3.13

WATER QUALITY, SEDIMENTS, AND OCEANOGRAPHY

3.13

WATER QUALITY, SEDIMENTS, AND OCEANOGRAPHY

3.13.1 Introduction

This section describes the existing environmental and regulatory setting for water quality, sediments, and oceanography, as well as the impacts on water quality, sediments, and oceanography that would result from the proposed Project. As discussed below in Section 3.13.4 “Impact Analysis,” construction and operational impacts from the proposed Project on water quality, sediments, and oceanography would be less than significant. No mitigation measures are required.

3.13.2 Environmental Setting

The following discussion addresses the existing water quality, sediments, and oceanography within the study area, defined for the purposes of this Draft EIR as the Outer Los Angeles Harbor (i.e., waters south of the Vincent Thomas Bridge) and Fish Harbor (Figure 2-2). The discussion relies upon the most recent available data that represents the environmental baseline, most of which was collected between 2007 and 2010. This time period represents an interval with relatively representative climate and homogeneous patterns of harbor utilization, and is thus presumed to be representative of environmental baseline conditions.

3.13.2.1 Regional Setting

The proposed project area has a Mediterranean climate with wet, cool winters and warm, dry summers. Most rainfall (90%) occurs between the beginning of November and the end of April, and averages 12.1 inches per year (MEC 2004).

The proposed project area, like all of Los Angeles Harbor, is located in the Dominguez Watershed, which drains approximately 133 square miles of western Los Angeles County, including the harbor area itself. Los Angeles Harbor occupies the western end of San Pedro Bay, and is adjacent to Long Beach Harbor (Figure 2-2). Los Angeles Harbor is divided for the purpose of managing water and sediment quality into two major areas; the Outer Harbor, which encompasses the open waters between the landmass and the federal breakwaters; and the Inner Harbor, which comprises the channels and basins that provide vessel access to the various berths and piers. The East Channel and Main Channel of Los Angeles Harbor, where the proposed Project would be located, are part of the Inner Harbor.

Both harbors function oceanographically as one unit due to connections via the Cerritos Channel and the Outer Harbor area behind the federal breakwaters. Los Angeles Harbor was created by extensive dredging and filling of the original marshes and sloughs, and the construction of the breakwaters, in the first half of the twentieth century. The combined Los Angeles/Long Beach Harbor oceanographic unit is comprised mainly of marine waters of the harbor, and is primarily influenced by the Southern California coastal marine environment known as the Southern California Bight. The harbors connect to the coastal ocean through two deep channel openings in the protective breakwaters, through the opening to eastern San Pedro Bay, and by exchange through the porous breakwaters themselves.

The main freshwater influx into the Los Angeles Harbor is through the Dominguez Channel Estuary, which enters the harbor about 4 miles northeast of the proposed project area and conveys the drainage of the majority of the Dominguez Watershed. Another freshwater contributor to the harbor is the discharge of treated wastewater effluent from TIWRP into the Outer Harbor off Pier 400, about 3 miles east of the proposed project area. Sheet runoff and storm drain discharges during and after storm events also add freshwater to the harbor. Despite these inputs, freshwater is a relatively minor component of the harbor waters, which consistently maintain oceanic salinities.

3.13.2.1.1 Surface Freshwater

Surface freshwater in the proposed project area is entirely stormwater runoff, which enters the harbor from numerous storm drains or drainage systems, including the Dominguez Channel. The East Channel receives stormwater from adjacent lands (most of which are paved) via small, local storm drains. Those stormwater systems are relatively old and have no associated treatment systems, discharging directly to the East Channel via a system of catch basins, ditches, and culverts. Stormwater from the southeastern portion of the proposed project area drains into the Main Channel through small, local drains.

There are no lakes, streams, or other natural surface water bodies in the proposed project area. The largest stormwater conveyance is the Dominguez Channel, which drains into the Consolidated Slip of the harbor, approximately 4 miles northeast of the proposed project area. That drainage does not directly affect the proposed project area, but it does have some influence on overall harbor water quality. Most land in the watershed is developed (93%), and 62% of stormwater runoff from these lands drains into the Dominguez Channel (LACFCD 2004, Section 1.4). As of 2008, there were a total of 62 active NPDES permitted discharges in the Dominguez Watershed (LARWQCB 2012). All of the developed upland areas in the Dominguez Watershed have storm drains that are designed for a 10-year event. These drains are inspected at least annually and maintained as necessary.

3.13.2.1.2 Marine Waters

The existing beneficial uses of coastal and tidal waters in the Inner Harbor areas of Los Angeles Harbor, as identified in the Basin Plan for the Coastal Watersheds of Los Angeles and Ventura Counties (LARWQCB 1994), include industrial service supply, navigation, water contact recreation, non-contact water recreation, commercial and sport fishing, preservation of rare and endangered species, marine habitat, and shellfish harvesting. Waters in the proposed project area that are 303(d)-listed for impairment, all as a result of sediment or tissue (fish or benthic invertebrates) contamination, include the Los Angeles/Long Beach Inner Harbor (LARWQCB and USEPA 2011). Other 303(d)-listed waters in Los Angeles Harbor are summarized in Table 3.13-1.

Table 3.13-1. 2008/2010 Section 303(d)-Listed Waters in Los Angeles Harbor

Listed Waters/Reaches	*Impairments*
Los Angeles/Long Beach Outer Harbor, inside breakwater (4,042 acres)	Tissue: DDT, PCBs Sediment: Toxicity
Cabrillo Marina (77 acres)	Tissue: DDT, PCBs Sediment: Benzo(a)pyrene
Inner Cabrillo Beach (82 acres)	Tissue: DDT, PCBs Sediment: none
Los Angeles/Long Beach Inner Harbor (3,003 acres)	Tissue: DDT, PCBs Sediments: Benthic community effects, toxicity, benzo(a)pyrene, chrysene, copper, zinc
Fish Harbor (91 acres)	Tissue: DDT, PCBs Sediment: Toxicity, chlordane, DDT, PCBs, PAHs, benzo[a]anthracene, benzo[a]pyrene, chrysene, dibenz[a,h]anthracene, phenanthrene, pyrene, copper, lead, mercury, zinc
Consolidated Slip (36 acres)	Tissue: Chlordane, dieldrin, DDT, PCBs, toxaphene Sediments: Benthic community effects, toxicity, chlordane, DDT, PCBs, benzo[a]anthracene, benzo[a]pyrene, chrysene, phenanthrene, pyrene, 2-methynaphthalene, cadmium, chromium, copper, lead, mercury, zinc
Dominguez Channel Estuary	Tissue: chlordane, dieldrin, DDT, lead Sediment: Benthic community effects, benzo[a]pyrene, benzo[a]anthracene, chrysene, phenanthrene, pyrene, DDT, PCBs, zinc

Notes:
PCBs = polychlorinated biphenyls
DDT = dichloro-diphenyl-trichloroethane
PAHs = polycyclic aromatic hydrocarbons

Source: LARWQCB & USEPA 2011.

Additionally, certain water-quality limited waters have designated plans, called Total Maximum Daily Load (TMDL) plans, which are designed to limit further impairments and to bring the affected waters into compliance with applicable water quality criteria. A TMDL is the amount of a particular pollutant that a stream, lake, estuary, or other water body can assimilate without violating state water quality standards. Once a TMDL is approved by the LARWQCB, responsibility for reducing pollution among point sources (wastewater NPDES permit holders) and non-point (diffuse) sources (such as runoff from urban and agricultural sources, leaking underground storage tanks, and septic systems) is assigned so that water quality standards are no longer violated.

A bacteria TMDL for Los Angeles Harbor (Main Channel and Inner Cabrillo Beach) has been in effect since 2005. Recently, a toxics TMDL for the entire harbor complex and lower reaches of the Dominguez Channel was adopted by the LARWQCB (May 5, 2011, Resolution R11-008) and approved by the SWRCB and the EPA. The toxics TMDL took effect on March 23, 2012, and is now the governing document for managing water and sediment contamination in the harbor. The TMDL is implemented as an amendment to the Basin Plan. When LARWQCB issues permits such as NPDES permits or Clean Water Act Section 401 certifications, they will include permit conditions that ensure compliance with the TMDL.

