Placement of ballast over the existing ocean outfalls (i.e., discharge of fill in waters of the U.S.)	Section 401 of the CWA	LARWQCB[a]	Section 401 of the CWA, Water Quality Certification ensures that discharge of dredge or fill materials in waters of the U.S. is in compliance with state water quality standards.
Rehabilitation of the Existing Ocean Outfalls	Placement of ballast over the existing ocean outfalls (i.e., discharge of fill in waters of the U.S.)	Section 404 of the CWA	Corps	Section 404 of the CWA regulates discharge of dredge or fill materials in order to minimize impacts to the physical, chemical, and biological environment through avoidance, minimization, and compensation measures that are incorporated as permit conditions.
Rehabilitation of the Existing Ocean Outfalls	Placement of ballast over the existing ocean outfalls (i.e., discharge of fill in waters of the U.S.)	Magnuson-Stevens Fishery Act	NMFS	The Magnuson-Stevens Fishery Act protects EFH.

[a] RWQCB-Los Angeles Region (Region 4) has jurisdiction in the project area.

These assumptions are incorporated in the analysis. Therefore, impacts are those outcomes that might occur despite these assumptions.

Suitable dredge and tunnel spoils as a result of construction activities would be disposed of at LA-2 or LA-3, or sidecast, if practicable, for graded seafloor sediments. If the material is not suitable for ocean disposal, it would be appropriately disposed of onshore. LA-2 and LA-3 are permanent offshore ocean sites approved by the EPA for the disposal of dredge materials from projects located within Los Angeles and Orange Counties. Figure 3-26 locates both LA-2 and LA-3 off the coast of Southern California. The Southern California Dredge Material Management Team (SC-DMMT)[8] would determine the suitability of

[8] The SC-DMMT is an inter-agency body comprised of state and federal agencies that have direct permitting authority over dredging projects, and other stakeholder agencies. SC-DMMT member agencies include the EPA, the Corps (Los Angeles District), the California Coastal Commission, and SWRCB, among others. The primary

the sediment based on sediment testing and characterization requirements outlined in the Ocean Testing Manual, a joint guidance prepared by the EPA and the Corps. This decision and approval for ocean disposal is made as part of the CWA Section 404 permitting process. Management of sediments found to be unsuitable for disposal at the LA-2 or LA-3 disposal sites or for sidecasting or seafloor grading would be consistent with practices outlined in the CSTF long-term management strategy to appropriately handle and dispose of contaminated sediments.

Environmental effects of placing suitable dredge materials at either LA-2 or LA-3, including potential placement of dredge materials associated with Clearwater project alternatives, were previously evaluated by the environmental impact statement for LA-3. For the purposes of the analysis in this chapter, the Draft Environmental Impact Statement for the Proposed Site Designation of the LA-3 Ocean Dredged Material Disposal Site off Newport Bay, Orange County, California (LA-3 DEIS), prepared by the EPA and the Corps, Los Angeles District (December 2004) is incorporated herein by reference. The Final Environmental Impact Statement for the Proposed Site Designation of the LA-3 Ocean Dredged Material Disposal Site off Newport Bay, Orange County, California, was adopted in September 2005. The LA-3 DEIS analyzed the impacts associated with the proposed designation of LA-3 as a permanent site for the ocean disposal of dredged materials and the continued operation of LA-2 (also known as the Preferred Alternative [Alternative 3]). The LA-3 site is used in conjunction with the LA-2 site for the disposal of dredged material originating from projects located within Los Angeles and Orange Counties. The relevant analysis for the LA-3 DEIS Preferred Alternative included in the LA-3 DEIS and incorporated into this chapter is associated with the following resources: marine environment (biological, physical, and chemical), public health and welfare, and socioeconomics.[9]

13.4.1.2 Operation Methodology and Assumptions

The project area analyzed for impacts associated with the operation of a new ocean discharge system is defined as the location of all risers and diffuser-related structures, as well as the ZID of the effluent discharge. Operational impacts on biota were assessed by using the same methodology previously described for construction. Operational impacts associated with beneficial uses were assessed using qualitative means by relying on the operational activities and impacts related to those activities and determining whether the beneficial use actually exists at the operation location or if the activities have the potential to have an impact on an existing beneficial use outside of the operation area.

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purpose of the SC-DMMT is to expedite reviews and approvals of dredging projects through monthly inter-agency meetings.

[9] This analysis is included in Chapter 4 of the LA-3 DEIS on pages 4-1 to 4-5, 4-14 to 4-32, and 4-38. Additionally, the cumulative analysis associated with the marine environment (biological, physical, and chemical), public health and welfare, and socioeconomics associated with the Preferred Alternative is included in Chapter 4 of the LA-3 DEIS on pages 4-76 to 4-79. Finally, the relationship between short-term and long-term resource use and the irreversible or irretrievable commitment of resources on pages 4-80 to 4-81 of Chapter 4 of the LA-3 DEIS is applicable. Appendix A of the LA-3 DEIS is also relevant to this chapter because it describes the Site Management and Monitoring Plan (SMMP) implemented as part of the operation of LA-3 and the requirements of the SMMP that are applied to each permitted disposal of dredged materials. The analysis in the LA-3 DEIS is relevant to the Clearwater Program analysis because construction of the offshore tunnel in Alternatives 1, 2, and 3 could require ocean disposal of the excavated material, making use of either LA-3 or LA-2. The quantity of excavated material is defined in Chapter 3 and would not exceed the maximum limits of either LA-3 or LA-2. Therefore, because the LA-3 DEIS analyzed the marine biological, chemical, and physical impacts; public health and welfare impacts; and socioeconomics impacts associated with disposing of dredged materials at LA-3 and LA-2, this chapter incorporates the analysis by reference and does not provide additional information.

Furthermore, the impact analysis for operation assumes the following:

- All effluent discharged from any of the alternative outfall sites would, at a minimum, be treated to levels consistent with the effluent currently discharged through the existing ocean outfalls.
- For operation of the new riser and diffuser, the Sanitation District's existing NPDES individual permit for wastewater treatment discharges would be updated.
- NPDES requirements for all discharge alternatives would be no less protective of the beneficial uses of the receiving waters than the current NPDES permit, and the Sanitation Districts would have to comply with either the existing NPDES permit or an updated permit for the new riser and diffuser (see Section 13.3).
- The physical characteristics of the effluent released on the SP Shelf and PV Shelf would be the same as the existing effluent characteristics despite any change in location or change in depth of release (between 175 and 200 feet).

13.4.1.3 Baseline

CEQA Baseline

The CEQA baseline for the project is described in Section 1.7.4.1. The CEQA baseline consists of the existing conditions of the marine environment at all sites where the project elements would be constructed, including the riser and diffuser areas and the existing ocean outfalls. The reference date for the CEQA baseline is 2008 when the notice of preparation of this EIR/EIS was released for public review.

NEPA No-Federal-Action Baseline

The NEPA baseline for the project is described in Section 1.7.4.2. The NEPA baseline is not bound to a "no growth" scenario. Therefore, the NEPA baseline may include increases in operations over the life of a project that do not require federal action or approval.

Note that the NEPA analysis includes direct and indirect impacts as discussed in Section 3.5.2. Any impact associated with project elements located within the Corps' geographic jurisdiction (i.e., the marine environment) during construction would be the direct result of the Corps permit and considered a direct impact under NEPA. Any impact associated with project elements located outside the Corps' geographic jurisdiction during construction would be the indirect result of the Corps permit and considered an indirect impact under NEPA. Any impact that occurs during operation would be considered an indirect impact under NEPA.

13.4.2 Thresholds of Significance

The project would pose a significant impact if it exceeds any of the following thresholds for marine environment (MAR):

MAR-1. Creates pollution, contamination, or nuisance, as defined in Section 13050 of the CWC; or causes regulatory standards to be violated, as defined in the applicable NPDES permit(s) or State Water Quality Control Plan for ocean waters for concentration and emissions of discharge.

MAR-2. Substantially degrades marine sediment quality or character.

MAR-3. Results in the substantial loss of individuals or the reduction of existing habitat of a state- or federally listed endangered, threatened, rare, protected, candidate, or sensitive plant or animal species or a species of special concern.

MAR-4. Results in the substantial degradation or disruption of marine habitat or local biological communities.

MAR-5. Interferes with the movement/migration corridors of marine biota.

MAR-6. Adversely affects public health.

MAR-7. Impairs beneficial uses designated in the California Ocean Plan.

Program and project elements were analyzed by threshold in the Preliminary Screening Analysis (Appendix 1-A) to identify potentially significant impacts on the marine environment before mitigation. Table 13-12 identifies which elements were brought forward for further analysis by threshold in this EIR/EIS for Alternatives 1 through 4. If applicable, Table 13-12 also identifies thresholds evaluated in this EIR/EIS if an emergency discharge into various water courses were to occur under the No-Project or No-Federal-Action Alternatives, as described in Sections 3.4.1.5 and 3.4.1.6.

Table 13-12. Thresholds Evaluated

		Threshold						
	Alt.	MAR-1	MAR-2	MAR-3	MAR-4	MAR-5	MAR-6	MAR-7
Project Element								
Royal Palms Shaft Site	4							X
SP Shelf Riser/Diffuser Area	1	X	X	X	X	X	X	X
PV Shelf Riser/Diffuser Area	2,3	X	X	X	X	X	X	X
Existing Ocean Outfalls Riser/Diffuser Area	1–4	X	X	X	X	X	X	X
Emergency Discharge	5,6	X	X	X	X		X	X
Alt. = alternative								

In the alternatives analysis that follows, if a project element is common to more than one alternative, a detailed discussion is presented only in the first alternative in which it appears.

Because of the interdisciplinary nature of marine resources, some cross-referencing and comingling of analysis occurs under each threshold. For example, water quality and sediment, which are discussed in detail under Impacts MAR-1 and MAR-2, could have an effect on marine mammals and communities, which are discussed under Impacts MAR-3 and MAR-4. Therefore, water quality and sediment information is presented in Impact MAR-3, as it relates to protected species and habitat, and Impact MAR-4, as it relates to local biological communities and habitat.

Shaft sites would be required along each alignment to facilitate tunnel construction. All shaft sites would be constructed on land, and there would be no effects on the marine environment from their construction or use. However, construction at the Royal Palms shaft site (Alternative 4) would occur adjacent to marine waters and thus has the potential to impact the marine environment. Therefore, Impact MAR-7 is analyzed for potential impacts on designated beneficial uses associated with construction at Royal Palms Beach. Similarly, tunnels would be constructed to connect to the riser and diffuser areas; however, the tunneling would be performed under the seafloor; therefore, there would be no effects on the marine environment from their construction or use.

13.4.3 Alternative 1

13.4.3.1 Program

Alternative 1 (Program) does not include marine elements and, therefore, has no potential to have an impact on the marine environment.

13.4.3.2 Project

Impact MAR-1. Would Alternative 1 (Project) create pollution, contamination, or nuisance, as defined in Section 13050 of the CWC; or cause regulatory standards to be violated, as defined in the applicable NPDES permit(s) or State Water Quality Control Plan for ocean waters for concentration and emissions of discharge?

Riser/Diffuser Area – San Pedro Shelf

Construction

CEQA Analysis

Construction on the SP Shelf would take approximately 3 years, likely beginning in 2019 and ending in the 2021. The majority of the riser and diffuser construction work would be based on one 10-hour shift per day, 5 days per week. A jack-up barge would first be anchored at the construction location, stabilized by pilings driven into the seafloor. This barge would be the primary location for beginning all construction activities related to the riser and diffuser. A riser would then be constructed to physically connect the submarine tunnel to seafloor diffuser legs. The riser would be made of steel with a concrete lining. The riser inner casing diameter would be approximately 13 feet and the outer casing diameter would be approximately 16 feet. The casing would be driven into the seafloor to the depth of the submarine tunnel, extending through the water column to the sea surface. The construction casing would extend approximately 30 feet (9 meters) or more above the sea surface, allowing additional water in the casing to provide positive head pressure in the casing during construction. The riser configuration is shown on Figure 3-24.

Sediments within the riser casing would be removed by mechanical means. Sediments excavated for the riser vault structure would not be exposed to the open ocean, but would pass only through the water column contained within the casing during the excavation and removal process. Similarly, material for the submarine tunnel tie-in structure would be transported through the casing, limiting exposure to the open ocean (with the possible exception of exposure at the sea surface during transfer of excavated sediments from the riser to the transport barge). The submarine material would be removed and could be disposed of at the LA-2 or LA-3 disposal sites. Construction within the casing is estimated to take approximately 21 months.

Following excavation and construction of the riser, the water column casing would be removed, leaving the diffuser riser head structure, which would be positioned approximately 20 feet (6 meters) above the surrounding seafloor. Casing removal would release the contained water to the open ocean. This release of casing water would require an NPDES permit and compliance with discharge requirements as defined in the permit.

Ballast rock would be placed within a 75-foot radius around the riser head to protect the structure. The seafloor diffuser would be constructed of steel pipe, reinforced concrete pipe (RCP), or high-density polyethylene (HDPE) pipe. Each of these would include diffuser ports that would be spaced to facilitate initial dilution and distribution of the treated effluent.

If the diffuser were constructed of steel or RCP, it would have two legs oriented out of the riser head, 120 or 180 degrees apart, with each leg approximately 4,000 feet long. The inner diameter of the steel or RCP diffuser would incrementally decrease in size from approximately 132 inches to 48 inches. The steel and RCP diffuser configurations are shown on Figure 3-25. Installation of the steel or RCP diffuser would require seafloor grading and possibly trenching or dredging for site preparation. The trenched materials would be sidecast, if feasible. Sidecasting involves excavating seafloor sediments from the construction site with a clamshell dredge, raising and moving the clamshell away from the excavation site and releasing the sediments above the seafloor. The diffuser installation could also require construction of a roadbed base of ballast rock. The roadbed would be placed either in the trench or on the graded seafloor. The diffuser would be placed on the roadbed with additional ballast rock up to the center of the pipe for stability. The riser and diffuser would cover a seafloor area of approximately 5 to 10 acres, depending on the required roadbed width.

If HDPE pipe were used for the diffuser, no trenching would be required. The HDPE pipe would be placed directly on the seafloor, which could require some minor grading. There would also be a limited amount of ballast rock required to protect the piping and riser. The HDPE design would consist of a manifold with eight diffuser legs, four on each side of the manifold, configured in a sequentially staggered array from shortest (1,000 feet) to longest (4,000 feet). The HDPE diffuser configuration is shown on Figure 3-25. The riser, manifold, and diffuser would cover a seafloor area of approximately 8 acres.

When the prefabricated riser assembly is transported to the installation site, the construction work would take place on a continuous 24-hours-per-day basis for approximately 1 week. All of the work – including mobilization, preassembly, site preparation, construction, and demobilization – would take approximately 24 months for the riser and 6 to 12 months for the diffuser (depending on the type of diffuser).

Underwater construction activities for the project resulting in the discharge of fill material would require a CWA Section 404 permit from the Corps and a CWA Section 401 Water Quality Certification from the RWQCB. The water quality certification would specify receiving water monitoring requirements. Monitoring requirements typically include measurements of water quality parameters such as DO, light transmittance (turbidity), pH, and suspended solids at varying distances from the dredging operations, the mixing zone[10], or other in-water activities. The CWA Section 404 permit and the RHA Section 10 permit issued by the Corps would require that the dredger minimize the amount of water in the disposal vessel that flows back to the dredging site and would prohibit the flow back of dredged water from containing any solid dredged material. Therefore, effects from dredging would be measured *in situ*. The objective of the monitoring program is adaptive management of the dredging operations, including dredging modifications, to

[10] According to the EPA, "a mixing zone is an area where an effluent discharge undergoes initial dilution and is extended to cover the secondary mixing in the ambient waterbody. A mixing zone is an allocated impact zone where water quality criteria can be exceeded as long as acutely toxic conditions are prevented." The CWA Section 401 certification would define a "mixing zone" around the dredging and construction operations.

avoid potential violations of water quality objectives. If permit conditions pertaining to water quality parameters are exceeded, dredging operations would be modified to maintain water quality parameters at acceptable levels.

Construction activities would disturb and resuspend near-bottom sediments, change the levels of DO, and possibly release nutrients. These effects would result in temporary and localized changes to some water quality indicators in the mixing zone defined by the CWA Section 401 Water Quality Certification. The construction activities are expected to affect water quality in the vicinity of construction, but these changes generally would not extend beyond the mixing zone as defined in the CWA Section 401 Water Quality Certification, nor would they persist following the completion of construction.

Turbidity

Construction activities on the SP Shelf could alter water quality by generating a turbid environment at the surface of the ocean and near the bottom by increasing suspended sediment levels. Surface turbidity could result as overflow or spill when sediments within the riser casings and riser structure are brought to the surface and transferred from the top of the casing to the transport barge. Near-bottom turbidity could occur during sidecasting, grading, and placement of ballast for construction of the diffuser structure. The size and persistence of a sediment plume would depend on several factors, including sediment characteristics, water depth, and current direction and velocity. Settling rates are largely determined by the grain size of the suspended material.

Several studies have evaluated turbidity generated by underwater activities in various locations in the SCB, such as the PV Shelf and the Los Angeles Harbor. Monitoring in the Los Angeles Harbor has documented minor impacts on light transmission, DO, and pH during sediment-disturbing activities of dredging (CH2M Hill 2008:Section 3.14). In sediment plume tracking surveys conducted off Palos Verdes, near-bottom suspended sediment levels in the area of disturbance were found to approach baseline levels within 2 hours of disturbance (Fredette et al. 2002:3-29, 3-30, 3-118.). The particle settling velocities developed for dredged material fate modeling for the LA-3 DEIS also indicate particles would settle rapidly to the seafloor, as summarized in Table 13-13 (Corps 2003:4–8, 9).

Table 13-13. Description of Particle Type, Fall Velocity, and Settlement Time From a Drop of 20 Feet (6 Meters) Above the Seafloor

Particle Type	Grain Size (D_{50}) (mm)	Fall Velocity (feet/second)	Fall Velocity (meters/second)	Settling Time (approximate minutes)
Gravel	> = 1	0.9	0.27	< 1
Coarse Sand	0.5 – 0.1	0.36	0.11	< 1
Medium Sand	0.25 – 0.5	0.16	0.05	2
Fine Sand	0.13 – 0.25	0.06	0.02	5
Very Fine Sand	0.063 – 0.13	0.02	0.006	17
Silt-Clays[a]	< 0.063	0.007	0.002	50
Silt-Clays[b]	< 0.063	0.36	0.11	< 1

[a] as particles
[b] as clumps

If sidecasted, sediment generally would not be released more than 20 feet from the bottom thereby limiting the spread of sediment. As discussed in Appendix 13-A, sediments on the SP Shelf at project depths contain less than 30 percent fine material (silt and clay) compared to a mean of 45 percent fine material for midshelf stations throughout the SCB (Schiff et al. 2006), suggesting that most of the sediments suspended during sidecasting would settle to the bottom well within an hour of disturbance.

Localized areas of elevated turbidity conditions would occur in the vicinity of the near-bottom construction activities for the duration of construction. However, the studies cited suggest that near-bottom turbidity generated by construction activities on the SP Shelf is expected to settle and rapidly mix with ambient water, with normal conditions likely to be found in the area within hours to days of cessation of construction activities.

If dredged or graded seafloor sediments were found to be unsuitable for the LA-2 or LA-3 disposal sites or for sidecasting, sediments would be brought to the surface via a clamshell dredge and loaded onto a barge and appropriately disposed of at an approved onshore site. As sediment is brought up through the water column, some amount of sediment would wash out of the dredge. This is typical of all dredging operations. Therefore, water column turbidity would occur using this dredging and removal method. The process of raising these sediments from the seafloor to the dredge barge would create turbidity throughout the entire water column instead of just near bottom; however, overall, more sediments would be removed from the marine environment when compared to sidecasting. The rate of sediment settling would remain the same, which is described in Table 13-13; however, sediments would take longer to mix and diffuse through the water column.

If sediment characterization indicated presence of contaminants, sediment-disturbing activities could introduce these contaminants to the water column in concentrations exceeding water quality criteria or project-specific WDRs and/or CWA Section 401 certification requirements. Impacts would be significant before mitigation. Implementation of mitigation measure (MM) MAR-1a and MM MAR-1b would reduce impacts to less than significant.

For a discussion of the effects of surface and subsurface turbidity on protected species see Impact MAR-3 and on non-protected species see Impact MAR-4.

Dissolved Oxygen

Removal of the riser casing after construction of the diffuser vault would likely result in a temporary increase in turbidity. This water could be isolated from the open ocean for approximately 21 months with little or no phytoplankton activity. It would also likely contain some nutrients and/or organic matter derived from exposure to disturbed sediments. Accordingly, this water would have very low DO content and would contain some level of biochemical oxygen demand. Both factors would contribute to a localized impact on DO concentrations when the casing water mixes with ambient waters. However, local currents in the project area average approximately 0.1 ft/s over the entire depth of the water column, with average velocities approximately 0.4 ft/s near bottom. At 0.1 ft/s, currents are expected to mix and disperse the entrained water with ambient water over a distance of 460 feet within 1 hour of release. Within approximately 1 day, the entrained water would be diluted and dispersed over 2.2 miles, and a residual plume would likely be undetectable. Ambient water conditions would be expected in the area within hours to a day of release. Therefore, water quality impacts resulting from the removal of the riser casing would be less than significant.

Nutrients and Harmful Algal Blooms

The sediment on the SP Shelf is known to have various types and levels of nutrients from source deposition (fecal matter from marine species, aerial deposition, etc.). The sediments associated with the depths at which construction would occur on the SP Shelf would not contain substantial amounts of nutrients. Sediments would be sidecast and generally not released more than 20 feet from the bottom, thereby limiting the spread of sediment. However, nutrients could be released into the water column during construction when the sediment is disturbed. The depth of construction activities on the SP Shelf would be approximately 100 feet below the trapping layer for most of the year. This would likely prevent any nutrients from reaching phytoplankton closer to the sea surface and would prevent any blooms that could be caused by the release of nutrients. Therefore, nutrient and HAB impacts resulting from construction on the SP Shelf would be less than significant.

Spills

A spill prevention and control plan would be required for marine vessels carrying petroleum and nontank vessels over 300 gross tons. The plan would detail and implement spill prevention and control measures. If an accidental spill were to occur, response and notification actions required by the plan would immediately be implemented. These would include efforts to contain and neutralize the spill, such as deploying floating booms to contain and absorb the spill and using pumps to assist the cleanup. Such measures would likely prevent the accidental spill from causing any persistent degradation of water quality. Therefore, significant water quality impacts are not expected to occur as a result of accidental spills of pollutants during in-water construction. Impacts would be less than significant.

NEPA Analysis

Environmental impacts would be the same as described for the CEQA analysis, and would occur for the duration of construction. With respect to the Corps' NEPA scope of analysis described in Section 3.5, the environmental impacts would be considered direct impacts.

Operation

CEQA Analysis

Operation of the SP Shelf diffuser would be similar to the existing ocean outfalls. The two possible configurations of the SP Shelf diffuser would not influence operation of the diffuser. Either configuration (i.e., RCP or steel pipe, or HDPE pipe) would discharge the treated effluent in the same manner by releasing treated effluent from ports (holes from which the treated effluent is discharged) on a continuous basis. The diffuser would be sized and permitted to accommodate the release of 400 million gallons per day (MGD) of average flow similar to the existing ocean outfalls. The composition of effluent released from the diffuser could impact the water quality of the receiving waters (Pacific Ocean).

Water Quality

An NPDES permit, required by the CWA and issued and enforced by the LARWQCB, is necessary for any effluent discharges into the Pacific Ocean. The discharger, such as the JWPCP, is permitted by the LARWQCB. The NPDES permit contains several regulatory requirements including both effluent and receiving water limits and requirements for certain treatment processes to maintain water quality in the receiving water (e.g., the Pacific Ocean) (Appendix 13-E). Effluent limitations are required for pollutants that are determined by the RWQCB to be discharged at a level that would or may cause or contribute to an excursion above a water quality standard (SWRCB 2005). The RWQCB conducts a statistical analysis using historical monitoring data to determine which pollutants in a discharge, such as metals, ammonia, or organic and inorganic chemicals, have the "reasonable potential" to cause or contribute to an exceedance of a water quality objective, and develops numeric effluent limitations for those pollutants based upon applicable water quality standards (SWRCB 2005). For constituents that have not been determined to have a "reasonable potential," narrative statements are included in the NPDES permit requiring the discharge comply with applicable water quality requirements (Appendix 13-E). Typically, the California Ocean Plan identifies the applicable water quality requirements. For NPDES regulatory purposes, measured discharge parameters/constituents from the JWPCP are grouped into general categories: major wastewater constituents, marine aquatic life toxicants, and human health toxicants (carcinogens and non-carcinogens) (Appendix 13-E). Numerical effluent limitations are set based on specifications in the California Ocean Plan (SWRCB 2005) and secondary treatment standards outlined in 40 CFR Part 133, Section 102.

The operation of the JWPCP and the physical design of the existing ocean outfalls allow the Sanitation Districts to meet the effluent limitations and performance goals outlined in the NPDES permit and maintain water quality off the coast of Southern California. The JWPCP is operated to treat wastewater to a secondary level. Secondary treatment utilizes biological processes in which microorganisms convert nonsettleable solids to settleable solids. After the effluent passes through the biological reactors, sedimentation follows, allowing the solids to settle out. All of the effluent is then disinfected using chlorination prior to its discharge to the Pacific Ocean. The permitted minimum monthly average for the initial dilution rate of treated effluent discharged from the existing 120- and 90-inch ocean outfalls is 166:1. For the existing 72- and 60-inch ocean outfalls, which are available on standby to provide hydraulic relief, the initial minimum dilutions are 150:1 and 115:1, respectively. (This is the minimum initial dilution of the treated effluent outside of the ZID after it initially mixes with ambient water.) The average depth of the current discharge is approximately 200 feet (61 meters) below the water surface. Currents at the depth where the plume is trapped by the overlying density stratification move water inshore and offshore as tides rise and fall; however, cross-shelf current speeds are relatively slow, and there is minimal net cross-shelf displacement. Alongshelf currents, while also oscillating with tides, generally have higher speeds, and frequently include a net current component that can move the plume away from the discharge point by several kilometers per day.

As part of the NPDES permit requirements, the Sanitation Districts test the effluent from the JWPCP and designated nearshore and offshore stations to ensure the JWPCP is in compliance. Monthly, quarterly, annual, and biennial reports (depending on the monitoring program) are prepared for the LARWQCB and other agencies summarizing the results and showing compliance with the NPDES permit. The JWPCP NPDES permit issued in 2011 (which is renewed every 5 years[11]) contains effluent limitations and performance goals, receiving water limitations, and monitoring and reporting provisions (Appendix 13-F). The California Integrated Water Quality System Project (CIWQS) has not reported an effluent violation from the JWPCP between 2004 and 2009 (SWRCB 2010). The JWPCP Annual Monitoring Report for 2009 (submitted to the LARWQCB on March 24, 2010) identified that the JWPCP achieved 100 percent compliance with all numeric effluent limits from 2002 to 2008, as well as in 2009 (Sanitation Districts 2010c).

Prior to placing the SP Shelf diffuser in operation, the JWPCP NPDES permit would need to be updated. The current JWPCP treatment process would not change. The SP Shelf diffuser would be constructed with diffuser ports spaced to provide an initial dilution of 166:1, or greater, which is consistent with the existing ocean outfalls. The SP Shelf diffuser would be constructed at a depth of approximately 200 feet (61 meters) below the surface, which is about the same average discharge depth as the existing ocean outfalls. The localized currents on the SP Shelf would generally move the discharged effluent plume primarily upcoast. The Sanitation Districts would continue to regularly monitor for all the constituents identified in the current NPDES permit. Because the operation of the JWPCP would not change and the SP Shelf diffuser would be designed to perform equal to, or better than, the existing ocean outfalls, impacts on water quality from the operation of the SP Shelf diffuser would be less than significant.

Nutrients and Harmful Algal Blooms

As discussed in Section 13.2.1.1 and in Appendix 13-A and Appendix 13-B, there has been no obvious link established between anthropogenic inputs, including ocean discharges, and increase in phytoplanktonic HABs. However, HABs have been a concern in the SCB and thus on the SP Shelf because of their increased frequency and severity in recent years. HABs can result in the production of

[11] A new permit was adopted in September 2011, and the Sanitation Districts must comply with the conditions of this permit.

toxins at levels that can bioaccumulate and cause illness and death in higher food chain animals (Appendix 13-B). Domoic acid, produced by several species of the phytoplankton diatom *Pseudo-nitzchia*, is the most commonly occurring and most serious of the HAB-related toxins. Domoic acid poisoning results in a condition called amnesic shellfish poisoning, which is a serious threat to marine wildlife populations along the California coast (see Impact MAR-3 for additional discussion of how HABs may impact protected species).

There is no established connection between nutrient contributions from JWPCP effluent and HABs. Water column data collected over 4 years during monitoring of the existing ocean outfall discharges was recently reviewed (Appendix 13-B). The analysis confirmed that the majority of phytoplankton is typically found in the upper water column, while the effluent plume is normally trapped below a density stratification layer at deeper depths and, therefore, is unavailable to the phytoplankton (Appendix 13-B). Between November 2002 and November 2008, local upwelling may have occasionally pushed the trapping layer up to depths that make the nutrients in the discharge available to phytoplankton; however, no increase in phytoplankton levels was associated with the effluent plume. In addition, no association between the JWPCP discharge and HABs was detected.

Accordingly, it is very unlikely that the JWPCP discharges would affect HABs in the vicinity of the proposed SP Shelf diffuser. At greater distances from the discharge, nutrients from the effluent would be greatly diluted via mixing and transport processes by the time the plume reached depths shallow enough to influence phytoplankton productivity. The nutrients would become entrained with naturally nutrient-rich deep ocean waters that upwell along coastlines within the SCB, and that contain about 25 times as much nitrogen and other nutrients as do JWPCP outfall discharges. It follows that minor changes in ocean circulation and upwelling rates would have a much higher potential to affect HABs by altering nutrient flux than do any foreseeable changes in outfall discharges. Moreover, modifying nutrient availability in an area does not simply alter the HAB frequencies. Studies in Monterey Bay (Ryan et al. 2005) have shown that the causes of HABs are complex and subtle, involving numerous exogenous and some endogenous factors. Schnetzer et al. (2007), working in San Pedro Bay and the Los Angeles Harbor, have also shown that HABs are not easily predicted and do not simply respond to nutrient changes; indeed, they note research showing higher algal toxin production in nutrient-limited settings.

If nutrients from the JWPCP and other SCB discharges were associated with HABs, the events would likely have been present in the SCB for decades. Because operational volumes and effluent quality discharged through the proposed SP Shelf diffuser would be similar to existing discharge conditions at the existing ocean outfalls, and discharge depths and predicted trapping depths are comparable with the existing JWPCP discharge site, it is unlikely that relocating the JWPCP discharge would cause any change in the phytoplankton response between sites and thereby result in HABs (Appendix 13-B).

In summary, because operational volumes and effluent quality discharged through the new SP Shelf diffuser would be similar to existing conditions, and discharge depths and predicted trapping depths are comparable to the existing ocean outfalls, it is unlikely that similar discharge on the SP Shelf would result in pollution, contamination, nuisance, or violation of regulatory standards. The new ocean discharge system would comply with NPDES provisions, which prohibit contamination, pollution, or nuisance. Impacts would be less than significant.

NEPA Analysis

Environmental impacts would be the same as described for the CEQA analysis, and would occur for the operational life of the structure. With respect to the Corps' NEPA scope of analysis described in Section 3.5, the environmental impacts would be considered indirect impacts.

Riser/Diffuser Area – Existing Ocean Outfalls

Construction

CEQA Analysis

The rehabilitation of the existing ocean outfalls includes joint repairs and re-ballasting. Table 13-11 in Section 13.4.1 identifies the permits that would be required for the rehabilitation of the existing ocean outfalls. The existing ocean outfalls extend from the manifold structure at Royal Palms Beach. The re-ballasting work would occur on the existing 72-, 90-, and 120-inch outfalls in water depths ranging from approximately 20 to 50 feet (6 to 15 meters). A small derrick barge would be used to place the ballast rock around the outfalls and support the joint repair work. Joint repairs would involve temporarily removing some of the existing ballast rock from around the outfalls to fully expose the joint. A coupling would be installed, and the annular space filled with either concrete or epoxy. The ballast rock would then be replaced around the pipe. It is estimated that in-water construction would take approximately 2 months. All of the rehabilitation work – including mobilization, construction, and demobilization – would take approximately 9 months.

Turbidity

The rehabilitation of the existing ocean outfalls would not include the removal or disturbance of sediments in the project area; however, rock placement activities would result in surface and near-bottom turbidity in the immediate vicinity of the work vessels.

The existing ocean outfalls are within the EPA-designated DDT/PCB study area, which is defined as the area of the shelf and slope off the Palos Verdes Peninsula between Point Fermin and Redondo Canyon, from the shore to the 200-meter (approximately 660-foot) isobath (depth contour) (EPA 2009b). According to the EPA feasibility study, the contaminated sediments are along an identifiable deposit over 1 mile offshore at a depth of 50 meters (approximately 160 feet) to the shelf break (EPA 2009b). The sediments on the existing ballast rocks around the rehabilitation work for the existing ocean outfalls (between 20- and 50-foot depths) are most likely sparse and of recent origin, and are not expected to be contaminated by DDT. Therefore, in consultation with the EPA, the rehabilitation work would not result in adverse impacts on the DDT area of concern (White pers. comm. 2010).

Suspension of bottom sediments as a result of rock removal is expected to be limited to near the seafloor, and because current speeds are relatively low (average of 0.1 ft/s), suspended sediments are expected to settle relatively quickly and near the site of suspension. During sediment plume tracking surveys conducted during the contaminated sediment capping study (EPA 2009b), near-bottom suspended sediment levels in the area of disturbance were found to approach baseline levels within 2 hours of disturbance (Fredette et al. 2002:3-29, 3-30, 3-118). Plumes were found to disperse primarily parallel to shore. Water column contaminant levels were found to be highest during the inception of the plume and decreased to background levels within 1 to 2 hours. The average current speed in the area of the existing ocean outfalls is 0.1 ft/s; therefore, assuming project sediments are similar to those found in the sediment capping study, sediments could travel up to approximately 950 feet from the construction work site in 2 hours before they settle out of the water column. Similarly, light transmission and suspended sediment levels in surface waters were found to be similar to baseline levels within 2 hours of exposure to a surface plume. Turbidity is expected to be localized and temporary during construction; therefore, impacts associated with the suspension of sediment would be less than significant.

Spills

There is a risk of accidental spillage of fuel, lubricants, concrete, or other potentially toxic materials used during construction activities. A spill prevention and control plan would be required for marine vessels carrying petroleum and nontank vessels over 300 gross tons. The plan would detail and implement spill prevention and control measures. If an accidental spill were to occur, response and notification actions required by the plan would be implemented. Efforts to contain and neutralize the spill, such as deploying floating booms to contain and absorb the spill and using pumps to assist the cleanup, would be implemented. These measures would likely prevent the accidental spill from causing any persistent degradation of water quality. As a result, significant water quality impacts are not expected to occur as a result of accidental spills of pollutants during in-water construction. Impacts would be less than significant.

NEPA Analysis

Environmental impacts would be the same as described for the CEQA analysis, and would occur for the duration of construction. With respect to the Corps' NEPA scope of analysis described in Section 3.5, the environmental impacts would be considered direct impacts.

Operation

CEQA Analysis

Operation of the existing ocean outfalls following rehabilitation of the outfall pipeline would not result in contamination, pollution, or nuisance. Alternative 1 (Project) would result in the discharge of secondary treated effluent on the SP Shelf while allowing for the temporary use of the existing ocean outfalls during emergency situations or maintenance of the new ocean discharge system. The emergency use of the existing ocean outfalls is anticipated to occur only occasionally.

Potential impacts resulting from temporary use of the outfalls would generally be the same as those occurring under current conditions, or those which would occur during operation of the new ocean discharge system on the SP Shelf, as previously discussed. To summarize the analysis:

- The use of the new ocean discharge system would be consistent with an approved NPDES permit and WDRs for discharges from the JWPCP.
- Permit requirements include extensive monitoring and reporting, the data from which are considered during each permit renewal, thereby providing an adaptive management mechanism to track and improve water quality protection via the regulatory vehicle of NPDES permitting.
- The CIWQS has not reported an effluent violation from the JWPCP between 2004 and 2009 (SWRCB 2010). The JWPCP Annual Monitoring Report for 2009 (submitted to the LARWQCB on March 24, 2010) identified that the JWPCP achieved 100 percent compliance with all numeric effluent limits from 2002 to 2008, as well as in 2009 (Sanitation Districts 2010c).
- Monitoring data show that the existing ocean outfalls perform as designed, discharging below a trapping depth, with the effluent dispersing and mixing to immeasurably low concentrations before entering the ecosystem as a nutrient source. Therefore, there is no evident mechanism by which outfall operation could contribute to HABs.

In consideration of these points, coupled with the expectation that the existing ocean outfalls would be used only on a limited temporary basis, impacts resulting from operation of the existing ocean outfalls would be less than significant.

NEPA Analysis

Environmental impacts would be the same as described for the CEQA analysis, and would occur for the operational life of the structure. With respect to the Corps' NEPA scope of analysis described in Section 3.5, the environmental impacts would be considered indirect impacts.

CEQA Impact Determination

Construction of the riser and diffuser on the SP Shelf for Alternative 1 (Project) would create pollution, contamination, or nuisance, as defined in Section 13050 of the CWC. Impacts under CEQA would be significant before mitigation. Operation of Alternative 1 (Project) would result in less than significant impacts.

Mitigation

MM MAR-1a. During riser and diffuser construction, analyses of contaminant concentrations (i.e., metals, dichlorodiphenyltrichloroethane [DDT], polychlorinated biphenyls [PCBs], polycyclic aromatic hydrocarbons [PAHs]) in waters near the dredging operations will be required if the contaminant levels in the dredged sediments are known to be elevated and represent a potential risk to beneficial uses. Monitoring data will be used to demonstrate that water quality limits specified in applicable state and federal permits are not exceeded. Corrective or adaptive actions consistent with state and federal permits will be implemented if the monitoring data indicate that water quality conditions outside the mixing zone are above the permit-specified limits.

MM MAR-1b. Prepare and implement a contaminated sediment management plan that is consistent with practices outlined in the Los Angeles Regional Contaminated Sediment Task Force long-term management strategy if contaminant levels in the dredged sediments are known to be elevated and represent a potential risk. At a minimum, the plan will include site-specific best management practices at the immediate work site to reduce the potential area of exposure to contaminated sediments.

Residual Impacts

Mitigation for dredging operations on the SP Shelf would require sediment testing and a contaminated sediment management plan, which would reduce the risk of contaminant dispersal outside of the vicinity of the construction area, and would be consistent with requirements in the project CWA Section 401 certification or WDRs. Disposal of sediments in accordance with requirements provided by the Los Angeles Regional CSTF would reduce the likelihood of suspension and distribution of contaminated sediments and limit the potential for exposure of ocean waters to levels of contaminants that could result in violations of regulatory standards. Residual impacts would be less than significant.

NEPA Impact Determination

Construction of the riser and diffuser on the SP Shelf for Alternative 1 (Project) would create pollution, contamination, or nuisance, as defined in Section 13050 of the CWC. Impacts under NEPA would be significant before mitigation with respect to the No-Federal-Action Alternative (see Section 3.4.1.6). Operation of Alternative 1 (Project) would result in less than significant impacts.

Mitigation

Implement MM MAR-1a and MM MAR-1b.

Residual Impacts

Residual impacts would be less than significant, as described under the CEQA impact determination.

Impact MAR-2. Would Alternative 1 (Project) substantially degrade marine sediment quality or character?

Riser/Diffuser Area – San Pedro Shelf

<u>Construction</u>

CEQA Analysis

The SP Shelf primarily contains fine silty sediments. There are approximately 133,251 acres of soft-bottom sediments found at midshelf depths on the SP Shelf. Soft-bottom sediments provide habitat for a variety of benthic infauna and epifaunal species. As discussed in the project setting and in Impact MAR-1, some contaminated sediments have been found on the SP Shelf. Construction activities on the SP Shelf could disturb near-bottom sediments for the duration of the construction period. Sediment would be considered degraded if it becomes contaminated with chemicals, thereby affecting its quality, or if the character of the sediment is substantially altered (e.g., changing from fine silty sediment to large course sediment or vice versa) during construction activities.

Construction of the SP Shelf riser and diffuser and the turbidity generated during construction are described in Impact MAR-1. Construction activities would not add contaminants to the sediment. Additionally, based on current velocity and settling times on the SP Shelf, sediments disturbed by construction activities would most likely be redeposited in areas close to their point of origin and of similar sediment quality and characteristics. Therefore, the disturbance of bottom sediments as a result of construction would be expected to be short term and localized, and sediment quality or character would not be degraded. Impacts would be less than significant.

NEPA Analysis

Environmental impacts would be the same as described for the CEQA analysis, and would occur for the duration of construction. With respect to the Corps' NEPA scope of analysis described in Section 3.5, the environmental impacts would be considered direct impacts.

<u>Operation</u>

CEQA Analysis

Operation of the riser and diffuser on the SP Shelf is described in Impact MAR-1. The operation of the SP Shelf diffuser could change the quality of the sediment through deposition of particles in the discharged effluent. The impacts on the character and quality of sediment from the operation of the SP Shelf diffuser are evaluated using data from the existing ocean outfalls and other outfalls in Southern California.

In Southern California, municipal dischargers have been discharging in the same general locations for many years, and in some cases for decades. In 1993, the city of San Diego's Point Loma Wastewater Treatment Plant (PLWTP) began operation of an extension of its ocean outfall system in an area of the continental shelf that had not previously been subject to discharge of treated municipal wastewater effluent. In 2008, after 15 years of discharging mixed advanced primary and secondary treated effluent (a lower level of treatment than achieved at the JWPCP), monitoring conducted by the city of San Diego at the PLWTP found no relationship between sediment composition and distance from the outfall. Conditions in the area of the PLWTP outfall are similar to those near the JWPCP existing ocean outfalls. Concentrations of contaminants, including total nitrogen, total volatile solids, trace metals, pesticides (including DDT), PCBs, and PAHs, in sediments off Point Loma were found to be normal. No pattern of contamination, outside of sulfides and BOD, or changes to sediment characteristics in the vicinity of the PLWTP outfall were observed in 2008. (City of San Diego 2009:1–4.)

It is difficult to assess recent deposition around the existing ocean outfalls on the PV Shelf due to the length of operation at the site, relatively recent changes in treatment levels at the JWPCP, and the legacy sediment contamination. However, indicators of organic enrichment in sediment, such as hydrogen sulfide, organic nitrogen, and total organic compounds can provide information regarding the sediment conditions around the existing ocean outfalls. Monitoring has shown that the levels of these indicators, although somewhat variable, have improved near the existing ocean outfalls on the PV Shelf over time (Appendix 13-A). The levels of legacy contaminants, including DDT, PCBs, chlordane, PAHs, and trace metals in sediments near the existing ocean outfalls, have declined over time. These contaminants are no longer discharged in the effluent in substantial levels as confirmed by JWPCP effluent sampling.

Improved conditions in the area of the existing ocean outfalls, and monitoring results near the outfall at Point Loma, suggest that other than some slight organic enrichment in the immediate area of the discharge, operation of the SP Shelf diffuser would not change the sediment characteristics in the area, nor substantially degrade the quality or character of the sediments. Impacts would be less than significant.

NEPA Analysis

Environmental impacts would be the same as described for the CEQA analysis, and would occur for the operational life of the structure. With respect to the Corps' NEPA scope of analysis described in Section 3.5, the environmental impacts would be considered indirect impacts.

Riser/Diffuser Area – Existing Ocean Outfalls

Construction

CEQA Analysis

Sediments on the PV Shelf include bioturbated fine silt and hard substrate, such as natural rocks and the existing ocean outfalls. These substrates provide habitat for a variety of species. As discussed in the project setting, the existing ocean outfalls are located within the EPA-designated DDT/PCB study area. Surface sediments, largely derived from current and recent discharge, are not degraded, while subsurface sediments due to deposits of legacy contaminants discharged decades ago remain in degraded condition. In 2006 and 2007, DDT levels at the shallowest station inshore of the outfalls at a 30-meter (98-foot) depth (somewhat deeper than the proposed rehabilitation) exceeded the ERM value during both years – cadmium exceeded the ERL value in 2006 and 2007, and arsenic exceeded the ERL in 2007 (Sanitation Districts 2008b).

Rehabilitation of the existing ocean outfalls is described in Impact MAR-1. The primary sediment-disturbing activity during construction would be placement of additional ballast rocks. Sediment would be considered degraded during construction activities if it becomes contaminated with chemicals, thereby reducing its quality, or if the character of the sediment is substantially altered (e.g., changing from fine silty sediment to large coarse sediment or vice versa) during construction activities. Rehabilitation of the existing outfalls would not substantially degrade marine sediment quality or character. Although local sediments may contain elevated concentrations of some contaminants, the disturbance of bottom sediments as a result of construction would be short term and localized, and would not result in a significant impact on sediment quality or character.

As discussed in Impact MAR-1, rock removal and ballast rock placement activities would result in temporary turbidity and relocation of sediments in the immediate vicinity of the outfall rehabilitation activities. However, sediments are expected to settle rapidly following disturbance, depositing within the vicinity of the activity. Based on the average current speed in the vicinity of the existing ocean outfalls and the sediment characteristics described in the EPA capping study, sediments could travel up to approximately 950 feet before they settle out of the water column (EPA 2009b). Similarly, light transmission and suspended sediment levels in surface waters were found to be similar to baseline levels within 2 hours of exposure to a surface plume. Therefore, disturbed sediments are most likely to settle within areas of similar sediment quality and character. The disturbance of bottom sediments as a result of construction is expected to be short term and localized, and would result in a less than significant impact on sediment quality or character.

NEPA Analysis

Environmental impacts would be the same as described for the CEQA analysis, and would occur for the duration of construction. With respect to the Corps' NEPA scope of analysis described in Section 3.5, the environmental impacts would be considered direct impacts.

Operation

CEQA Analysis

Operation of the rehabilitated existing ocean outfalls is discussed in Impact MAR-1. Subsurface sediments in the area of the existing ocean outfalls are known to be degraded as a result of the historic discharge of contaminants such as DDT and PCBs. As discussed in the environmental setting and SP Shelf sections, as well as in Appendix 13-A, sediment conditions in the vicinity of the current discharge are improving, and current levels of wastewater treatment do not appear to be contributing to sediment degradation in the area. Surface sediments, largely derived from current and recent discharge, are not degraded, while subsurface sediments due to deposits of legacy contaminants discharged decades ago remain in degraded condition.

As discussed in Impact MAR-1, the movement and location of particles and materials in the ocean are influenced by their size and the strength and direction of local currents. Discharged materials, like the existing sediment, deposit in areas where currents are not fast enough to maintain them in suspension. Thus, particulates discharged from the outfall, which are very fine in size, deposit a substantial distance from the outfall, in areas having comparable sediment grain size. Consequently, outfall operation does not have the potential to result in altered sediment grain size distribution. Therefore, intermediate and emergency operation of the existing ocean outfalls system following rehabilitation would not substantially degrade marine sediment quality or character.

NEPA Analysis

Environmental impacts would be the same as described for the CEQA analysis, and would occur for the operational life of the structure. With respect to the Corps' NEPA scope of analysis described in Section 3.5, the environmental impacts would be considered indirect impacts.

CEQA Impact Determination

Construction and operation of Alternative 1 (Project) would not substantially degrade marine sediment quality or character. Impacts under CEQA would be less than significant.

Mitigation

No mitigation is required.

Residual Impacts

Impacts would be less than significant.

NEPA Impact Determination

Construction and operation of Alternative 1 (Project) would not substantially degrade marine sediment quality or character. Impacts under NEPA would be less than significant with respect to the No-Federal-Action Alternative (see Section 3.4.1.6).

Mitigation

No mitigation is required.

Residual Impacts

Impacts would be less than significant.

Impact MAR-3. Would Alternative 1 (Project) result in the substantial loss of individuals or the reduction of existing habitat of a state- or federally listed endangered, threatened, rare, protected, candidate, or sensitive plant or animal species or a species of special concern?

Riser/Diffuser Area – San Pedro Shelf

Construction

CEQA Analysis

Construction activities that would occur on the SP Shelf are discussed in Impact MAR-1. A combination of hydro-jetting, drop-and-release methods, and vibratory or impact pile driving would be used to install the jack-up barge legs and riser casing on the SP Shelf. For this analysis, it was conservatively assumed that impact pile driving was used during riser construction. Driving the jack-up barge legs would occur continuously for 10 hours per day over approximately 5 days, for as many as 24,000 pile strikes per day. For both the outer and inner casing, driving would occur continuously 10 hours per day over approximately 15 days each, for an estimated 2,400 strikes per day. The total duration of pile driving is expected to be 35 days, although those days are likely to be in blocks, with the discrete pile driving processes occurring over a period of several months. The pile driving construction activities would likely begin in 2019.

As described in Chapter 19, submarine material removed by the tunnel boring machines could be disposed at the LA-2 Ocean Dredged Material Disposal Site (ODMDS), approximately 5 miles south–southeast of the existing ocean outfalls, or the LA-3 ODMDS, which is about 21 to 26 miles downcoast from the SP Shelf riser and diffuser area. Maximum tunneling rates were assumed in this analysis, in which case there would be up to approximately 135 one-way barge trips between Fish Harbor and LA-3 each year during the construction of the offshore tunnel.

If dredged sediments are determined to be unsuitable for ocean disposal, the number of barge trips for transport of dredged materials would be equivalent, but the barge destinations (disposal site or port to unload for upland disposal, respectively) would differ and are assumed to be less than barge trips to LA-2 or LA-3. If sidecasting of dredged sediments is allowed, the number of barge trips would be fewer.

Apart from the barge trips for transport of excavated or dredged soils, a number of barge and vessel trips would also be required during riser and diffuser construction. The anticipated vessel trips for the SP Shelf riser and diffuser construction are summarized in Chapters 3 and 19. Approximately 1,600 vessel round trips would be needed for riser construction. Approximately 330 (for HDPE) to 640 (for steel/RCP) vessel round trips would be needed for diffuser construction. This results in approximately 1,930 to 2,240 vessel round trips during the estimated 3-year construction period.

This analysis evaluates protected marine biological resources, specifically invertebrates, reptiles, birds, and mammals, and their habitat, as protected under the authority of the federal ESA, California ESA, MMPA, BGEPA, and/or MBTA, detailed in Section 13.3. These species are listed in Section 13.2.1.5 and discussed in detail in Appendix 13-A. They are collectively referred to herein as *protected species*. Impacts on these protected species that could occur during construction include the potential for injury or mortality associated with collision with vessels used during construction, injury or mortality associated with entanglement in cables and lines, injury or alteration of behavior associated with exposure to underwater sound, and impacts on foraging habitat associated with increase in surface and near-bottom turbidity generated by construction activities. As discussed under Impacts MAR-1, impacts resulting from spills would be less than significant; therefore, impacts on protected species would be less than significant and are not further discussed. Other potential effects on protected species associated with changes in migration patterns are discussed under MAR-5.

Vessel Collisions

Any marine mammals or sea turtles in the work area or along vessel transit routes to the construction area could collide with vessels during construction. Although uncommon, ship strikes involving marine mammals and sea turtles have been documented in the United States, including within the SCB. The majority of vessel collisions has involved large whales and is typically reported. Strikes on smaller animals are less likely to be noted and recorded. Blue, fin, gray, minke, and humpback whales are known or suspected to have been killed in California by ship strikes (Barlow 1994), with gray, blue, and fin whales the species most frequently reported struck by ships offshore of California (Cordero pers. comm. 2010; Jensen and Silber 2004). For example, three blue whales were killed in the Santa Barbara Channel during 2008 and 2009. Between 2000 and March 2010, two turtle strikes and 23 whale strikes were reported in the Southern California region (Cordero pers. comm. 2010).

Laist et al. (2001) examined worldwide records of whale strikes by non-motorized and motorized vessels between 1830 and 1998, and made the following observations about the reported whale strikes:

- There were 11 species involved, including three that are commonly found in west coast waters (gray, minke, and humpback whales).
- Most lethal and serious injuries to whales were caused by large vessels (260 feet or longer).
- Most severe or lethal injuries to whales occurred with vessels traveling at 14 knots (16 miles per hour [mph]) or higher.
- Whale strikes occurred infrequently with vessels traveling slower than 14 knots (16 mph) and rarely with vessels traveling at speeds of less than 10 knots (11.5 mph).

Although vessel speed is not the only factor in projecting the likelihood of whale collisions and the level of injury, data indicate that collisions are more likely to occur when large ships are traveling at speeds of 14 knots (16 mph) or higher. The NMFS has collected limited data detailing vessel operations at the time of known whale strikes (Jensen and Silber 2004). This data identified 292 records of confirmed or possible ship/whale strikes. Four percent involved vessels traveling at speeds of less than 13 knots (15 mph), and only 2 percent were traveling at speeds of less than 10 knots (11.5 mph). No tugboat/whale collisions were reported (Jensen and Silber 2004). Of the 292 records, 134 were confirmed vessel strikes in U.S. coastal waters, and vessel speed was known for 58 of the 134 confirmed cases (Jensen and Silber 2004). Of these, 39 strikes were known to have resulted in injury or mortality to the whale. In addition to gray, minke, and humpback whales, the NOAA also reported one strike of a killer whale calf that was injured by a commercial ferry traveling at speeds of 15 to18 knots (17 to 21 mph).

In response to blue whale ship strikes off Southern California, the Channel Islands National Marine Sanctuary, the NMFS, and the U.S. Coast Guard advises ships to travel at 10 knots (11.5 mph) or less in shipping lanes to the ports of Los Angeles and Long Beach when blue whales are present (Silber et al. 2009). Based on these and other studies, NMFS "recommends that speed restrictions in the range of 10-13 knots be used, where appropriate, feasible, and effective, in areas where reduced speed is likely to reduce the risk of ship strikes and facilitate whale avoidance" (NOAA 2012). The type of vessel, as well as the speed, is also a factor in avoiding strikes. It is recognized that single hull smaller vessels, such as crew and supply boats typically used during ocean-going construction activities, are highly maneuverable and can stop over short distances when compared to other much larger container vessels or tugs (Silber et al. 2009). These features give these types of vessels advantages in avoiding strikes such as an increase response time and maneuverability.

For pinnipeds, the average mortality rate from boat collisions in California, Oregon, and Washington is approximately four California sea lions and two Pacific harbor seals per year (Carretta et al. 2009:5, 11). The common dolphin is one of the more abundant marine mammals in the SCB, and the bottlenose dolphin is also fairly common and widespread in nearshore areas. Mortality and injury of dolphins due to vessel collisions has not been reported by NMFS, but their agility and speed reduces the potential for injury/mortality due to ship strikes (Carretta et al. 2009). Similarly, seabirds are highly mobile and able to avoid collisions with vessels and other construction equipment.

Approximately 70,000 inbound/outbound vessel trips occurred in the course of traffic to and from the Port of Los Angeles and the Port of Long Beach in 2008 (Corps 2010). (See Chapter 19 for additional details regarding vessel traffic and trips.) The ports currently have a vessel speed reduction program (VSRP) that slows ship speeds to 12 knots from Point Fermin, approximately 40 nautical miles out, to the harbor. There is an approximate 90 percent participation rate with VSRP over all vessels entering the harbor complex. Mandatory vessel speed reduction is required in the precautionary zones entering and exiting the ports as shown on Figure 19-1 in Chapter 19. Approximately 135 one-way barge trips per year would carry excavated material to LA-2 and/or LA-3. Furthermore, approximately 1,930 to 2,240 vessel round trips would occur during construction of the riser and diffuser for approximately 3 years. The potential for vessel interactions with marine mammals would be increased by these additional trips. However, the significance of vessel traffic to marine mammals depends on the vessel speed, location of the vessels, the vessel type, as well as the species present in the areas traversed. Marine mammals in the SP Shelf area may come in proximity to large construction vessels, primarily tugboats and barges. Because construction at the riser and diffuser sites would increase the number of vessel trips in an area that is already susceptible to collisions with marine mammals, there is the potential for a significant impact. Implementation of MM MAR-3a through MM MAR-3c would reduce impacts to less than significant.

Entanglement

Marine mammals, sea turtles, or marine birds that dive underwater in the construction area could become entangled in ropes, lines, or other construction debris. Mortality has been reported in marine mammals, sea turtles, and seabirds as a result of entanglement (Carretta et al. 2005; NOAA 2008; Carretta et al. 2009), usually associated with fishing gear, particularly gillnets. Entanglement in anchor lines also has been documented, but no information is available on the prevalence of such events (Carretta et al. 2005; NMFS 2007). Because construction would require anchors, buoy lines, and rope, there is a potential for protected species to become entangled in lines associated with project construction.

Impacts would be significant. Implementation of MM MAR-3d to MM MAR-3g would reduce impacts associated with entanglement risk to less than significant.

Underwater Sound

Any marine mammals, sea turtles, or marine birds that dive underwater, within an area experiencing elevated underwater sound levels due to construction activities, could be injured or its behavior could be altered. For this analysis, it was conservatively assumed that impact pile driving would be used during riser construction. Underwater sound pressure waves from pile driving may affect protected species in the project area, particularly marine mammals, many of which use sound to communicate and, for cetaceans (whales and dolphins), to echolocate. Echolocation is a biological form of sonar used to locate objects such as prey or predators. Responses to underwater sound by marine mammals may include disturbance (Level B Harassment) and injury (Level A Harassment) during construction of the riser and diffuser.

Underwater sound is evaluated in terms of dB relative to a measurement standard, typically a pressure wave with an amplitude of 1 microPascal (µPa). During pile driving, the size and type of pilings used affect the sound volume produced. Because underwater sound levels would differ for each construction activity, levels were estimated separately for impact pile driving of the jack-up barge piles, the inner riser casing, and the outer riser casing. Underwater sound impacts are presented on Figure 13-9. The quantified analysis of the underwater sound impacts on protected marine mammals and birds during construction activities associated with pile driving for the jack-up barge, inner casing, and outer casing is provided in Appendix 13-G.

For cetaceans, sound pressure levels could exceed the injury threshold of 180 dB_{RMS} within approximately 60 feet of the location of pile driving during stabilization of the jack-up barge. This construction activity is expected to last 10 hours per day on each of the five working days. During riser casing installation, the injury threshold for cetaceans could be exceeded within distances of approximately 430 feet for the inner riser casing and 630 feet for the outer riser casing, with impact driving occurring for 10 hours on each of the 15 days for each casing.

Disturbance occurs when animals are startled by underwater sound. The disturbance threshold for cetaceans is 150 dB_{RMS} and, therefore, disturbance could occur within 800 feet of the jack-up barge, within 1.1 miles of the inner riser casing, or within 1.6 miles of the outer riser casing during pile driving.

For pinnipeds, the injury threshold of 190 dB_{RMS} would not be exceeded during stabilization of the jack-up barge, though the injury threshold would be exceeded within distances of approximately 180 feet during the pile driving of the inner riser casing and 260 feet for the outer riser casing. The disturbance threshold for pinnipeds is 160 dB_{RMS}; therefore, pinnipeds would potentially be startled and disturbed when they are within approximately 330 feet of the jack-up barge pile driving, within 2,500 feet of the inner riser casing, and within 3,600 feet of the outer riser casing.

The California brown pelican, grebes, murres, and cormorants are diving birds that could be present during riser and diffuser construction. These birds would be underwater only briefly while diving for food. However, individuals have the potential to be injured by impact driving sound while underwater. The injury threshold of 180 dB_{PEAK} for diving seabirds is estimated to be exceeded within approximately 360 feet of the jack-up barge stabilization, 1,230 feet for the inner riser casing, and 1,800 feet for the outer riser casing. Once a bird has dove for food within these injury radii, it would be very difficult for them to change direction or surface quickly enough to avoid the acoustic impact. Therefore, at these anticipated underwater sound levels, birds may be injured. Like cetaceans, diving seabirds could be

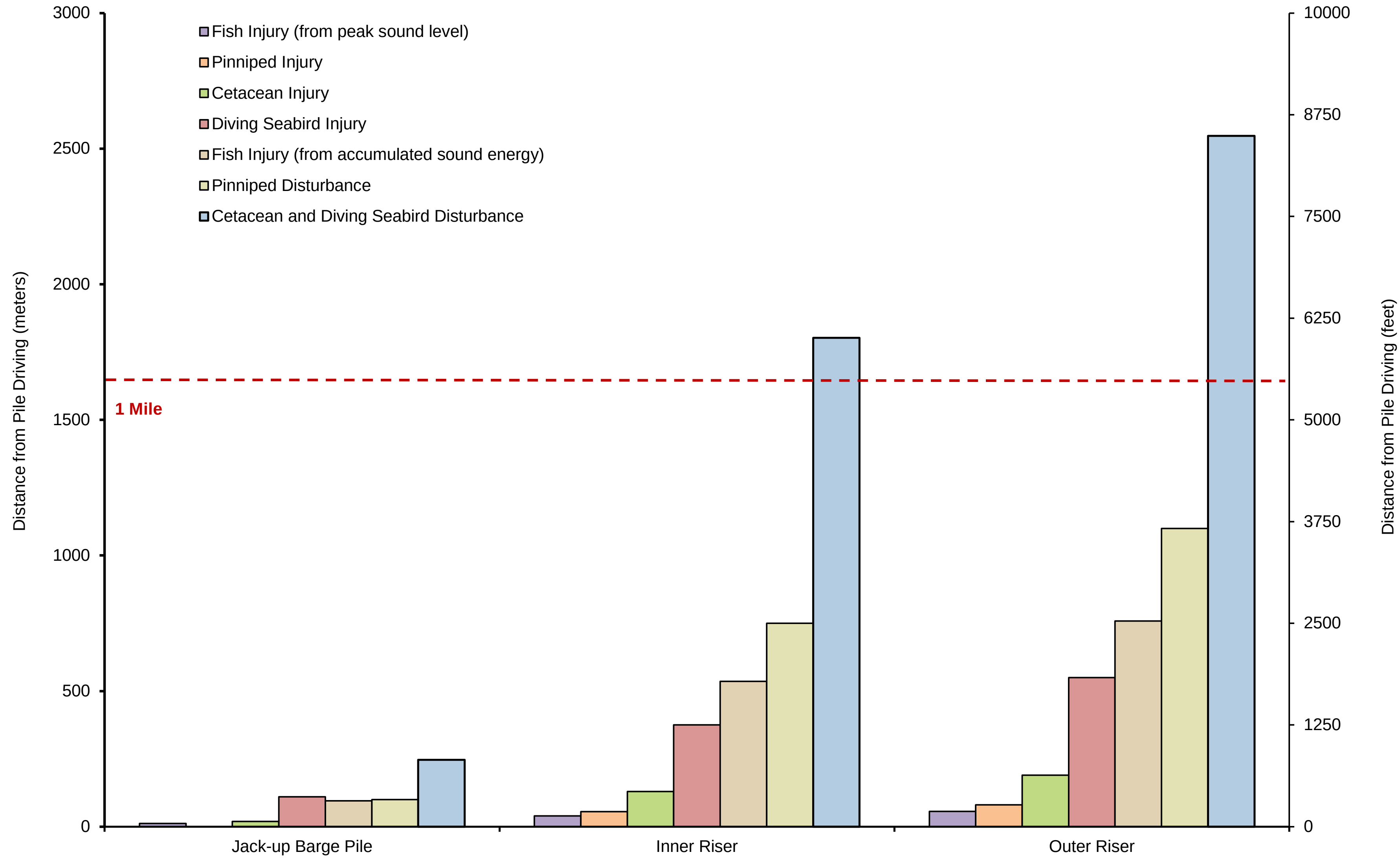


FIGURE 13-9

CLEARWATER Program

Noise Impacts Associated with Marine Construction Activities

Source: Sanitation Districts of Los Angeles County 2011 (Appendix 13-G) startled and disturbed when they are within approximately 800 feet of the jack-up barge pile driving, within 1.1 miles of the inner riser casing, and within 1.6 miles of the outer riser casing.

In conclusion, underwater sound generated by construction activities associated with pile driving could result in significant impacts on protected marine mammals and birds. Implementation of MM MAR-3h and MM MAR-3i would reduce impacts to less than significant.

The SP Shelf is located in a major shipping corridor. Approximately 70,000 inbound/outbound vessel trips were recorded in 2008 for the combined trips of the Ports of Los Angeles and Long Beach (Corps 2010). Sound levels produced by ships are roughly correlated to the ship's size and speed (Richardson et al. 1995). A study conducted to evaluate underwater sound levels produced by large ships indicates that levels at a reference distance of 3 feet are in the range of 157 to 182 dB re 1µPa for vessels traveling at 10 knots (11.5 mph) (Kipple and Gabriele 2007). Underwater sound produced by vessels, by ship length, is displayed on Figure 13-10 (Kipple and Gabriele 2007).

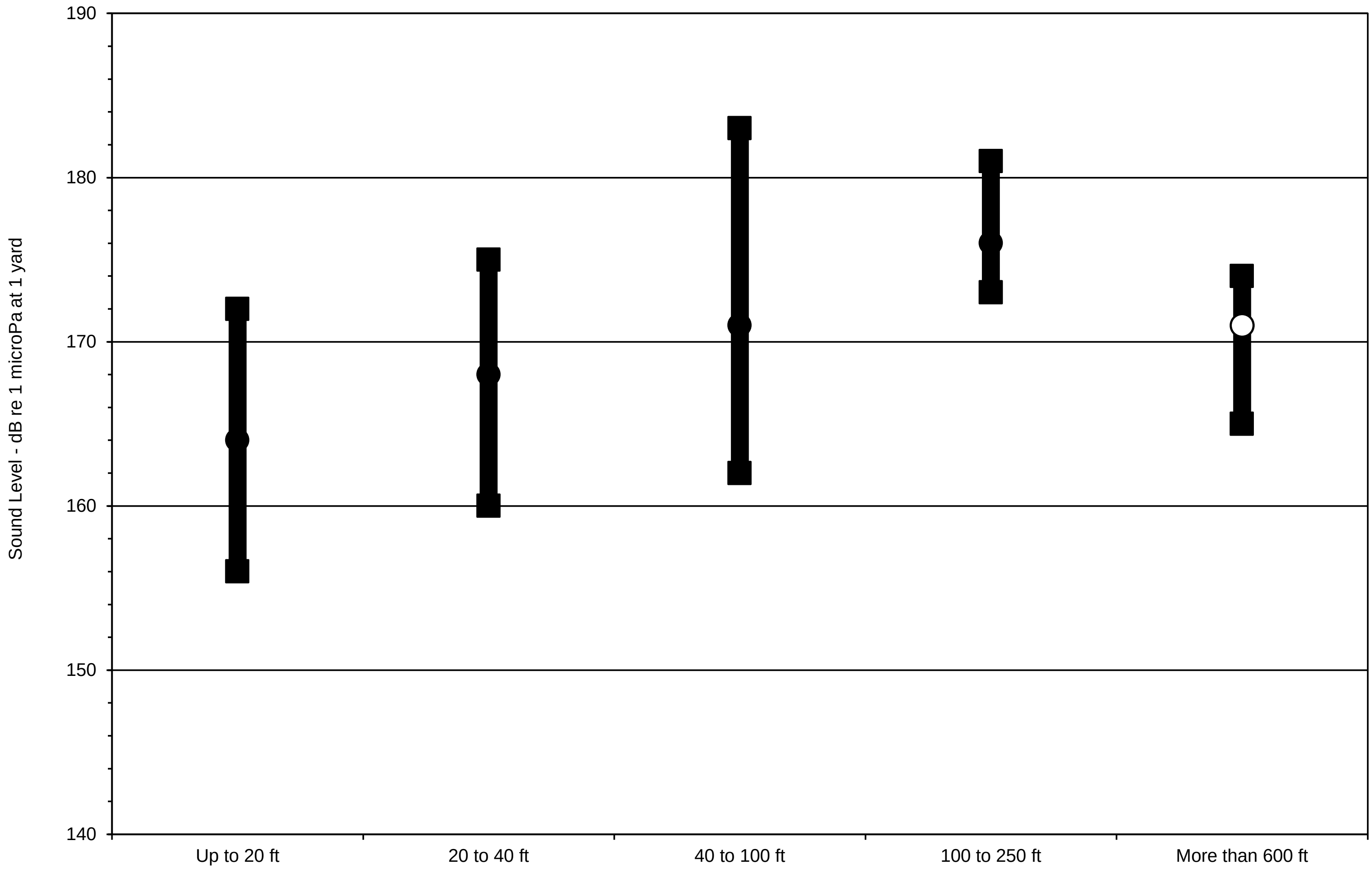
During the 3 years of project construction, there would be approximately 1,930 to 2,240 vessel round trips to the SP Shelf. Also, there would be approximately 135 one-way barge trips per year between the Port of Los Angeles and LA-2 or LA-3 to dispose of excavated material. The most intensive marine-related construction period would likely occur for a 2-year period during the construction of the riser and the construction of the offshore tunnel, assuming disposal of the excavated submarine tunnel material is at sea. During this time, approximately 900 vessel and barge round trips per year would occur. In the context of the approximately 70,000 existing inbound/outbound (one-way) vessel trips, the addition of approximately 900 round trips correspond to an increase of acoustical energy from vessels of approximately 1 percent. A 1 percent increase in acoustical energy corresponds to an increase of less than 1 dB. In humans, a 3 dB change is commonly accepted as a barely perceptible change with 1 dB being imperceptible. A single dB increase in the ambient underwater sound is similarly considered to be imperceptible to marine organisms. Accordingly, the introduction of project-related trips to the shipping corridor is not expected to change the underwater sound along the corridor. Therefore, underwater sound associated with the increased vessel traffic from construction activities would result in less than significant impacts on protected species.

Water Quality and Sediment Quality

The SP Shelf is not located within the DDT/PCB study area; therefore, construction would not affect sediment within this area.