3.13.2.1.3 Water Quality

This summary of water quality conditions in the harbor complex and proposed project area is taken from a 2008 baseline biological study (SAIC 2010), a comprehensive water quality monitoring program conducted by LAHD in 2008, and a long-term water sampling program conducted by LAHD. The LAHD program's results through 2008 are summarized in Weston (2009), and more recent data are available from the LAHD Environmental Management Division. Although LAHD has been conducting routine monitoring since the 1960s, LAHD began a Port Wide Water Quality study in 2004 to establish a baseline of physical and chemical parameters in harbor waters for use in future water quality programs.

In the port-wide program, Station LA-22A is located in the Main Channel adjacent to the City Dock No. 1 site at Berth 70, Station LA-23 is located on the other side of the Main Channel, Station LA-05 is located in the Outer Harbor south of the City Dock No. 1 site, and Station LA-14 is located in Fish Harbor near the existing SCMI facility (Figure 3.13-1); no stations are located in the East Channel. Stations LA-22A and LA-14 are the closest to the proposed project area, and therefore of most interest, but the other stations provide additional relevant data.

Water quality sampling data from 2005 through 2011 did not reveal temporal trends, indicating that data from all years represent baseline conditions. Water quality in the Los Angeles Harbor is influenced by a number of factors including climate, circulation, biological activity, surface runoff (including storm drain inputs), effluent discharges, and accidental discharges of pollutants related to shipping activities. Parameters such as salinity, pH, temperature, and transparency/turbidity are influenced primarily by large-scale oceanographic and meteorological conditions, while dissolved oxygen and nutrients are related to local processes such as land runoff and plant photosynthesis in addition to regional conditions. Water and sediment quality within the harbor are affected by inputs of chemical contaminants, including historical deposition, municipal and industrial wastewaters, marine vessel activities, and stormwater runoff (Anchor et al. 2005; LARWQCB 2007).

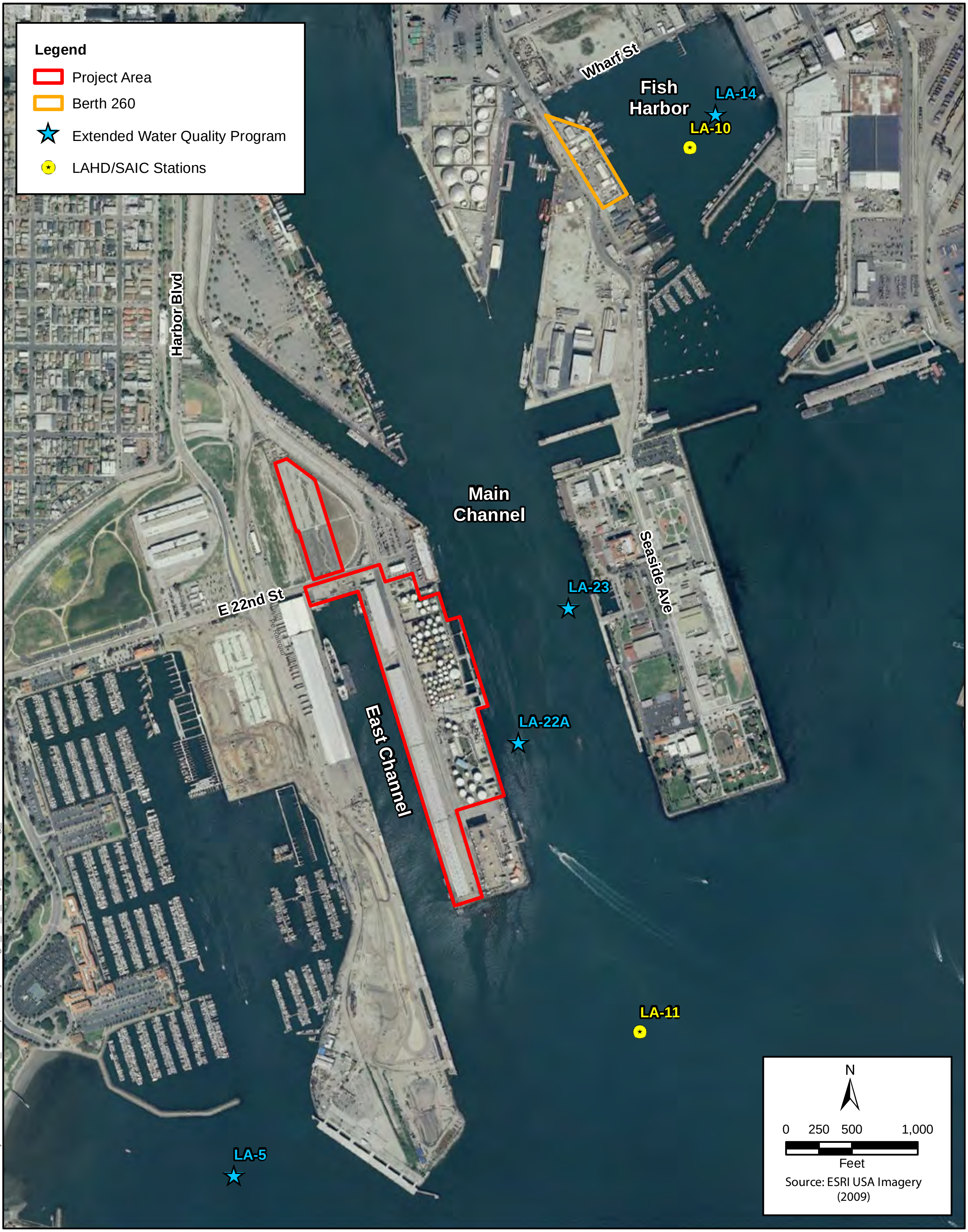

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Figure 3.13-1
Water Quality Monitoring Locations
City Dock No. 1 Marine Research Center Project

Discharges from storm drains into the East Channel and Main Channel, and from Terminal Island storm drains into Fish Harbor, also can affect water quality in receiving waters of the study area. Information to characterize the quality of this storm runoff is unavailable.

Temperature

The seasonal and spatial variation in water temperature in the harbor reflects the influence of the ocean, local climate, the physical configuration of the harbor, and circulation patterns. Inter-annual or longer-term patterns in water temperatures reflect the influences of oceanographic conditions, such as those associated with El Niño/La Niña cycles (MEC 2002). General seasonal trends in water temperature consist of uniform, cooler temperatures throughout the water column in the winter and spring, and of stratified, warmer temperatures with cooler waters at the bottom in the summer and fall. For example, in July 2010, sampling at Station LA-14 in Fish Harbor (Table 3.13-2) measured a temperature of 67.3°F at the surface and 62.1°F at the bottom in a water depth of 24 feet, and sampling at Station LA-22A, near City Dock No. 1, measured 63.0°F at the surface and 54.1°F the bottom, in approximately 45 feet of water (LAHD 2011). The water column, even in relatively shallow Fish Harbor, was strongly stratified from surface to bottom. By contrast, sampling at the two stations in December 2010 found less than 0.2°F difference in temperature between the surface and the bottom, indicating an unstratified water column.

The stratified summer and fall conditions may be attributed to warmer ocean currents, local warming of surface waters through insolation (especially in the confined waters of Fish Harbor), and reduced runoff into nearshore waters. In winter and spring, stronger winds and currents and less solar heating allow the water column to become isothermal (the same temperature), which removes the barrier to mixing.

Table 3.13-2. Summer and Winter Values of Water Quality Constituents in Harbor Waters of the Proposed Project Area.

Station		*LA-14 (Fish Harbor)*		*LA-22A (City Dock No. 1)*	
Date (2010)		*July 14*	*December 1*	*July 14*	*December 1*
Dissolved Oxygen (mg/l)	Surface	7.81	5.84	6.87	5.89
	Bottom	8.95	5.85	5.50	5.90
pH	Surface	8.3	7.9	8.1	8.0
	Bottom	8.0	7.9	8.0	8.0
Salinity (ppt)	Surface	35.1	33.3	32.8	33.2
	Bottom	33.6	33.3	33.6	33.2
Temperature (°F)	Surface	67.3	57.6	62.9	56.8
	Bottom	62.06	57.4	54.1	56.8

Station		*LA-14 (Fish Harbor)*		*LA-22A (City Dock No. 1)*	
Transparency (%)	Surface	47.2	77.8	53.4	78.3
	Bottom	53.1	74.5	75.8	79.1
Source: LAHD 2011					

Dissolved Oxygen

Dissolved oxygen (DO) is a principal indicator of water quality. EPA and LARWQCB have established a DO concentration of 5 milligrams per liter (mg/l) as the minimum allowable concentration for aquatic habitats (EPA 1986:211; LARWQCB 1994). The LARWQCB also requires that the mean annual DO concentration be 7 mg/l or greater, with no event less than 5 mg/l and a mean annual DO concentration in the Outer Harbor of 6 mg/l. DO concentrations may vary considerably based on the influence of a number of parameters:

- respiration of plants and other organisms;
- waste (nutrient, oxygen demanding substances) discharges;
- surface water mixing through wave action;
- diffusion rates at the water surface;
- water depth; and
- disturbance of bottom sediments that contain oxidizable material.