Any marine mammals, sea turtles, or marine birds that forage underwater in the construction area could experience a change in foraging habitat associated with near-bottom or surface turbidity generated during construction activities. Seabirds could be affected by surface turbidity generated by construction activities, as described in Impact MAR-1. These birds forage by visually searching the ocean surface and diving for fish. Therefore, surface turbidity caused by construction activities could reduce their foraging effectiveness. However, seabirds using offshore waters forage over open water habitats throughout the entire SCB. Therefore, local surface turbidity would not substantially reduce foraging opportunities for seabirds.

Diving seabirds would not be impacted by subsurface turbidity because it would occur at depths near 200 feet. Cetaceans and pinnipeds are generally not benthic feeders, but rather are water column feeders. Although most local species are able to reach depths of 200 feet, they would not lose foraging opportunities as a result of near-bottom turbidity generated during construction. Gray whales, which are benthic feeders, feed nearshore typically at depths of less than 100 feet and feed only occasionally while migrating through the SCB. Gray whales may be observed in the SCB from December through May



Note: Based on the relationship between underwater sound level and speed indicated in Kipple and Gabrielle 2007, sound levels from vessels traveling at 12 knots are estimated to be 2 to 3 dB higher than sound levels for vessels traveling at 10 knots.

FIGURE 13-10

CLEARWATER Program

Range of 10-Knot Sound Levels by Vessel Category

Source: Kipple, Blair and Chris Gabriele, 2007

Underwater noise from skiffs to ships. Proceedings of the Fourth Glacier Bay Science Symposium. U.S. Geological Survey Alaska Science Center. Anchorage, Alaska.

during their northbound and southbound migrations. However, because gray whales feed nearshore, they would not be affected by the near-bottom turbidity at project depths. Finally, dredging and excavation activities would require a dredge permit from the Corps, and the permit would identify requirements to control discharge and the discharge plume. Accordingly, near-bottom turbidity generated by construction is not likely to affect protected species. Impacts would be less than significant.

NEPA Analysis

Environmental impacts would be the same as described for the CEQA analysis, and would occur for the duration of construction. With respect to the Corps' NEPA scope of analysis described in Section 3.5, the environmental impacts would be considered direct impacts.

Operation

CEQA Analysis

Once constructed, the new ocean discharge system would operate continuously, as described under Impact MAR-1. As discussed in Impact MAR-2, the discharge of effluent would not substantially change the composition or quality of the sediment on the SP Shelf. Change in migration patterns are discussed in Impact MAR-5.

Impacts on protected species associated with water quality could occur because of the operation of the diffuser. Nutrients and HABs have historically affected marine species. In 1991, large numbers of seabirds died as a result of a *Pseudo-nitzschia* bloom in Monterey Bay. In response, the state of California initiated a phytoplankton monitoring program (Appendix 13-B). In 1998, domoic acid was first linked to deaths in marine mammals (NOAA 2009). Mortality in protected species including sea otters, California brown pelicans, and a gray whale have been linked to domoic acid poisoning during periods of algal blooms, and high levels of domoic acid have been reported in blue and humpback whales (NOAA 2002, 2009). Since the late 1990s, the deaths of thousands of marine mammals, particularly pinnipeds, and sea birds have been attributed to domoic acid intoxication, and the frequency and severity of HABs appears to be increasing (Caron et al. 2010; NOAA 2009). At least six additional groups of toxins caused by phytoplankton are known to occur on the west coast, two of which have been linked to marine mammal mortality (Caron et al. 2010).

However, as discussed in Impact MAR-1, operation of the SP Shelf diffuser would not have the potential to affect the frequency or location of HABs. Furthermore, the diffuser's physical construction, location, and the existing conditions on the SP Shelf would not create pollution or contamination that would adversely affect protected species. Therefore, operational impacts on protected species would be less than significant.

NEPA Analysis

Environmental impacts would be the same as described for the CEQA analysis, and would occur for the operational life of the structure. With respect to the Corps' NEPA scope of analysis described in Section 3.5, the environmental impacts would be considered indirect impacts.

Riser/Diffuser Area – Existing Ocean Outfalls

Construction

CEQA Analysis

Construction activities for rehabilitation of the existing ocean outfalls are described in Impact MAR-1. Impacts are associated with temporary increases in the potential for collision with vessels; entanglement in cables and lines, rope, or other debris; exposure to turbidity and contaminated sediment; underwater sound; and removal of rocky habitat used by the black abalone.

Vessel Collisions

Impacts on protected species as a result of collisions with vessels working on the existing ocean outfalls would be similar to those described for construction on the SP Shelf. However, because there would be fewer vessel and barge trips during the 2-month rehabilitation work period, resulting in only a 1 percent increase in vessel trips over existing conditions, the likelihood of a collision would be less than that described for the SP Shelf. There would also be a somewhat different group of species potentially exposed to this hazard; with the exception of humpback and gray whales, large whales would not enter the shallow waters where rehabilitation work would be performed. Smaller cetaceans, pinnipeds, sea turtles, and a variety of marine birds could still be present. However, due to the limited vessel trips and shorter construction duration, impacts on these protected species would be less than significant.

Entanglement

Impacts on protected species from potential entanglement would be similar to those described for construction on the SP Shelf. However, there would be much less equipment, with fewer anchor lines, and a shorter construction duration, resulting in less chance of entanglement compared to the SP Shelf construction. Therefore, impacts would be less than significant.

Underwater Sound

No pile driving would be employed at this location; therefore, no underwater sound impacts on protected species would occur from pile driving. Impacts on protected species could occur as a result of underwater sound produced by vessels associated with construction activities. However, there would be fewer vessel trips associated with the existing ocean outfall rehabilitation activities as compared to the SP Shelf riser and diffuser construction activities. Furthermore, as described in Impact MAR-3, vessel trips would not generate underwater sound levels exceeding existing conditions. Therefore, protected species would not be harassed or harmed, and impacts from underwater sound would be less than significant.

Water Quality and Sediment Quality

As discussed in Impacts MAR-1 and MAR-2, rehabilitation of the existing ocean outfalls would result in subsurface and near-bottom turbidity. Surface turbidity may briefly and locally affect foraging by diving seabirds, chiefly (in this area) the California least tern and pelican, but abundant other foraging habitat is available nearby. Near-bottom turbidity generated by construction work may affect gray whale foraging, but gray whale prefer to feed in soft-bottom benthic sediments, and many other foraging areas of more preferred sediment type are available nearby on the PV Shelf. Elevated water column turbidity resulting from construction activities is expected to be short term and remain localized. Furthermore, the sediments on the existing ballast rocks around the rehabilitation work for the existing ocean outfalls (between 20- and 50-foot depths) are most likely sparse and of recent origin, and are not expected to be contaminated by DDT. Therefore, in consultation with the EPA, the rehabilitation work would not result in adverse impacts on the DDT area of concern (White pers. comm. 2010). Therefore, impacts would be less than significant.

Removal of Protected Species and Marine Habitat

Black abalone, which like all abalone live attached to hard substrate and rocks, is not a highly mobile species. Black abalone is known to occur to depths of about 30 feet off White Point. Rehabilitation of the existing ocean outfalls also would occur near these depths. Therefore, there is potential for loss of black abalone because of a change in habitat (e.g., rock removal and replacement) during construction.

The Sanitation Districts have not encountered black abalone on the existing ocean outfall pipes or ballasts during their routine maintenance and inspection activities (Sanitation Districts 2011a). Additionally, other surveys performed on the Palos Verdes Peninsula have not encountered black abalone on or around the existing ocean outfall pipes (Sanitation Districts 2011a). The CDFG has identified areas off Palos Verdes near the JWPCP outfalls as key locations for the recovery of black abalone, and NMFS recently designated the Palos Verdes Peninsula as critical habitat for the black abalone (CDFG 2005:6–27; NMFS 2011). Previous surveys and inspections have not detected the presence of black abalone and, therefore, this species is unlikely to occur on the existing ocean outfalls. However, construction could result in significant impacts because of the depth at which construction would occur and the fact that this area is designated by CDFG and NMFS as habitat for this species. Implementation of MM MAR-3j would reduce impacts to less than significant.

NEPA Analysis

Environmental impacts would be the same as described for the CEQA analysis, and would occur for the duration of construction. With respect to the Corps' NEPA scope of analysis described in Section 3.5, the environmental impacts would be considered direct impacts.

Operation

CEQA Analysis

Operation of the existing ocean outfalls are described in Impact MAR-1. Impacts are associated with water quality and black abalone habitat.

Water Quality

As noted in Impact MAR-1, operation of the outfalls is consistent with the terms of a valid NPDES permit, which incorporates consideration of beneficial uses of the affected waters. For the waters receiving outfall discharges, those beneficial uses include rare and endangered species, marine habitat, and fish migration, as well as other uses unrelated to Impact MAR-3. As discussed previously, the Sanitation Districts have a solid record of NPDES permit compliance. There is, therefore, little risk that outfall operations adversely affect protected species. Under this alternative, the outfalls would cease to be used routinely and would only be used temporarily in emergencies or during maintenance of the new ocean discharge system. The quality of treatment would be as good as or better than it is now, and any discharges would continue to be subject to the requirements of a current, valid NPDES permit. Therefore, impacts would be reduced in comparison with current conditions, and would be less than significant.

Removal of Protected Species and Marine Habitat

There would be no net loss of black abalone habitat or species once ballast rocks are replaced under operating conditions. Furthermore, ballast rocks would be considered suitable habitat for black abalone. Therefore, operating impacts would be less than significant.

NEPA Analysis

Environmental impacts would be the same as described for the CEQA analysis, and would occur for the operational life of the structure. With respect to the Corps' NEPA scope of analysis described in Section 3.5, the environmental impacts would be considered indirect impacts.

CEQA Impact Determination

Construction of the riser and diffuser on the SP Shelf and on the existing ocean outfalls for Alternative 1 (Project) could result in the substantial loss of individuals or the reduction of existing habitat of a state- or federally listed endangered, threatened, rare, protected, candidate, or sensitive plant or animal species or a species of special concern. Impacts under CEQA would be significant before mitigation. Operation of Alternative 1 (Project) would result in less than significant impacts.

Mitigation

Vessel Collisions

MM MAR-3a. Prepare and implement a collision protection plan to address sensitive and protected species. All construction personnel and boat operators will receive protected species training. The training will include review of the plan as well as identification of animals, species, and habitats potentially present in the project area.

MM MAR-3b. Restrict tugs, tugs with barges under tow, and large work vessels to speeds of 12 knots (14 miles per hour [mph]) or less at all times. Maneuverable single hull vessels such as crew or supply boats may proceed at speeds of 20 knots (23 mph) or less under most conditions, but will reduce speed to 12 knots or less when whales or sea turtles are reported in the project area.

MM MAR-3c. Immediately report all vessel collisions with marine mammals or sea turtles to the National Marine Fisheries Service.

Entanglement

MM MAR-3d. Limit the deployment of any material that has the potential to entangle marine mammals or sea turtles (e.g., anchor lines, cables, rope, other construction debris) to only as long as necessary.

MM MAR-3e. Remove as much slack as possible from any potentially entangling material to the point of not jeopardizing construction operations.

MM MAR-3f. Position temporary mooring buoys with heavy steel cables or chains to minimize potential entanglements.

MM MAR-3g. In the event that a marine mammal or sea turtle becomes entangled, immediately seek guidance from the National Marine Fisheries Service for safe disentanglement options.

Underwater Sound

MM MAR-3h. Implement a "soft start" method for all pile driving by operating the hammer at less than full capacity (i.e., approximately 40 to 60 percent energy levels) with no less than a 1-minute interval between each strike for a 5-minute period on initial driving for the day, or after a delay of 15 minutes between strikes.

MM MAR-3i. Prepare and implement a pile driving management plan. The plan will require that a National Marine Fisheries Service–approved observer be stationed on the work platform or work vessel to monitor the presence of sensitive marine species in the construction area on all days when pile driving is taking place. The observer will survey the project vicinity before pile driving is started and give approval before such work begins. The observer will continue to advise the construction crew throughout the day to modify or stop pile driving if a sensitive or protected species travels within injury distances

Removal of Protected Species (Black Abalone)

MM MAR-3j. Within 90 days prior to initiation of the rehabilitation work, survey the existing ocean outfall pipelines for black abalone at depths between the 15- and 55-foot isobaths in areas potentially affected by the work. The survey team will include divers/biologists experienced in locating abalone. If black abalone are determined to be present, consult with the National Marine Fisheries Service to develop a black abalone transplantation plan that includes the identification of a suitable nearby transplant location, temporary holding and transport methods, and reporting requirements. Implementation of the plan will occur no more than 30 days preceding the in-water rehabilitation activities and will be conducted by qualified divers/biologists.

Residual Impacts

Implementation of MM MAR-3a through MM MAR-3c for the SP Shelf construction would reduce the risk of vessel collisions with protected species. While these measures are primarily focused on reducing known impacts on marine mammals, they would also reduce the likelihood of impacts on sea turtles and seabirds. Residual impacts would be less than significant.

Implementation of MM MAR-3d through MM MAR-3g for the SP Shelf construction would reduce the likelihood of entanglement of protected species. Residual impacts would be less than significant.

Implementation of MM MAR-3h and MM MAR-3i for the SP Shelf construction would substantially reduce the potential for injury to individuals of a protected species as a result of underwater sound associated with pile driving. These measures would also lessen the likelihood of disturbance impacts, but because of the distances over which substantial underwater sound could be transmitted, harassment disturbance (Level B Harassment) remains possible. Harassment impacts would be short term and would not result in injury of individuals or reduction of existing habitat of a state- or federally listed endangered, threatened, rare, protected, candidate, or sensitive plant or animal species or a species of special concern. Residual impacts would be less than significant.

Implementation of MM MAR-3j for the existing ocean outfalls construction would reduce the potential for substantial loss of individual black abalone. Residual impacts would be less than significant.

NEPA Impact Determination

Construction of the riser and diffuser on the SP Shelf and on the existing ocean outfalls for Alternative 1 (Project) could result in the substantial loss of individuals or the reduction of existing habitat of a state- or federally listed endangered, threatened, rare, protected, candidate, or sensitive plant or animal species or a species of special concern. Construction impacts under NEPA would be significant before mitigation with respect to the No-Federal-Action Alternative (see Section 3.4.1.6). Operation of Alternative 1 (Project) would result in less than significant impacts.

Mitigation

Implement MM MAR-3a through MM MAR-3j.

Residual Impacts

Residual impacts would be less than significant, as described under the CEQA impact determination.

Impact MAR-4. Would Alternative 1 (Project) result in the substantial degradation or disruption of marine habitat or local biological communities?

Riser/Diffuser Area – San Pedro Shelf

Construction

CEQA Analysis

This analysis discusses non-protected marine biological resources, such as local biological communities and marine habitat. Local biological communities are strongly influenced by substrate (rock, sand, muddy sand, etc.) and small-scale morphology (bedforms, gullies) discussed in Impact MAR-2 and oceanographic and water quality conditions discussed in Impact MAR-1. In shallow areas, tides, waves, water temperature, and terrestrial inputs strongly influence the community composition of soft- and hard-bottom marine habitats. In deeper areas, physical oceanographic conditions are more uniform (e.g., uniform size and type of sediment); therefore, similar communities are found associated with similar sediment type over a generally greater depth range than what are found in shallow areas. However, depth and local oceanography remain important in deeper areas. Local biological communities and marine habitat present on the SP Shelf are discussed in Sections 13.2.1.5 and 13.2.2.1. Local biological communities generally include plankton, invertebrates, and fish. Marine habitat generally includes soft-bottom habitat, hard-bottom substrate, and designated EFH.

Construction of the SP Shelf riser and diffuser is described in Impact MAR-1. Potential construction impacts on local biological communities and the marine habitat that they rely on include: short-term increase in underwater sound levels during pile driving resulting in injury or disturbance to invertebrates and fishes; temporary increase in surface and subsurface turbidity affecting surface foraging habitat and near bottom habitat for invertebrates and fishes; reduction in DO at near bottom during the removal of the riser casing affecting invertebrates and fishes; damage to existing hard-bottom substrate resulting from anchor lines; conversion of soft-bottom substrate to hard-bottom substrate, resulting from the placement of diffuser legs on the seafloor, effecting EFH.

Underwater Sound

Underwater sound generated during SP Shelf construction is described in Impact MAR-3. Short-term increases in underwater sound impacts would result in the displacement, and possibly injury, of fishes in the water column and on or near the ocean floor. There is no designated regulatory injury threshold for fishes except for those protected under the federal ESA by NMFS. The injury threshold for fishes from peak sound levels (206 dB) would be exceeded at a distance of up to 40 feet during stabilization of the jack-up barge. This construction would take approximately 5 days. During riser installation, the peak injury threshold for fishes would be exceeded at distances of 130 to 185 feet. Injury to fishes from accumulated sound energy could occur within 315 feet of the pile driving for the jack-up barge, within 1,760 feet for impact driving of the inner casing, and within 2,490 feet for driving the outer casing (Figure 13-9). Most fishes would likely leave the immediate area of disturbance, although some may stay to feed on invertebrates released from the sediments (Anchor 2002:18–29). However, there would be no substantial disruption of SP Shelf fish communities because the affected area represents only a small proportion of the total available open water and near-bottom habitat on the SP Shelf. Implementation of MM MAR-4a and MM MAR-4b (same as MM MAR-3h and MM MAR-3i) would reduce the likelihood of disturbance or injury caused by underwater sound associated with pile driving to less than significant. As described under Impact MAR-3, impacts on fishes from vessel noise, which are expected to be minor and short term, would be less than significant.

Water Quality and Sediment Quality

As discussed in Impacts MAR-1 and MAR-2, construction activities on the SP Shelf could alter water and sediment quality, which would affect existing local biological communities by reducing foraging area, possibly releasing nutrients into the water column, or smothering existing benthic organisms with sediment. Mortality could also occur as a result of construction activities modifying the sediment quality and the habitat of the benthic organisms.

Planktonic organisms would be temporarily affected by turbidity in the water column. Turbidity can impact phytoplankton populations by lowering the light available for phytoplankton photosynthesis and by clogging the filter feeding mechanisms of zooplankton. Effects on phytoplankton would be short term and limited to the immediate vicinity of the dredging due to the rapid dispersal and settling out of the turbidity plume, as discussed in Impact MAR-1. Furthermore, phytoplanktonic organisms have a naturally occurring high mortality rate, and their reproductive rates are correspondingly high (Dawson and Pieper 1993), which allows for rapid recovery from small, localized impacts. Zooplankton would likely show localized declines but also would quickly recover because they share mobility and lifecycle characteristics with phytoplankton. Ichthyoplankton (lifecycle phases of fish) would likely not recover quickly because they are seasonally abundant and dependent on the phasing of lifecycles of individual fish species. However, impacts on phytoplankton, zooplankton, and ichthyoplankton are less than significant because construction would be short term and take place in a limited area. Thus, planktonic organisms on the SP Shelf would not be substantially disrupted.

Benthic and epifaunal (bottom dwelling) and demersal (bottom associated) marine species are adapted to life associated with specific bottom types and, on a finer scale, often show preferences among similar types of sediments. For example, species that burrow through or live in tubes within soft sediments (infauna) would not be found on exposed rocks, while those that form permanent attachments to hard surfaces would not be successful in a sand bed. Within these broader soft- and hard-bottom habitat types, there are further influences of sediment characteristics, so that different assemblages are found in fine sand and coarse sand bottoms, or on low-relief rock cobble versus a high-relief rocky reef. In addition, water depth, currents, and nutrient availability play important roles in bottom community characteristics. While benthic and epibenthic organisms located within the construction area would be subjected to temporary disturbances from turbidity and sediment resuspension and deposition generated by construction activities, the impacts associated with the construction activities would not be considered a substantial degradation or disruption of the communities due to their brevity and localized extent within a large area (tens of thousands of acres) of relatively uniform soft-bottom habitat.

Short-term lethal and sublethal effects that would occur during construction include direct mortality, arrested development, reduced growth, reduced ingestion, depressed filtration rate, and increased mucous secretion. Some organisms would be buried by settling sediments, while others would be able to move upward as the sediments accumulate (EPA 2009b:Ch 5) The SP Shelf has approximately 59,650 acres of soft-bottom habitat between depths of 100 and 400 feet (30 and 120 meters). As discussed in Appendix 13-A, the different depths within this area are common across the entire midshelf and support common communities of benthic and epibenthic organisms. The direct construction laydown area for the riser, diffuser, and roadbeds on the SP Shelf would be approximately 5 to 10 acres, which is less than 0.1 percent of the entire soft-bottom midshelf habitat of the SP Shelf. Therefore, although construction activities may cause mortality and sublethal effects on benthic and epibenthic communities at the work site during construction, the construction activities would not produce a substantial degradation or disruption to these common communities on the SP Shelf. Furthermore, effects of turbidity and sediment deposition on benthic habitat would be temporary, and the benthic and epibenthic communities that reside on the SP Shelf would recover.

Previous studies within the Port of Los Angeles and on the PV Shelf have examined the effects of sediment settling on benthic communities and recovery rates. Although there are some physical differences between the location of the Port of Los Angeles and the PV Shelf and the SP Shelf, the benthic communities are similar. Colonization of settled sediments by burrowing of buried residents or nearby organisms is expected to occur within hours or days following deposit, and later stage successional communities are expected within months to a year (MEC 1988:4-78 through 4-84). Similarly, the Palos Verdes Shelf Superfund Site Feasibility Study found that offshore habitat recolonization begins within days or weeks. Recovery to conditions similar to those found before disturbance were expected within months and almost certainly within 2 to 5 years based on the recolonization time of days to weeks measured in the study (EPA 2009b:6-21, 6-22). As a result, benthic and epibenthic communities would not be substantially disrupted or disturbed, and impacts would be less than significant.

Fishes in the water column and on or near the ocean floor in the construction area would be temporarily disturbed by the underwater construction activities as a result of turbidity. Studies have identified that most fishes would leave the temporary area of disturbance, although some may stay to feed on invertebrates released from the sediments (Anchor 2002:18–29). There are no unique habitats within the general vicinity of the construction area that would draw fishes to that area and that are not found elsewhere on the SP Shelf. As previously discussed, the construction area footprint on the SP Shelf would be no larger than 10 acres, or less than 0.1 percent of similar habitat otherwise available to fishes on the SP Shelf at depths of 100 to 400 feet (30 to 120 meters). Fishes would have other locations to feed and move away from the disturbance; therefore, the impacts would be less than significant.

Water column turbidity generated by construction activities is expected to be short term and stay localized. Therefore, impacts on benthic species and the food chain would be less than significant.

Marine Habitat

Dredging/grading and sidecasting would result in the disturbance of some soft-bottom organisms, as previously discussed; however, areas with sidecast sediments would be recolonized after disturbance and later stage successional communities are expected within months to a year (MEC 1988:4-78 through 4-84; EPA 2009b). Anchor lines and/or mooring lines could drag on the seafloor, temporarily disturbing soft-bottom habitat. In soft sediments on the SP Shelf, anchors or anchor/mooring lines could create large divots or furrows, disrupting benthic and epibenthic communities. Such disruptions to soft-bottom habitat are common because the SP Shelf riser and diffuser area is located within proximity of the shipping lanes to the Ports of Los Angeles and Long Beach. Furthermore, as previously discussed, the soft-bottom habitat would recolonize relatively quickly (MEC 1988:4-78 through 4-84; EPA 2009b).

As discussed in Section 13.2.2.1, kelp can be found in the White Point area at water depths ranging from approximately 40 to 70 feet. The proposed re-ballasting work would occur at water depths ranging between approximately 20 and 50 feet. Thus, there would be some overlap between the general work area and the kelp habitat from approximately 40 feet to 50 feet. As a result, re-ballasting activities could impact kelp growing on the outfall pipes and the adjacent rock ballast. However, the impact would be minimized because the proposed method of placing the new ballast rock ensures that the work would be limited to the existing footprint of the outfalls (i.e., pipeline and adjacent rock ballast). The impact would also be temporary because kelp would be able to recolonize the rock ballast upon completion of construction. Furthermore, replacement of rock ballast would increase hard substrate and thus benefit benthic habitat. Overall, direct and indirect impacts on kelp forests would be minimal and temporary. Therefore, impacts would be less than significant.

Hard-bottom substrates, including reefs, are much less common on the SP Shelf, but are known to occur at midshelf depths. There are different types of organisms that only live on hard-bottom substrates, and many are physically attached to the substrate (e.g., sea fans and cup corals). Patches of hard-bottom substrate can be located many miles apart. When this type of habitat is disturbed, recovery depends on the duration of disturbance and the distance from other similar habitat. Therefore, the recolonization of disturbed hard-bottom habitat can result in different community dominants than were found initially in the area. Because anchors and lines could alter low- or high-relief reefs, and disrupt the associated communities, substantial disruption of this type of habitat would be considered a significant impact requiring mitigation. Disruption of naturally occurring hard-substrate habitat that would likely occur during construction due to the anchor spreads would be considered a significant impact. MM MAR-4c would reduce these impacts to less than significant.

Construction of the riser and diffuser would include placement of ballast rock. This would result in soft-bottom habitat on the SP Shelf being replaced with natural and anthropogenic hard substrate. However, given the small amount of soft-bottom habitat disrupted (approximately 10 acres or less), and the availability of approximately 59,650 acres of similar habitat throughout the midshelf of the SP Shelf, this decrease is not considered substantial. Furthermore, because hard-bottom habitat is intermittent on the SP Shelf, the placement of the riser, diffuser, and rock ballast would actually provide additional hard-bottom habitat for species. There would be a net increase in hard-substrate habitat available as a result of construction of the riser and diffuser structure. Wastewater outfalls in Southern California essentially serve as artificial reefs, attracting surrounding fauna and resulting in higher abundance than soft-bottom communities (Allen and Moore 1976). Placement of bottom structures would result in less habitat for soft-bottom species, such as Dover sole and Pacific sanddab, and more habitat for structure-oriented species, or those that prefer a sand/structure interface. Soft-bottom infauna and epifauna would be replaced by hard-substrate epifauna and attached invertebrates, resulting in a community similar to that found on naturally occurring hard structures at similar depths in the SCB. Therefore, impacts on marine habitat would be less than significant.

Essential Fish Habitat

A complete EFH assessment was prepared for Alternative 1 (Project) and is included in Appendix 13-C. The construction of the riser and diffuser would have no effect on the managed species that do not occur on the SP Shelf, and minimal effects on those that do. Riser placement, dredging/grading, and placement of ballast rock could affect the managed fish/invertebrate species that occur on the SP Shelf through habitat disturbance, turbidity, suspension of contaminants from sediments, and underwater sound. These effects would be temporary, occurring at intervals lasting approximately 3 years during the in-water construction period, with a general return to baseline conditions between construction activities and following construction, resulting in little disturbance to individuals or to EFH from construction.

There would be a decrease of soft-bottom habitat on the SP Shelf and an increase in hard structure. Placement of bottom structures would result in less habitat for soft-bottom species, such as recreationally important Dover sole and Pacific sanddab. However, given the small amount of soft-bottom habitat disrupted (approximately 10 acres or less) and the availability of similar habitat throughout the SP Shelf (approximately 59,650 acres between 100- and 400-foot [30- and 120-meter] depth), this decrease is not considered substantial. Furthermore, placement of the riser and diffuser structure would result in an increase in hard-bottom habitat, which would be a net increase in more desirable and less available habitat on the SP Shelf. Thus, more habitat for structure-oriented species, or those that prefer sand/structure interface, would be available. Accordingly, impacts on EFH from riser and diffuser construction would be less than significant.

NEPA Analysis

Environmental impacts would be the same as described for the CEQA analysis, and would occur for the duration of construction. With respect to the Corps' NEPA scope of analysis described in Section 3.5, the environmental impacts would be considered direct impacts.

Operation

CEQA Analysis

Operation of the SP Shelf diffuser is described in Impact MAR-1. The treated effluent discharged from the new ocean discharge system would have the same physical properties as the discharge from the existing ocean outfalls because the dilution would be the same, if not better. Impacts on local biological communities and marine habitat that could be affected by the operation of the new ocean discharge system include: change in nutrients being discharged and resulting in an increased risk of HABs to plankton and fish habitat; change in water quality and sediment quality resulting in a change to local biological communities and marine habitat, including EFH.

Nutrients and Harmful Algal Blooms

As discussed in Section 13.2.1.5, HABs can result in the production of toxins at levels that can affect local biological communities by bioaccumulating in species' tissue and causing illness and death in higher food chain animals (Appendix 13-B). The potential linkage between JWPCP effluent discharge and HABs is evaluated in Impact MAR-1 and was found unsupported by evidence. Operational volumes, effluent quality, and mass emissions discharged through the proposed SP Shelf discharge would be similar to existing conditions discharged on the PV Shelf at the existing ocean outfalls, and discharge depths and predicted trapping depths are comparable with the existing JWPCP effluent discharge site. Therefore, it is unlikely that relocating the JWPCP discharge would cause any change in frequency or distribution of HABs in the SCB (Appendix 13-B). Impacts on local biological communities and habitat would be less than significant.

Water Quality and Sediment Quality

Water and sediment quality can have effects on local biological community composition and density. As described in the project setting, there are common/similar biological communities on the SP and PV Shelves, and within the influence of the current discharge at the existing ocean outfalls' location. Local biological communities are largely distributed by depth ranges. Fish and benthic invertebrate communities within proximity of the current discharge are representative of unimpacted, or reference, communities, despite legacy contaminants (DDT and PCB) that still persist on the PV Shelf (Sanitation Districts 2008b). These communities were originally altered and reduced primarily due to the discharge of organically enriched suspended solids and to a lesser extent other contaminants such as DDT/PCBs in the 1970s. However, a normal epibenthic community was reestablished on the PV Shelf by 1980, and today the infaunal community is generally representative of other locations on the PV Shelf. Currently, the health of fishes and invertebrates within proximity of the existing discharge is considered excellent, with no diseases or anomalies evident in invertebrates and no disease in fishes (Sanitation Districts 2008b:6.20).

In Southern California, municipal dischargers have been discharging in the same general locations for many years, in some cases for decades, such as the Sanitation Districts' existing ocean outfalls on the PV Shelf. As a result, despite improvements in treatment and discharge quality, the legacy of historic contamination makes it difficult to determine if impacts on local biological communities are indicative of current or historic inputs. In 1993, however, the city of San Diego PLWTP began operation of an extension of their ocean outfall system in an area of the continental shelf that had not previously been subject to discharge of treated municipal waste (City of San Diego 2009:1–4). In preparation of the new outfall, the city conducted a 2.5-year baseline study to characterize the background environmental conditions prior to the initiation of effluent discharge. The PLWTP effluent is a mixture of advanced primary and secondary treated wastewater, which is of lower quality than current secondary treatment levels at the JWPCP. In 2008, after 15 years of discharge, studies found that outside of some changes in the infauna community near the discharge in the ZID, the infaunal assemblages in the region have remained similar to those found prior to effluent discharge and to natural communities characteristic of similar habitats elsewhere on the continental shelf of the SCB. Similarly, trawl surveys found no indications of effects of the discharge on either the demersal fish or epifaunal invertebrate communities in the region, or in levels of contaminants found in local fish tissues. Therefore, 15 years of data have shown a new discharge location, with no legacy effects and a treatment level lower than that of the JWPCP, has no effects on local biological communities.

The local biological communities on the PV and SP Shelves are similar in terms of species diversity and type, regardless of the fact that the existing ocean outfalls discharge at the PV Shelf. Furthermore, no effects on the local biological communities were found in relation to treated effluent discharges in other areas studied in Southern California with similar characteristics to the SP Shelf. Therefore, impacts related to a discharge of treated effluent on the SP Shelf would be less than significant to local communities.

Essential Fish Habitat

A complete EFH assessment for Alternative 1 (Project) is included in Appendix 13-C. As discussed in Impacts MAR-1 and MAR-3, operational volumes and effluent quality discharged on the SP Shelf would be similar to existing conditions, and discharge depths and predicted trapping depths are comparable to the existing JWPCP discharge site. Therefore, the operation of the riser and diffuser would have no effect on EFH on the SP Shelf.

NEPA Analysis

Environmental impacts would be the same as described for the CEQA analysis, and would occur for the operational life of the structure. With respect to the Corps' NEPA scope of analysis described in Section 3.5, the environmental impacts would be considered indirect impacts.

Riser/Diffuser Area – Existing Ocean Outfalls

Construction

CEQA Analysis

Rehabilitation of the existing ocean outfalls is described in Impact MAR-1. Potential construction impacts on local biological communities and the marine habitat that they rely on are the same as those described for construction on the SP Shelf.

Underwater Sound

Rehabilitation of the existing ocean outfalls would not involve pile driving. Therefore, there would be no underwater sound impacts on local biological communities or marine habitat due to pile driving. A description of the vessels used during rehabilitation of the existing ocean outfalls is provided in Chapter 3. Vessel sound does not have the potential to exceed thresholds for harm to or disturbance of fishes, and, moreover, as discussed in Impact MAR-3, would not materially affect ambient high underwater sound levels attributable to heavy port traffic. Therefore, underwater sound impacts associated with increased vessel traffic from construction activities would be less than significant.

Water Quality and Sediment Quality

As discussed in Impacts MAR-1 and MAR-2, rehabilitation of the existing ocean outfalls would result in subsurface and near-bottom turbidity. Elevated water column turbidity resulting from construction activities is expected to be short term and remain localized. Furthermore, the sediments on the existing ballast rocks around the rehabilitation work for the existing ocean outfalls (between 20- and 50-foot depths) are most likely sparse and of recent origin, and are not expected to be contaminated by DDT. Therefore, impacts would be less than significant.

Marine Habitat

Impacts on fishes and invertebrates, including attached algae that inhabit the ballast rock surrounding the existing ocean outfalls, would occur as additional ballast rock is added. Organisms could be smothered or crushed. As discussed previously for the SP Shelf construction, recovery depends on the duration of disturbance and the distance from other similar habitat, as well as the season of disturbance

(Dayton et al. 1984; Dayton et al. 1992; Ebling et al. 1985). In the area of the new ballast rock, the work area would be immediately adjacent to the existing ballast rock community; therefore, the distance between the disturbed community and the recruitment community to recolonize the ballast rock after disturbance would be short. The existing ballast rock community would provide a source of recruits of the type found on the rocks before removal. Therefore, the new ballast rock is expected to be recolonized rapidly by a community similar to that found on the rocks initially. Impacts would be less than significant.

Essential Fish Habitat

A complete EFH assessment is included in Appendix 13-C. The entire PV Shelf is within the designated area of EFH. The rehabilitation of the existing ocean outfalls would have no effect on the managed species that do not occur on the PV Shelf, and minimal effects on those that do. Rehabilitation could affect the managed fish/invertebrate species that occur on the PV Shelf through habitat disturbance, turbidity, suspension of contaminants from sediments associated with underwater construction, and underwater sound. These effects would be temporary, occurring at intervals lasting up to approximately 9 months during the in-water construction period, with a general return to baseline conditions between construction activities and following construction. It is expected that few, if any, individual fish would be lost because most individuals would avoid the work area, resulting in little disturbance to individuals or to EFH from construction. Therefore, impacts would be less than significant.

NEPA Analysis

Environmental impacts would be the same as described for the CEQA analysis, and would occur for the duration of construction. With respect to the Corps' NEPA scope of analysis described in Section 3.5, the environmental impacts would be considered direct impacts.

Operation

CEQA Analysis

As discussed in Impact MAR-1, rehabilitation of the existing ocean outfalls would allow for the temporary use of the existing ocean outfalls during emergency situations or maintenance of the new ocean discharge system on the SP Shelf. Operations would not occur if the new ocean discharge system on the SP Shelf were operating. Therefore, the volume of discharge would be reduced compared to existing conditions.

Water Quality and Sediment Quality

As noted in Impacts MAR-1 and MAR-3, water and sediment quality are influenced by discharges and in turn affect local biological community composition and density. As described in the project setting, there are common/similar biological communities on the SP and PV Shelves, and within the influence of the current discharge at the existing ocean outfalls' location. Fish and benthic invertebrate communities within proximity of the current discharge are representative of unimpacted, or reference, communities, despite legacy contaminants (DDT and PCB) that still persist on the PV Shelf (Sanitation Districts 2008b). These communities were originally altered and reduced primarily due to the discharge of organically enriched suspended solids and to a lesser extent other contaminants such as DDT/PCBs in the 1970s. However, a normal epibenthic community was reestablished on the PV Shelf by 1980, and today the infaunal community is generally representative of other locations on the PV Shelf. Currently, the health of fishes and invertebrates within proximity of the existing discharge is considered excellent, with no diseases or anomalies evident in invertebrates and no disease in fish (Sanitation Districts 2008b:6.20). Accordingly, conditions at the existing discharge support a conclusion of no significant adverse impacts on marine communities. Under Alternative 1 (Project), operation of the existing ocean outfalls would be further reduced. Therefore, impacts would be less than significant.

Essential Fish Habitat

Discharge through the rehabilitated existing ocean outfalls would be temporary and intermittent during operating conditions. Ongoing studies of the current ocean outfalls indicate fish communities in the vicinity of the ocean outfalls are representative of reference conditions (see Appendix 13-C and Impacts MAR-1 and MAR-2). Therefore, the temporary resumption of discharge from the existing ocean outfalls would not result in a degradation of fish habitat in the area. Overall, impacts on EFH as a result of the operation of the existing ocean outfalls would be less than significant.

NEPA Analysis

Environmental impacts would be the same as described for the CEQA analysis, and would occur for the operational life of the structure. With respect to the Corps' NEPA scope of analysis described in Section 3.5, the environmental impacts would be considered indirect impacts.

CEQA Impact Determination

Construction of the riser and diffuser on the SP Shelf for Alternative 1 (Project) could result in the substantial degradation or disruption of marine habitat or local biological communities. Impacts under CEQA would be significant before mitigation. Operation of Alternative 1 (Project) would result in less than significant impacts.

Mitigation

Underwater Sound

Implement MM MAR-4a and MM MAR-4b (same as MM MAR-3h and MM MAR-3i).

Marine Habitat

MM MAR-4c. Prepare and implement an anchoring plan prior to in-water construction activities in accordance with the U.S. Army Corps of Engineers' permitting requirements. The plan will identify deployment methods for anchors, lines, cables, and moorings to minimize damage to hard-bottom substrate.

Residual Impacts

Residual impacts would be less than significant. Compliance with MM MAR-4c would identify the location of hard substrate and would avoid the hard-substrate habitat, thereby reducing impacts to less than significant. Other impacts also would be less than significant. See residual impacts discussion under Impact MAR-3.

NEPA Impact Determination

Construction of the riser and diffuser on the SP Shelf for Alternative 1 (Project) could result in the substantial degradation or disruption of marine habitat or local biological communities. Impacts under NEPA would be significant before mitigation with respect to the No-Federal-Action Alternative (see Section 3.4.1.6). Operation of Alternative 1 (Project) would result in less than significant impacts.

Mitigation

Implement MM MAR-4a and MM MAR-4b (same as MM MAR-3h and MM MAR-3i) and MM MAR-4c.

Residual Impacts

Residual impacts would be less than significant, as described under the CEQA impact determination.

Impact MAR-5. Would Alternative 1 (Project) interfere with the movement/migration corridors of marine biota?

Riser/Diffuser Area – San Pedro Shelf

Construction

CEQA Analysis

As discussed in Section 13.2.1.5 and Appendix 13-A, several marine species migrate through the SCB, including birds, marine mammals, sea turtles, and fishes. Some of the construction activities could affect the migration of these species.

Birds

Seasonality of seabird and shorebird species in the SCB is discussed in Appendix 13-A. Migrating birds that visit or pass through the project area would not be affected because construction activities on the surface of the ocean would not impede or disrupt their movement.

Whales

Each year, the majority of the gray whale population migrates from feeding grounds in Arctic seas to mating and calving grounds in the coastal lagoons of Baja California and the Gulf of California and back again. From late fall through winter, gray whales travel south from the Arctic to Mexico, usually leaving the Bering Sea between late October and early January (Bonnell and Dailey 1993). The southbound gray whales begin arriving in the SCB in mid-December, and some small portion of the gray whale population is known to calve in SCB waters (Dohl et al. 1981). In Southern California, gray whales are seen up to 125 miles from shore, although about half travel within 7 miles of the shoreline (Bonnell and Dailey 1993; MBC 1989). Southbound whales follow one of three general routes: a nearshore route that closely follows the mainland except around Santa Barbara and Santa Monica Bay, an inshore route that passes through the Channel Islands, and an offshore route that follows an undersea ridge offshore of the Channel Islands. Individuals on the nearshore or inshore routes may use part of either route during their southbound migration. Calving takes place from January through March, after which the northbound migration begins. The northbound migration routes through the SCB do not differ substantially from the southbound routes, again with about half the population found nearshore. Gray whales feed only occasionally during their migration, though observations of nearshore feeding in the SCB during migration have been reported. Humpback whales are also present in the SCB from March through June and from September through December. In these months, however, sightings are uncommon and widespread (Bonnell and Dailey 1993).

Blue, fin, and sei whales also migrate through the SCB annually between June and September along a path that follows the continental slope well offshore of the project area (Bonnell and Daily 1993). Blue whales have become increasingly common in nearshore waters of the SCB (Barlow 1994). Eastern north Pacific blue whales may be found from the Gulf of Alaska to the eastern tropical Pacific, and possibly as far west as Wake Island (Carretta et al 2009:175). Most of the population is thought to migrate south in winter to highly productive feeding grounds in the Gulf of California and off of Costa Rica. The west coast of North America, including the SCB, is considered an important feeding area for blue whales in summer and fall. Not much is known about the distribution of fin whales, and while aggregations occur year-round off southern and central California, their abundance appears to be lower in winter and spring, suggesting that the population migrates seasonally outside of coastal waters (Carretta et al. 2009:181).

Minke whales are present in the SCB year-round, though their abundance varies. Most sightings have been in the vicinity of the Channel Islands or seaward; however, minke whales have been known to occur in the San Pedro Channel between Santa Catalina Island and Palos Verdes Point in late spring and early summer (Bonnell and Dailey 1993).

Construction on the SP Shelf is described under Impact MAR-1. Impact MAR-3 identifies impacts on whales associated with vessel collisions, entanglement, and underwater sound. The implementation of MM MAR-5a through MM MAR-5g (same as MM MAR-3a through MM MAR-3g) would reduce impacts on protected marine mammals, such as the whales described. These measures would reduce vessel collision and entanglement impacts to less than significant for any whale that migrates through the SP Shelf riser and diffuser area.

Pile driving associated with the jack-up barge and the installation of the inner and outer casings would produce underwater sound levels potentially disturbing or injuring marine mammals. Construction of the SP Shelf riser would last approximately 2 years, and likely start in 2019 and end in 2021. During this time, pile driving would likely occur in the fall of 2019 over approximately 5 days for the jack-up barge and over approximately 15 days for each casing (for a duration of approximately 30 days). Therefore, pile driving could occur during the gray whale southward migration along nearshore routes. Because elevated underwater sound levels would occur within the nearshore migration corridor, construction activities would result in a significant impact on gray whale migration. Implementation of MM MAR-5h and MM MAR-5i (same as MM MAR-3h and MM MAR-3i) would reduce impacts on migrating gray whales to less than significant.

Sea Turtles

The green turtle, loggerhead turtle, leatherback turtle, and olive ridley sea turtle all have broad, international geographic ranges and are highly migratory, as discussed in Section 13.2.1.5 and Appendix 13-A. All of these species are encountered on an occasional basis in the SCB, primarily during warmer summer months. However, they generally do not mass migrate as whales do, and their migration routes are typically located far offshore. Based on this evidence, migration of turtles would not be impeded and their movement would not be disrupted during construction based on planned construction timing for underwater sound impacts (to occur in fall 2019).

Fishes

Underwater sound generated specifically by pile driving construction activities could impact fishes, as discussed in Impact MAR-4. As discussed in Section 13.2.1.5, the migration of various fish species to inshore areas of the SCB occurs seasonally, in the spring and summer. Pile driving would occur on the SP Shelf in the fall of 2019. Fishes would not be disrupted during their movement because the underwater sound associated with construction on the SP Shelf would not occur during migration times.

NEPA Analysis

Environmental impacts would be the same as described for the CEQA analysis, and would occur for the duration of construction. Baseline conditions would resume upon termination of construction. With respect to the Corps' NEPA scope of analysis described in Section 3.5, the environmental impacts would be considered direct impacts.

Operation

CEQA Analysis

Operation of the SP Shelf diffuser is described in Impact MAR-1 and is not expected to impede or disrupt the movement or migration of any whale, turtle, or fish species. There are a number of permanent structures in the ocean and on the seafloor, including other ocean outfalls on the seafloor; oil and natural gas rigs that extend from the seafloor to the ocean surface; and fiber optic lines, which extend along the seafloor. None of these permanent structures impede the migration or movement of whales or fishes because these species are able to negotiate around the structures. The SP Shelf diffuser would be located on the seafloor of the shelf in waters approximately 200 feet deep and would be covered with ballast rock. It would be no more intrusive than the existing ocean outfalls or other permanent ocean structures. Furthermore, as demonstrated in Impacts MAR-1 and MAR-3, the treated effluent plume would maintain water quality on the shelf and thus has no potential to impact migrating species. Therefore, operation of the new ocean discharge system would not interfere with movement or migration corridors of marine biota, and impacts would be less than significant.

NEPA Analysis

Environmental impacts would be the same as described for the CEQA analysis, and would occur for the operational life of the structure. With respect to the Corps' NEPA scope of analysis described in Section 3.5, the environmental impacts would be considered indirect impacts.

Riser/Diffuser Area – Existing Ocean Outfalls

Construction

CEQA Analysis

The analysis for the construction on the SP Shelf regarding birds, sea turtles, and fishes would be the same for the rehabilitation of the existing ocean outfalls. As described previously, gray whales migrate through the SCB twice per year, traveling south from late fall though winter and north again in spring. Gray whales, including cow/calf pairs, may pass the existing ocean outfalls seasonally. Additionally, bottlenose dolphins have a large seasonal variation in abundance, which suggests some portion of the population migrates through the SCB. In the SCB, there are two distinct populations of this species: the coastal population and the offshore population (Carretta et al. 2009). The coastal population generally inhabits waters within approximately 3,200 feet of the mainland shore, while the offshore population inhabits both nearshore and offshore waters extending out beyond the Channel Islands (Bonnell and Dailey 1993). Therefore, gray whale and bottlenose dolphin migration could be affected by nearshore work on the existing ocean outfalls.

Impacts on these protected species would be less than significant regarding vessel collisions and entanglement as discussed under MAR-3. This is due to limited vessel trips and short construction duration for the rehabilitation of the existing ocean outfalls. Rehabilitation of the existing ocean outfalls would not involve pile driving; therefore, there would be no impact on protected migrating species due to pile driving. The introduction of project-related vessel trips nearshore and shipping corridors is not expected to change the underwater sound environment in any meaningful way as discussed in MAR-3; therefore underwater sound impacts on protected migrating species would be less than significant. Impacts on protected migrating species would be less than significant.

NEPA Analysis

Environmental impacts would be the same as described for the CEQA analysis, and would occur for the duration of construction. Baseline conditions would resume upon termination of construction. With respect to the Corps' NEPA scope of analysis described in Section 3.5, the environmental impacts would be considered direct impacts.

Operation

CEQA Analysis

Operation of the rehabilitated existing ocean outfalls is described in Impact MAR-1. Current operation of the existing ocean outfalls does not physically impede the migration of species. The rehabilitated existing ocean outfalls would not physically be altered and would, by operating infrequently, produce a lower volume of effluent. As discussed in Impacts MAR-1 and MAR-3, the current operation of the existing ocean outfalls meets all water quality standards, and the rehabilitation would not alter the nature of the treated effluent discharged. Therefore, migrating species would not be impacted by water quality of the treated effluent released from the rehabilitated existing ocean outfalls. Impacts would be less than significant.

NEPA Analysis

Environmental impacts would be the same as described for the CEQA analysis, and would occur for the operational life of the structure. With respect to the Corps' NEPA scope of analysis described in Section 3.5, the environmental impacts would be considered indirect impacts.

CEQA Impact Determination

Construction of the riser and diffuser on the SP Shelf for Alternative 1 (Project) could interfere with the movement/migration corridors of marine biota. Impacts under CEQA would be significant before mitigation. Operation of Alternative 1 (Project) would result in less than significant impacts.

Mitigation

Vessel Collisions

Implement MM MAR-5a through MM MAR-5c (same as MM MAR-3a through MM MAR-3c).

Entanglement

Implement MM MAR-5d through MM MAR-5g (same as MM MAR-3d through MM MAR-3g).

Underwater Sound

Implement MM MAR-5h and MM MAR-5i (same as MM MAR-3h and MM MAR-3i).

Residual Impacts

Residual impacts would be less than significant. See the residual impacts discussion under Impact MAR-3.

NEPA Impact Determination

Construction of the riser and diffuser on the SP Shelf for Alternative 1 (Project) could interfere with the movement/migration corridors of marine biota before mitigation. Impacts under NEPA would be significant before mitigation with respect to the No-Federal-Action Alternative (see Section 3.4.1.6). Operation of Alternative 1 (Project) would result in less than significant impacts.

Mitigation

Implement MM MAR-5a through MM MAR-5i (same as MM MAR-3a through MM MAR-3i).

Residual Impacts

Residual impacts would be less than significant, as described under the CEQA impact determination.

Impact MAR-6. Would Alternative 1 (Project) adversely affect public health?

Riser/Diffuser Area – San Pedro Shelf

Construction

CEQA Analysis

Impact MAR-6 addresses the operation of the new ocean discharge system on the SP Shelf; therefore, construction is not analyzed for this threshold.

Operation

CEQA Analysis

The Sanitation Districts have discharged treated effluent off the Palos Verde Peninsula for over 73 years. The annual volume of effluent discharged to the ocean from the JWPCP has remained relatively steady (averaging less than 350 MGD) since 1971 (Sanitation Districts 2008b). The JWPCP has been extensively modified over the years to improve effluent quality. As a result of full secondary effluent treatment and improved solids handling, the amount of suspended solids discharged to the ocean has been reduced by 96 percent from the quantity discharged in 1971. Approximately 97 percent of the solids entering the JWPCP each day are removed before the effluent is discharged to the ocean. Also, aggressive industrial pretreatment measures and more effective treatment and operational strategies have resulted in a dramatic decline in trace contaminants in the effluent since the 1970s.

The Sanitation Districts' JWPCP Biennial Receiving Water Monitoring Report for 2008-2009 (Sanitation Districts 2010a) shows that throughout 2009, the effluent discharge from the JWPCP has complied with California Ocean Plan standards. Over the past three decades, the improvements in effluent quality and, hence, benthic habitat quality, have resulted in positive changes in the demersal fish and invertebrate assemblages off Palos Verdes.

Compliance monitoring data for the JWPCP wastewater discharges between 1998 and 2009 indicate that the Sanitation Districts have consistently complied with the effluent limitations of the RWQCB WDR Order and NPDES permit, with the exception of a single observation of waste of sewage origin in 1999, and two exceedances of effluent daily maximum settleable solids limitations (one in 2000 and one in 2001) (Sanitation Districts 2010c:1-1; Appendix 13-E).

Meeting the receiving water quality objectives of the California Ocean Plan and NPDES permit is a fundamental component of the overall ocean discharge system diffuser selection and evaluation process for the SP Shelf. This water quality control plan for the ocean waters of California regulates discharge of waste to the ocean by setting limits or levels for water quality parameters to provide reasonable protection of beneficial uses. The discharger of waste to ocean waters of California must not cause a violation of these objectives. These standards include bacterial characteristics to protect water contact recreation and shellfish that may be harvested for human consumption from bacterial contamination; therefore, they provide protection to human health. Furthermore, the NPDES permit also provides limitations on the discharge to ensure that beneficial uses of the receiving waters are protected, including beneficial uses which involve a level of protection to human health (e.g., direct contact with water).

The JWPCP tunnel and ocean outfall feasibility report (Parsons 2011) stated that the following objectives should be considered in the outfall design:

- Satisfy or exceed existing permit requirements
- Assure no significant effects on other regional discharges
- Improve the receiving water quality – no deterioration of receiving water quality
- Maintain a submerged plume – no increase in surfacing of the effluent

As discussed in Impact MAR-1, the proposed SP Shelf diffuser is being designed to meet the receiving water standards of the California Ocean Plan as well as the requirements of the JWPCP's existing RWQCB WDR order and NPDES permit. With compliance with these standards and requirements, there would be no adverse effect on the public using beaches or the ocean for recreational or commercial fishing purposes associated with the release of effluent at the SP Shelf. The Sanitation Districts would continue to monitor the performance of the ocean discharge system for conformance with the California Ocean Plan and NPDES requirements. Furthermore, the discharge of treated effluent would occur at a depth of 200 feet approximately seven miles off the coast of Southern California. People would have no direct or indirect contact with the effluent plume at this depth and distance and thus adverse effects on public health would not occur. Therefore, impacts would be less than significant.

NEPA Analysis

Environmental impacts would be the same as described for the CEQA analysis, and would occur for the operational life of the structure. With respect to the Corps' NEPA scope of analysis described in Section 3.5, the environmental impacts would be considered indirect impacts.

Riser/Diffuser Area – Existing Ocean Outfalls

Construction

Impact MAR-6 addresses the operation of the rehabilitated existing ocean outfalls; therefore, construction is not analyzed for this threshold.

Operation

CEQA Analysis

As previously discussed, the Sanitation Districts have been discharging treated effluent into the Pacific Ocean for over 73 years, and the annual volume of discharge has remained relatively constant (Sanitation Districts 2006). The rehabilitated existing ocean outfalls would only be used temporarily in emergencies or during maintenance of the new ocean discharge system; therefore, the overall volume discharged from the existing ocean outfalls would decrease. Potential impacts from emergency use or temporary maintenance of the existing ocean outfalls would be substantially the same as those occurring under current conditions, or that would occur during operation of the SP Shelf outfall, as detailed in Impact MAR-1. Specifically, the use of the outfalls would be consistent with an approved NPDES permit and WDRs for discharges from the JWPCP. Those requirements are not likely to be less protective of water quality than the current NPDES permit for current, daily use of the outfalls. That permit was adopted in September 2011, with further renewal required every 5 years. The Sanitation Districts would continue to monitor the performance of the existing ocean outfalls for conformance with the California Ocean Plan and NPDES requirements. Therefore, impacts would be less than significant.

NEPA Analysis

Environmental impacts would be the same as described for the CEQA analysis, and would occur for the operational life of the structure. With respect to the Corps' NEPA scope of analysis described in Section 3.5, the environmental impacts would be considered indirect impacts.

CEQA Impact Determination

Operation of Alternative 1 (Project) would not adversely affect public health. Impacts under CEQA would be less than significant.

Mitigation

No mitigation is required.

Residual Impacts

Impacts would be less than significant.

NEPA Impact Determination

Operation of Alternative 1 (Project) would not adversely affect public health. Impacts under NEPA would be less than significant with respect to the No-Federal-Action Alternative (see Section 3.4.1.6).

Mitigation

No mitigation is required.

Residual Impacts

Impacts would be less than significant.

Impact MAR-7. Would Alternative 1 (Project) impair beneficial uses designated in the California Ocean Plan?

Riser/Diffuser Area – San Pedro Shelf

<u>Construction</u>

CEQA Analysis

Construction of the SP Shelf riser and diffuser is described in Impact MAR-1. The Sanitation Districts would acquire and comply with a CWA Section 401 Water Quality Certification from the RWQCB for construction dredging and filling activities. The Sanitation Districts would also acquire and comply with a Department of Army permit from the Corps for work in waters of the U.S. for the discharge of fill material and transport of dredged material during construction. A spill prevention and control plan would be required for marine vessels carrying petroleum and nontank vessels over 300 gross tons. The plan would detail and implement spill prevention and control measures. A NPDES permit would also be obtained, as required, for the removal of the riser casing and the release of the entrained water.

The California Ocean Plan, discussed in Section 13.3.2.4, specifies: "The beneficial uses of the ocean waters of the State that shall be protected include industrial water supply; water contact and non-contact recreation, including aesthetic enjoyment; navigation; commercial and sport fishing; mariculture; preservation and enhancement of designated Areas of Special Biological Significance (ASBS); rare and endangered species; marine habitat; fish migration; fish spawning and shellfish harvesting" (SWRCB 2005:3).

The construction of the SP Shelf riser and diffuser would not result in a decrease in water quality that would significantly impact the designated beneficial use of the receiving water. Construction on the SP Shelf would last approximately 3 years from 2019 to 2022. As discussed in Impact MAR-1, turbidity would be generated during certain activities, such as pile driving and preparing the diffuser bed, and DO would be reduced for a period of time when the outer casing is removed.

Construction would not have an impact on the offshore beneficial uses that are summarized in Table 13-14 and discussed in the analysis that follows.

Table 13-14. Summary of No Construction Impacts on Beneficial Uses – SP Shelf

Designated Offshore Beneficial Uses	Construction Impact
IND – Industrial Service Supply	No impact because of distance and no nearby users.
NAV – Navigation	No impact because of location.
REC 1 – Water Contact Recreation	No impact because of distance.
REC 2 – Non-Contact Water Recreation (including aesthetics)	No impact because of distance and location.
COMM – Commercial and Sport Fishing	No impact on sports fishing because of distance, depth, and habitat. Temporary loss of a small area available on the SP Shelf for permitted shrimp and other species trawling activities would occur during construction. Increase in preferred recreational hard-bottom fishing habitat at the discharge site.
SHELL – Shellfish Harvesting	No impact because of distance, depth, and habitat. Temporary loss of a small area available on the SP Shelf for permitted shrimp activities would occur during construction.
SPWN – Spawning, Reproduction, and/or Early Development	No impact because of habitat.

Industrial water users draw industrial water supplies from the Pacific Ocean immediately along the coast. The construction activity would occur approximately 7 miles offshore. Any turbidity and decrease in DO caused by construction activities would, as detailed in Impact MAR-1, be local and would not affect the beneficial use designation of the Pacific Ocean for industrial water supply.

Construction impacts on the SP Shelf to navigation are discussed in Chapter 19. Navigation off the coast of California or the ships entering and exiting the ports of Los Angeles and Long Beach would not be affected. Therefore, construction would not affect the beneficial use designation of navigation.

The construction area on the SP Shelf is not a location that would be typically used for contact recreation. It is approximately 7 miles offshore and, therefore, is too far from the coast for recreational swimming, surfing, or other recreational water contact activities. This site is too deep to provide typical opportunities for SCUBA diving and has no natural features that would attract SCUBA divers. As discussed in Chapter 4, the location of construction is far offshore; therefore, coastal viewers would not see any surface turbidity generated by construction activities. Those using the ocean for non-contact recreation such as boating may see some surface turbidity. However, as also discussed in Chapter 4, water-based recreationists are generally not stationary, and their views would be temporary as they passed by the construction site. Therefore, construction would not affect the designated beneficial use of contact recreation, non-contact recreation, or aesthetics.

Reefs and rocky outcroppings fished by recreational anglers and sport fishing boats occur along the shelf edge; however, most recreational reefs, including the area of the SP Shelf commonly known as Horseshoe Kelp, are located inshore of the project at shallower depths (Sloan pers. comm. 2007). Recreational species taken on the SP Shelf reefs include rockfishes, lingcod, ocean whitefish, and California scorpionfish. The SP Shelf construction area is a relatively flat area with little rocky structure in the immediate vicinity. The nearest known recreationally fished reef is approximately 3 miles southeast of the riser area at a shallower depth (Sloan pers. comm. 2007). During construction, pile driving could result in injuries to fishes at a maximum of approximately 2,400 feet away. This reef is located outside of this distance. The construction of the SP Shelf diffuser would provide hard substrate in a relatively flat area with little rocky structure in the immediate vicinity. Therefore, construction of the SP Shelf diffuser would provide reef-like hard-bottom substrate in an area where there is none. This could increase the recreational catch of rockfishes, kelp greenling, lingcod, ocean whitefish, and California scorpionfish. Therefore, construction would not affect the beneficial use designation of recreational fishing.

The SP Shelf is located within commercial Catch Block 740, as identified in Appendix 13-A. In 2006, six methods of commercial take were reported for fishes in Catch Block 740 including collection by various traps and nets, hook and line, longlines, harpoon and spear, set and drift gill nets, purse seines, and trawls (CDFG 2007). Total commercial fish catch for Block 740 in 2006 was nearly 437,000 pounds for 40 fish species with a total value of over $375,000 (CDFG 2007). The SP Shelf construction area is too deep for the commercial harvest of shellfish such as sea urchins by divers, and depth and lack of rocky habitat in the vicinity of the construction area would make the area impractical for commercial trap fishing for lobster and rock crab. Furthermore, areas that are actively fished for shellfish such as lobster and rock crab are generally nearshore and at depths that are generally between 20 and 100 feet. Therefore, they are at sufficient distances to not be affected by any surface turbidity or low DO impacts. The use of gill nets to harvest shellfish and other species is prohibited within 3 nautical miles of shore, with the additional condition that gill nets cannot be set at depths of less than 70 fathoms (420 feet); therefore, the SP Shelf construction area is not approved for gillnet harvesting.

Trawls for shrimp and other species could be used on the SP Shelf at the depths of construction; therefore, construction activities would result in a temporary loss of a relatively small area suitable for trawl fishing. The area restricted to shrimp and other species trawls during construction would be limited because of a slight reduction in soft-bottom available by physically blocking trawling in the area during construction (other types of commercial fishing, including net sets and hook and line would be blocked only at the footprint of surface vessels, while trawl paths would need to consider surface and bottom obstructions and anchor and mooring locations). Construction activities would result in a temporary loss of a relatively small area available for permitted commercial fishing (specifically shrimp or other species trawling), and would not impact the designated beneficial use.

Four species together contributed more than 81 percent of the value of the catch in 2006: California halibut, Pacific bonito, swordfish, and white croaker. Of these, bonito and swordfish are pelagic fisheries and are unlikely to be impacted during construction because they are surface fished, not trawled. White croaker is a nearshore species and would not be fished in the project area. Halibut, which would occur in the project area, is primarily a hook and line caught fish, which would not be impacted by construction. Therefore, construction activities would temporarily affect the beneficial use designation of shellfish and commercial fishing. However, because of the temporary nature and the limited area affected by construction, impacts on these beneficial uses would not occur.

Construction would convert approximately 10 acres of soft-bottom substrate to hard-bottom substrate and would slightly reduce the area suitable for trawling purposes. However, as discussed in Impact MAR-4, this is less than 0.1 percent of the soft-bottom habitat on the SP Shelf at midshelf depths, which does not contain any unique or distinguishing features that indicate it would be superior trawling substrate when compared to the other 99.98 percent of soft-bottom substrate on the SP Shelf. Therefore, the conversion of soft-bottom sediment to hard-bottom substrate during the construction of the SP Shelf diffuser would not affect the designated beneficial use of commercial fishing or shellfishing.

The construction area on the SP Shelf is not a known fish spawning area; however, some fishes may spawn in pelagic habitats, and there is no apparent reason for such fishes to avoid the construction area. The turbidity generated during construction and underwater sound associated with the pile driving could disturb fish spawning, although these impacts would be temporary and limited in area compared to similar habitat otherwise available on the SP Shelf. As discussed in the regional setting and Appendix 13-A, icthtyoplankton may be found in the project area, but impacts are not expected to be significant (see Impact MAR-4). Furthermore, the conversion of soft-bottom habitat to hard-bottom substrate would result in a change to a fish spawning area. However, the amount of soft-bottom habitat for fishes to use for spawning compared to hard-bottom substrate on the SP Shelf is substantial; therefore, the decrease in soft-bottom habitat would not constitute a significant impact. Furthermore, the hard-bottom substrate would provide opportunities for other fishes drawn to hard-bottom substrate to spawn. Therefore, construction would not affect the beneficial use designation of fish spawning.

Construction would have a potential impact on the offshore beneficial uses summarized in Table 13-15 and discussed in the analysis that follows.

Table 13-15. Summary of Potential Construction Impacts on Beneficial Uses – SP Shelf

Designated Offshore Beneficial Uses	Construction Impact
MAR – Marine Habitat	Potential impact because of permanent conversion of about 10 acres of soft-bottom seafloor habitat to hard-bottom habitat.
WILD – Wildlife Habitat	Potential impact because of permanent conversion of about 10 acres of soft-bottom seafloor habitat to hard-bottom habitat.
RARE – Rare, Threatened, or Endangered Species	Potential impact because of vessel collisions, entanglement, underwater sound.
MIGR – Migration of Aquatic Organisms	Potential impact because of vessel collisions, entanglement, underwater sound.

Although the NPDES permit and other construction permits would serve to maintain water quality, some of the beneficial uses designated for offshore may be affected temporarily. Mitigation measures summarized in previous sections would reduce significant impacts to less than significant.

As discussed in Impacts MAR-3, MAR-4, and MAR-5, protected and migrating species and soft-bottom marine habitat could be affected by vessel collisions, entanglement, and underwater sound. However, construction impacts would be mitigated through the implementation of MM MAR-7a through MM MAR-7i (same as MM MAR-3a through MM MAR-3i). Furthermore, less than 0.1 percent of the soft-bottom marine habitat at midshelf depths would be altered. Therefore, SP Shelf construction would not affect the beneficial use designation of marine habitat; wildlife habitat; migrating, rare, threatened, or endangered species after mitigation. As discussed in Impact MAR-4, soft-bottom marine habitat would be altered during construction due to turbidity and the dragging of anchor lines. However, as described in Impact MAR-4, soft-bottom habitat is not rare, and protected species do not rely on the habitat. Furthermore, less than 0.1 percent of the soft-bottom habitat at midshelf depths would be altered. Hard-bottom habitat is less prevalent on the SP Shelf. As discussed in Impact MAR-4, anchor lines could disrupt or destroy any hard-bottom habitat. Therefore, construction could affect the beneficial use designation of marine habitat; however, implementation of MM MAR-7j (same as MM MAR-4c) would reduce impacts on this beneficial use to less than significant. Furthermore, as described in Impacts MAR-3 and MAR-4, soft-bottom habitat is not protected, and protected species do not rely on the habitat. Less than 0.1 percent of the soft-bottom habitat would be altered. Therefore, construction on the SP Shelf would not affect the beneficial use designations of marine habitat; wildlife habitat; or rare, threatened, or endangered species after mitigation.

Construction permits and approvals are designed to protect the marine environment and the beneficial uses of ocean waters. Compliance with these requirements and implementation of mitigation measures for short-term impacts related to construction as presented in this EIR/EIS would reduce the impacts on beneficial uses to less than significant.

NEPA Analysis

Environmental impacts would be the same as described for the CEQA analysis, and would occur for the duration of construction. With respect to the Corps' NEPA scope of analysis described in Section 3.5, the environmental impacts would be considered direct impacts.

Operation

CEQA Analysis

Operation of the SP Shelf diffuser is described in Impact MAR-1. The effluent discharge would meet NPDES compliance requirements. Limitations and requirements of the existing NPDES permit protect the marine environment and the beneficial uses of ocean waters. As discussed in Impact MAR-1, the nature of the treated effluent would remain the same as the effluent currently released from the existing ocean outfalls because the JWPCP would continue to treat it to secondary levels. Furthermore, the physical design of the outfall would allow the same minimum dilution ratio of the effluent. Therefore, the effluent from the SP Shelf diffuser would have similar effects on water quality as the existing ocean outfalls effluent. Currently, the effluent from the existing ocean outfalls meets all water quality criteria identified in the NPDES permit.

Operation of the SP Shelf would result in either no or less than significant impacts on offshore beneficial uses as summarized in Table 13-16 and discussed in the analysis that follows.

Table 13-16. Summary of Operational Impacts on Offshore Beneficial Uses – SP Shelf

Offshore Beneficial Uses	Operational Impact
IND – Industrial Service Supply	No impact because of distance and no available users.
NAV – Navigation	No impact because of location.
REC 1 – Water Contact Recreation	No impact because of distance, public health.
REC 2 – Non-contact Water Recreation (including aesthetics)	No impact because of distance and location.
COMM – Commercial and Sport Fishing	No impact because of distance, depth, and habitat. Gear depth and other restrictions do not allow commercial gill net. Small area of bottom permanently lost to use by trawl fisheries.
SHELL – Shellfish Harvesting	No impact because of distance, depth, and habitat.
MAR – Marine Habitat	No impact on EFH.
WILD – Wildlife Habitat	No impact on EFH.
RARE – Rare, Threatened, or Endangered Species	Less than significant impacts on water quality, sediment quality, nutrients, and HABs related to protected species.
MIGR – Migration of Aquatic Organisms	No impact because of location and depth of the riser and diffuser.
SPWN – Spawning, Reproduction, and/or Early Development	No impact because of habitat.

Operation of the SP Shelf diffuser would not result in an impact on any designated beneficial use, as previously summarized and detailed herein. The analysis of operation impacts on designated beneficial uses is similar to the analysis for construction; however, the impacts would be less than those associated with construction, and no mitigation would be required. Mitigation is required for construction impacts because of the disturbance of sediment during construction activities. Construction activities could lead to water quality concerns, risk of vessel collisions and entanglement to protected species associated with construction equipment, underwater sound generated by construction activities, and conversion of soft-bottom habitat to hard-bottom habitat. All of these impacts are specific to construction activities and would not occur under operating conditions.

As discussed in the construction analysis, industrial water users draw industrial water supplies from the Pacific Ocean immediately along the coast. Due to the location of the operational discharge, any effects on water quality caused by the discharge would be negligible at the limits of the mixing zone designated in the operational NPDES permit. Therefore, operation would not affect the beneficial use designation of the Pacific Ocean for industrial water supply.

Once the SP Shelf diffuser is operational, it would be located on the bottom of the ocean at a depth of 200 feet. Therefore, it would not affect navigation off the coast of California or the ships entering and exiting the ports of Los Angeles and Long Beach as discussed in Chapter 19. Consequently, operation would not affect the beneficial use designation of navigation.