As recently as the late 1960s, DO levels at some locations in Los Angeles Harbor were so low that little or no marine life could survive. Since that time, regulations have reduced direct waste discharges into the harbor, resulting in improved DO levels throughout the harbor (MEC 2002).

Algal (dinoflagellate) blooms occur occasionally within the harbor, typically associated with high solar radiation and nutrient levels, such as on sunny days following storm events, particularly in the summer. These blooms can severely reduce DO levels, but the effects are usually localized and short-lived. Disturbances of anaerobic sediments by dredging activities also result in short-term, localized DO reductions due to resuspension of materials with a high oxygen demand. Water quality monitoring associated with a dredging operation at Southwest Slip in June 2003 recorded DO concentrations from 7.8 to 7.9 mg/l throughout the water column (POLA 2007), indicating that in this case dredging did not result in reduced DO concentrations.

Water quality monitoring data from 1999 to 2008 (POLB and POLA 2009) showed that surface DO at stations in the Outer Harbor, adjacent to the City Dock No. 1 site, averaged 7.39 mg/l and dropped below 5 mg/l in only 2 of the 280 samples. The 2010 monitoring (the baseline year) found that DO concentrations at Station LA-22A ranged between 4.7 and 9.0 mg/l at Station LA-22A near City Dock No. 1 (LAHD 2011). In Fish Harbor, ten years of sampling at two stations showed that surface DO fell below 5 mg/l in 9 of the 243 samples, with one value as low as 1 mg/l, and averaged approximately 7.17 mg/l (AMEC 2009). In 2010, sampling at Station LA-14 measured concentrations between 5.0 and 9.6 mg/l (LAHD 2011). The lowest DO concentrations at both stations occurred during September to November, which is consistent with previous monitoring (e.g., LAHD 2008; SAIC 2010). In warm months there was a marked difference between DO concentrations near the surface and those near the bottom (see Table 3.13-2) because of depletion by intense biological activity and lower solubility in the warm water at the surface. Overall, DO concentrations near the proposed project area rarely fall below LARWQCB standards.

Hydrogen Ion Concentration

Hydrogen ion concentration (pH) in marine waters is affected by plant and animal metabolism, mixing with water with different pH values from external sources, and (on a small scale) disturbances in the water column that cause redistribution of waters with varying pH levels or the resuspension of bottom sediments. LARWQCB has established an acceptable range of 6.5–8.5 pH units with a change tolerance level of no more than 0.2 units due to discharges (LARWQCB 1994). In the Outer Harbor, pH levels have ranged from 8.1 (upper level in warmer months) to 7.4 (lower levels in cooler months). Samples collected in 2010 at Stations LA-14 and LA-22A showed a similar range, although phytoplankton activity in the restricted basin of Fish Harbor in July 2010 drove pH up to 8.3 (Table 3.13-2).

Turbidity and Transparency

Turbidity is the measure of suspended solids in the water column. Water clarity, or how well water transmits light, is known as transparency, commonly measured as transmissivity. Increased turbidity usually results in decreased transparency, and transparency, which is simpler to measure, is often used as an indicator of turbidity. Transparency generally decreases as a result of one or a combination of the following: suspended sediment from terrestrial runoff, phytoplankton blooms, wind-generated turbulence, vessel-related disturbances, and dredging (MEC 2002). In general, the transparency of the harbor has improved since 1967, although individual measurements vary substantially (LAHD 2002).

Transparency values at Stations LA-14 and LA-22A ranged from 47 to 79% (Table 3.13-2). The effects of algal blooms can be seen in the reduced transparency at the surface in July, a common occurrence in the harbor.

Salinity

Variations in salinity occur due to the effects of stormwater runoff, waste discharges, rainfall, and evaporation (LAHD 2002). Deeper Outer Harbor locations are typically more saline than shallower locations (SAIC 2010), although evaporation in the confined waters of Fish Harbor can cause locally higher salinity. Nevertheless, salinity in the harbor is typically around 33.5 ppt, similar to that of coastal marine water. Measurements at LA-11 during 2008 showed a salinity of 33.4 (SAIC 2010) and other studies have shown values ranging from 32.8 to 33.6 ppt in surface and bottom waters (MEC 2002; MBC 2003). Sampling in 2010 at the proposed project area (Stations LA-14 and LA-22A) yielded salinities between approximately 33 and 35 ppt (Table 3.13-2).

Storm drains empty into both the Fish Harbor and City Dock No. 1 sites; therefore, stormwater discharges probably cause reduced salinity during storm runoff events. This phenomenon is particularly marked in surface waters because freshwater is lighter and floats on top of the denser seawater (POLA 2007). However, stormwater is quickly diluted by the ocean, and salinities typically return to normal within a day or two of a storm event.

Nutrients

Nutrients are necessary for primary production of organic matter by phytoplankton. Low nutrient concentrations can limit the photosynthetic production, whereas excess nutrient concentrations can cause eutrophication and promote harmful algal blooms. Major nutrients that may limit phytoplankton photosynthesis are phosphates and nitrates. The availability of phosphates and nitrates changes from day to day and is influenced by factors that include biological processes, wastewater discharge, and stormwater runoff. Point source discharges are regulated through discharge permits, and stormwater discharges are regulated though municipal and industrial stormwater permits. The harbor, as an enclosed water body, has different seasonal and spatial variation in nutrient concentration than what is observed outside the breakwater (LAHD 2002)

Data on total Kjeldahl nitrogen (a measure of nitrogen available as a plant nutrient) collected at nine stations throughout the harbor by the Port in January 2008 (POLA 2008) varied from 0.56 to 0.98 mg/l, with two samples measured below the detection limit of 0.50 mg/l. These are very low values, indicating that nitrogen, at the time of measurement, was likely not contributing to water quality limitations in the harbor. However, it is possible that higher nitrogen concentrations occur at other times of the year or in response to isolated events such as a flush of stormwater from upland areas adjoining the harbor. In the Los Angeles Harbor, no data relevant to the environmental baseline are available to describe other measures of nutrient abundance such as phosphate, nitrate, or nitrite concentrations. However, the generally high dissolved oxygen values listed in Table 3.13-2 are consistent with a diagnosis that harbor waters are generally not limited by excessive nutrient loading.

Chemical Contaminants

Contaminants in harbor waters can originate from a number of sources within and outside of the Port. Potential sources of trace metals and organics include municipal and industrial wastewater discharges, stormwater runoff, dry weather flows, leaching from ship hull anti-fouling paints, petroleum or waste spills, atmospheric deposition, and resuspension of bottom sediments containing legacy (i.e., historically deposited) contaminants such as DDT and PCBs. Most of the metal, pesticide, and PAH contaminants that enter the harbor have a low solubility in water and adsorb onto particulate matter that eventually settles to the bottom and accumulates in bottom sediments. Dredging projects in both the Inner and Outer Harbor areas, including the Los Angeles Harbor Deepening Project (USACE and LAHD 1984, in LAHD 2002), have removed contaminated sediments from the harbor. In addition, some contaminated sediment areas have been covered by less contaminated sediments as part of construction of landfills or shallow water habitat, thereby sealing them from exchange with the overlying water. Controls on other discharge sources have also contributed to decreases over time in the input of contaminants.

Metals: Sampling for the enhanced water quality monitoring program at Stations LA-05, LA-22A, and LA-23 (Figure 3.13-1) between May 2005 and September 2008 found concentrations of metals consistently well below regulatory limits, except that dissolved copper reached 2.8 micrograms per liter (µg/l) at Station LA-05 in May 2008 (the lowest regulatory limit is 3.1 µg /l); in all other samples from the City Dock No.1 area copper concentrations ranged from 0.5 to 1.5 µg/l.