As discussed previously in the construction analysis, the SP Shelf is not a location that would be typically used for contact recreation due to its distance offshore. As discussed in Impacts MAR-1 and MAR-6, the SP Shelf diffuser would be designed to meet the receiving water standards of the California Ocean Plan as well as the requirements of the JWPCP's existing RWQCB WDR order and NPDES permit. With compliance with these standards and requirements, there would be no health effects associated with the release of effluent at the SP Shelf to the public using beaches or the ocean for recreational or commercial fishing purposes. Once the diffuser is operational, it would be located on the bottom of the ocean at a depth of 200 feet; therefore, it would not be visible to boaters. Consequently, operation of the SP Shelf diffuser would not affect the designated beneficial use of contact recreation, non-contact recreation, or aesthetics.

The analysis associated with the designated beneficial uses of recreational fishing, commercial fishing, and shellfish is similar to the previous analysis for construction. Therefore, these three designated beneficial uses would not be impacted by the operation of the SP Shelf diffuser.

As discussed in Impacts MAR-3 and MAR-5, some protected species could be impacted by water quality or alteration of habitat used by protected species, but those impacts would be less than significant. As previously discussed in Impact MAR-3, operation of the SP Shelf diffuser does not have the potential to affect the frequency or location of HABs and no impact would occur.

As discussed in Impact MAR-5, operation of the SP Shelf diffuser is not expected to impede or disrupt the movement or migration of any whale, turtle, or fish species. The SP Shelf diffuser would be located on the seafloor of the SP Shelf and would be covered with ballast rock. It would be no more intrusive than the existing ocean outfalls or other permanent ocean structures. Furthermore, as demonstrated in Impacts MAR-1 and MAR-3, the treated effluent plume would maintain water quality on the shelf and, therefore, would not impact migrating species. Consequently, operation of the SP Shelf diffuser would not affect the beneficial use designation of migration of aquatic organisms.

As discussed previously in the construction analysis, the diffuser area on the SP Shelf is not a known fish spawning area; however, some fishes may spawn in pelagic habitats, and there is no reason for such fishes to avoid the outfall area under operating conditions. However, as discussed in MAR-3 and MAR-4, the operation of the SP Shelf riser and diffuser would be similar to that of the existing ocean outfall, which currently does not impact pelagic spawning. Furthermore, as identified in MAR-4, the operation of the SP Shelf riser and diffuser would not impact EFH. Therefore, impacts on fish spawning would not occur.

NEPA Analysis

Environmental impacts would be the same as described for the CEQA analysis, and would occur for the operational life of the structure. With respect to the Corps' NEPA scope of analysis described in Section 3.5, the environmental impacts would be considered indirect impacts.

Riser/Diffuser Area – Existing Ocean Outfalls

Construction

CEQA Analysis

Rehabilitation of the existing ocean outfalls is described in Impact MAR-1. Rehabilitation of the existing ocean outfalls would take approximately 9 months, with in-water construction occurring for approximately 2 months. As discussed in Impact MAR-7 for construction on the SP Shelf, all construction activities would require acquisition and compliance with CWA Section 401 and Department of Army permits. Additionally, a spill prevention and control plan would be required for marine vessels carrying petroleum and nontank vessels over 300 gross tons. The plan would detail and implement spill prevention and control measures. Because of the depth range (20 to 50 feet [6 to 15 meters]) and location of the project, existing beneficial uses defined in the Basin Plan for Royal Palms Beach, the nearshore zone (the zone bounded by the shoreline and a line 1,000 feet from the shoreline or the 30-foot depth contour, whichever is further from the shoreline), and the offshore zone would apply (LARWQCB 1994).

Construction would not have an impact on the offshore beneficial uses that are summarized in Table 13-17 and discussed in the analysis that follows.

Table 13-17. Summary of No Construction Impacts on Beneficial Uses – Existing Ocean Outfalls

Royal Palms Beach	Nearshore	Offshore	Beneficial Uses	Construction Impact
	X	X	IND – Industrial Service Supply	No impact because there is no industrial water supply at Royal Palms Beach and not designated as industrial water supply.
X	X	X	NAV – Navigation	No impact because of location and because there is no launching point for boats at Royal Palms Beach.
X	X	X	COMM – Commercial and Sport Fishing	No impact because commercial fishing for white croaker is not allowed in the construction area, advisories are in place for several other fish species, and temporary and localized loss of fishing during construction.

As discussed in Impact MAR-1, the rehabilitation of the existing ocean outfalls would generate turbidity during the placement of ballast rocks. Disturbed sediments would settle quickly, with initial drift generally off coast based on the currents in the area, as described in Impacts MAR-1 and MAR-2. Although the rehabilitation of the existing ocean outfalls would be nearer to the coastline, the general direction of the currents and the rate of settling would allow much of the turbidity generated by the construction to stay away from the coastline and any industrial users. As discussed previously, the California coastline provides an industrial water supply. However, there are no industrial water users at Royal Palms Beach and industrial water supply is not designated a beneficial use for the beach. Therefore, construction at the existing ocean outfalls would not affect the beneficial use designation of industrial supply nearshore or offshore.

There are no boat launches at Royal Palms Beach, and the beach itself is not used for navigation; therefore, there would be no impact on the beneficial use designation of navigation at Royal Palms Beach. Also, as discussed in Chapter 19, rehabilitation of the existing ocean outfalls would not impact navigation of vessels. Therefore, construction at the existing ocean outfalls would not affect the beneficial use of navigation.

The area around the existing ocean outfalls has limits on the type of commercial and recreational fishing that can occur based on consumption warnings for certain fish. For example, this area is closed to commercial white croaker fishing, and advisories are in place for consumption of fishes from the area for commercial and recreational fishing purposes. However, there are commercial and recreational shellfish fisheries (lobster and rock crab – 20- to 100-foot depth) and hook and line fisheries, such as bass, that are available in the area of the existing ocean outfalls for commercial and sports fishing. Several existing reefs used by sports fishermen are located in the general area of the existing ocean outfalls (Royal Palms Beach, nearshore, and offshore including the pipeline itself). However, construction would only require the placing of ballast rocks and the fixing of outfall joints at depths of up to 50 feet for approximately 2 months. Therefore, construction activities would result in a temporary loss of a relatively small area available for permitted shellfishing (lobster and rock crab) and commercial/recreational fishing at Royal Palms Beach, nearshore, and offshore. Given the temporary nature and the limited area affected by construction, impacts on these beneficial uses would not occur.

Construction would have a potential impact on the offshore beneficial uses summarized in Table 13-18 and discussed in the analysis that follows.

Table 13-18. Summary of Potential Construction Impacts on Beneficial Uses – Existing Ocean Outfalls

Royal Palms Beach	Nearshore	Offshore	Beneficial Uses	Construction Impact
X	X	X	REC 1 – Water Contact Recreation	Potential impact because of temporary and localized loss of beneficial use in nearshore and offshore areas during construction.
X	X	X	REC 2 – Non-contact Water Recreation (including Aesthetics)	Potential impact because of temporary and localized loss of beneficial use in nearshore and offshore areas during construction.
X	X	X	SHELL – Shellfish Harvesting	Potential impact because of temporary loss of a relatively small area available for permitted fishing activities during construction.
X	X	X	MAR – Marine Habitat	Potential impact because of temporary loss of hard-bottom habitat at the work site.
X	X	X	WILD – Wildlife Habitat	Potential impact because of temporary loss of hard-bottom habitat at the work site.
	X		BIOL – Preservation of Biological Habitats	Potential impact because of temporary loss of hard-bottom habitat at the work site.
	X	X	RARE – Rare, Threatened, or Endangered Species	Potential impact because of underwater sound, vessel collisions, and entanglement.
	X	X	MIGR – Migration of Aquatic Organisms	Potential impact because of underwater sound, vessel collisions, and entanglement.
P	X	X	SPWN – Spawning, Reproduction, and/or Early Development	Potential impact because of on-shore habitat.

P = potential beneficial use

Rehabilitation of the existing ocean outfalls would temporarily reduce contact recreational opportunities such as swimming, SCUBA diving, and surfing in the immediate vicinity of the existing ocean outfalls for up to 9 months. Royal Palms Beach and the nearshore area are designated for those types of water contact recreation. However, there are over 62 locations designated for swimming, SCUBA diving, and surfing within 50 miles of the existing ocean outfalls. With the reduction of water contact recreation at Royal Palms Beach and nearshore, people would have multiple other locations from which to choose. Additionally, recreational boats, kayaks, or other non-contact water recreation would be temporarily barred from using the ocean in the immediate vicinity of the construction barges and other equipment. However, there is nothing unique or specific about the ocean surface over the existing ocean outfalls that the temporary closure of this area would prevent the public from experiencing. Furthermore, the remaining coastline and nearshore of Southern California would remain available to these types of recreational users during the temporary construction period. Therefore, rehabilitation of the existing ocean outfalls would not affect the beneficial use designations of water contact or non-contact recreation for Royal Palms Beach, nearshore, or offshore.

As discussed in Impact MAR-4, in the area of the new ballast rock placement, the new rock is expected to be recolonized rapidly by a community similar to that found on the existing rocks. Therefore, construction would not affect the beneficial use designation of habitat, wildlife, or the preservation of biological habitats.

As previously discussed in Impacts MAR-3, MAR-4, and MAR-5, the impacts associated with vessel collisions, entanglement, and underwater sound, on protected and migrating species would be less than significant. Additionally, as discussed in Impact MAR-3, implementation of MM MAR-7k (same as MM MAR-3j) would reduce impacts on black abalone to less than significant. Therefore, construction would not affect the beneficial use of protected (rare, threatened, and endangered) species or migrating aquatic organisms.

California grunion (*Leuresthes tenuis*) are unique for utilizing beaches throughout Southern California for spawning and depositing eggs. Grunion spawning occurs at night during the highest tides of the month, with “runs” occurring over several nights twice per month from March through August. Use of any particular beach by grunion for spawning during any particular run cannot be predicted, but spawning is known to occur at Royal Palms Beach in spring and summer months. Construction activities associated with the rehabilitation of the existing ocean outfalls would be conducted near- and offshore and, therefore, would not directly impact beach spawning by these fish. Rehabilitation of the existing ocean outfalls would not be conducted during nighttime hours, which is when the fish spawn. Safety lights would be left on the rehabilitation barge, but all other activities would cease during the nighttime. Therefore, construction would not affect the beneficial use designation of fish spawning.

Construction permits and approvals are designed to protect the marine environment and the beneficial uses of ocean waters. Compliance with these requirements and implementation of mitigation measures for short-term impacts related to construction as presented in this EIR/EIS would reduce the impacts on beneficial uses to less than significant.

NEPA Analysis

Environmental impacts would be the same as described for the CEQA analysis, and would occur for the duration of construction. Baseline conditions would resume upon termination of construction. With respect to the Corps’ NEPA scope of analysis described in Section 3.5, the environmental impacts would be considered direct impacts.

Operation

CEQA Analysis

Operation of the rehabilitated existing ocean outfalls is described in Impact MAR-1. Beneficial uses in the existing ocean outfalls area were also previously discussed. As discussed in Impact MAR-1, the limitations and requirements of the existing NPDES permit protect the marine environment and the beneficial uses of ocean waters. Based on past and present performance of the JWPCP secondary treatment and the past and present performance of the existing ocean outfalls, the treated effluent discharges through the existing outfalls currently meet the NPDES requirements and protect the designated beneficial uses. As described in Impact MAR-1, because post-rehabilitation operational volumes would be less than, and effluent quality would the same as, existing conditions, continued use of the JWPCP discharge would not impair beneficial uses designated in the California Ocean Plan.

NEPA Analysis

Environmental impacts would be the same as described for the CEQA analysis, and would occur for the operational life of the structure. With respect to the Corps' NEPA scope of analysis described in Section 3.5, the environmental impacts would be considered indirect impacts.

CEQA Impact Determination

Construction of the riser and diffuser on the SP Shelf and on the existing ocean outfalls for Alternative 1 (Project) would impair beneficial uses designated in the California Ocean Plan. Construction impacts under CEQA would be significant before mitigation. Operation of Alternative 1 (Project) would result in less than significant impacts.

Mitigation

Vessel Collisions

Implement MM MAR-7a through MM MAR-7c (same as MM MAR-3a through MM MAR-3c).

Entanglement

Implement MM MAR-7d through MM MAR-7g (same as MM MAR-3d through MM MAR-3g).

Underwater Sound

Implement MM MAR-7h and MM MAR-7i (same as MM MAR-3h and MM MAR-3i).

Marine Habitat

Implement MM MAR-7j (same as MM MAR-4c).

Removal of Protected Species

Implement MM MAR-7k (same as MM MAR-3j).

Residual Impacts

Residual impacts would be less than significant. See the residual impacts discussion under Impact MAR-3.

NEPA Impact Determination

Construction of the riser and diffuser on the SP Shelf and on the existing ocean outfalls for Alternative 1 (Project) would impair beneficial uses designated in the California Ocean Plan. Construction impacts under NEPA would be significant before mitigation with respect to the No-Federal-Action Alternative (see Section 3.4.1.6). Operation of Alternative 1 (Project) would result in less than significant impacts.

Mitigation

Implement MM MAR-7k (same as MM MAR-3j).

Residual Impacts

Residual impacts would be less than significant, as described under the CEQA impact determination.

13.4.3.3 Impact Summary – Alternative 1

Impacts on the marine environment analyzed in this EIR/EIS for Alternative 1 are summarized in Table 13-19. The proposed mitigation, where feasible, and the significance of the impact before and following mitigation are also listed in the table.

Alternative 1 (Program) does not include marine elements and has no potential to have an impact on the marine environment; therefore, an Impact Summary – Alternative 1 (Program) table is not included.

Table 13-19. Impact Summary – Alternative 1 (Project)

Project Element	Impact Determination Before Mitigation	NEPA Direct or Indirect	Mitigation	Residual Impact After Mitigation
Impact MAR-1. Would Alternative 1 (Project) create pollution, contamination, or nuisance, as defined in Section 13050 of the CWC; or cause regulatory standards to be violated, as defined in the applicable NPDES permit(s) or State Water Quality Control Plan for ocean waters for concentration and emissions of discharge?				
Riser/Diffuser Area				
SP Shelf	CEQA Significant Impact During Construction	N/A	MM MAR-1a. During riser and diffuser construction, analyses of contaminant concentrations (i.e., metals, dichlorodiphenyltrichloroethane [DDT], polychlorinated biphenyls [PCBs], polycyclic aromatic hydrocarbons [PAHs]) in waters near the dredging operations will be required if the contaminant levels in the dredged sediments are known to be elevated and represent a potential risk to beneficial uses. Monitoring data will be used to demonstrate that water quality limits specified in applicable state and federal permits are not exceeded. Corrective or adaptive actions would be implemented if the monitoring data indicate that water quality conditions outside the mixing zone are above the permit-specified limits. MM MAR-1b. Prepare and implement a contaminated sediment management plan that is consistent with practices outlined in the Los Angeles Regional Contaminated Sediment Task Force long-term management strategy if contaminant levels in the dredged sediments are known to be elevated and represent a potential risk. At a minimum, the plan will include site-	CEQA Less Than Significant Impact During Construction

Table 13-19 (Continued)

Project Element	Impact Determination Before Mitigation	NEPA Direct or Indirect	Mitigation	Residual Impact After Mitigation
			specific best management practices at the immediate work site to reduce the potential area of exposure to contaminated sediments.	
	NEPA Significant Impact During Construction	Direct	MM MAR-1a and MM MAR-1b	NEPA Less Than Significant Impact During Construction
	CEQA Less Than Significant Impact During Operation	N/A	No mitigation is required.	CEQA Less Than Significant Impact During Operation
	NEPA Less Than Significant Impact During Operation	Indirect	No mitigation is required.	NEPA Less Than Significant Impact During Operation
Existing Ocean Outfalls	CEQA Less Than Significant Impact During Construction	N/A	No mitigation is required.	CEQA Less Than Significant Impact During Construction
	NEPA Less Than Significant Impact During Construction	Direct	No mitigation is required.	NEPA Less Than Significant Impact During Construction
	CEQA Less Than Significant Impact During Operation	N/A	No mitigation is required.	CEQA Less Than Significant Impact During Operation
	NEPA Less Than Significant Impact During Operation	Indirect	No mitigation is required.	NEPA Less Than Significant Impact During Operation
Impact MAR-2. Would Alternative 1 (Project) substantially degrade marine sediment quality or character?				
Riser/Diffuser Area				
SP Shelf	CEQA Less Than Significant Impact During Construction	N/A	No mitigation is required.	CEQA Less Than Significant Impact During Construction
	NEPA Less Than Significant Impact During Construction	Direct	No mitigation is required.	NEPA Less Than Significant Impact During Construction
	CEQA Less Than Significant Impact During Operation	N/A	No mitigation is required.	CEQA Less Than Significant Impact During Operation
	NEPA Less Than Significant Impact During Operation	Indirect	No mitigation is required.	NEPA Less Than Significant Impact During Operation
Existing Ocean Outfalls	CEQA Less Than Significant Impact During Construction	N/A	No mitigation is required.	CEQA Less Than Significant Impact During Construction
	NEPA Less Than Significant Impact During Construction	Direct	No mitigation is required.	NEPA Less Than Significant Impact During Construction
	CEQA Less Than Significant Impact During Operation	N/A	No mitigation is required.	CEQA Less Than Significant Impact During Operation

Table 13-19 (Continued)

Project Element	Impact Determination Before Mitigation	NEPA Direct or Indirect	Mitigation	Residual Impact After Mitigation
	NEPA Less Than Significant Impact During Operation	Indirect	No mitigation is required.	NEPA Less Than Significant Impact During Operation
Impact MAR-3. Would Alternative 1 (Project) result in the substantial loss of individuals or the reduction of existing habitat of a state- or federally listed endangered, threatened, rare, protected, candidate, or sensitive plant or animal species or a species of special concern?				
Riser/Diffuser Area				
SP Shelf	CEQA Significant Impact During Construction	N/A	*Vessel Collisions* MM MAR-3a. Prepare and implement a collision protection plan to address sensitive and protected species. All construction personnel and boat operators will receive protected species training. The training will include review of the plan as well as identification of animals, species, and habitats potentially present in the project area. MM MAR-3b. Restrict tugs, tugs with barges under tow, and large work vessels to speeds of 12 knots (14 miles per hour [mph]) or less at all times. Maneuverable single hull vessels such as crew or supply boats may proceed at speeds of 20 knots (23 mph) or less under most conditions, but will reduce speed to 12 knots or less when whales or sea turtles are reported in the project area. MM MAR-3c. Immediately report all vessel collisions with marine mammals or sea turtles to the National Marine Fisheries Service. *Entanglement* MM MAR-3d. Limit the deployment of any material that has the potential to entangle marine mammals or sea turtles (e.g., anchor lines, cables, rope, other construction debris) to only as long as necessary. MM MAR-3e. Remove as much slack as possible from any potentially entangling material to the point of not jeopardizing construction operations. MM MAR-3f. Position temporary mooring buoys with heavy steel cables or chains to minimize potential entanglements.	CEQA Less Than Significant Impact During Construction

Table 13-19 (Continued)

Project Element	Impact Determination Before Mitigation	NEPA Direct or Indirect	Mitigation	Residual Impact After Mitigation
			MM MAR-3g. In the event that a marine mammal or sea turtle becomes entangled, immediately seek guidance from the National Marine Fisheries Service for safe disentanglement options. *Underwater Sound* MM MAR-3h. Implement a "soft start" method for all pile driving by operating the hammer at less than full capacity (i.e., approximately 40 to 60 percent energy levels) with no less than a 1-minute interval between each strike for a 5-minute period on initial driving for the day, or after a delay of 15 minutes between strikes. MM MAR-3i. Prepare and implement a pile driving management plan. The plan will require that a National Marine Fisheries Service–approved observer be stationed on the work platform or work vessel to monitor the presence of sensitive marine species in the construction area on all days when pile driving is taking place. The observer will survey the project vicinity before pile driving is started and give approval before such work begins. The observer will continue to advise the construction crew throughout the day to modify or stop pile driving if a sensitive or protected species travels within injury distances.	
	NEPA Significant Impact During Construction	Direct	MM MAR-3a through MM MAR-3i	NEPA Less Than Significant Impact During Construction
	CEQA Less Than Significant Impact During Operation	N/A	No mitigation is required.	CEQA Less Than Significant Impact During Operation
	NEPA Less Than Significant Impact During Operation	Indirect	No mitigation is required.	NEPA Less Than Significant Impact During Operation
Existing Ocean Outfalls	CEQA Significant Impact During Construction	N/A	*Removal of Protected Species (Black Abalone)* MM MAR-3j. Within 90 days prior to initiation of the rehabilitation work, survey the existing ocean outfall pipelines for black abalone at depths between the 15- and 55-foot isobaths in areas potentially affected by the work. The survey team will include divers/biologists experienced in locating abalone. If black abalone are determined to be present, consult with the National Marine Fisheries Service to	CEQA Less Than Significant Impact During Construction

Table 13-19 (Continued)

Project Element	Impact Determination Before Mitigation	NEPA Direct or Indirect	Mitigation	Residual Impact After Mitigation
			develop a black abalone transplantation plan that includes the identification of a suitable nearby transplant location, temporary holding and transport methods, and reporting requirements. Implementation of the plan will occur no more than 30 days preceding the in-water rehabilitation activities and will be conducted by qualified divers/biologists.	
	NEPA Significant Impact During Construction	Direct	MM MAR-3j	NEPA Less Than Significant Impact During Construction
	CEQA Less Than Significant Impact During Operation	N/A	No mitigation is required.	CEQA Less Than Significant Impact During Operation
	NEPA Less Than Significant Impact During Operation	Indirect	No mitigation is required.	NEPA Less Than Significant Impact During Operation
Impact MAR-4. Would Alternative 1 (Project) result in the substantial degradation or disruption of marine habitat or local biological communities?				
Riser/Diffuser Area				
SP Shelf	CEQA Significant Impact During Construction	N/A	*Underwater Sound* MM MAR-4a and MM MAR-4b (same as MM MAR-3h and MM MAR-3i) *Marine Habitat* MM MAR-4c. Prepare and implement an anchoring plan prior to in-water construction activities in accordance with the U.S. Corps of Engineers' permitting requirements. The plan will identify deployment methods for anchors, lines, cables, and moorings to minimize damage to hard-bottom substrate.	CEQA Less Than Significant Impact During Construction
	NEPA Significant Impact During Construction	Direct	MM MAR-4a and MM MAR-4b (same as MM MAR-3h and MM MAR-3i) MM MAR-4c	NEPA Less Than Significant Impact During Construction
	CEQA Less Than Significant Impact During Operation	N/A	No mitigation is required.	CEQA Less Than Significant Impact During Operation
	NEPA Less Than Significant Impact During Operation	Indirect	No mitigation is required.	NEPA Less Than Significant Impact During Operation
Existing Ocean Outfalls	CEQA Less Than Significant Impact During Construction	N/A	No mitigation is required.	CEQA Less Than Significant Impact During Construction
	NEPA Less Than Significant Impact During Construction	Direct	No mitigation is required.	NEPA Less Than Significant Impact During Construction

Table 13-19 (Continued)

Project Element	Impact Determination Before Mitigation	NEPA Direct or Indirect	Mitigation	Residual Impact After Mitigation
	CEQA Less Than Significant Impact During Operation	N/A	No mitigation is required.	CEQA Less Than Significant Impact During Operation
	NEPA Less Than Significant Impact During Operation	Indirect	No mitigation is required.	NEPA Less Than Significant Impact During Operation
Impact MAR-5. Would Alternative 1 (Project) interfere with the movement/migration corridors of marine biota?				
Riser/Diffuser Area				
SP Shelf	CEQA Significant Impact During Construction	N/A	*Vessel Collisions* MM MAR-5a through MM MAR-5c (same as MM MAR-3a through MM MAR-3c) *Entanglement* MM MAR-5d through MM MAR-5g (same as MM MAR-3d through MM MAR-3g) *Underwater Sound* MM MAR-5h and MM MAR-5i (same as MM MAR-3h and MAR-3i)	CEQA Less Than Significant Impact During Construction
	NEPA Significant Impact During Construction	Direct	MM MAR-5a through MM MAR-5i (same as MM MAR-3a through MM MAR-3i)	NEPA Less Than Significant Impact During Construction
	CEQA Less Than Significant Impact During Operation	N/A	No mitigation is required.	CEQA Less Than Significant Impact During Operation
	NEPA Less Than Significant Impact During Operation	Indirect	No mitigation is required.	NEPA Less Than Significant Impact During Operation
Existing Ocean Outfalls	CEQA Less Than Significant Impact During Construction	N/A	No mitigation is required.	CEQA Less Than Significant Impact During Construction
	NEPA Less Than Significant Impact During Construction	Direct	No mitigation is required.	NEPA Less Than Significant Impact During Construction
	CEQA Less Than Significant Impact During Operation	N/A	No mitigation is required.	CEQA Less Than Significant Impact During Operation
	NEPA Less Than Significant Impact During Operation	Indirect	No mitigation is required.	NEPA Less Than Significant Impact During Operation
Impact MAR-6. Would Alternative 1 (Project) adversely affect public health?				
Riser/Diffuser Area				
SP Shelf	CEQA Less Than Significant Impact During Operation	N/A	No mitigation is required.	CEQA Less Than Significant Impact During Operation
	NEPA Less Than Significant Impact During Operation	Indirect	No mitigation is required.	NEPA Less Than Significant Impact During Operation

Table 13-19 (Continued)

Project Element	Impact Determination Before Mitigation	NEPA Direct or Indirect	Mitigation	Residual Impact After Mitigation
Existing Ocean Outfalls	CEQA Less Than Significant Impact During Operation	N/A	No mitigation is required.	CEQA Less Than Significant Impact During Operation
	NEPA Less Than Significant Impact During Operation	Indirect	No mitigation is required.	NEPA Less Than Significant Impact During Operation
Impact MAR-7. Would Alternative 1 (Project) impair beneficial uses designated in the California Ocean Plan?				
Riser/Diffuser Area				
SP Shelf	CEQA Significant Impact During Construction	N/A	*Vessel Collisions* MM MAR-7a through MM MAR-7c (same as MM MAR-3a through MM MAR-3c) *Entanglement* MM MAR-7d through MM MAR-7g (same as MM MAR-3d through MM MAR-3g) *Underwater Sound* MM MAR-7h and MM MAR-7i (same as MM MAR-3h and MM MAR 3i) *Marine Habitat* MM MAR-7j (same as MM MAR-4c)	CEQA Less Than Significant Impact During Construction
	NEPA Significant Impact During Construction	Direct	MM MAR-7a through MM MAR-7i (same as MM MAR-3a through MM MAR-3i) MM MAR-7j (same as MM MAR-4c)	NEPA Less Than Significant Impact During Construction
	CEQA Less Than Significant Impact During Operation	N/A	No mitigation is required.	CEQA Less Than Significant Impact During Operation
	NEPA Less Than Significant Impact During Operation	Indirect	No mitigation is required.	NEPA Less Than Significant Impact During Operation
Existing Ocean Outfalls	CEQA Significant Impact During Construction	N/A	*Removal of Protected Species* MM MAR-7k (same as MM MAR-3j)	CEQA Less Than Significant Impact During Construction
	NEPA Significant Impact During Construction	Direct	MM MAR-7k (same as MM MAR-3j)	NEPA Less Than Significant Impact During Construction
	CEQA Less Than Significant Impact During Operation	N/A	No mitigation is required.	CEQA Less Than Significant Impact During Operation
	NEPA Less Than Significant Impact During Operation	Indirect	No mitigation is required.	NEPA Less Than Significant Impact During Operation

13.4.4 Alternative 2

13.4.4.1 Program

Alternative 2 (Program) does not include marine elements and, therefore, has no potential to have an impact on the marine environment.

13.4.4.2 Project

The impacts for the rehabilitation of the existing ocean outfalls for Alternative 2 (Project) would be the same as for Alternative 1 (Project).

Impact MAR-1. Would Alternative 2 (Project) create pollution, contamination, or nuisance, as defined in Section 13050 of the CWC; or cause regulatory standards to be violated, as defined in the applicable NPDES permit(s) or State Water Quality Control Plan for ocean waters for concentration and emissions of discharge?

Riser/Diffuser Area – Palos Verdes Shelf

Construction

CEQA Analysis

Construction activities on the PV Shelf would be very similar to those described for the SP Shelf in Alternative 1 (Project) under Impact MAR-1. Construction on the PV Shelf would take approximately 3 years, likely beginning in 2018 and ending in 2021. The riser would be constructed in the same manner as for the SP Shelf and have the same inner and outer casing dimensions. Construction within the casing is expected to take the same amount of time (21 months), and the water and sediments within the casings would be removed in the same manner. Construction of the diffuser on the PV Shelf would not include trenching and thus would not include sidecasting or bringing sediment to the surface. Some grading activities would take place on the seafloor and would be similar to land-based grading. Activities would involve flattening and smoothing the sea floor to prepare it for rock ballast and diffuser placement, and would occur closer to the shore and at a shallower depth than for the SP Shelf. The distance from Point Fermin would be approximately 2 miles and the depth would be approximately 175 feet. Construction activities could potentially impact water quality.

As discussed for Alternative 1 (Project), a CWA Section 401 Water Quality Certification from the RWQCB that contains conditions including standard WDRs and a Department of Army permit from the Corps would be acquired for in-water construction activities on the PV Shelf. As discussed in Appendix 13-A, sediment contamination levels at a station sampled near the riser location have declined from historic levels. Prior to all in-water construction, the sediment would be sampled in the immediate project area to determine sediment contaminant levels and all grading would be performed in accordance with permit requirements. A spill prevention and control plan would be required for marine vessels carrying petroleum and nontank vessels over 300 gross tons. The plan would detail and implement spill prevention and control measures. Riser and diffuser construction on the PV Shelf would result in similar water quality impacts as those described for the SP Shelf, such as disturbing and resuspending near-bottom sediments, changing the levels of DO, and possibly releasing nutrients. These effects would result in temporary and localized changes to some water quality indicators in the mixing zone defined by the CWA Section 401 Water Quality Certification. Water quality in the vicinity of construction would be affected, but the effects would generally not extend beyond the mixing zone or persist following the completion of construction.

Turbidity

The physical characteristics of the sediments on the PV Shelf influence turbidity in the water column. These sediments are similar to the SP Shelf, as identified in the project setting (Section 13.2.2) and Appendix 13-A. Turbidity associated with grading the seafloor and placing the ballast rocks would be much less than turbidity generated for the SP Shelf construction because sidecasting or removal of seafloor sediment would not be implemented on the PV Shelf. Long-term current velocities of 0.3 ft/sec at project depths on the PV Shelf are slightly slower than those found on the SP Shelf, resulting in a smaller area of distribution as the sediments settle following disturbance by grading or placing ballast rocks. The studies discussed in Alternative 1 (Project) under Impact MAR-1 for construction on the SP Shelf suggest that near-bottom turbidity generated by construction activities would settle to the bottom within approximately 2 hours. Therefore, turbidity during construction represents a less than significant impact on water quality.

Water quality is also influenced by the chemical composition of the sediments mobilized during activities that cause turbidity. The PV Shelf is located within the EPA-designated DDT/PCB study area. Construction activities on the PV Shelf would be more limited than those on the SP Shelf, and would only include grading of the seafloor and placing of ballast rocks. During preparation of the seafloor, sediment would not be sidecast or brought to the surface for onshore disposal. Conditions in the CWA Section 401 and the CWA Section 404 permits would require implementation of appropriate sediment management practices to minimize water quality impacts. Monitoring of contaminant concentrations in waters near sediment-disturbing activities would be required. Both permits would require adaptative management of in-water work that would be implemented if the monitoring data indicate that water quality conditions outside the mixing zone would be noncompliant with permit-specified limits. Because elevated levels of DDT and mercury have been identified on the PV Shelf, MM MAR-1a and MM MAR-1b are required, and would reduce any significant impacts associated with suspension of contaminated sediment to less than significant. Impacts on the surrounding sediment and on protected species and local biological communities and habitat related to contaminated sediment are discussed in Impacts MAR-2, MAR-3, and MAR-4.

Dissolved Oxygen

Removal of the riser casing after construction of the diffuser vault would occur on the PV Shelf as described for Alternative 1 (Project) on the SP Shelf. Local currents in the project area averaged almost 0.3 ft/s over a 9-year study period. At this rate, currents are expected to mix and disperse the entrained water with ambient water over a distance of more than 1,180 feet within 1 hour of release. Within approximately 1 day, the entrained water would be diluted and dispersed over 5.4 miles and a residual plume is likely to be undetectable. Ambient water conditions are expected to be found in the area within hours to a day following release. Therefore, water quality impacts resulting from the removal of the riser casing would be less than significant.

Nutrients and Harmful Algal Blooms

The sediment on the PV Shelf is known to contain nutrients. The depth of construction activities on the PV Shelf is approximately 75 feet below the trapping layer for most of the year. This would minimize the possibility of nutrients from reaching phytoplankton closer to the sea surface and would prevent any blooms that could be caused by the release of nutrients. Therefore, nutrient and HAB impacts resulting from construction on the PV Shelf would be less than significant.

Spills

As described in Section 13.4.1, a spill prevention and control plan would be required for marine vessels carrying petroleum and nontank vessels over 300 gross tons. The plan would detail and implement spill prevention and control measures. If an accidental spill were to occur, the response and notification actions required by the plan would immediately be implemented. These would include efforts to contain and neutralize the spill, such as deploying floating booms to contain and absorb the spill and using pumps to assist the cleanup. Such measures would likely prevent the accidental spill from causing any persistent degradation of water quality. Therefore, significant water quality impacts are not expected to occur as a result of accidental spills of pollutants during in-water construction. Impacts would be less than significant.

NEPA Analysis

Environmental impacts would be the same as described for the CEQA analysis, and would occur for the duration of construction. With respect to the Corps' NEPA scope of analysis described in Section 3.5, the environmental impacts would be considered direct impacts.

Operation

CEQA Analysis

Operation of the PV Shelf diffuser would be the same as those discussed for the SP Shelf in Alternative 1 (Project) under Impact MAR-1. The new ocean discharge system on the PV Shelf would operate continuously, as similarly described in Alternative 1 (Project) under Impact MAR-1 for the SP Shelf. There would be no difference in the operation of the JWPCP or the physical design of the PV Shelf diffuser as compared to the SP Shelf diffuser. Although the PV Shelf diffuser would be located at a depth of approximately 175 feet, operational volumes and effluent quality discharged through the PV Shelf diffuser would be similar to existing discharge conditions at the existing ocean outfalls, and discharge depths and predicted trapping depths are comparable to the existing JWPCP discharge site. Therefore, a similar discharge on the PV Shelf would not result in pollution, contamination, nuisance, or violation of regulatory standards. The new ocean discharge system would be required to comply with NPDES provisions, which prohibit contamination, pollution, or nuisance.

Water Quality

As discussed in Alternative 1 (Project) under Impact MAR-1, an NPDES permit, required by the CWA and enforced by the LARWQCB, is necessary for any effluent discharges into the Pacific Ocean. The NPDES permit contains several regulatory requirements including both effluent and receiving water limits and requirements for certain treatment processes to maintain water quality in the receiving water (e.g., the Pacific Ocean) (Appendix 13-E). As discussed in Alternative 1 (Project) under Impact MAR-1, the operation of the JWPCP and the physical design of the existing ocean outfalls allow the Sanitation Districts to meet the effluent limitations and performance goals outlined in the NPDES permit and maintain water quality off the coast of Southern California; this would be the same for the PV Shelf diffuser.