At Station LA-14, in Fish Harbor, dissolved copper concentrations have regularly exceeded 2 µg/l since monitoring began in 2005, but have never exceeded the regulatory limit of 3.1 µg/l. No other metals have approached regulatory limits.

Organic Compounds: Organic compounds of concern in harbor waters include organotins (butylated tin, used in anti-fouling paint), PCBs, pesticides, phthalates (an ingredient of many plastics), phenols, and PHAs (common products of combustion and components of many heavier petroleum fractions). Most organic compounds of concern are not very soluble in water, and in addition, volatile organic compounds (gasoline components and solvents) tend to evaporate rapidly, so it is typical to find organic compounds at very low concentrations (parts per trillion, or nanograms per liter [ng/l]), if at all. These compounds are of concern, even at low concentrations, because of the combination of their toxicity and their bioaccumulative tendencies. There are, as yet, few regulatory criteria for organic compounds; therefore, it is difficult to interpret the significance of the concentrations reported in harbor waters.

Near the City Dock No. 1 site, organic tin in the form of tributyltin (TBT) was detected at LA-23 in May 2008, but not thereafter, in concentrations not exceeding water quality criteria. PCBs and pesticides have not been detected at any of the monitoring stations. Phthalates in the form of bis (2-ethylhexyl) phthalate have been detected sporadically at low concentrations, and with the ultra-sensitive methods used during the 2008 surveys, PAHs were detected at stations LA-05, LA-22A, and LA-23 at concentrations ranging from non-detectable up to 50 ng/l, depending upon the specific compound.

In Fish Harbor, concentrations of organic compounds tend to be somewhat higher than at the City Dock No. 1 site. TBT was detected twice, in May 2005 and May 2008, both times at concentrations exceeding regulatory criteria. PCBs and pesticides have not been detected in the waters of Fish Harbor, but bis (2-ethylhexyl) phthalate has been detected on two occasions. PAHs are typically present at two to three times the concentrations observed at the City Dock No. 1 stations.

3.13.2.1.4 Marine Sediments

Sediments in the proposed project area are primarily composed of nearshore marine or estuarine sediments that were either deposited in place along the margin of the early San Pedro embayment or subsequently dredged and placed at their current locations as fill material. The MEC (2002) biological study results suggest that the removal of contaminated sediments during the Channel Deepening Project has led to a significant improvement in the environmental quality of the Harbor. Although Inner Harbor sediments are significantly cleaner than they were 25 years ago, some areas still exhibit the effects of historic deposits of pollution in the sediments and of existing point and nonpoint discharges (LARWQCB 2010). Sediment quality in the study area is characterized in accordance with California's Water Quality Control Plan for Enclosed Bays and Estuaries (SWRCB 2009), which includes both narrative and numerical sediment quality objectives (SQOs). The evaluation employs a "multiple lines of evidence" approach that considers the condition of the benthic invertebrate community, numerical values of sediment chemistry, and measured sediment toxicity. In addition, fish tissue objectives protect human health and wildlife.

The SQOs established by the SWRCB were used in the designation of impaired waterbodies and the promulgation of TMDLs for those waterbodies. As described above, various areas in the Los Angeles/Long Beach Harbor complex are listed as impaired waterbodies under Section 303(d) of the Clean Water Act for specific sediment contaminants (see Table 3.13-1). The TMDLs contain waste load allocations designed to remedy those impairments (see Section 6 of LARWQCB & USEPA 2011).

Potential contaminants in the sediments in the proposed project area include:

- metals (e.g., copper, lead, mercury, silver, and zinc),
- chlorinated hydrocarbons (particularly chlordane and DDT and derivatives),
- PAHs (benzo[a]anthracene, benzo[a]pyrene, chrysene, dibenz[a,h]anthracene, phenanthrene, pyrene), and
- PCBs.

These contaminants have been found in harbor sediments and are on the California 303(d) list for various portions of Los Angeles Harbor (LARWQCB & USEPA 2011; Table 3.13-1). Although a large portion of contaminated sediments have been removed via channel deepening and maintenance dredging activities, contaminated sediments remain in localized areas (LARWQCB 2007; POLB and POLA 2009), and the level of contamination varies substantially throughout the Los Angeles Inner Harbor (LARWQCB 2007).

The most recent sediment quality survey, based upon both field sampling and a literature review, was completed in 2008 (Weston 2008), and represents baseline conditions for the proposed Project. Few samples have been collected in the area of the City Dock No. 1 site, and none in the East Channel, but extensive data are available for the sediments within Fish Harbor, including data from samples collected by Weston at four stations in 2008.

Past sampling near the City Dock No. 1 site (summarized in Weston 2008) found sediments with relatively low levels of contamination. For example, whereas the threshold for the 303(d) listing is 270 parts per billion (ppb, or micrograms per gram of sediment), concentrations in the sediments in the lower reaches of the Main Channel did not exceed approximately 70 ppb. Lead, mercury, silver, and zinc were present at similarly low concentrations relative to listing criteria. The chlorinated pesticide chlordane has been detected at high concentrations in the sediments of dead-end slips and basins in Los Angeles Harbor, but concentrations in Main Channel sediments are a fraction of the listing criterion of 6 ppt (parts per trillion, or micrograms per kilogram of sediment). The harbor is listed on the basis of elevated concentrations of DDTs in fish tissues, but although DDTs are ubiquitous in harbor sediments, the harbor is not listed on the basis of sediment concentrations because concentrations do not exceed the listing criterion. Historic data indicate that sediment DDT concentrations in the Main Channel, including near the City Dock No. 1 site, are lower than in basins and slips. PCBs were detected at low concentrations (less than 50 ppt) in the Main Channel off the City Dock No.1 site. As with DDT, the harbor is listed for PCBs in fish tissue but not sediments.

Numerous sediment quality analyses have been performed in Fish Harbor. The most representative data, however, and the information that constitutes the baseline, was collected in 2008 by Weston (2008); older data summarized by Weston (2009) are useful to provide an historical context. Sampling in Fish Harbor in 2008 found copper in surficial sediments at concentrations of between 30 and 320 ppb, meaning that some samples exceeded the 303(d) listing criterion of 270 ppb. Previous sampling studies also found elevated copper concentrations (POLB and POLA 2009). Concentrations of lead in the 2008 samples and historical samples rarely exceeded the listing criterion of 112 ppb but sometimes exceeded the numeric target of 46.7 ppb (Weston 2008, 2009). In the case of mercury, most samples collected in 2008 and in earlier studies exceeded the numeric target of 0.15 ppb (there is no TMDL listing value). Silver and zinc were present in elevated concentrations in surface sediments collected in 2008 (Weston 2008). No historical analysis of silver was conducted, but Weston (2008) points out that elevated silver concentrations are widespread in Los Angeles Harbor. Zinc has been consistently found at elevated concentrations in Fish Harbor, with about half of the samples evaluated by Weston (2009) being above the numeric target of 150 ppb.

Fish Harbor sediments also contain elevated concentrations of certain organic compounds of concern. As Table 3.13-1 shows, Fish Harbor is listed on the basis of elevated concentrations of DDT and PCBs in fish tissue and of a variety of contaminants in sediments. The 2008 sampling detected total DDTs at concentrations well below the listing criterion in all of the surface sediment samples (Weston 2008), and the range of earlier samples evaluated by Weston (2009) showed a similar pattern. Neither study found chlordane or dieldrin at concentrations exceeding listing criteria.

Total PCBs and total PAHs in sediments did not exceed the listing criterion at any of the Fish Harbor stations in the 2008 sampling (Weston Solutions 2008). In the earlier samples evaluated by Weston (2009), 3 of the 11 samples analyzed for PCBs and 1 of the 33 samples analyzed for PAHs exceeded the listing criteria.

The pattern of contaminants in Fish Harbor sediments is consistent with historical shipbuilding and boat repair activities, which tend to release heavy metals, and with the harborwide inputs of DDT that are a legacy of the manufacture and use of that compound up to the 1970s.

3.13.2.2 Oceanography

Although Los Angeles Harbor is the southern extension of a relatively flat coastal plain, it is bounded on the west by the Palos Verdes Hills, which offer protection to the bay from prevailing westerly winds and ocean currents. The harbor is the result of 100 years of development of the Los Angeles/Long Beach Harbor complex, through dredging, filling, and channelization that has established a different physiography from the original bay-estuary system. The oceanography of the harbor is dominated by tidal cycles, oceanic waves, and local winds.