The JWPCP NPDES permit would be updated before operation of the PV Shelf diffuser. The JWPCP would continue to use secondary treatment to produce treated effluent, and the effluent would continue to be chlorinated prior to release to the Pacific Ocean. The PV Shelf diffuser would be constructed with diffuser ports spaced to provide initial dilution of 166:1 or greater. As identified in the project setting (Section 13.2.2), the localized currents on the PV Shelf are similar in velocity to those at the existing ocean outfalls on the PV Shelf and the SP Shelf, but may be seasonally somewhat more variable in direction. Similar to the existing ocean outfalls, the discharged effluent plume would likely move primarily upcoast, particularly in winter; however, in summer, upslope currents in the riser area may entrain the plume, with flow to the south and east across the SP Shelf. The Sanitation Districts would continue to regularly monitor for all the constituents identified in the NPDES permit authorizing the discharge. Because the operation of the JWPCP would not change and the PV Shelf diffuser would be designed to perform equal to or better than the existing ocean outfalls, impacts on water quality from the operation of the PV Shelf diffuser would be less than significant.

Nutrients and Harmful Algal Blooms

As discussed in Alternative 1 (Project) under Impact MAR-1, there is no evidence that outfall discharges influence the distribution or abundance of HABs. If nutrients from the JWPCP and other SCB discharges were associated with HABs, the events would likely have been present in the SCB for decades. Because operational volumes and effluent quality discharged through the PV Shelf diffuser would be similar to existing discharge conditions at the existing ocean outfalls, and discharge depths and predicted trapping depths are comparable with the existing JWPCP discharge site, it is unlikely that relocating the JWPCP discharge would cause any change in the phytoplankton response between sites and thereby result in HABs (Appendix 13-B). Therefore, impacts associated with nutrients and HABs would be less than significant.

In summary, because operational volumes and effluent quality discharged through the new PV Shelf diffuser would be similar to the existing conditions, and discharge depths and predicted trapping depths would be comparable to the existing ocean outfalls, it is unlikely that a similar discharge on the PV Shelf would result in pollution, contamination, nuisance, or violation of regulatory standards. The new ocean discharge system would comply with NPDES provisions, which prohibit contamination, pollution, or nuisance. Impacts would be less than significant.

NEPA Analysis

Environmental impacts would be the same as described for the CEQA analysis, and would occur for the operational life of the structure. With respect to the Corps' NEPA scope of analysis described in Section 3.5, the environmental impacts would be considered indirect impacts.

CEQA Impact Determination

Construction of the riser and diffuser on the PV Shelf for Alternative 2 (Project) would create pollution, contamination, or nuisance, as defined in Section 13050 of the CWC. Impacts under CEQA would be significant before mitigation. Operation of Alternative 2 (Project) would result in less than significant impacts.

Mitigation

Implement MM MAR-1a and MM MAR-1b.

Residual Impacts

Impacts would be less than significant. See residual impacts discussion in Alternative 1 (Project) under Impact MAR-1.

NEPA Impact Determination

Construction of the riser and diffuser on the PV Shelf for Alternative 2 (Project) would create pollution, contamination, or nuisance, as defined in Section 13050 of the CWC. Impacts under NEPA would be significant before mitigation with respect to the No-Federal-Action Alternative (see Section 3.4.1.6). Operation of Alternative 1 (Project) would result in less than significant impacts.

Mitigation

Implement MM MAR-1a and MM MAR-1b.

Residual Impacts

Residual impacts would be less than significant, as described under the CEQA impact determination.

Impact MAR-2. Would Alternative 2 (Project) substantially degrade marine sediment quality or character?

Riser/Diffuser Area – Palos Verdes Shelf

Construction

CEQA Analysis

The PV Shelf contains primarily fine silty sediment and hard substrate. There are approximately 19,335 acres of soft-bottom sediments on the PV Shelf at depths of 100 to 400 feet (30 to 120 meters). Soft-bottom sediments provide habitat for a variety of species, which comprise the benthic epifauna and infauna. As discussed in the project setting and Impact MAR-1, the construction area is located within the EPA-designated DDT/PCB study area. Construction activities on the PV Shelf could disturb near-bottom sediments for the duration of the construction period. Sediment would be considered degraded if it becomes contaminated with chemicals, thereby reducing its quality, or if the character of the sediment is substantially altered (e.g., changing from fine silty sediment to large course sediment or vice versa) during construction activities.

Construction of the PV Shelf riser and diffuser and its impacts on turbidity in the marine environment are described in Impact MAR-1. Based on current velocity and settling times on the PV Shelf, sediments disturbed by construction activities would most likely be redeposited in areas close to their point of origin and of similar sediment quality and characteristics. Additionally, the construction activities would not add contaminants to the sediment. Therefore, the disturbance of bottom sediments as a result of construction would be expected to be short term and localized and sediment quality or character would not be substantially degraded. Impacts would be less than significant.

NEPA Analysis

Environmental impacts would be the same as described for the CEQA analysis, and would occur for the duration of construction. With respect to the Corps' NEPA scope of analysis described in Section 3.5, the environmental impacts would be considered direct impacts.

Operation

CEQA Analysis

Impacts on sediments as a result of operations under Alternative 2 (Project) would be the same as for Alternative 1 (Project). The new diffuser on the PV Shelf would operate the same as the new diffuser on the SP Shelf.

The operation of the PV Shelf diffuser could change the quality of the sediment by deposition of particles in discharged effluent. However, data from the existing ocean outfalls and studies of the city of San Diego PLWTP outfall show that the effluent would not substantially degrade sediment character or quality. As discussed in Impact MAR-1, some organic enrichment in the vicinity of the new PV Shelf diffuser would occur; however, as demonstrated by the city of San Diego, and in the ongoing monitoring of the existing ocean outfalls, enrichment would be variable and transitory near the diffuser. The legacy contamination in the existing sediment of the PV Shelf would continue to remain in the area where the diffuser would operate; however, because the discharge of DDT/PCBs into the sewer system ceased in the 1970s, operation of the PV Shelf riser and diffuser would not substantially degrade marine sediment quality or character. Impacts would be less than significant.

NEPA Analysis

Environmental impacts would be the same as described for the CEQA analysis, and would occur for the operational life of the structure. With respect to the Corps' NEPA scope of analysis described in Section 3.5, the environmental impacts would be considered indirect impacts.

CEQA Impact Determination

Construction and operation of Alternative 2 (Project) would not substantially degrade marine sediment quality or character. Impacts under CEQA would be less than significant.

Mitigation

No mitigation is required.

Residual Impacts

Impacts would be less than significant.

NEPA Impact Determination

Construction and operation of Alternative 2 (Project) would not substantially degrade marine sediment quality or character before mitigation. Impacts under NEPA would be less than significant with respect to the No-Federal-Action Alternative (see Section 3.4.1.6).

Mitigation

No mitigation is required.

Residual Impacts

Impacts would be less than significant.

Impact MAR-3. Would Alternative 2 (Project) result in the substantial loss of individuals or the reduction of existing habitat, of a state- or federally listed endangered, threatened, rare, protected, candidate, or sensitive plant or animal species or a species of special concern?

Riser/Diffuser Area – Palos Verdes Shelf

Construction

CEQA Analysis

Construction on the PV Shelf would take approximately 3 years beginning 2018 and ending in 2021. Vessel traffic during this time would be the same as described for the SP Shelf and would depend on the type of diffuser constructed. In addition, barges would make round trips between LA-2 and/or LA-3 and the Port of Los Angeles or the construction area for disposing of excavated tunneling and excavated riser material. Pile driving of the jack-up barge legs would be of the same duration as described for the SP Shelf, but would likely take place in 2018.

Impacts on protected species during construction of the riser and diffuser on the PV Shelf for Alternative 2 (Project) would be similar to construction of the riser and diffuser on the SP Shelf analyzed under Alternative 1 (Project). With the addition of the California least tern (potential impacts are the same as those presented for the California brown pelican in Alternative 1 [Project]), the species and potential impacts would be the same for the PV Shelf. Short-term construction impacts on the PV Shelf are associated with temporary increases in the potential for collision with vessels or entanglement in anchor or buoy cables and lines, rope, or other debris for the duration of construction. Short-term increases in underwater sound could result in the displacement, and possibly injury, of individuals within the immediate vicinity of the work area during pile driving activities. Short-term, temporary impacts on protected species would result from turbidity or reduction in water quality during construction.

Vessel Collisions, Entanglement, Underwater Sound

Impacts on protected species at the PV Shelf location associated with vessel collisions, entanglement, and underwater sound would be the same as discussed in Alternative 1 (Project) under Impact MAR-3 for the SP Shelf. The levels of underwater sound generated by pile driving would be the same, because the activities would be the same; however, the locations impacted would be different. Underwater impacts are presented on Figure 13-9. Impacts associated with vessel collisions, entanglement, and underwater sound would be considered significant before mitigation. Implementation of MM MAR-3a through MM MAR-3i would reduce these impacts to less than significant.

Sediment Quality

The PV Shelf site is within the EPA-designated DDT/PCB study area. As discussed in Impacts MAR-1 and MAR-2, construction activities on the PV Shelf would result in increased turbidity and disturbance of sediment. Suspension of DDT/PCB contaminated sediments would result in increased availability of DDT/PCB to benthic and pelagic organisms and the local food web, which could impact protected species relying on these organisms as sources of food (Eganhouse and Venkatesan 1993:121–122). DDT/PCB can become available through two pathways, both of which would increase the amount of DDT/PCB available to organisms, which could increase concentrations of DDT/PCB in higher trophic levels. However, because sediment-disturbing trenching would not be implemented on the PV Shelf, and the water column turbidity generated by construction activities would be expected to be short term and remain localized, the impact of potential exposure to contaminated sediment on benthic species and the food chain would be less than significant.

Water Quality

As discussed in Alternative 1 (Project) under Impact MAR-3, surface turbidity would result in impacts on foraging for certain species. California least terns forage over the PV Shelf, including the construction location, because there are nearby nesting sites in the port complex (Atwood and Minsky 1983). Impacts associated with surface turbidity generated by construction activities on California least terns would be similar to those described for marine birds in Alternative 1 (Project) under Impact MAR-3. Therefore, local surface turbidity would not substantially reduce foraging opportunities for the California least tern. Impacts would be less than significant.

NEPA Analysis

Environmental impacts would be the same as described for the CEQA analysis, and would occur for the duration of construction. With respect to the Corps' NEPA scope of analysis described in Section 3.5, the environmental impacts would be considered direct impacts.

Operation

CEQA Analysis

As discussed in Impact MAR-1, the new ocean discharge system on the PV Shelf would operate continuously, and the only difference in operation of the JWPCP or the physical design of the PV Shelf diffuser compared to the SP Shelf diffuser would be a reduction in depth for the discharge to 175 feet. The depth of the PV Shelf discharge is approximately 75 feet below the trapping layer. Protected species and the potential impacts that could occur as a result of the operation of the PV Shelf diffuser would be the same as those on the SP Shelf. Once constructed, the impacts on protected species during operation of the PV Shelf diffuser under Alternative 2 (Project) would be similar to operation of the diffuser on the SP Shelf under Alternative 1 (Project). Protected species and the potential operation impacts would be the same for the PV Shelf diffuser. Impacts on California least terns would be similar to those presented for California brown pelicans.

Nutrients and Harmful Algal Blooms

The operation and water quality associated with the PV Shelf diffuser are discussed in detail in Alternative 1 (Project) under Impact MAR-1 and in Alternative 2 (Project) under Impact MAR-1. Impacts on protected species associated with water quality could occur because of the operation of the diffuser. Nutrients and HABs have historically affected marine species. However, as discussed in Alternative 1 (Project) under Impact MAR-1 and Alternative 2 (Project) under Impact MAR-1, operation of the PV Shelf diffuser would not have the potential to affect the frequency or location of HABs. Furthermore, the diffuser's physical construction and location, and the existing conditions on the PV Shelf would not create pollution or contamination that would impact protected species. Therefore, impacts on protected species would be less than significant.

Sediment Quality

As discussed in Appendix 13-A and Impact MAR-1, sediment contamination levels at a station sampled near the proposed riser location have declined from historic levels, and further improvements over time are likely. As discussed in Impact MAR-2, legacy contamination in the existing sediment of the PV Shelf would continue to remain in the riser/diffuser area; however, because the discharge of DDT/PCBs into the sewer system ceased in the 1970s, operation of the PV Shelf diffuser would not disturb the existing legacy sediment contamination or increase the volume or concentrations such that effects on protected species would occur. Impacts would be less than significant.

NEPA Analysis

Environmental impacts would be the same as described for the CEQA analysis, and would occur for the operational life of the structure. With respect to the Corps' NEPA scope of analysis described in Section 3.5, the environmental impacts would be considered indirect impacts.

CEQA Impact Determination

Construction of the riser and diffuser on the PV Shelf and on the existing ocean outfalls for Alternative 2 (Project) could result in the substantial loss of individuals or the reduction of existing habitat of a state- or federally listed endangered, threatened, rare, protected, candidate, or sensitive plant or animal species or a species of special concern. Impacts under CEQA would be significant before mitigation. Operation of Alternative 2 (Project) would result in less than significant impacts.

Mitigation

Vessel Collisions

Implement MM MAR-3a through MM MAR-3c.

Entanglement

Implement MM MAR-3d through MM MAR-3g.

Underwater Sound

Implement MM MAR-3h and MM MAR-3i.

Removal of Protected Species (Black Abalone)

Implement MM MAR-3j.

Residual Impacts
Residual impacts would be less than significant. See the residual impacts discussion under Alternative 1, Impact MAR-3.

NEPA Impact Determination
Construction of the riser and diffuser on the PV Shelf and on the existing ocean outfalls for Alternative 2 (Project) could result in the substantial loss of individuals or the reduction of existing habitat of a state- or federally listed endangered, threatened, rare, protected, candidate, or sensitive plant or animal species or a species of special concern. Impacts under NEPA would be significant before mitigation with respect to the No-Federal-Action Alternative (see Section 3.4.1.6). Operation of Alternative 1 (Project) would result in less than significant impacts.

Mitigation
Implement MM MAR-3a through MM MAR-3j.

Residual Impacts
Residual impacts would be less than significant, as described under the CEQA impact determination.

Impact MAR-4. Would Alternative 2 (Project) result in the substantial degradation or disruption of habitat for marine biota or local biological communities?

Riser/Diffuser Area – Palos Verdes Shelf

Construction

CEQA Analysis
This analysis discusses non-protected marine biological resources, such as local biological communities and marine habitat. Local biological communities and marine habitat present on the PV Shelf are specifically discussed in Sections 13.2.1.5 and 13.2.2.1. Local biological communities include plankton, invertebrates, fishes, soft-bottom habitat, and EFH (see Impact MAR-3 for analysis of protected species). Construction of the riser and diffuser on the PV Shelf is generally described in Impact MAR-1, and Alternative 1 (Project) under Impact MAR-1. The potential impacts associated with construction of the PV Shelf riser and diffuser would be the same as those described for the SP Shelf diffuser.

Underwater Sound
The levels of underwater sound generated by the pile driving for the PV Shelf would be the same as for the SP Shelf because the activities would be the same; however, the locations impacted would be different. Fishes in the water column and on or near the ocean floor could be disturbed or injured by underwater construction activities. Most fishes would likely leave the immediate area of disturbance, although some may stay to feed on invertebrates released from the sediments (Anchor 2002:18–29). Noise impacts are depicted in Figure 13-9. However, there would be no substantial disruption of PV Shelf fish communities because the affected area represents only a small proportion of the total available open water and near-bottom habitat on the PV Shelf. In addition, the nearest rocky habitat to the proposed PV Shelf riser area is approximately 0.9 mile southeast of the riser area at a shallower depth (Sloan pers. comm. 2007), outside of the maximum distance of accumulated underwater sound impacts of 2,487 feet. Implementation of MM MAR-4a and MM MAR-4b (same as MM MAR-3h and MM MAR-3i) would reduce the likelihood of disturbance or injury caused by underwater sound associated with pile driving to less than significant. As described under Impact MAR-3, impacts on fishes from vessel noise, which are expected to be minor and short term, would be less than significant.

Water Quality and Sediment Quality

As discussed in Impacts MAR-1 and MAR-2, construction activities on the PV Shelf could alter water and sediment quality, which would affect existing local biological communities by reducing foraging area, possibly releasing nutrients into the water column, or smothering existing benthic organisms with sediment.

Planktonic organisms would be temporarily affected by turbidity in the water column, as discussed in Alternative 1 (Project) under Impact MAR-4 for construction on the SP Shelf. However, impacts on phytoplankton, zooplankton, and ichthyoplankton are less than significant because construction would be short term and would only affect a limited area. Thus, planktonic organisms on the PV Shelf would not be substantially disrupted.

Impacts on benthic and epibenthic organisms located within the construction area include temporary disturbances from turbidity and sediment resuspension and deposition generated by construction activities. Lethal and sublethal direct effects that would occur during construction include mortality, arrested development, reduction in growth, reduced ingestion, depressed filtration rate, and increased mucous secretion. (EPA 2009b:Ch 5.)

The PV Shelf has approximately 19,335 acres of soft-bottom habitat between depths of 100 and 400 feet (30 and 120 meters). As discussed in Appendix 13-A, the different depths within this area are common across the entire midshelf and support common communities of benthic and epibenthic organisms. The direct construction laydown area for the riser, diffuser, and roadbeds on the PV Shelf would be approximately 5 to 10 acres, which is less than 0.1 percent of the entire soft-bottom habitat of the PV Shelf. Therefore, although construction activities may cause mortality and sublethal effects on benthic and epibenthic communities on the PV Shelf during construction, the construction activities would not actually result in a substantial degradation or disruption to these common communities. Furthermore, effects of turbidity and sediment deposition on the benthic habitat would be temporary, and the benthic and epibenthic communities that reside on the PV Shelf would recover. Previous studies offshore of Los Angeles and on the PV Shelf have examined the effects of sediment settling on benthic communities and recovery rates. Although there are some physical differences between the locations of these studies and the PV Shelf construction area, the benthic communities are very similar. Colonization of settled sediments by burrowing of buried residents or nearby organisms is expected to occur within hours or days following deposit, and later stage successional communities are expected within months to a year (MEC 1988:4-78 through 4-84). Similarly, the Palos Verdes Shelf Superfund Site Feasibility Study identified that offshore habitat recolonization begins within days or weeks. Recovery to conditions similar to those found before disturbance were expected within months and almost certainly within 2 to 5 years based on the recolonization time of days to weeks measured in the study (EPA 2009b:6-21, 6-22). As a result, benthic and epibenthic communities would not be substantially disrupted or disturbed, and impacts would be less than significant.

Fishes in the water column and on or near the ocean floor in the construction area would be temporarily disturbed by underwater construction activities as a result of turbidity. There are no unique habitats within the general vicinity of the construction area that would draw fishes to that area that are not found elsewhere on the PV Shelf. The PV Shelf riser area is a relatively flat soft-bottom habitat; the nearest rocky structure is found approximately 0.9 mile southeast of the riser area at a shallower depth (Sloan pers. comm. 2007). Construction on the PV Shelf would be approximately 5 to 10 acres, or less than 0.1 percent of similar habitat otherwise available to fishes on the PV Shelf at depths of 100 to 400 feet (30 to 120 meters). Therefore, fishes would have other locations to feed and move away from the disturbance, and impacts would be less than significant.

Water column turbidity generated by construction activities is expected to be short term and stay localized. Therefore, impacts on benthic species and the food chain would be less than significant.

Marine Habitat

Grading and placement of ballast rocks on the soft-bottom habitat would result in disturbance and mortality of some organisms as discussed under water quality and sediment quality. Anchor and/or mooring lines could drag on the seafloor, temporarily disturbing soft-bottom habitat. In soft sediments on the PV Shelf, anchors or anchor/mooring lines could create large divots or furrows, disrupting benthic and epibenthic communities. Such disruptions to soft-bottom habitat are common because the PV Shelf riser and diffuser area is located close to the shipping lanes offshore of Los Angeles and Long Beach. However, as previously discussed, the soft-bottom habitat would recolonize relatively quickly (MEC 1988:4-78 through 4-84).

Hard-bottom substrate, including reefs, is more common on the PV Shelf, where it is known to occur at midshelf depths, than on the SP Shelf. As discussed in Alternative 1 (Project) under Impact MAR-4 for the SP Shelf construction area, when this type of habitat is disturbed, recovery depends on the duration of disturbance and the distance from other similar habitat. Therefore, the recolonization of disturbed hard-bottom habitat can result in different community dominants than were found initially in the area. Because anchors and lines could alter low- or high-relief reefs and disrupt the associated communities, substantial disruption of this type of habitat would be considered a significant impact that would be reduced to less than significant through the implementation of MM MAR-4c.

Construction of the riser and diffuser would include placement of ballast rock. This would result in soft-bottom habitat on the PV Shelf being replaced with hard substrate. However, given the small amount of soft-bottom habitat disturbed (approximately 10 acres or less), and the availability of similar habitat throughout the PV Shelf, this is not considered substantial. This soft-bottom habitat would be replaced with hard substrate (i.e., riser, diffuser, and ballast rock), resulting in a shift in fish and invertebrate communities from soft-bottom to reef/hard-substrate and rocky/soft-bottom interface species over a relatively small area. As further discussed in Alternative 1 (Project) under Impact MAR-4, construction of the riser and diffuser would not result in a substantial degradation or disruption of soft-bottom habitat on the SP Shelf, and impacts would be less than significant.

Essential Fish Habitat

A complete EFH assessment was prepared for Alternative 2 (Project) and is attached as Appendix 13-C. The construction of the riser and diffuser would have no effect on the managed species that do not occur on the PV Shelf and minimal effects on those that do. Riser placement, grading, and placement of ballast rock could affect the managed fish/invertebrate species that occur on the PV Shelf through habitat disturbance, turbidity, and suspension of contaminants from sediments, as well as by underwater sound. These effects would be temporary, occurring at intervals lasting approximately 3 years during the in-water construction period, with a general return to baseline conditions between construction activities and following construction, resulting in little disturbance to individuals or to EFH from construction.

There would be a decrease of soft-bottom habitat on the PV Shelf and an increase in hard structure. However, given the small amount of soft-bottom habitat disrupted (approximately 10 acres or less), and the availability of similar habitat throughout the PV Shelf (approximately 19,335 acres between a 33- and 330-foot [10- and 100-meter] depth), this is not considered substantial. Placement of bottom structures would result in less habitat for soft-bottom species, such as recreationally important Dover sole and Pacific sanddab, and more habitat for structure-oriented species, or those that prefer a sand/structure interface. Accordingly, impacts on EFH from riser and diffuser construction would be less than significant.

NEPA Analysis

Environmental impacts would be the same as described for the CEQA analysis, and would occur for the duration of construction. With respect to the Corps' NEPA scope of analysis described in Section 3.5, the environmental impacts would be considered direct impacts.

Operation

CEQA Analysis

Operation of the PV Shelf diffuser is described in Impact MAR-1. The treated effluent discharged from the new ocean discharge system would have the same physical properties as the discharge from the existing ocean outfalls because the dilution would be the same, if not better. The potential operational impacts associated with the operation of the PV Shelf riser and diffuser would be the same as those described for the SP Shelf diffuser.

Nutrients and Harmful Algal Blooms

As discussed in Section 13.2.1.5, HABs can result in the production of toxins at levels that can affect local biological communities by bioaccumulating in species tissue and cause illness and death in higher food chain animals (Appendix 13-B). However, HABs have not been linked to the operation of ocean outfalls in Southern California, as discussed in Impact MAR-1. Therefore, impacts on local biological communities and habitat would be less than significant.

Water Quality and Sediment Quality

As discussed in Impact MAR-1, operational volumes and effluent quality discharged through the PV Shelf diffuser would be similar to the existing characteristics of the current effluent discharged, and discharge depths and predicted trapping depths would be comparable to the existing ocean outfalls. Furthermore, as discussed in Alternative 1 (Project) under Impact MAR-1 for the SP Shelf, extra fine materials and particles are regularly released from the ocean outfalls. Therefore, particles that settle near ocean outfalls are common features of wastewater disposal systems, as discussed in Impact MAR-1 for operation of the new ocean discharge system on the PV Shelf. However, data from the existing ocean outfalls and studies of the city of San Diego PLWTP outfall show that the chemical composition of the sediment within the vicinity of ocean outfalls and the distribution of particle size from the effluent would not substantially degrade sediment character or quality. Some organic enrichment in the vicinity of the PV Shelf outfall would occur; however, as demonstrated at the city of San Diego outfalls, and in the ongoing monitoring of the existing ocean outfalls, enrichment would be variable and transitory near the diffuser. The legacy contamination in the existing sediment of the PV Shelf would continue to remain in the area where the new diffuser would operate; however, because the discharge of DDT/PCBs into the sewer system ceased in the 1970s, it is unlikely that a new similar discharge on the PV Shelf would result in impacts on local biological communities from an alteration in water and/or sediment quality. Impacts would be less than significant.

Essential Fish Habitat

A complete EFH assessment for Alternative 2 (Project) is included in Appendix 13-C. As discussed in Impacts MAR-1 and MAR-3, operational volumes and effluent quality discharged on the PV Shelf would be similar to existing conditions, and discharge depths and predicted trapping depths are comparable with the existing JWPCP discharge site. The operation of the riser and diffuser would have no effect on EFH on the PV Shelf.

NEPA Analysis

Environmental impacts would be the same as described for the CEQA analysis, and would occur for the operational life of the structure. With respect to the Corps' NEPA scope of analysis described in Section 3.5, the environmental impacts would be considered indirect impacts.

CEQA Impact Determination

Construction of the riser and diffuser on the PV Shelf for Alternative 2 (Project) could result in the substantial degradation or disruption of habitat for marine biota or local biological communities. Impacts under CEQA would be significant before mitigation. Operation of Alternative 2 (Project) would result in less than significant impacts.

Mitigation

Underwater Sound

Implement MM MAR-4a and MM MAR-4b (same as MM MAR-3h and MM MAR-3i).

Marine Habitat

Implement MM MAR-4c.

Residual Impacts

Impacts would be less than significant. See the residual impacts discussion for Alternative 1 (Project) under Impacts MAR-3 and MAR-4.

NEPA Impact Determination

Construction of the riser and diffuser for Alternative 2 (Project) could result in the substantial degradation or disruption of habitat for marine biota or local biological communities. Impacts under NEPA would be significant before mitigation with respect to the No-Federal-Action Alternative (see Section 3.4.1.6). Operation of Alternative 2 (Project) would result in less than significant impacts.

Mitigation

Implement MM MAR-4a and MM MAR-4b (same as MM MAR-3h and MM MAR-3i) and MM MAR-4c.

Residual Impacts

Residual impacts would be less than significant, as described under the CEQA impact determination.

Impact MAR-5. Would Alternative 2 (Project) interfere with the movement/migration corridors of marine biota?

Riser/Diffuser Area – Palos Verdes Shelf

<u>Construction</u>

CEQA Analysis

As discussed in Section 13.2.1.5 and Appendix 13-A, several marine species migrate through the SCB, including birds, sea turtles, marine mammals, and fishes. The impacts on these species would be the same as those described for the SP Shelf. Therefore, the analysis on migration under Alternative 2 (Project) would be the same as Alternative 1 (Project); however, the timing associated with the pile driving would likely occur in the spring of 2018. Implementation of MM MAR-5a to MM MAR-5i (same as MM MAR-3a to MM MAR-3i) would reduce impacts on any whale migrating in the area to less than significant.

NEPA Analysis

Environmental impacts would be the same as described for the CEQA analysis, and would occur for the duration of construction. Baseline conditions would resume upon termination of construction. With respect to the Corps' NEPA scope of analysis described in Section 3.5, the environmental impacts would be considered direct impacts.

Operation

CEQA Analysis

Operation of the PV Shelf diffuser is described in Impact MAR-1. Impacts on movement and migration of marine species as a result of operations under Alternative 2 (Project) would be the same as for Alternative 1 (Project). Operation of the PV Shelf diffuser is not expected to impede or disrupt the movement or migration of any marine species. Therefore, the operation of the new ocean discharge system would not interfere with the movement or migration corridors of marine biota, and impacts would be less than significant.

NEPA Analysis

Environmental impacts would be the same as described for the CEQA analysis, and would occur for the operational life of the structure. With respect to the Corps' NEPA scope of analysis described in Section 3.5, the environmental impacts would be considered indirect impacts.

CEQA Impact Determination

Construction of the riser and diffuser on the PV Shelf for Alternative 2 (Project) could interfere with the movement/migration corridors of marine biota. Impacts under CEQA would be significant before mitigation. Operation of Alternative 2 (Project) would result in less than significant impacts.

Mitigation

Vessel Collisions

Implement MM MAR-5a through MM MAR-5c (same as MM MAR-3a through MM MAR-3c).

Entanglement

Implement MM MAR-5d through MM MAR-5g (same as MM MAR-3d through MM MAR-3g).

Underwater Sound

Implement MM MAR-5h and MM MAR-5i (same as MM MAR-3h and MM MAR-3i).

Residual Impacts

Residual impacts would be less than significant. See the residual impacts discussion for Alternative 1 (Project) under Impact MAR-3.

NEPA Impact Determination

Construction of the riser and diffuser on the PV Shelf for Alternative 2 (Project) could interfere with the movement/migration corridors of marine biota. Impacts under NEPA would be significant before mitigation with respect to the No-Federal-Action Alternative (see Section 3.4.1.6). Operation of Alternative 2 (Project) would result in less than significant impacts.

Mitigation
Implement MM MAR-5a through MM MAR-5i (same as MM MAR-3a through MM MAR-3i).

Residual Impacts
Residual impacts would be less than significant, as described under the CEQA impact determination.

Impact MAR-6. Would Alternative 2 (Project) adversely affect public health?

Riser/Diffuser Area – Palos Verdes Shelf

Construction

CEQA Analysis
Impact MAR-6 addresses the operation of the new ocean discharge system on the PV Shelf; therefore, construction is not analyzed for this threshold.

Operation

CEQA Analysis
As discussed in Alternative 1 (Project) under Impact MAR-6 for the SP Shelf diffuser operation, the JWPCP has been extensively modified over the years to improve the effluent quality discharged into the Pacific Ocean. Meeting the receiving water quality objectives of the California Ocean Plan and NPDES permit is a fundamental component of the overall ocean discharge system diffuser selection and evaluation process for the PV Shelf. The JWPCP tunnel and ocean outfall feasibility report (Parsons 2011) stated that the following objectives should be considered in the outfall design:

- Satisfy or exceed existing permit requirements
- Assure no significant effects to other regional discharges
- Improve the receiving water quality – no deterioration of receiving water quality
- Maintain a submerged plume – no increase in surfacing of the effluent

As discussed in Impact MAR-1, the proposed PV Shelf diffuser is being designed to meet the receiving water standards of the California Ocean Plan, as well as the requirements of the JWPCP's existing RWQCB WDR order and NPDES permit. With compliance with these standards and requirements, there would be no adverse effect on the public using beaches or the ocean for recreational or commercial fishing purposes associated with the release of effluent at the PV Shelf. Furthermore, the discharge of treated effluent would occur at a depth of 175 feet approximately three miles of the coast of Southern California. People would have no direct or indirect contact with the effluent plume at this depth and distance and thus adverse effects on public health would not occur. Therefore, impacts would be less than significant.

NEPA Analysis
Environmental impacts would be the same as described for the CEQA analysis, and would occur for the operational life of the structure. With respect to the Corps' NEPA scope of analysis described in Section 3.5, the environmental impacts would be considered indirect impacts.

CEQA Impact Determination
Operation of Alternative 2 (Project) would not adversely affect public health. Impacts under CEQA would be less than significant.

Mitigation
No mitigation is required.

Residual Impacts
Impacts would be less than significant.

NEPA Impact Determination
Operation of Alternative 2 (Project) would not adversely affect public health. Impacts under NEPA would be less than significant with respect to the No-Federal-Action Alternative (see Section 3.4.1.6).

Mitigation
No mitigation is required.

Residual Impacts
Impacts would be less than significant.

Impact MAR-7. Would Alternative 2 (Project) impair beneficial uses designated in the California Ocean Plan?

Riser/Diffuser Area – Palos Verdes Shelf

<u>Construction</u>

CEQA Analysis
Construction impacts on designated beneficial uses on the PV Shelf would be similar to those described for the SP Shelf. Therefore, the implementation of MM MAR-7a through MM MAR-7i (same as MM MAR-3a through MM MAR-3i) and MM MAR-7j (same as MM MAR-4c) would reduce impacts to less than significant.

NEPA Analysis
Environmental impacts would be the same as described for the CEQA analysis, and would occur for the duration of construction. With respect to the Corps' NEPA scope of analysis described in Section 3.5, the environmental impacts would be considered direct impacts.

<u>Operation</u>

CEQA Analysis
Operation of the PV Shelf diffuser is described in Impact MAR-1. Limitations and requirements of the existing NPDES permit protect the marine environment and the beneficial uses of ocean waters. Because the current JWPCP discharge meets NPDES requirements and operational characteristics would be comparable to the existing ocean outfalls, it is unlikely that relocating the discharge on the PV Shelf would impair beneficial uses designated in the California Ocean Plan. The offshore designated beneficial uses are the same for the PV Shelf as for the SP Shelf. Operational conditions resulting in impacts on designated beneficial uses under Alternative 2 (Project) would be the same as for Alternative 1 (Project). No operational impacts on offshore beneficial uses would occur or impacts would be less than significant as summarized in Table 13-16.

NEPA Analysis

Environmental impacts would be the same as described for the CEQA analysis, and would occur for the operational life of the structure. With respect to the Corps' NEPA scope of analysis described in Section 3.5, the environmental impacts would be considered indirect impacts.

CEQA Impact Determination

Construction of the riser and diffuser on the PV Shelf and on the existing ocean outfalls for Alternative 2 (Project) would impair beneficial uses designated in the California Ocean Plan. Impacts under CEQA would be significant before mitigation. Operation of Alternative 2 (Project) would result in less than significant impacts.

Mitigation

Vessel Collisions

Implement MM MAR-7a through MM MAR-7c (same as MM MAR-3a through MM MAR-3c).

Entanglement

Implement MM MAR-7d through MM MAR-7g (same as MM MAR-3d through MM MAR-3g).

Underwater Sound

Implement MM MAR-7h and MM MAR-7i (same as MM MAR-3h and MM MAR-3i).

Marine Habitat

Implement MM MAR-7j (same as MM MAR-4c).

Removal of Protected Species

Implement MM MAR-7k (same as MM MAR-3j).

Residual Impacts

Residual impacts would be less than significant. See the residual impacts discussion for Alternative 1 (Project) under Impact MAR-3.

NEPA Impact Determination

Construction of the riser and diffuser on the PV Shelf and on the existing ocean outfalls for Alternative 2 (Project) would impair beneficial uses designated in the California Ocean Plan. Impacts under NEPA would be significant before mitigation with respect to the No-Federal-Action Alternative (see Section 3.4.1.6). Operation of Alternative 1 (Project) would result in less than significant impacts.

Mitigation

Implement MM MAR-7a through MM MAR-7i (same as MM MAR-3a through MM MAR-3i) and MM MAR-7j (same as MM MAR-4c).

Residual Impacts

Residual impacts would be less than significant, as described under the CEQA impact determination.

13.4.4.3 Impact Summary – Alternative 2

Impacts on the marine environment for Alternative 2 are summarized in Table 13-20. The proposed mitigation, where feasible, and the significance of the impact before and following mitigation are also listed in the table.

Alternative 2 (Program), which is the same as Alternative 1 (Program), does not include marine elements and has no potential to have an impact on the marine environment; therefore, an Impact Summary – Alternative 2 (Program) table is not included.

Table 13-20. Impact Summary – Alternative 2 (Project)

Project Element	Impact Determination Before Mitigation	NEPA Direct or Indirect	Mitigation	Residual Impact After Mitigation
Impact MAR-1. Would Alternative 2 (Project) create pollution, contamination, or nuisance, as defined in Section 13050 of the CWC; or cause regulatory standards to be violated, as defined in the applicable NPDES permit(s) or State Water Quality Control Plan for ocean waters for concentration and emissions of discharge?				
Riser/Diffuser Area				
PV Shelf	CEQA Significant Impact During Construction	N/A	MM MAR-1a. During riser and diffuser construction, analyses of contaminant concentrations (i.e., metals, dichlorodiphenyltrichloroethane [DDT], polychlorinated biphenyls [PCBs], polycyclic aromatic hydrocarbons [PAHs]) in waters near the dredging operations will be required if the contaminant levels in the dredged sediments are known to be elevated and represent a potential risk to beneficial uses. Monitoring data will be used to demonstrate that water quality limits specified in applicable state and federal permits are not exceeded. Corrective or adaptive actions would be implemented if the monitoring data indicate that water quality conditions outside the mixing zone are above the permit-specified limits. MM MAR-1b. Prepare and implement a contaminated sediment management plan that is consistent with practices outlined in the Los Angeles Regional Contaminated Sediment Task Force long-term management strategy if contaminant levels in the dredged sediments are known to be elevated and represent a potential risk. At a minimum, the plan will include site-specific best management plans at the immediate work site to reduce the potential area of exposure to contaminated sediments.	CEQA Less Than Significant Impact During Construction
	NEPA Significant Impact During Construction	Direct	MM MAR-1a and MM MAR-1b	NEPA Less Than Significant Impact During Construction
	CEQA Less Than Significant Impact During Operation	N/A	No mitigation is required.	CEQA Less Than Significant Impact During Operation
	NEPA Less Than Significant Impact During Operation	Indirect	No mitigation is required.	NEPA Less Than Significant Impact During Operation

Table 13-20 (Continued)

Project Element	Impact Determination Before Mitigation	NEPA Direct or Indirect	Mitigation	Residual Impact After Mitigation
Existing Ocean Outfalls	CEQA Less Than Significant Impact During Construction	N/A	No mitigation is required.	CEQA Less Than Significant Impact During Construction
	NEPA Less Than Significant Impact During Construction	Direct	No mitigation is required.	NEPA Less Than Significant Impact During Construction
	CEQA Less Than Significant Impact During Operation	N/A	No mitigation is required.	CEQA Less Than Significant Impact During Operation
	NEPA Less Than Significant Impact During Operation	Indirect	No mitigation is required.	NEPA Less Than Significant Impact During Operation
Impact MAR-2. Would Alternative 2 (Project) substantially degrade marine sediment quality or character?				
Riser/Diffuser Area				
PV Shelf	CEQA Less Than Significant Impact During Construction	N/A	No mitigation is required.	CEQA Less Than Significant Impact During Construction
	NEPA Less Than Significant Impact During Construction	Direct	No mitigation is required.	NEPA Less Than Significant Impact During Construction
	CEQA Less Than Significant Impact During Operation	N/A	No mitigation is required.	CEQA Less Than Significant Impact During Operation
	NEPA Less Than Significant Impact During Operation	Indirect	No mitigation is required.	NEPA Less Than Significant Impact During Operation
Existing Ocean Outfalls	CEQA Less Than Significant Impact During Construction	N/A	No mitigation is required.	CEQA Less Than Significant Impact During Construction
	NEPA Less Than Significant Impact During Construction	Direct	No mitigation is required.	NEPA Less Than Significant Impact During Construction
	CEQA Less Than Significant Impact During Operation	N/A	No mitigation is required.	CEQA Less Than Significant Impact During Operation
	NEPA Less Than Significant Impact During Operation	Indirect	No mitigation is required.	NEPA Less Than Significant Impact During Operation

Table 13-20 (Continued)

Project Element	Impact Determination Before Mitigation	NEPA Direct or Indirect	Mitigation	Residual Impact After Mitigation
Impact MAR-3. Would Alternative 2 (Project) result in the substantial loss of individuals or the reduction of existing habitat, of a state- or federally listed endangered, threatened, rare, protected, candidate, or sensitive plant or animal species or a species of special concern?				
Riser/Diffuser Area				
PV Shelf	CEQA Significant Impact During Construction	N/A	*Vessel Collisions* MM MAR-3a. Prepare and implement a collision protection plan to address sensitive and protected species. All construction personnel and boat operators will receive protected species training. The training will include review of the plan as well as identification of animals, species, and habitats potentially present in the project area. MM MAR-3b. Restrict tugs, tugs with barges under tow, and large work vessels to speeds of 12 knots (14 miles per hour [mph]) or less at all times. Maneuverable single hull vessels such as crew or supply boats may proceed at speeds of 20 knots (23 mph) or less under most conditions, but will reduce speed to 12 knots or less when whales or sea turtles are reported in the project area. MM MAR-3c. Immediately report all vessel collisions with marine mammals or sea turtles to the National Marine Fisheries Service. *Entanglement* MM MAR-3d. Limit the deployment of any material that has the potential to entangle marine mammals or sea turtles (e.g., anchor lines, cables, rope, other construction debris) to only as long as necessary. MM MAR-3e. Remove as much slack as possible from any potentially entangling material to the point of not jeopardizing construction operations. MM MAR-3f. Position temporary mooring buoys with heavy steel cables or chains to minimize potential entanglements. MM MAR-3g. In the event that a marine mammal or sea turtle becomes entangled, immediately seek guidance from the National Marine Fisheries Service for safe disentanglement options.	CEQA Less Than Significant Impact During Construction

Table 13-20 (Continued)

Project Element	Impact Determination Before Mitigation	NEPA Direct or Indirect	Mitigation	Residual Impact After Mitigation
			Underwater Sound MM MAR-3h. Implement a "soft start" method for all pile driving by operating the hammer at less than full capacity (i.e., approximately 40 to 60 percent energy levels) with no less than a 1-minute interval between each strike for a 5-minute period on initial driving for the day, or after a delay of 15 minutes between strikes. MM MAR-3i. Prepare and implement a pile driving management plan. The plan will require that a National Marine Fisheries Service–approved observer be stationed on the work platform or work vessel to monitor the presence of sensitive marine species in the construction area on all days when pile driving is taking place. The observer will survey the project vicinity before pile driving is started and give approval before such work begins. The observer will continue to advise the construction crew throughout the day to modify or stop pile driving if a sensitive or protected species travels within injury distances.	
	NEPA Significant Impact During Construction	Direct	MM MAR-3a through MM MAR-3i	NEPA Less Than Significant Impact During Construction
	CEQA Less Than Significant Impact During Operation	N/A	No mitigation is required.	CEQA Less Than Significant Impact During Operation
	NEPA Less Than Significant Impact During Operation	Indirect	No mitigation is required.	NEPA Less Than Significant Impact During Operation
Existing Ocean Outfalls	CEQA Significant Impact During Construction	N/A	*Removal of Protected Species (Black Abalone)* MM MAR-3j. Within 90 days prior to initiation of the rehabilitation work, survey the existing ocean outfall pipelines for black abalone at depths between the 15- and 55-foot isobaths in areas potentially affected by the work. The survey team will include divers/biologists experienced in locating abalone. If black abalone are determined to be present, consult with the National Marine Fisheries Service to develop a black abalone transplantation plan that includes the identification of a suitable nearby transplant location, temporary holding and transport methods, and reporting requirements.	CEQA Less Than Significant Impact During Construction

Table 13-20 (Continued)

Project Element	Impact Determination Before Mitigation	NEPA Direct or Indirect	Mitigation	Residual Impact After Mitigation
			Implementation of the plan will occur no more than 30 days preceding the in-water rehabilitation activities and will be conducted by qualified divers/biologists.	
	NEPA Significant Impact During Construction	Direct	MM MAR-3j	NEPA Less Than Significant Impact During Construction
	CEQA Less Than Significant Impact During Operation	N/A	No mitigation is required.	CEQA Less Than Significant Impact During Operation
	NEPA Less Than Significant Impact During Operation	Indirect	No mitigation is required.	NEPA Less Than Significant Impact During Operation
Impact MAR-4. Would Alternative 2 (Project) result in the substantial degradation or disruption of marine habitat or local biological communities?				
Riser/Diffuser Area				
PV Shelf	CEQA Significant Impact During Construction	N/A	*Underwater Sound* MM MAR-4a and MM MAR-4b (same as MM MAR-3h and MM MAR-3i) *Marine Habitat* MM MAR-4c. Prepare and implement an anchoring plan prior to in-water construction activities in accordance with the U.S. Army Corps of Engineers' permitting requirements. The plan will identify deployment methods for anchors, lines, cables, and moorings to minimize damage to hard-bottom substrate.	CEQA Less Than Significant Impact During Construction
	NEPA Significant Impact During Construction	Direct	MM MAR-4a and MM MAR-4b (same as MM MAR-3h and MM MAR-3i) MM MAR-4c	NEPA Less Than Significant Impact During Construction
	CEQA Less Than Significant Impact During Operation	N/A	No mitigation is required.	CEQA Less Than Significant Impact During Operation
	NEPA Less Than Significant Impact During Operation	Indirect	No mitigation is required.	NEPA Less Than Significant Impact During Operation
Existing Ocean Outfalls	CEQA Less Than Significant Impact During Construction	N/A	No mitigation is required.	CEQA Less Than Significant Impact During Construction
	NEPA Less Than Significant Impact During Construction	Direct	No mitigation is required.	NEPA Less Than Significant Impact During Construction
	CEQA Less Than Significant Impact During Operation	N/A	No mitigation is required.	CEQA Less Than Significant Impact During Operation
	NEPA Less Than Significant Impact During Operation	Indirect	No mitigation is required.	NEPA Less Than Significant Impact During Operation

Table 13-20 (Continued)

Project Element	Impact Determination Before Mitigation	NEPA Direct or Indirect	Mitigation	Residual Impact After Mitigation
Impact MAR-5. Would Alternative 2 (Project) interfere with the movement/migration corridors of marine biota?				
Riser/Diffuser Area				
PV Shelf	CEQA Significant Impact During Construction	N/A	*Vessel Collisions* MM MAR-5a through MM MAR-5c (same as MM MAR-3a through MM MAR-3c) *Entanglement* MM MAR-5d through MM MAR-5g (same as MM MAR-3d through MM MAR-3g) *Underwater Sound* MM MAR-5h and MM MAR-5i (same as MM MAR-3h and MAR-3i)	CEQA Less Than Significant Impact During Construction
	NEPA Significant Impact During Construction	Direct	MM MAR-5a through MM MAR-5i (same as MM MAR-3a through MM MAR-3i)	NEPA Less Than Significant Impact During Construction
	CEQA Less Than Significant Impact During Operation	N/A	No mitigation is required.	CEQA Less Than Significant Impact During Operation
	NEPA Less Than Significant Impact During Operation	Indirect	No mitigation is required.	NEPA Less Than Significant Impact During Operation
Existing Ocean Outfalls	CEQA Less Than Significant Impact During Construction	N/A	No mitigation is required.	CEQA Less Than Significant Impact During Construction
	NEPA Less Than Significant Impact During Construction	Direct	No mitigation is required.	NEPA Less Than Significant Impact During Construction
	CEQA Less Than Significant Impact During Operation	N/A	No mitigation is required.	CEQA Less Than Significant Impact During Operation
	NEPA Less Than Significant Impact During Operation	Indirect	No mitigation is required.	NEPA Less Than Significant Impact During Operation
Impact MAR-6. Would Alternative 2 (Project) adversely affect public health?				
Riser/Diffuser Area				
PV Shelf	CEQA Less Than Significant Impact During Operation	N/A	No mitigation is required.	CEQA Less Than Significant Impact During Operation
	NEPA Less Than Significant Impact During Operation	Indirect	No mitigation is required.	NEPA Less Than Significant Impact During Operation
Existing Ocean Outfalls	CEQA Less Than Significant Impact During Operation	N/A	No mitigation is required.	CEQA Less Than Significant Impact During Operation
	NEPA Less Than Significant Impact During Operation	Indirect	No mitigation is required.	NEPA Less Than Significant Impact During Operation

Table 13-20 (Continued)

Project Element	Impact Determination Before Mitigation	NEPA Direct or Indirect	Mitigation	Residual Impact After Mitigation
Impact MAR-7. Would Alternative 2 (Project) impair beneficial uses designated in the California Ocean Plan?				
Riser/Diffuser Area				
PV Shelf	CEQA Significant Impact During Construction	N/A	*Vessel Collisions* MM MAR-7a through MM MAR-7c (same as MM MAR-3a through MM MAR-3c) *Entanglement* MM MAR-7d through MM MAR-7g (same as MM MAR-3d through MM MAR-3g) *Underwater Sound* MM MAR-7h and MM MAR-7i (same as MM MAR-3h and MM MAR 3i) *Marine Habitat* MM MAR-7j (same as MM MAR-4c)	CEQA Less Than Significant Impact During Construction
	NEPA Significant Impact During Construction	Direct	MM MAR-7a through MM MAR-7i (same as MM MAR-3a through MM MAR-3i) MM MAR-7j (same as MM MAR-4c)	NEPA Less Than Significant Impact During Construction
	CEQA Less Than Significant Impact During Operation	N/A	No mitigation is required.	CEQA Less Than Significant Impact During Operation
	NEPA Less Than Significant Impact During Operation	Indirect	No mitigation is required.	NEPA Less Than Significant Impact During Operation
Existing Ocean Outfalls	CEQA Significant Impact During Construction	N/A	*Removal of Protected Species* MM MAR-7k (same as MM MAR-3j)	CEQA Less Than Significant Impact During Construction
	NEPA Significant Impact During Construction	Direct	MM MAR-7k (same as MM MAR-3j)	NEPA Less Than Significant Impact During Construction
	CEQA Less Than Significant Impact During Operation	N/A	No mitigation is required.	CEQA Less Than Significant Impact During Operation
	NEPA Less Than Significant Impact During Operation	Indirect	No mitigation is required.	NEPA Less Than Significant Impact During Operation

13.4.5 Alternative 3

13.4.5.1 Program

Alternative 3 (Program) does not include marine elements and, therefore, has no potential to have an impact on the marine environment.

13.4.5.2 Project

The impacts for the riser and diffuser area on the PV Shelf for Alternative 3 (Project) would be the same as for Alternative 2 (Project). The impacts for the existing ocean outfalls would be the same as for Alternative 1 (Project).

13.4.5.3 Impact Summary – Alternative 3

Impacts on the marine environment for Alternative 3 are summarized in Table 13-21. The proposed mitigation, where feasible, and the significance of the impact before and following mitigation are also listed in the table.

Alternative 3 (Program), which is the same as Alternative 1 (Program), does not include marine elements and has no potential to have an impact on the marine environment; therefore, an Impact Summary – Alternative 3 (Program) table is not included.

Table 13-21. Impact Summary – Alternative 3 (Project)

Project Element	Impact Determination Before Mitigation	NEPA Direct or Indirect	Mitigation	Residual Impact After Mitigation
Impact MAR-1. Would Alternative 3 (Project) create pollution, contamination, or nuisance, as defined in Section 13050 of the CWC; or cause regulatory standards to be violated, as defined in the applicable NPDES permit(s) or State Water Quality Control Plan for ocean waters for concentration and emissions of discharge?				
Riser/Diffuser Area				
PV Shelf	CEQA Significant Impact During Construction	N/A	MM MAR-1a. During riser and diffuser construction, analyses of contaminant concentrations (i.e., metals, dichlorodiphenyltrichloroethane [DDT], polychlorinated biphenyls [PCBs], polycyclic aromatic hydrocarbons [PAHs]) in waters near the dredging operations will be required if the contaminant levels in the dredged sediments are known to be elevated and represent a potential risk to beneficial uses. Monitoring data will be used to demonstrate that water quality limits specified in applicable state and federal permits are not exceeded. Corrective or adaptive actions would be implemented if the monitoring data indicate that water quality conditions outside the mixing zone are above the permit-specified limits. MM MAR-1b. Prepare and implement a contaminated sediment management plan that is consistent with practices outlined in the Los Angeles Regional Contaminated Sediment Task Force long-term management strategy if contaminant levels in the dredged sediments are known to be elevated and represent a potential risk. At a minimum, the plan will include site-specific best management plans at the immediate work site to reduce the potential area of exposure to contaminated sediments.	CEQA Less Than Significant Impact During Construction

Table 13-21 (Continued)

Project Element	Impact Determination Before Mitigation	NEPA Direct or Indirect	Mitigation	Residual Impact After Mitigation
	NEPA Significant Impact During Construction	Direct	MM MAR-1a and MM MAR-1b	NEPA Less Than Significant Impact During Construction
	CEQA Less Than Significant Impact During Operation	N/A	No mitigation is required.	CEQA Less Than Significant Impact During Operation
	NEPA Less Than Significant Impact During Operation	Indirect	No mitigation is required.	NEPA Less Than Significant Impact During Operation
Existing Ocean Outfalls	CEQA Less Than Significant Impact During Construction	N/A	No mitigation is required.	CEQA Less Than Significant Impact During Construction
	NEPA Less Than Significant Impact During Construction	Direct	No mitigation is required.	NEPA Less Than Significant Impact During Construction
	CEQA Less Than Significant Impact During Operation	N/A	No mitigation is required.	CEQA Less Than Significant Impact During Operation
	NEPA Less Than Significant Impact During Operation	Indirect	No mitigation is required.	NEPA Less Than Significant Impact During Operation
Impact MAR-2. Would Alternative 3 (Project) substantially degrade marine sediment quality or character?				
Riser/Diffuser Area				
PV Shelf	CEQA Less Than Significant Impact During Construction	N/A	No mitigation is required.	CEQA Less Than Significant Impact During Construction
	NEPA Less Than Significant Impact During Construction	Direct	No mitigation is required.	NEPA Less Than Significant Impact During Construction
	CEQA Less Than Significant Impact During Operation	N/A	No mitigation is required.	CEQA Less Than Significant Impact During Operation
	NEPA Less Than Significant Impact During Operation	Indirect	No mitigation is required.	NEPA Less Than Significant Impact During Operation
Existing Ocean Outfalls	CEQA Less Than Significant Impact During Construction	N/A	No mitigation is required.	CEQA Less Than Significant Impact During Construction
	NEPA Less Than Significant Impact During Construction	Direct	No mitigation is required.	NEPA Less Than Significant Impact During Construction
	CEQA Less Than Significant Impact During Operation	N/A	No mitigation is required.	CEQA Less Than Significant Impact During Operation
	NEPA Less Than Significant Impact During Operation	Indirect	No mitigation is required.	NEPA Less Than Significant Impact During Operation

Table 13-21 (Continued)

Project Element	Impact Determination Before Mitigation	NEPA Direct or Indirect	Mitigation	Residual Impact After Mitigation
Impact MAR-3. Would Alternative 3 (Project) result in the substantial loss of individuals or the reduction of existing habitat, of a state- or federally listed endangered, threatened, rare, protected, candidate, or sensitive plant or animal species or a species of special concern?				
Riser/Diffuser Area				
PV Shelf	CEQA Significant Impact During Construction	N/A	*Vessel Collisions* MM MAR-3a. Prepare and implement a collision protection plan to address sensitive and protected species. All construction personnel and boat operators will receive protected species training. The training will include review of the plan as well as identification of animals, species, and habitats potentially present in the project area. MM MAR-3b. Restrict tugs, tugs with barges under tow, and large work vessels to speeds of 12 knots (14 miles per hour [mph]) or less at all times. Maneuverable single hull vessels such as crew or supply boats may proceed at speeds of 20 knots (23 mph) or less under most conditions, but will reduce speed to 12 knots or less when whales or sea turtles are reported in the project area. MM MAR-3c. Immediately report all vessel collisions with marine mammals or sea turtles to the National Marine Fisheries Service. *Entanglement* MM MAR-3d. Limit the deployment of any material that has the potential to entangle marine mammals or sea turtles (e.g., anchor lines, cables, rope, other construction debris) to only as long as necessary. MM MAR-3e. Remove as much slack as possible from any potentially entangling material to the point of not jeopardizing construction operations. MM MAR-3f. Position temporary mooring buoys with heavy steel cables or chains to minimize potential entanglements. MM MAR-3g. In the event that a marine mammal or sea turtle becomes entangled, immediately seek guidance from the National Marine Fisheries Service for safe disentanglement options.	CEQA Less Than Significant Impact During Construction

Table 13-21 (Continued)

Project Element	Impact Determination Before Mitigation	NEPA Direct or Indirect	Mitigation	Residual Impact After Mitigation
			Underwater Sound MM MAR-3h. Implement a “soft start” method for all pile driving by operating the hammer at less than full capacity (i.e., approximately 40 to 60 percent energy levels) with no less than a 1-minute interval between each strike for a 5-minute period on initial driving for the day, or after a delay of 15 minutes between strikes. MM MAR-3i. Prepare and implement a pile driving management plan. The plan will require that a National Marine Fisheries Service–approved observer be stationed on the work platform or work vessel to monitor the presence of sensitive marine species in the construction area on all days when pile driving is taking place. The observer will survey the project vicinity before pile driving is started and give approval before such work begins. The observer will continue to advise the construction crew throughout the day to modify or stop pile driving if a sensitive or protected species travels within injury distances.	
	NEPA Significant Impact During Construction	Direct	MM MAR-3a through MM MAR-3i	NEPA Less Than Significant Impact During Construction
	CEQA Less Than Significant Impact During Operation	N/A	No mitigation is required.	CEQA Less Than Significant Impact During Operation
	NEPA Less Than Significant Impact During Operation	Indirect	No mitigation is required.	NEPA Less Than Significant Impact During Operation
Existing Ocean Outfalls	CEQA Significant Impact During Construction	N/A	*Removal of Protected Species (Black Abalone)* MM MAR-3j. Within 90 days prior to initiation of the rehabilitation work, survey the existing ocean outfall pipelines for black abalone at depths between the 15- and 55-foot isobaths in areas potentially affected by the work. The survey team will include divers/biologists experienced in locating abalone. If black abalone are determined to be present, consult with the National Marine Fisheries Service to develop a black abalone transplantation plan that includes the identification of a suitable nearby transplant location, temporary holding and transport methods, and reporting requirements.	CEQA Less Than Significant Impact During Construction

Table 13-21 (Continued)

Project Element	Impact Determination Before Mitigation	NEPA Direct or Indirect	Mitigation	Residual Impact After Mitigation
			Implementation of the plan will occur no more than 30 days preceding the in-water rehabilitation activities and will be conducted by qualified divers/biologists.	
	NEPA Significant Impact During Construction	Direct	MM MAR-3j	NEPA Less Than Significant Impact During Construction
	CEQA Less Than Significant Impact During Operation	N/A	No mitigation is required.	CEQA Less Than Significant Impact During Operation
	NEPA Less Than Significant Impact During Operation	Indirect	No mitigation is required.	NEPA Less Than Significant Impact During Operation
Impact MAR-4. Would Alternative 3 (Project) result in the substantial degradation or disruption of marine habitat or local biological communities?				
Riser/Diffuser Area				
PV Shelf	CEQA Significant Impact During Construction	N/A	*Underwater Sound* MM MAR-4a and MM MAR-4b (same as MM MAR-3h and MM MAR-3i) *Marine Habitat* MM MAR-4c. Prepare and implement an anchoring plan prior to in-water construction activities in accordance with the U.S. Army Corps of Engineers' permitting requirements. The plan will identify deployment methods for anchors, lines, cables, and moorings to minimize damage to hard-bottom substrate.	CEQA Less Than Significant Impact During Construction
	NEPA Significant Impact During Construction	Direct	MM MAR-4a and MM MAR-4b (same as MM MAR-3h and MM MAR-3i) MM MAR-4c	NEPA Less Than Significant Impact During Construction
	CEQA Less Than Significant Impact During Operation	N/A	No mitigation is required.	CEQA Less Than Significant Impact During Operation
	NEPA Less Than Significant Impact During Operation	Indirect	No mitigation is required.	NEPA Less Than Significant Impact During Operation
Existing Ocean Outfalls	CEQA Less Than Significant Impact During Construction	N/A	No mitigation is required.	CEQA Less Than Significant Impact During Construction
	NEPA Less Than Significant Impact During Construction	Direct	No mitigation is required.	NEPA Less Than Significant Impact During Construction
	CEQA Less Than Significant Impact During Operation	N/A	No mitigation is required.	CEQA Less Than Significant Impact During Operation
	NEPA Less Than Significant Impact During Operation	Indirect	No mitigation is required.	NEPA Less Than Significant Impact During Operation

Table 13-21 (Continued)

Project Element	Impact Determination Before Mitigation	NEPA Direct or Indirect	Mitigation	Residual Impact After Mitigation
Impact MAR-5. Would Alternative 3 (Project) interfere with the movement/migration corridors of marine biota?				
Riser/Diffuser Area				
PV Shelf	CEQA Significant Impact During Construction	N/A	*Vessel Collisions* MM MAR-5a through MM MAR-5c (same as MM MAR-3a through MM MAR-3c) *Entanglement* MM MAR-5d through MM MAR-5g (same as MM MAR-3d through MM MAR-3g) *Underwater Sound* MM MAR-5h and MM MAR-5i (same as MM MAR-3h and MAR-3i)	CEQA Less Than Significant Impact During Construction
	NEPA Significant Impact During Construction	Direct	MM MAR-5a through MM MAR-5i (same as MM MAR-3a through MM MAR-3i)	NEPA Less Than Significant Impact During Construction
	CEQA Less Than Significant Impact During Operation	N/A	No mitigation is required.	CEQA Less Than Significant Impact During Operation
	NEPA Less Than Significant Impact During Operation	Indirect	No mitigation is required.	NEPA Less Than Significant Impact During Operation
Existing Ocean Outfalls	CEQA Less Than Significant Impact During Construction	N/A	No mitigation is required.	CEQA Less Than Significant Impact During Construction
	NEPA Less Than Significant Impact During Construction	Direct	No mitigation is required.	NEPA Less Than Significant Impact During Construction
	CEQA Less Than Significant Impact During Operation	N/A	No mitigation is required.	CEQA Less Than Significant Impact During Operation
	NEPA Less Than Significant Impact During Operation	Indirect	No mitigation is required.	NEPA Less Than Significant Impact During Operation
Impact MAR-6. Would Alternative 3 (Project) adversely affect public health?				
Riser/Diffuser Area				
PV Shelf	CEQA Less Than Significant Impact During Operation	N/A	No mitigation is required.	CEQA Less Than Significant Impact During Operation
	NEPA Less Than Significant Impact During Operation	Indirect	No mitigation is required.	NEPA Less Than Significant Impact During Operation
Existing Ocean Outfalls	CEQA Less Than Significant Impact During Operation	N/A	No mitigation is required.	CEQA Less Than Significant Impact During Operation
	NEPA Less Than Significant Impact During Operation	Indirect	No mitigation is required.	NEPA Less Than Significant Impact During Operation

Table 13-21 (Continued)

Project Element	Impact Determination Before Mitigation	NEPA Direct or Indirect	Mitigation	Residual Impact After Mitigation
Impact MAR-7. Would Alternative 3 (Project) impair beneficial uses designated in the California Ocean Plan?				
Riser/Diffuser Area				
PV Shelf	CEQA Significant Impact During Construction	N/A	*Vessel Collisions* MM MAR-7a through MM MAR-7c (same as MM MAR-3a through MM MAR-3c) *Entanglement* MM MAR-7d through MM MAR-7g (same as MM MAR-3d through MM MAR-3g) *Underwater Sound* MM MAR-7h and MM MAR-7i (same as MM MAR-3h and MM MAR 3i) *Marine Habitat* MM MAR-7j (same as MM MAR-4c)	CEQA Less Than Significant Impact During Construction
	NEPA Significant Impact During Construction	Direct	MM MAR-7a through MM MAR-7i (same as MM MAR-3a through MM MAR-3i) MM MAR-7j (same as MM MAR-4c)	NEPA Less Than Significant Impact During Construction
	CEQA Less Than Significant Impact During Operation	N/A	No mitigation is required.	CEQA Less Than Significant Impact During Operation
	NEPA Less Than Significant Impact During Operation	Indirect	No mitigation is required.	NEPA Less Than Significant Impact During Operation
Existing Ocean Outfalls	CEQA Significant Impact During Construction	N/A	*Removal of Protected Species* MM MAR-7k (same as MM MAR-3j)	CEQA Less Than Significant Impact During Construction
	NEPA Significant Impact During Construction	Direct	MM MAR-7k (same as MM MAR-3j)	NEPA Less Than Significant Impact During Construction
	CEQA Less Than Significant Impact During Operation	N/A	No mitigation is required.	CEQA Less Than Significant Impact During Operation
	NEPA Less Than Significant Impact During Operation	Indirect	No mitigation is required.	NEPA Less Than Significant Impact During Operation

13.4.6 Alternative 4 (Recommended Alternative)

13.4.6.1 Program

Alternative 4 (Program) does not include marine elements and, therefore, has no potential to have an impact on the marine environment.

13.4.6.2 Project

The construction impacts for the rehabilitation of the existing ocean outfalls for Alternative 4 (Project) would be the same as for Alternative 1 (Project). Operational impacts would be the same as baseline conditions; therefore, there would be no operational impacts for the existing ocean outfalls under Alternative 4 (Project). The shaft sites have not been discussed in Alternatives 1, 2, or 3 because they are located outside of the marine environment and would not affect marine resources; however, the Royal Palms shaft site is assessed in this section because of its applicability to Impact MAR-7.

Impact MAR-7. Would Alternative 4 (Project) impair beneficial uses designated in the California Ocean Plan?

Shaft Site – Royal Palms

Construction

CEQA Analysis

Construction activities at the Royal Palms shaft site would occur for approximately 2 years. This shaft site would primarily operate during daytime hours; however, limited nighttime construction may occur during the connection of the onshore tunnel to the existing manifold structure. Safety lights would be left on when no nighttime work is occurring and full lights would be used during the limited period of nighttime work. None of the construction activities would occur on the beach. All construction activities would be subject to the analysis and mitigation measures identified in Chapters 6 and 11.

Construction activities could impact Royal Palms Beach and the nearshore and offshore areas during grunion spawning. As discussed in Alternative 1 (Project) under Impact MAR-7, California grunion are unique in their utilization of beaches throughout Southern California for spawning and depositing eggs. Use of any particular beach by grunion for spawning during any particular run cannot be predicted, but spawning is known to occur at Royal Palms Beach in spring and summer months. Typically, construction would cease during the nighttime hours, with the exception of the limited period when it may occur. If grunion were spawning during a period of nighttime construction, lighting could affect their spawning ability. However, implementation of MM MAR-7l (same as MM AES-5b) would reduce this impact to less than significant. Therefore, construction would not affect the beneficial use designation of fish spawning after mitigation.

Although construction at the Royal Palms shaft site would not occur on the beach itself, construction activities could make non-contact recreational activities less attractive at this site. Recreational boats, kayaks, or other non-contact water recreation would be temporarily barred from using the ocean in the immediate vicinity of the construction barges and other equipment. However, there is nothing unique or specific about this site that the temporary closure of this area would prevent the public from experiencing. The remaining coastline and nearshore of Southern California would remain available to these types of recreationists during the 9-month temporary construction period. Furthermore, as discussed in Chapter 17, impacts on recreation at the Royal Palms shaft site would be less than significant. Therefore, construction at the Royal Palms shaft site would be less than significant.

NEPA Analysis

Environmental impacts would be the same as described for the CEQA analysis, and would occur for the duration of construction. Baseline conditions would resume upon termination of construction. With respect to the Corps' NEPA scope of analysis described in Section 3.5, the environmental impacts would be considered indirect impacts.

Operation

CEQA Analysis

Once the new onshore tunnel is connected to the existing manifold, the parking lot at Royal Palms Beach would be returned to its existing condition. Therefore, the operation of the shaft site at Royal Palms Beach would not have an impact on any designated beneficial uses.

NEPA Analysis

Environmental impacts would be the same as described for the CEQA analysis, and would occur for the operational life of the structure. With respect to the Corps' NEPA scope of analysis described in Section 3.5, the environmental impacts would be considered indirect impacts.

CEQA Impact Determination

Construction at the Royal Palms shaft site and on the existing ocean outfalls for Alternative 4 (Project) would impair beneficial uses designated in the California Ocean Plan. Impacts under CEQA would be significant before mitigation. Operation of Alternative 4 (Project) would result in no impacts.

Mitigation

Implement MM MAR-7k (same as MM MAR-3j).

MM MAR-7l (same as MM AES-5b). Lights will be installed at the lowest practicable height, and the lowest practicable wattage will be used. Lights will be screened and directed downward, away from the night sky, to the highest degree possible. The number of nighttime lights will be minimized to the highest degree possible.

Residual Impacts

See the residual impacts discussion for Impact MAR-3 under Alternative 1 (Project) for MM MAR-7k (same as MM MAR-3j). Impacts on grunion spawning at White Points Beach due to nighttime construction lighting at the Royal Palms shaft site would be minimized with implementation of MM MAR-7l (same as MM AES-5b). Residual impacts would be less than significant.

NEPA Impact Determination

Construction at the Royal Palms shaft site and on the existing ocean outfalls for Alternative 4 (Project) would impair beneficial uses designated in the California Ocean Plan. Impacts under NEPA would be significant before mitigation with respect to the No-Federal-Action Alternative (see Section 3.4.1.6). Operation of Alternative 4 (Project) would result in no impacts.

Mitigation

Implement MM MAR-7k (same as MM MAR-3j) and MM MAR-7l (same as MM AES-5b).

Residual Impacts

Impacts would be less than significant, as described under the CEQA impact determination.

13.4.6.3 Impact Summary – Alternative 4

Impacts on the marine environment for Alternative 4 are summarized in Table 13-22. The proposed mitigation, where feasible, and the significance of the impact before and following mitigation are also listed in the table.

Alternative 4 (Program), which is the same as Alternative 1 (Program), does not include marine elements and has no potential to have an impact on the marine environment; therefore, an Impact Summary – Alternative 4 (Program) table is not included.