3.13.2.2.1 Tides

Tides are the result of astronomical and, to a lesser extent, meteorological conditions. The tidal cycle along the coast of Southern California produces two high and two low tides each day, characterized as a diurnal inequality, or mixed semidiurnal tide. The result is two high waters of unequal height and two low waters of unequal height each day (“water” is commonly used in this context instead of “tide”). These tides are denoted as “higher high water” (HHW), “lower high water” (LHW), “higher low water” (HLW), and “lower low water” (LLW). Other factors cause these extremes to vary in height from day to day, so that tidal characteristics are more usefully expressed in terms of long-term mean values, the common data being MLLW, which is the long-term average of all the LLWs, and MSL. MLLW is the datum from which southern California tides are measured (i.e., 0 feet MLLW = -2.8 feet MSL; LAHD 2002)

The mean diurnal tidal range for the Outer Harbor, calculated by averaging the difference between all the HHW and LLW, is approximately 5.6 feet (USACE and LAHD 1992). The extreme tidal range (between maximum high and maximum low waters) is about 10.6 feet; the highest and lowest tides reported are 8 feet above MLLW and 2.6 feet below MLLW, respectively (USACE and LAHD 1992).

3.13.2.2.2 Waves

Ocean waves impinging on the southern California coast can be divided into three primary categories according to origin: Southern Hemisphere swell, Northern Hemisphere swell, and seas generated by local winds. Los Angeles Harbor is directly exposed to ocean swells entering from two main exposure windows to the south and southeast, regardless of swell origin. The more severe waves from extra-tropical storms (Hawaiian storms) enter from the south to southeast direction. The Channel Islands, particularly Santa Catalina Island, provide some shelter from these larger waves, depending on the direction of approach. The other major exposure window opens to the south, allowing swells to enter from storms in the Southern Hemisphere, tropical storms (chubascos), and southerly waves from extra-tropical storms.

Most swells from the Southern Hemisphere arrive at Los Angeles from May through October. Southern Hemisphere swells characteristically have low heights and long wave periods (wave period is a measurement of the time between two consecutive peaks as they pass a stationary location). Typical swells rarely exceed 4 feet in height in deep water. However, with periods as long as 18–21 seconds, they can break at over twice their deepwater wave height (LAHD 2002).

Northern Hemisphere swells occur primarily from November through April, with wave periods generally ranging from 12–18 seconds (LAHD 2002). Deepwater wave heights have ranged up to 20 feet, but are typically less than 12 feet.

Local wind-generated waves are predominantly from the west and southwest; however, they can occur from all offshore directions throughout the year, as can waves generated by diurnal sea breezes. Local waves are usually less than 6 feet in height, with wave periods of less than 10 seconds (LAHD 2002)

3.13.2.2.3 Circulation

Circulation patterns in Los Angeles Harbor are established and maintained by tidal currents, which in turn are affected by the presence of the breakwaters and piers. In addition to the physical protection the Federal Breakwater provides to the Los Angeles and Long Beach Harbors, the breakwater also reduces water exchange between the Ports and San Pedro Bay (MEC 2002). Wind plays a strong role in harbor circulation by altering surface currents, particularly in the Outer Harbor.

Flood (rising) tides in Los Angeles Harbor flow into the harbor through the Angel’s Gate and divide around Pier 400 to flow northwestward up the Main Channel and northeastward into the Outer Harbor, while during ebb (falling) tides the pattern essentially reverses (POLA & POLB 2009). Tidal currents are generally not strong, with typical maximum tidal currents in open water areas of less than 0.24 feet per second (fps). Tidal currents entering and exiting Angel’s Gate and Queen’s Gate are higher, but are in general less than (0.6 fps). Overall daily tidal exchange rates fluctuate between 8 and 25% of the harbor volume, with the flushing rate estimated at 90 tidal cycles (Maloney and Chan 1974; as cited in LAHD 2002).

3.13.2.2.4 Flooding

Much of the harbor area, including the City Dock No. 1 and Fish Harbor sites, was formerly a marsh and barrier island complex. Over the past 100 years the area has been modified by dredging, filling, and the construction of piers and wharves, so that current elevations are 10 to 15 feet above sea level. Portions of the Fish Harbor site adjacent to the water are within the 100-year flood zone (Zone X, Los Angeles County DPW 2011), and therefore within the 50-year zone, but because of its height above sea level, none of the City Dock No. 1 site is within the 100-year or 50-year flood zone. Both sites in the proposed project area are predominantly paved or otherwise impervious, resulting in minimal surface water infiltration during rainfall events and flooding. The only potential sources of flooding at the sites would be storm surge, tsunami, or seiche. The latter two sources are discussed in Section 3.5, "Geology and Soils." Storm surge is the elevation of the water level that results from reduced barometric pressure and wind stress during storm events. Storm surge is relatively small (less than 1 foot) along the Southern California coast when compared with tidal fluctuations. For example, the winter storm of January 17 and 18, 1988, produced the all-time record low barometric pressure. Measured water level at the Los Angeles Harbor gauge during this event was 0.7 foot above predicted astronomical levels (Rossmiller 2007). Thus, storm surge is likely to make at most a minor contribution to flooding in the Los Angeles Harbor area.

3.13.3 Applicable Regulations

A variety of federal, state, and local agencies have jurisdiction over the proposed project area. Important agencies and statutory authorities relevant to water quality, sediments, and oceanography as it relates to the proposed Project are outlined below.

3.13.3.1 Federal Regulations

3.13.3.1.1 Clean Water Act

The federal Water Pollution Control Act Amendments of 1972, better known as the Clean Water Act (33 U.S. Government Code [USC] 1251–1376), as amended by the Water Quality Act of 1987, is the major federal legislation governing water quality. The objective of the CWA is "to restore and maintain the chemical, physical, and biological integrity of the Nation's water." Important applicable sections of the act are as follows:

- Section 303 requires states to develop water quality standards for all waters and submit to the EPA for approval all new or revised standards established for inland surface and ocean waters. Under Section 303(d), the state is required to list water segments that do not meet water quality standards and to develop action plans, called TMDLs, to improve water quality.
- Section 304 provides for water quality standards, criteria, and guidelines. The guidelines are enforced under the California Toxics Rule, described below (Section 3.13.3.2.3).
- Section 401 requires an applicant for any federal permit that proposes an activity that may result in a discharge to waters of the United States to obtain certification from the state that the discharge will comply with other provisions of the act. Certification is provided by the RWQCB.
- Section 402 establishes the NPDES, a permitting system for the discharge of any pollutant (except for dredge or fill material) into waters of the United States. This permit program is administered by the RWQCB and is discussed further below.
- Section 404 provides for issuance of dredge/fill permits by the USACE. Permits typically include conditions to minimize impacts on water quality. Common conditions include (1) USACE review and approval of sediment quality analysis prior to dredging, (2) a detailed pre- and post-construction monitoring plan that

includes disposal site monitoring, (3) timing and water quality restrictions on flow back of dredged water at the dredging site, and (4) requiring compensation for loss of waters of the United States, including wetlands.

3.13.3.2 State Regulations

3.13.3.2.1 Porter-Cologne Water Quality Control Act

The State of California's Porter-Cologne Water Quality Control Act (California Water Code Section 13000 et seq.) is the principal law governing water quality regulation within California. The act established the California SWRCB and nine RWQCBs, which are charged with implementing its provisions and which have primary responsibility for protecting water quality in California. The Porter-Cologne Act also implements many provisions of the federal CWA, such as the NPDES permitting program. CWA Section 401 gives the California SWRCB the authority to review any proposed federally permitted or federally licensed activity that may impact water quality and to certify, condition, or deny the activity if it does not comply with state water quality standards. If the California SWRCB imposes a condition on its certification, those conditions must be included in the federal permit or license. The Porter-Cologne Act also requires a "Report of Waste Discharge" for any discharge of waste (liquid, solid, or otherwise) to land or surface waters that may impair a beneficial use of surface or groundwater of the state. Beneficial uses are discussed below.

3.13.3.2.2 Water Quality Control Plan, Los Angeles Region (Basin Plan)

The 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 which 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 and characteristics that could be affected by the proposed Project. These constituents include: bioaccumulation, biostimulatory substances, chemical constituents, dissolved oxygen, oil and grease, pesticides, pH, polychlorinated biphenyls, 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 which 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; and
- 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. These are not evaluated in this Draft EIR because the proposed Project does not include any discharges or activities that would affect the water quality objectives for these parameters.

Construction and Industrial Permitting

LARWQCB administers the NPDES permitting program for construction and industrial activities. Two of these permits, issued by the California SWRCB, are a statewide general construction activities stormwater permit (GCASP) and a statewide general industrial activities stormwater permit (GIASP). The GCASP requires all dischargers where construction activity disturbs 1 acre or more to:

- develop and implement a SWPPP, which specifies BMPs that will prevent all construction pollutants from contacting stormwater and with the intent of keeping all products of erosion from moving off site into receiving waters;
- eliminate or reduce non-stormwater discharges to storm sewer systems and other waters of the United States; and
- perform inspections of all BMPs.

Similar to the GCASP, the GIASP requires industrial stormwater dischargers to:

- develop and implement a SWPPP to reduce or prevent industrial pollutants in stormwater discharges;
- eliminate unauthorized non-storm discharges; and
- conduct visual and analytical stormwater discharge monitoring to indicate the effectiveness of the SWPPP in reducing or preventing pollutants in stormwater discharges.

Best management practices that could be implemented as part of the GIASP or GCASP requirements are described below.

Best Management Practices

The term BMPs refers to a variety of measures used to reduce pollutants in stormwater and other non–point source runoff. Measures range from source control, such as use of permeable pavement, to treatment of polluted runoff, such as use of detention or retention basins and constructed wetlands. Maintenance practices (e.g., street sweeping) and public outreach campaigns also fall under the category of BMPs. The effectiveness of a particular BMP is highly contingent upon the context in which it is applied and the method in which it is implemented. BMPs are best used in combination to most effectively remove target pollutants.

Post-Construction Permitting

On January 26, 2000, LARWQCB adopted and approved Board Resolution No. R-00-02, which requires new development and significant redevelopment projects in Los Angeles County to control the discharge of stormwater pollutants in post-construction stormwater. The Regional Board Executive Officer issued the approved SUSMPs on March 8, 2000. The California SWRCB in large part affirmed the LARWQCB action and SUSMPs in State Board Order No. WQ 2000-11, issued on October 5, 2000.

The City of Los Angeles, and therefore the LAHD, is covered under the Permit for Municipal Storm Water and Urban Runoff Discharges within Los Angeles County (LARWQCB Order No. 01-182) and is obligated to incorporate provisions of this document in City permitting actions. The municipal permit incorporates SUSMP requirements, and these include a treatment control BMP for projects falling within certain development and redevelopment categories. The treatment control BMP requirement applies throughout the proposed project area and requires infiltration, filtration, or treatment of the runoff from the first 0.75 inch of rainfall (or equivalent numerical design criteria) prior to its discharge to a stormwater conveyance system.

3.13.3.2.3 California Toxics Rule

This 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 California Toxics 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 EPA in its CWA Section 304(a) guidance.

3.13.3.2.4 California Ocean Plan

The California Ocean Plan was developed and is maintained via periodic updates by the SWRCB (2009) in order to protect the quality of ocean waters by controlling discharges to those waters. The plan sets numerical water quality objectives for the state's ocean waters and establishes procedures for determining effluent limitations. Although the plan does not cover Los Angeles Harbor, which is an "enclosed bay," the plan's standards and objectives are often used as an indication of water quality.

3.13.3.3 Local Regulations

3.13.3.3.1 City of Los Angeles Ordinances

The Stormwater Ordinance, LAMC 64.70, makes it a crime (misdemeanor, punishable by fine, imprisonment, or both) to discharge pollutants into a stormwater disposal system. The Stormwater Ordinance is the primary vehicle for City enforcement of NPDES permits.

In December 2010 the City of Los Angeles developed an ordinance that amended the LAMC to include Low Impact Development (LID) practices in new development and redevelopment projects. LID refers to the method of developing or redeveloping urban areas that serves to both reduce the quantity and improve the quality of stormwater that discharges from the development, essentially seeking to maintain or restore the natural pre-development hydrologic characteristics of the site.

The intention of the LID ordinance is to:

- require the use of LID standards and practices in future developments and redevelopments to encourage use of rainwater and urban runoff;
- reduce stormwater/urban runoff while improving water quality;
- promote rainwater harvesting;
- reduce off-site runoff and provide increased groundwater recharge;
- reduce erosion and hydrologic impacts downstream; and
- enhance the recreational and aesthetic values in communities.

The LID ordinance essentially expands the SUSMP requirements by increasing the number of new and redevelopment conditions under which stormwater mitigation measures must be implemented. As with SUSMP requirements, the LID requirements would need to be met for a building permit to be issued. For new nonresidential development or for redevelopment projects that result in an alteration of at least 50% or more of the impervious surfaces of an existing developed site, the entire site shall comply with the standards and requirements of the ordinance and of the LID section of the Development BMP Handbook.

The ordinance provides that where LID requirements cannot be met, at a minimum SUSMP requirements would instead need to be met onsite. For the remaining runoff that cannot be managed onsite (the difference between the amount of runoff that is managed by SUSMP requirements and the amount that was required to have been managed to meet LID requirements), either the runoff would need to be managed somewhere else in the same subwatershed, or a fee would need to be paid to the City of Los Angeles Stormwater Pollution Abatement Fund, whereby the City would allocate that fee toward stormwater mitigation projects within that subwatershed.

3.13.3.3.2 Port of Los Angeles Tariff No. 4

Port of Los Angeles Tariff No. 4 describes the rates, charges, rules, and regulations of the Port of Los Angeles. The tariff applies to all persons making use of the navigable waters of Los Angeles Harbor. Included is information about pilotage, dockage, wharfage, passengers, free time, wharf demurrage, wharf storage, space assignments, cranes, and other operational rules and regulations. Certain provisions of Tariff No. 4 are intended to ensure safe and lawful operations of vessels while in the Port and thereby function to minimize the risk of accidents that could cause impairment of water quality. Sections of Tariff No. 4 that have particular relevance to water quality regulation include Section 17, which governs the handling of hazardous materials; and Section 18, which includes prohibitions related to waste oil, materials dumping, oil discharges, regulation of ballast water, and any related activities that may potentially affect water quality.

3.13.3.3.3 Port of Los Angeles Clean Marinas Program

The Clean Marinas Program for the Port of Los Angeles is a non-regulatory program that encourages recreational boaters and marina operators to use BMPs to prevent the discharge of pollutants into the harbor from boating activities. As part of the program, a number of innovative clean water measures have been developed that are unique to the Port. These measures and BMPs are implemented via voluntary incentives, Port lease requirements, CEQA mitigation requirements, and/or federal, state, and local regulations.

3.13.3.3.4 Water Resources Action Plan

In 2009 the ports of Los Angeles and Long Beach, with the cooperation of EPA and the Los Angeles RWCQB, developed the WRAP to direct their implementation of programs aimed at protecting and enhancing water and sediments in the harbors. The WRAP has two main driving forces: (1) the ports' need to achieve their broad mission to protect and improve water and sediment quality, and (2) the imminent promulgation by the Los Angeles RWQCB and the EPA of TMDLs for harbor waters, and the associated CWA permits. The WRAP contains a variety of control measures to address four basic types of sources: land-use discharges (i.e., from terminals and other landside uses), on-water discharges (from vessels and in-water structures), sediments, and watershed discharges (i.e., uses outside of the ports). The control measures consist of both improvements on current control measures such as housekeeping practices, BMPs, and permit compliance programs, and the addition of new measures such as development of standards, guidance materials, and new policies.

3.13.4 Impact Analysis

3.13.4.1 Methodology

Potential impacts of the proposed Project on water quality, sediments, and oceanography were assessed through a combination of literature review (including applicable water quality criteria), review of the results of past projects in the Port, review of water quality data collected in surface waters near the proposed project area, results from previous testing of Los Angeles Harbor sediments, and scientific expertise of the preparers. Impacts are considered significant if any of the significance criteria described below would be met or exceeded as a result of the effects of construction or operation of the proposed Project.