Table 13-22. Impact Summary – Alternative 4 (Project)

Project Element	Impact Determination Before Mitigation	NEPA Direct or Indirect	Mitigation	Residual Impact After Mitigation
Impact MAR-1. Would Alternative 4 (Project) create pollution, contamination, or nuisance, as defined in Section 13050 of the CWC; or cause regulatory standards to be violated, as defined in the applicable NPDES permit(s) or State Water Quality Control Plan for ocean waters for concentration and emissions of discharge?				
Riser/Diffuser Area				
Existing Ocean Outfalls	CEQA Less Than Significant Impact During Construction	N/A	No mitigation is required.	CEQA Less Than Significant Impact During Construction
	NEPA Less Than Significant Impact During Construction	Direct	No mitigation is required.	NEPA Less Than Significant Impact During Construction
Impact MAR-2. Would Alternative 4 (Project) substantially degrade marine sediment quality or character?				
Riser/Diffuser Area				
Existing Ocean Outfalls	CEQA Less Than Significant Impact During Construction	N/A	No mitigation is required.	CEQA Less Than Significant Impact During Construction
	NEPA Less Than Significant Impact During Construction	Direct	No mitigation is required.	NEPA Less Than Significant Impact During Construction
Impact MAR-3. Would Alternative 4 (Project) result in the substantial loss of individuals or the reduction of existing habitat, of a state- or federally listed endangered, threatened, rare, protected, candidate, or sensitive plant or animal species or a species of special concern?				
Riser/Diffuser Area				
Existing Ocean Outfalls	CEQA Significant Impact During Construction	N/A	*Removal of Protected Species (Black Abalone)* MM MAR-3j. Within 90 days prior to initiation of the rehabilitation work, survey the existing ocean outfall pipelines for black abalone at depths between the 15- and 55-foot isobaths in areas potentially affected by the work. The survey team will include divers/biologists experienced in locating abalone. If black abalone are determined to be present, consult with the National Marine Fisheries Service to develop a black abalone transplantation plan that includes the identification of a suitable nearby transplant location,	CEQA Less Than Significant Impact During Construction

Table 13-22 (Continued)

Project Element	Impact Determination Before Mitigation	NEPA Direct or Indirect	Mitigation	Residual Impact After Mitigation
			temporary holding and transport methods, and reporting requirements. Implementation of the plan will occur no more than 30 days preceding the in-water rehabilitation activities and will be conducted by qualified divers/biologists.	
	NEPA Significant Impact During Construction	Direct	MM MAR-3j	NEPA Less Than Significant Impact During Construction
Impact MAR-4. Would Alternative 4 (Project) result in the substantial degradation or disruption of marine habitat or local biological communities?				
Riser/Diffuser Area				
Existing Ocean Outfalls	CEQA Less Than Significant Impact During Construction	N/A	No mitigation is required.	CEQA Less Than Significant Impact During Construction
	NEPA Less Than Significant Impact During Construction	Direct	No mitigation is required.	NEPA Less Than Significant Impact During Construction
Impact MAR-5. Would Alternative 4 (Project) interfere with the movement/migration corridors of marine biota?				
Riser/Diffuser Area				
Existing Ocean Outfalls	CEQA Less Than Significant Impact During Construction	N/A	No mitigation is required.	CEQA Less Than Significant Impact During Construction
	NEPA Less Than Significant Impact During Construction	Direct	No mitigation is required.	NEPA Less Than Significant Impact During Construction
Impact MAR-6. Would Alternative 4 (Project) adversely affect public health?				
Riser/Diffuser Area				
Existing Ocean Outfalls	CEQA Less Than Significant Impact During Operation	N/A	No mitigation is required.	CEQA Less Than Significant Impact During Operation
	NEPA Less Than Significant Impact During Operation	Indirect	No mitigation is required.	NEPA Less Than Significant Impact During Operation
Impact MAR-7. Would Alternative 4 (Project) impair beneficial uses designated in the California Ocean Plan?				
Shaft Site				
Royal Palms	CEQA Significant Impact During Construction	N/A	MM MAR-7l (same as MM AES-5b). Lights will be installed at the lowest practicable height, and the lowest practicable wattage will be used. Lights will be screened and directed downward, away from the night sky, to the highest degree possible. The number of nighttime lights will be minimized to the highest degree possible.	CEQA Less Than Significant Impact During Construction

Table 13-22 (Continued)

Project Element	Impact Determination Before Mitigation	NEPA Direct or Indirect	Mitigation	Residual Impact After Mitigation
	NEPA Significant Impact During Construction	Indirect	MM MAR-7l (same as MM AES-5b)	NEPA Less Than Significant Impact During Construction
	CEQA No Impact During Operation	N/A	No mitigation is required.	CEQA No Impact During Operation
	NEPA No Impact During Operation	N/A	No mitigation is required.	NEPA No Impact During Operation
Riser/Diffuser Area				
Existing Ocean Outfalls	CEQA Significant Impact During Construction	N/A	*Removal of Protected Species* MM MAR-7k (same as MM MAR-3j)	CEQA Less Than Significant Impact During Construction
	NEPA Significant Impact During Construction	Direct	MM MAR-7k (same as MM MAR-3j)	NEPA Less Than Significant Impact During Construction

13.4.7 Alternative 5 (No-Project Alternative)

Pursuant to CEQA, an environmental impact report must evaluate a no-project alternative. A no-project alternative describes the no-build scenario and what reasonably would be expected to occur in the foreseeable future if the project were not approved. Under the No-Project Alternative for the Clearwater Program, the Sanitation Districts would continue to expand, upgrade, and operate the JOS in accordance with the JOS 2010 Master Facilities Plan (2010 Plan) (Sanitation Districts 1994), which includes all program elements proposed under the Clearwater Program, excluding process optimization at the WRPs, as described in Section 3.4.1.5. A new or modified ocean discharge system would not be constructed. As a result, there would be a greater potential for an emergency discharge into various water courses, as described in Section 3.4.1.5.

Because there would be no construction of a new or modified JWPCP ocean discharge system, the Corps would not make any significance determinations under NEPA and would not issue any permits or discretionary approvals for dredge or fill actions or for transport or ocean disposal of dredged material.

13.4.7.1 Program

Alternative 5 (Program) does not include marine elements and, therefore, has no potential to have an impact on the marine environment.

13.4.7.2 Project

Alternative 5 does not include a project; therefore, a new or modified ocean discharge system would not be constructed. As a consequence of taking no action, there would be a greater potential for emergency discharges into various water courses, including the Wilmington Drain or Dominguez Channel, as described in Section 3.4.1.5.

The Wilmington Drain is a flood control structure extending from Interstate 110 to the north side of Pacific Coast Highway. South of Pacific Coast Highway, flow from the drain would enter the riparian woodland of Machado Lake (also known as Harbor Lake) in Ken Malloy Harbor Regional Park and ultimately would be discharged into the Los Angeles Harbor. The release of secondary treated effluent would be considered a violation of the JWPCP discharge permit and, therefore, would affect the beneficial uses of the Wilmington Drain, Machado Lake, the Ken Malloy Regional Park, and the Los Angeles Harbor. The city of Los Angeles has undertaken a number of upstream water quality improvement projects, including the Machado Lake Water Quality Improvement and Rehabilitation and the Wilmington Drain Rehabilitation projects (Port of Los Angeles and Port of Long Beach 2009). Emergency discharge into the watershed would likely result in violations of Los Angeles Harbor Bacteria Total Maximum Daily Load (TMDL), Machado Lake Nutrients TMDL, Los Angeles/Long Beach Harbor Toxic Pollutants (encompassing multiple TMDLs), and the Los Angeles County Municipal Separate Storm Sewer Systems Permit.

The Wilmington Drain has the capacity to handle a discharge from the JWPCP during normal flow or dry-weather flow events. However, during a storm event, the combined stormflow and discharge from the JWPCP could exceed the capacity of the Wilmington Drain. If sufficient capacity were not available in the Wilmington Drain, the sewers tributary to the JWPCP could overflow and untreated wastewater could enter various water courses via adjacent stormdrains. Any sewer overflow of untreated wastewater would be a violation of the JWPCP's NPDES permit and the SWRCB's Sanitary Sewer Overflow WDR and could affect the beneficial uses and/or violate the TMDLs of the Dominguez Channel, Los Angeles River, Wilmington Drain, Machado Lake, Long Beach Harbor, and Los Angeles Harbor. In addition to regulatory exceedances, the emergency discharge of JWPCP secondary effluent or a sewer overflow of untreated wastewater would result in detrimental impacts on the water quality and marine communities of the Los Angeles and Long Beach Harbor complex. Either discharge would result in increased turbidity and nutrients in the water column, as well as increased bacterial concentrations in the harbor. Increased turbidity, particularly in summer during the tern nesting season, could result in decreased foraging efficiency for sensitive plunge-diving bird species such as California least tern and California brown pelican. Turbidity could reduce light available to subtidal and intertidal alga species living on riprap, bulkheads, and other hard structures in the harbor as well as to eelgrass, a subtidal, soft-bottom species that provides habitat at several locations within the port. Suspended solids from the effluent could clog gills and feeding mechanisms of local benthic, epibenthic, and sessile organisms, including mussels and barnacles in subtidal and intertidal communities.

An emergency discharge of secondary effluent or a sewer overflow of untreated wastewater into the relatively shallow harbor would increase the amount of nutrients available to the phytoplankton population within the photic zone. This could stimulate a red tide algal bloom, which would further increase turbidity as well as affect local water quality. Water quality impacts could include very high DO concentrations near surface and very low DO values near bottom (potentially low enough to negatively affect benthic species) as well as local changes in the pH of the water column. Depending on the plankton species, red tides could also result in HABs, which, as described in Alternative 1 (Project), could lead to impacts on seabird species (including California brown pelican), sea lions, and other marine mammals and humans.

Bacterial contamination associated with untreated wastewater could result in the closure of the Cabrillo Beach area for human use such as swimming and other water contact activities, while fishing activities in the harbor could also be restricted following the discharge.

Complete flushing of the harbor is estimated at 90 tidal cycles, or 47 days (Maloney and Chan 1974:5–6). Although impacts associated with the release of secondary effluent or a sewer overflow of untreated wastewater would diminish with time prior to the full tidal exchange in the harbor. It is unlikely that an emergency discharge into the Wilmington Drain or a sewer overflow would be captured and treated subsequently. Therefore, the impact to the marine environment and its dependent species around the Los Angeles and Long Beach Harbors would be significant and unavoidable. There is no feasible mitigation that would reduce this impact.

Therefore, impacts would remain significant and unavoidable.

13.4.7.3 Impact Summary – Alternative 5

Alternative 5 (Program), which is the same as Alternative 1 (Program) excluding process optimization, does not include marine elements and has no potential to have an impact on the marine environment. Significant impacts on the marine environment for Alternative 5 (Project) are summarized in Table 13-23.

Table 13-23. Impact Summary – Alternative 5 (Project)

Project Element	Impact Determination Before Mitigation	Mitigation	Residual Impact After Mitigation
Impact MAR-1. Would Alternative 5 (Project) create pollution, contamination, or nuisance, as defined in Section 13050 of the CWC; or cause regulatory standards to be violated, as defined in the applicable NPDES permit(s) or State Water Quality Control Plan for ocean waters for concentration and emissions of discharge?			
Emergency Discharge	CEQA Significant Impact During Operation	No mitigation is feasible.	CEQA Significant and Unavoidable Impact During Operation
Impact MAR-2. Would Alternative 5 (Project) substantially degrade marine sediment quality or character?			
Emergency Discharge	CEQA Significant Impact During Operation	No mitigation is feasible.	CEQA Significant and Unavoidable Impact During Operation
Impact MAR-3. Would Alternative 5 (Project) result in the substantial loss of individuals or the reduction of existing habitat, of a state- or federally listed endangered, threatened, rare, protected, candidate, or sensitive plant or animal species or a species of special concern?			
Emergency Discharge	CEQA Significant Impact During Operation	No mitigation is feasible.	CEQA Significant and Unavoidable Impact During Operation
Impact MAR-4. Would Alternative 5 (Project) result in the substantial degradation or disruption of marine habitat or local biological communities?			
Emergency Discharge	CEQA Significant Impact During Operation	No mitigation is feasible.	CEQA Significant and Unavoidable Impact During Operation
Impact MAR-6. Would Alternative 5 (Project) adversely affect public health?			
Emergency Discharge	CEQA Significant Impact During Operation	No mitigation is feasible.	CEQA Significant and Unavoidable Impact During Operation
Impact MAR-7. Would Alternative 5 (Project) impair beneficial uses designated in the California Ocean Plan?			
Emergency Discharge	CEQA Significant Impact During Operation	No mitigation is feasible.	CEQA Significant and Unavoidable Impact During Operation

13.4.8 Alternative 6 (No-Federal-Action Alternative)

Pursuant to NEPA, an environmental impact statement must evaluate a no-federal-action alternative. The No-Federal-Action Alternative for the Clearwater Program consists of the activities that the Sanitation Districts would perform without the issuance of the Corps' permits. The Corps' permits would be required for the construction of the offshore tunnel, construction of the riser and diffuser, the rehabilitation of the existing ocean outfalls, and the ocean disposal of dredged material. Without a Corps permit to work on the aforementioned facilities, the Sanitation Districts would not construct the onshore tunnel and shaft sites. Therefore, none of the project elements would be constructed under the No-Federal-Action Alternative. The Sanitation Districts would continue to use the existing ocean discharge system, which could result in emergency discharges into various water courses, as described in Section 3.4.1.5 and 13.4.7.2. The program elements for the recommended alternative would be implemented in accordance with CEQA requirements. However, based on the NEPA scope of analysis established in Sections 1.4.2 and 3.5, these elements would not be subject to NEPA because the Corps would not make any significance determinations and would not issue any permits or discretionary approvals.

13.4.8.1 Program

The program elements are beyond the NEPA scope of analysis. Furthermore, the program does not include marine elements and, therefore, has no potential to have an impact on the marine environment.

13.4.8.2 Project

The impact analysis for Alternative 6 (Project) is the same as described for Alternative 5 (Project).

13.4.8.3 Impact Summary – Alternative 6

The program is not analyzed under Alternative 6. Significant impacts for Alternative 6 would be the same as summarized in Table 13-23 for Alternative 5 (Project).

13.4.9 Comparison of Significant Impacts and Mitigation for All Alternatives

A summary of significant impacts on the marine environment resulting from the construction and/or operation of project elements is provided in Table 13-24. Impacts are compared by alternative. Proposed mitigation, where feasible, and the significance of the impact following mitigation under CEQA and NEPA are also listed in the table.

Table 13-24. Comparison of Significant Impacts and Mitigation for Marine Environment (Marine Hydrology, Water Quality, Biological Resources, Noise, and Public Health) for All Alternatives

Element	Impact Before Mitigation	Mitigation Measure	Residual Impact After Mitigation
Alternative 1 (Project)			
Impact MAR-1. Would Alternative 1 (Project) create pollution, contamination, or nuisance, as defined in Section 13050 of the CWC; or cause regulatory standards to be violated, as defined in the applicable NPDES permit(s) or State Water Quality Control Plan for ocean waters for concentration and emissions of discharge?			
Riser and Diffuser Area – SP Shelf	CEQA Significant Impact During Construction	MM MAR-1a. During riser and diffuser construction, analyses of contaminant concentrations (i.e., metals, dichlorodiphenyltrichloroethane [DDT], polychlorinated biphenyls [PCBs], polycyclic aromatic hydrocarbons [PAHs]) in waters near the dredging operations will be required if the contaminant levels in the dredged sediments are known to be elevated and represent a potential risk to beneficial uses.	CEQA Less Than Significant Impact During Construction

Table 13-24 (Continued)

Element	Impact Before Mitigation	Mitigation Measure	Residual Impact After Mitigation
		Monitoring data will be used to demonstrate that water quality limits specified in applicable state and federal permits are not exceeded. Corrective or adaptive actions would be implemented if the monitoring data indicate that water quality conditions outside the mixing zone are above the permit-specified limits. MM MAR-1b. Prepare and implement a contaminated sediment management plan that is consistent with practices outlined in the Los Angeles Regional Contaminated Sediment Task Force long-term management strategy if contaminant levels in the dredged sediments are known to be elevated and represent a potential risk. At a minimum, the plan will include site-specific best management practices at the immediate work site to reduce the potential area of exposure to contaminated sediments.	
	NEPA Significant Impact (Direct) During Construction	MM MAR-1a and MM MAR-1b	NEPA Less Than Significant Impact During Construction
Impact MAR-3. Would Alternative 1 (Project) result in the substantial loss of individuals or the reduction of existing habitat of a state- or federally listed endangered, threatened, rare, protected, candidate, or sensitive plant or animal species or a species of special concern?			
Riser and Diffuser Area – SP Shelf	CEQA Significant Impact During Construction	*Vessel Collisions* MM MAR-3a. Prepare and implement a collision protection plan to address sensitive and protected species. All construction personnel and boat operators will receive protected species training. The training will include review of the plan as well as identification of animals, species, and habitats potentially present in the project area. MM MAR-3b. Restrict tugs, tugs with barges under tow, and large work vessels to speeds of 12 knots (14 miles per hour [mph]) or less at all times. Maneuverable single hull vessels such as crew or supply boats may proceed at speeds of 20 knots (23 mph) or less under most conditions, but will reduce speed to 12 knots or less when whales or sea turtles are reported in the project area. MM MAR-3c. Immediately report all vessel collisions with marine mammals or sea turtles to the National Marine Fisheries Service. *Entanglement* MM MAR-3d. Limit the deployment of any material that has the potential to entangle marine mammals or sea turtles (e.g., anchor lines, cables, rope, other construction debris) to only as long as necessary. MM MAR-3e. Remove as much slack as possible from any potentially entangling material to the point of not jeopardizing construction operations. MM MAR-3f. Position temporary mooring buoys with heavy steel cables or chains to minimize potential entanglements.	CEQA Less Than Significant Impact During Construction

Table 13-24 (Continued)

Element	Impact Before Mitigation	Mitigation Measure	Residual Impact After Mitigation
		MM MAR-3g. In the event that a marine mammal or sea turtle becomes entangled, immediately seek guidance from the National Marine Fisheries Service for safe disentanglement options. *Underwater Sound* MM MAR-3h. Implement a "soft start" method for all pile driving by operating the hammer at less than full capacity (i.e., approximately 40 to 60 percent energy levels) with no less than a 1-minute interval between each strike for a 5-minute period on initial driving for the day, or after a delay of 15 minutes between strikes. MM MAR-3i. Prepare and implement a pile driving management plan. The plan will require that a National Marine Fisheries Service–approved observer be stationed on the work platform or work vessel to monitor the presence of sensitive marine species in the construction area on all days when pile driving is taking place. The observer will survey the project vicinity before pile driving is started and give approval before such work begins. The observer will continue to advise the construction crew throughout the day to modify or stop pile driving if a sensitive or protected species travels within injury distances.	
	NEPA Significant Impact (Direct) During Construction	MM MAR-3a through MM MAR-3i	NEPA Less Than Significant Impact During Construction
Riser and Diffuser Area – Existing Ocean Outfalls	CEQA Significant Impact During Construction	*Removal of Protected Species (Black Abalone)* MM MAR-3j. Within 90 days prior to initiation of the rehabilitation work, survey the existing ocean outfall pipelines for black abalone at depths between the 15- and 55-foot isobaths in areas potentially affected by the work. The survey team will include divers/biologists experienced in locating abalone. If black abalone are determined to be present, consult with the National Marine Fisheries Service to develop a black abalone transplantation plan that includes the identification of a suitable nearby transplant location, temporary holding and transport methods, and reporting requirements. Implementation of the plan will occur no more than 30 days preceding the in-water rehabilitation activities and will be conducted by qualified divers/biologists.	CEQA Less Than Significant Impact During Construction
	NEPA Significant Impact (Direct) During Construction	MM MAR-3j	NEPA Less Than Significant Impact During Construction
Impact MAR-4. Would Alternative 1 (Project) result in the substantial degradation or disruption of marine habitat or local biological communities?			
Riser and Diffuser Area – SP Shelf	CEQA Significant Impact During Construction	*Underwater Sound* MM MAR-4a and MM MAR-4b (same as MM MAR-3h and MM MAR-3i) *Marine Habitat* MM MAR-4c. Prepare and implement an anchoring plan prior to in-water construction activities in accordance with the U.S. Army Corps of Engineers' permitting requirements. The plan will identify deployment methods for anchors, lines, cables, and moorings to minimize damage to hard-bottom substrate.	CEQA Less Than Significant Impact During Construction

Table 13-24 (Continued)

Element	Impact Before Mitigation	Mitigation Measure	Residual Impact After Mitigation
	NEPA Significant Impact (Direct) During Construction	MM MAR-4a and MM MAR-4b (same as MM MAR-3h and MM MAR-3i) MM MAR-4c	NEPA Less Than Significant Impact During Construction
Impact MAR-5. Would Alternative 1 (Project) interfere with the movement/migration corridors of marine biota?			
Riser and Diffuser Area – SP Shelf	CEQA Significant Impact During Construction	*Vessel Collisions* MM MAR-5a through MM MAR-5c (same as MM MAR-3a through MM MAR-3c) *Entanglement* MM MAR-5d through MM MAR-5g (same as MM MAR-3d through MM MAR-3g) *Underwater Sound* MM MAR-5h and MM MAR-5i (same as MM MAR-3h and MAR-3i)	CEQA Less Than Significant Impact During Construction
	NEPA Significant Impact (Direct) During Construction	MM MAR-5a through MM MAR-5i (same as MM MAR-3a through MM MAR-3i)	NEPA Less Than Significant Impact During Construction
Impact MAR-7. Would Alternative 1 (Project) impair beneficial uses designated in the California Ocean Plan?			
Riser and Diffuser Area – SP Shelf	CEQA Significant Impact During Construction	*Vessel Collisions* MM MAR-7a through MM MAR-7c (same as MM MAR-3a through MM MAR-3c) *Entanglement* MM MAR-7d through MM MAR-7g (same as MM MAR-3d through MM MAR-3g) *Underwater Sound* MM MAR-7h and MM MAR-7i (same as MM MAR-3h and MM MAR 3i) *Marine Habitat* MM MAR-7j (same as MM MAR-4c)	CEQA Less Than Significant Impact During Construction
	NEPA Significant Impact (Direct) During Construction	MM MAR-7a through MM MAR-7i (same as MM MAR-3a through MM MAR-3i) MM MAR-7j (same as MM MAR-4c)	NEPA Less Than Significant Impact During Construction
Riser and Diffuser Area – Existing Ocean Outfalls	CEQA Significant Impact During Construction	*Removal of Protected Species* MM MAR-7k (same as MM MAR-3j)	CEQA Less Than Significant Impact During Construction
	NEPA Significant Impact (Direct) During Construction	MM MAR-7k (same as MM MAR-3j)	NEPA Less Than Significant Impact During Construction

Table 13-24 (Continued)

Element	Impact Before Mitigation	Mitigation Measure	Residual Impact After Mitigation
Alternative 2 (Project)			
Impact MAR-1. Would Alternative 2 (Project) create pollution, contamination, or nuisance, as defined in Section 13050 of the CWC; or cause regulatory standards to be violated, as defined in the applicable NPDES permit(s) or State Water Quality Control Plan for ocean waters for concentration and emissions of discharge?			
Riser and Diffuser Area – PV Shelf	CEQA Significant Impact During Construction	MM MAR-1a and MM MAR 1b	CEQA Less Than Significant Impact During Construction
	NEPA Significant Impact (Direct) During Construction	MM MAR-1a and MM MAR-1b	NEPA Less Than Significant Impact During Construction
Impact MAR-3. Would Alternative 2 (Project) result in the substantial loss of individuals or the reduction of existing habitat of a state- or federally listed endangered, threatened, rare, protected, candidate, or sensitive plant or animal species or a species of special concern?			
Riser and Diffuser Area – PV Shelf	CEQA Significant Impact During Construction	MM MAR-3a through MM MAR-3i	CEQA Less Than Significant Impact During Construction
	NEPA Significant Impact (Direct) During Construction	MM MAR-3a through MM MAR-3i	NEPA Less Than Significant Impact During Construction
Riser and Diffuser Area – Existing Ocean Outfalls	CEQA Significant Impact During Construction	MM MAR-3j	CEQA Less Than Significant Impact During Construction
	NEPA Significant Impact (Direct) During Construction	MM MAR-3j	NEPA Less Than Significant Impact During Construction
Impact MAR-4. Would Alternative 2 (Project) result in the substantial degradation or disruption of marine habitat or local biological communities?			
Riser and Diffuser Area – PV Shelf	CEQA Significant Impact During Construction	MM MAR-4a and MM MAR-4b (same as MM MAR-3h and MM MAR-3i) MM MAR-4c	CEQA Less Than Significant Impact During Construction
	NEPA Significant Impact (Direct) During Construction	MM MAR-4a and MM MAR-4b (same as MM MAR-3h and MM MAR-3i) MM MAR-4c	NEPA Less Than Significant Impact During Construction
Impact MAR-5. Would Alternative 2 (Project) interfere with the movement/migration corridors of marine biota?			
Riser and Diffuser Area – PV Shelf	CEQA Significant Impact During Construction	MM MAR-5a through MM MAR-5i (same as MM MAR-3a through MM MAR-3i)	CEQA Less Than Significant Impact During Construction
	NEPA Significant Impact (Direct) During Construction	MM MAR-5a through MM MAR-5i (same as MM MAR-3a through MM MAR-3i)	NEPA Less Than Significant Impact During Construction
Impact MAR-7. Would Alternative 2 (Project) impair beneficial uses designated in the California Ocean Plan?			
Riser and Diffuser Area – PV Shelf	CEQA Significant Impact During Construction	MM MAR-7a through MM MAR-7i (same as MM MAR-3a through MM MAR-3i) MM MAR-7j (same as MM MAR-4c)	CEQA Less Than Significant Impact During Construction

Table 13-24 (Continued)

Element	Impact Before Mitigation	Mitigation Measure	Residual Impact After Mitigation
	NEPA Significant Impact (Direct) During Construction	MM MAR-7a through MM MAR-7i (same as MM MAR-3a through MM MAR-3i) MM MAR-7j (same as MM MAR-4c)	NEPA Less Than Significant Impact During Construction
Riser and Diffuser Area – Existing Ocean Outfalls	CEQA Significant Impact During Construction	MM MAR-7k (same as MM MAR-3j)	CEQA Less Than Significant Impact During Construction
	NEPA Significant Impact (Direct) During Construction	MM MAR-7k (same as MM MAR-3j)	NEPA Less Than Significant Impact During Construction
Alternative 3 (Project)			
Impact MAR-1. Would Alternative 3 (Project) create pollution, contamination, or nuisance, as defined in Section 13050 of the CWC; or cause regulatory standards to be violated, as defined in the applicable NPDES permit(s) or State Water Quality Control Plan for ocean waters for concentration and emissions of discharge?			
Riser and Diffuser Area – PV Shelf	CEQA Significant Impact During Construction	MM MAR-1a and MM MAR 1b	CEQA Less Than Significant Impact During Construction
	NEPA Significant Impact (Direct) During Construction	MM MAR-1a and MM MAR-1b	NEPA Less Than Significant Impact During Construction
Impact MAR-3. Would Alternative 3 (Project) result in the substantial loss of individuals or the reduction of existing habitat of a state- or federally listed endangered, threatened, rare, protected, candidate, or sensitive plant or animal species or a species of special concern?			
Riser and Diffuser Area – PV Shelf	CEQA Significant Impact During Construction	MM MAR-3a through MM MAR-3i	CEQA Less Than Significant Impact During Construction
	NEPA Significant Impact (Direct) During Construction	MM MAR-3a through MM MAR-3i	NEPA Less Than Significant Impact During Construction
Riser and Diffuser Area – Existing Ocean Outfalls	CEQA Significant Impact During Construction	MM MAR-3j	CEQA Less Than Significant Impact During Construction
	NEPA Significant Impact (Direct) During Construction	MM MAR-3j	NEPA Less Than Significant Impact During Construction
Impact MAR-4. Would Alternative 3 (Project) result in the substantial degradation or disruption of marine habitat or local biological communities?			
Riser and Diffuser Area – PV Shelf	CEQA Significant Impact During Construction	MM MAR-4a and MM MAR-4b (same as MM MAR-3h and MM MAR-3i) MM MAR-4c	CEQA Less Than Significant Impact During Construction
	NEPA Significant Impact (Direct) During Construction	MM MAR-4a and MM MAR-4b (same as MM MAR-3h and MM MAR-3i) MM MAR-4c	NEPA Less Than Significant Impact During Construction

Table 13-24 (Continued)

Element	Impact Before Mitigation	Mitigation Measure	Residual Impact After Mitigation
Impact MAR-5. Would Alternative 3 (Project) interfere with the movement/migration corridors of marine biota?			
Riser and Diffuser Area – PV Shelf	CEQA Significant Impact During Construction	MM MAR-5a through MM MAR-5i (same as MM MAR-3a through MM MAR-3i)	CEQA Less Than Significant Impact During Construction
	NEPA Significant Impact (Direct) During Construction	MM MAR-5a through MM MAR-5i (same as MM MAR-3a through MM MAR-3i)	NEPA Less Than Significant Impact During Construction
Impact MAR-7. Would Alternative 3 (Project) impair beneficial uses designated in the California Ocean Plan?			
Riser and Diffuser Area – PV Shelf	CEQA Significant Impact During Construction	MM MAR-7a through MM MAR-7i (same as MM MAR-3a through MM MAR-3i) MM MAR-7j (same as MM MAR-4c)	CEQA Less Than Significant Impact During Construction
	NEPA Significant Impact (Direct) During Construction	MM MAR-7a through MM MAR-7i (same as MM MAR-3a through MM MAR-3i) MM MAR-7j (same as MM MAR-4c)	NEPA Less Than Significant Impact During Construction
Riser and Diffuser Area – Existing Ocean Outfalls	CEQA Significant Impact During Construction	MM MAR-7k (same as MM MAR-3j)	CEQA Less Than Significant Impact During Construction
	NEPA Significant Impact (Direct) During Construction	MM MAR-7k (same as MM MAR-3j)	NEPA Less Than Significant Impact During Construction
Alternative 4			
Impact MAR-3. Would Alternative 4 (Project) result in the substantial loss of individuals or the reduction of existing habitat of a state- or federally listed endangered, threatened, rare, protected, candidate, or sensitive plant or animal species or a species of special concern?			
Riser and Diffuser Area – Existing Ocean Outfalls	CEQA Significant Impact During Construction	MM MAR-3j	CEQA Less Than Significant Impact During Construction
	NEPA Significant Impact (Direct) During Construction	MM MAR-3j	NEPA Less Than Significant Impact During Construction
Impact MAR-7. Would Alternative 4(Project) impair beneficial uses designated in the California Ocean Plan?			
Shaft Site – Royal Palms	CEQA Significant Impact During Construction	MM MAR-7l (same as MM AES-5b). Lights will be installed at the lowest practicable height, and the lowest practicable wattage will be used. Lights will be screened and directed downward, away from the night sky, to the highest degree possible. The number of nighttime lights will be minimized to the highest degree possible.	CEQA Less Than Significant Impact During Construction
	NEPA Significant Impact (Indirect) During Construction	MM MAR-7l (same as MM AES-5b)	NEPA Less Than Significant Impact During Construction

Table 13-24 (Continued)

Element	Impact Before Mitigation	Mitigation Measure	Residual Impact After Mitigation
Riser and Diffuser Area – Existing Ocean Outfalls	CEQA Significant Impact During Construction	MM MAR-7k (same as MM MAR-3j)	CEQA Less Than Significant Impact During Construction
	NEPA Significant Impact (Direct) During Construction	MM MAR-7k (same as MM MAR-3j)	NEPA Less Than Significant Impact During Construction
Alternative 5			
Impact MAR-1. Would Alternative 5 (Project) create pollution, contamination, or nuisance, as defined in Section 13050 of the CWC; or cause regulatory standards to be violated, as defined in the applicable NPDES permit(s) or State Water Quality Control Plan for ocean waters for concentration and emissions of discharge?			
Emergency Discharge	CEQA Significant Impact During Operation	No mitigation is feasible.	CEQA Significant and Unavoidable Impact During Operation
Impact MAR-2. Would Alternative 5 (Project) substantially degrade marine sediment quality or character?			
Emergency Discharge	CEQA Significant Impact During Operation	No mitigation is feasible.	CEQA Significant and Unavoidable Impact During Operation
Impact MAR-3. Would Alternative 5 (Project) result in the substantial loss of individuals or the reduction of existing habitat, of a state- or federally listed endangered, threatened, rare, protected, candidate, or sensitive plant or animal species or a species of special concern?			
Emergency Discharge	CEQA Significant Impact During Operation	No mitigation is feasible.	CEQA Significant and Unavoidable Impact During Operation
Impact MAR-4. Would Alternative 5 (Project) result in the substantial degradation or disruption of marine habitat or local biological communities?			
Emergency Discharge	CEQA Significant Impact During Operation	No mitigation is feasible.	CEQA Significant and Unavoidable Impact During Operation
Impact MAR-6. Would Alternative 5 (Project) adversely affect public health?			
Emergency Discharge	CEQA Significant Impact During Operation	No mitigation is feasible.	CEQA Significant and Unavoidable Impact During Operation
Impact MAR-7. Would Alternative 5 (Project) impair beneficial uses designated in the California Ocean Plan?			
Emergency Discharge	CEQA Significant Impact During Operation	No mitigation is feasible.	CEQA Significant and Unavoidable Impact During Operation
Alternative 6			
Impact MAR-1. Would Alternative 6 (Project) create pollution, contamination, or nuisance, as defined in Section 13050 of the CWC; or cause regulatory standards to be violated, as defined in the applicable NPDES permit(s) or State Water Quality Control Plan for ocean waters for concentration and emissions of discharge?			
Emergency Discharge	NEPA Significant Impact During Operation	No mitigation is feasible.	NEPA Significant and Unavoidable Impact During Operation

Table 13-24 (Continued)

Element	Impact Before Mitigation	Mitigation Measure	Residual Impact After Mitigation
Impact MAR-2. Would Alternative 6 (Project) substantially degrade marine sediment quality or character?			
Emergency Discharge	NEPA Significant Impact During Operation	No mitigation is feasible.	NEPA Significant and Unavoidable Impact During Operation
Impact MAR-3. Would Alternative 6 (Project) result in the substantial loss of individuals or the reduction of existing habitat, of a state- or federally listed endangered, threatened, rare, protected, candidate, or sensitive plant or animal species or a species of special concern?			
Emergency Discharge	NEPA Significant Impact During Operation	No mitigation is feasible.	NEPA Significant and Unavoidable Impact During Operation
Impact MAR-4. Would Alternative 6 (Project) result in the substantial degradation or disruption of marine habitat or local biological communities?			
Emergency Discharge	NEPA Significant Impact During Operation	No mitigation is feasible.	NEPA Significant and Unavoidable Impact During Operation
Impact MAR-6. Would Alternative 6 (Project) adversely affect public health?			
Emergency Discharge	NEPA Significant Impact During Operation	No mitigation is feasible.	NEPA Significant and Unavoidable Impact During Operation
Impact MAR-7. Would Alternative 6 (Project) impair beneficial uses designated in the California Ocean Plan?			
Emergency Discharge	NEPA Significant Impact During Operation	No mitigation is feasible.	NEPA Significant and Unavoidable Impact During Operation