The assessment of impacts is based on the assumption that the proposed Project would include the following:

- an individual NPDES permit for construction-related stormwater discharges or coverage under the General Construction Activity Storm Water Permit for the onshore portions of the proposed Project would be obtained by the tenant. The associated SWPPP would contain the following measures:
    - equipment would be inspected regularly (daily) during construction, and any leaks found would be repaired immediately;
    - refueling of vehicles and equipment would be in a designated, contained area;
    - drip pans would be used under stationary equipment (e.g., diesel fuel generators), during refueling, and when equipment is maintained;
    - drip pans would be covered during rainfall to prevent washout of pollutants; and
    - appropriate containment structures would be built and maintained to prevent offsite transport of pollutants from spills and construction debris.
- monitoring would be performed to verify that the BMPs were implemented and kept in good working order;
- other standard operating procedures and BMPs for Port construction projects would be followed;
- all onshore contaminated upland soils would be characterized and remediated in accordance with LAHD, LARWQCB, DTSC, and Los Angeles County Fire Department protocol and clean-up standards;
- the tenant would obtain and implement the appropriate stormwater discharge permits for operations;
- a Section 404 (of the CWA) and Section 10 (of the Rivers and Harbors Act) permit from USACE would be secured for construction activities in waters of the harbor;

- a Section 401 (of the CWA) Water Quality Certification from LARWQCB, including standard Waste Discharge Requirements (WDRs), would be secured for in-water work activities;
- a Debris Management Plan and SPCC Plan would be prepared and implemented prior to the start of demolition and construction activities associated with the proposed Project;
- tarps or other barriers would be rigged in areas of over-water work so as to prevent demolition or construction debris from falling into the water; and
- an individual NPDES permit for any discharge of seawater from the facility.

3.13.4.2 Thresholds of Significance

The *L.A. CEQA Thresholds Guide* (City of Los Angeles 2006) sets forth specific thresholds to be utilized in determining the significance of impacts on water resources. The thresholds guide does not address some of the potential impacts of the proposed Project related to modification of aquatic sediments and flushing within the harbor; these potential impacts are discussed here under threshold WQ-2.

The following thresholds are unique to the proposed Project. Thresholds related to groundwater impacts are not included here; however, see Section 3.6, "Groundwater and Soils," for a discussion of the impacts on groundwater resources. The following criteria were used to determine significance for water quality, sediments, and oceanography.

WQ-1: A project would have a significant impact if it would substantially reduce or increase the amount of surface water in a water body.

WQ-2: A project would have a significant impact if it would result in discharges that create pollution, contamination or nuisance as defined in Section 13050 of the California Water Code (CWC) (see definitions below) or that cause regulatory standards to be violated, as defined in the applicable NPDES stormwater permit or Water Quality Control Plan for the receiving water body.

1. "**Pollution**" means an alteration of the quality of the waters of the state to a degree that unreasonably affects either of the following: (1) the waters for beneficial uses; or (2) facilities that serve these beneficial uses. "Pollution" may include "Contamination."

2. "**Contamination**" means an impairment of the quality of the waters of the state by waste to a degree that creates a hazard to the public health through poisoning or through the spread of disease. "Contamination" includes any equivalent effect resulting from the disposal of waste, whether or not waters of the state are affected.

3. "**Nuisance**" means anything that meets all of the following requirements: (1) is injurious to health, or is indecent or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life

or property; (2) affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal; and (3) occurs during, or as a result of, the treatment or disposal of wastes.

As discussed in the Initial Study, the proposed Project was determined to result in no impact related to the following four other criteria from Appendix G of the State CEQA Guidelines and are not considered further in the analysis below:

- Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?
- Substantially alter the existing drainage pattern of a site or area through the alteration of the course of a stream or river, or by other means, substantially increase the rate or amount of surface runoff in a manner that would result in flooding on- or off-site?
- Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?
- Place within a 100-year flood hazard area structures that would impede or redirect flood flows?

3.13.4.3 Impacts and Mitigation

3.13.4.3.1 Construction Impacts

Impact WQ-1a: Construction of the proposed Project would not substantially reduce or increase the amount of surface water in a water body.

The proposed Project does not include any substantial filling of water area or removal of land area. Installation of piles for the wharf improvements would not have a measurable effect on the East Channel or the volume of water in the harbor, or adversely affect beneficial uses.

Impact Determination

Because the proposed Project would result in a negligible change in the amount of surface area and water volume in the East Channel and, by extension, in Los Angeles Harbor, impacts would be less than significant.

Mitigation Measures

No mitigation is required.

Residual Impacts

Impacts would be less than significant.

Impact WQ-2a: Construction of the proposed Project would not result in discharges that create pollution, contamination, or nuisance as defined in Section 13050 of the CWC or that cause regulatory standards to be violated, as defined in the applicable NPDES stormwater permit or Water Quality Control Plan for the receiving water body.

Removal and Placement of Pilings

The removal of concrete pilings in the East Channel and the installation of new steel and concrete pilings in the East Channel could generate localized turbidity underneath the dock as a result of resuspended sediment. Existing concrete pilings would be cut at the mudline and left in place, while new piles would be installed adjacent to them. Piles placed for seismic upgrade purposes would be driven through an existing rock blanket and would not, therefore, result in substantial sediment resuspension and turbidity. Piles driven for the floating docks adjacent to Berth 57 would resuspend small amounts of sediment. The resuspended sediments could have temporary, very localized effects on water quality in the East Channel, but these effects would be minimal.

Installation of Water Intake and Discharge Pipes for Research Facilities

The installation of the seawater intake pipes would require in-water work. A seawater intake structure would be constructed for the research operations for SCMI and other research facilities within the proposed project study area, which would be located at the southern end of City Dock No. 1, near Berth 60 and Warehouse No. 1. A second intake and discharge, for the wave tank, may be constructed at Berth 70-71. A small number of piles may be needed to support the structures, depending on the intakes' design and the distance it extends offshore. While a majority of the construction would be accomplished with shore-based equipment, some piles could be installed from a barge, temporarily anchored offshore or moored adjacent to the wharfs (Chapter 2, "Project Description," provides a description of the intake structure and other associated components of the proposed Project).

The potential effects of the limited pile driving activities associated with the installation of the seawater intake pipes would be similar to those described above for installing the wharf piles. If required for direct discharge of spent seawater from the proposed Project facilities, an outfall pipe would be constructed. The location of one outfall pipe is expected to be under the East Channel wharf, adjacent to Berth 60. Another outfall pipe, to serve the wave tank if necessary, may be constructed at Berths 70-71. It is assumed that the end of the seawater discharge pipes (invert elevation) will be above the high water level, to allow access for periodic water quality sampling of the discharge water. Therefore, no in-water work is expected, and these construction activities would have no effect on water quality conditions in the area. This discharge pipes would not be constructed if it is decided to discharge all effluent seawater to the existing TIWRP.

Spills and Leaks

Accidents resulting in spills of fuel, lubricants, or hydraulic fluid from equipment used during demolition and construction could occur during the proposed Project. Based on past history for this type of work in the harbor, accidental leaks and spills of large volumes of hazardous materials or wastes containing contaminants during onshore construction activities have a very low probability of occurring because large volumes of these materials typically are not used or stored at construction sites (see Section 3.7, "Hazards and Hazardous Materials"). Spills associated with construction equipment, such as oil/fluid drips or gasoline/diesel spills during fueling, typically involve small volumes that can be effectively contained within the work area and cleaned up immediately (Port of Los Angeles Spill Prevention and Control procedures [CA012]). Construction and industrial SWPPPs and standard Port BMPs listed in Section 3.13.3.2.2, "Water Quality Control Plan" (e.g., use of drip pans, contained refueling areas, regular inspections of equipment and vehicles, and immediate repairs of leaks) would reduce the potential for materials from onshore construction activities to be transported off site and enter storm drains or the harbor.

Some pile removal and installation activities along with floating dock installation would be performed with the assistance of barge- and boat-mounted equipment. Accidents or spills from such in-water construction equipment could result in direct releases of petroleum materials or other contaminants to harbor waters. Precautions would be taken to minimize this risk, and contractors would have spill response materials on hand.

Stormwater Runoff

Land-based construction could result in temporary impacts on surface water quality through runoff of soils, asphalt leachate, concrete washwater, and other construction materials. No upland fresh surface water bodies currently exist within the area of disturbance for the proposed Project. Thus, impacts on surface water quality related to onshore construction would be limited to waters of the harbor that receive runoff from the construction site. Runoff from onshore construction sites could enter harbor waters primarily through storm drains. Most runoff would occur during storm events, although some runoff could occur from water use as part of construction activities, such as dust control.

The WDRs for stormwater runoff in the County of Los Angeles and incorporated cities covered under NPDES Permit No. CAS004001 (13 December 2001) require implementation of runoff control from all construction sites. A construction SWPPP will be prepared in accordance with the GCASP and implemented prior to start of any construction activities. This construction SWPPP would specify BMPs to prevent/contain releases of soils and contaminants. BMPs such as wheel washing, dust control activities, and structural measures such as soil barriers, sedimentation basins, and site contouring would be employed () Standard Port BMPs specify procedures for handling, storage, and disposal of contaminated materials encountered during excavation. Regulatory guidance and requirements with respect to handling and disposing of lead-based paint and asbestos-containing materials (see Section 3.7, "Hazards and Hazardous Materials") would ensure that those substances would not enter stormwater runoff. These procedures would be followed for upland construction activities associated with the proposed Project to ensure that any contaminants potentially present in soil or groundwater were not transported off site by runoff.

Impact Determination

The limited extent of in-water construction would minimize turbidity and any associated water quality impacts. Furthermore, BMPs and other construction controls that would be employed, as described above, in compliance with the construction and discharge requirements of the relevant permits would minimize the likelihood and severity of contaminant inputs to harbor waters. Any such discharges would be small and result in temporary, localized impacts to water quality that would not violate water quality standards. Accordingly, impacts of construction-related water quality standards and discharge requirements would be less than significant.

Mitigation Measures

No mitigation is required.

Residual Impacts

Impacts would be less than significant.

3.13.4.3.2 Operational Impacts

Impact WQ-1b: Operation of the proposed Project would not substantially reduce or increase the amount of surface water in a water body.

Operation of the proposed Project would withdraw seawater from the harbor for use in research, holding, and aquaculture facilities, and discharge the spent water either back to the harbor or into the sanitary sewer system. In either case, the amount of water consumed would be negligible in the context of the volume of the East Channel. Fresh water used at the facility would come from the municipal water supply (see Section 3.12, "Utilities") and thus would not deplete local natural water bodies. Operations would place no fill in harbor waters and would not increase the surface area of the harbor. Thus, there is no mechanism by which operation of the proposed Project could affect the amount of surface water in Los Angeles Harbor.

Impact Determination

The proposed Project would have no effect on the amount of surface water in the East Channel, Fish Harbor, or Los Angeles Harbor as a whole. No impacts would occur.

Mitigation Measures

No mitigation is required.

Residual Impacts

No impacts would occur.

Impact WQ-2b: Operation of the proposed Project would not result in discharges that create pollution, contamination, or nuisance as defined in Section 13050 of the CWC or that cause regulatory standards to be violated, as defined in the applicable NPDES stormwater permit or water quality control plan for the receiving water body.

Seawater discharge from the flow-through portion of the system is estimated at 2,000,000 gallons per day (twice the volume of the tanks). Seawater discharge from the recirculating portion of the system would consist of spent seawater and water from filter backwash. The discharge volume under the recycled system scenario is estimated at no more than 28,000 gallons per day.

Seawater used for life support of indigenous marine organisms could be discharged with minimal treatment, as its use would not alter its chemical characteristics. Seawater used in experiments or procedures involving chemical additives, non-indigenous species, or altered temperatures could contain, in addition to the normal constituents of harbor water, elevated BOD and ammonia from animal and plant wastes, and elevated concentrations of plant nutrients such as nitrogen and phosphorus. In addition, the likelihood that research would involve the mixing of various antibiotics, hormones, and test substances (e.g., for toxicity testing) to the seawater, means that prior to discharge, spent seawater could contain elevated concentrations of volatile and semi-volatile hydrocarbons, as well as heavy metals. Therefore, seawater used for research would be processed through enhanced treatment systems, such as micro-filtration, protein skimmers, and ozone treatment, before being discharged to the harbor.

Seawater in the wave tank would partially discharge on rare occasions to accommodate different research projects and scenarios. The volume of discharge cannot be estimated but would be minimal since discharge would occur on only rare occasions. Moreover, the water would contain chemicals added to inhibit the growth of marine organisms within the tank. Accordingly, prior to any discharge the water would be tested and treated to ensure compliance with all applicable discharge requirements, similar to treatment described in the paragraph above.

Any water that could not be treated to meet water quality standards for discharge to the harbor would have to be discharged to the sanitary system. Pre-treatment would be required if it is determined necessary in order to meet the Bureau of Sanitation’s requirements for discharge. The proposed Project’s infrastructure would include the facilities necessary to accomplish that treatment, and its operating permits would specify treatment requirements.

Monitoring results of water discharged by the existing SCMI Fish Harbor facility during 2009 and 2010 illustrates probable water quality in the spent seawater discharge of the proposed City Dock No. 1 facility (Table 3.13-3). The table includes both the intake water (i.e., the source water in Fish Harbor) and the effluent (i.e., the spent seawater discharged to the harbor). In 2009, heavy metals and semi-volatile hydrocarbons (primarily PAHs such as chrysene, fluoranthene, and pyrene) were substantially lower in the effluent than in the source water, presumably as a result of both the treatment method and adsorption by the organisms and filters in the system. In 2010, however, values in the source water and the discharge were not very different, although effluent values were generally somewhat higher than intake values. Accordingly, it is unlikely that, under normal operating conditions, the spent seawater discharged from the proposed Project would introduce substantial amounts of contaminants to harbor waters. This conclusion is supported by an SWRCB assessment of effluent discharge from the Monterey Bay Aquarium (SWRCB 2011), which found that aquarium effluent contained low levels of waste, but that none of the samples exhibited toxicity effects. The possibility that non-indigenous organisms used in research and development programs could be discharged to harbor waters is addressed in Section 3.3, "Biological Resources."

Table 3.13-3. Water Quality in the Intake and Discharge Waters of the SCMI Facility in Fish Harbor, 2009 and 2010.

Monitoring Parameter		*2009*	*2010*
Copper (µg/l)	Intake	8.0	4.8
	Effluent	3.4	6.0
Lead (µg/l)	Intake	6.0	0.6
	Effluent	0.1	1.1
Mercury (µg/l)	Intake	ND	ND
	Effluent	ND	ND
Zinc (µg/l)	Intake	9.3	ND
	Effluent	4.5	26.5
Anthracene (ng/l)	Intake	87	22
	Effluent	14	19
Benzo(a)pyrene (ng/l)	Intake	114	3
	Effluent	46	15
Chrysene (ng/l)	Intake	374	18
	Effluent	389	125
Fluoranthene (ng/l)	Intake	356	75
	Effluent	196	123

Monitoring Parameter		*2009*	*2010*
Pyrene (ng/l)	Intake	190	19
	Effluent	136	76
Dissolved Oxygen (mg/l)	Effluent	6.8–8.4	6.4–8.2
BOD_5 (mg/l)	Effluent	ND–8.7	ND–3.5
Oil & Grease (mg/l)	Effluent	ND–1.0	ND
Ammonia (mg/l)	Effluent	0.1–0.3	ND–0.2
Nitrate & Nitrite Nitrogen (mg/l)	Effluent	0.1	ND–1.1
Suspended Solids (mg/l)	Effluent	1.5–2.8	ND–1.5
ND – Non-detection Source: SCMI 2011.			

Any discharge of spent seawater to the East Channel would occur per the terms and conditions of NPDES permits issued by LARWQCB, which would specify discharge limits protective of harbor water quality and designed to comply with applicable TMDLs (see Section 3.13.3.1.1, "Clean Water Act") established by EPA and the LARWQCB. The NPDES permit would define a mixing zone in the immediate vicinity of the discharge (typically, within 300 feet) beyond which water quality standards and discharge limitations could not be exceeded. Individual research laboratories would be required to meet the discharge limits before adding their spent seawater to the discharge stream. For example, a laboratory that used antibiotics, hormones, or other test substances would be required to remove any residual additives to a point that is at or below permit limits before releasing to the discharge stream, or to dispose of its wastewater by another means such as sending it to an approved wastewater treatment facility or discharging to the sanitary sewer.

The discharge of non-toxic substances and components such as BOD, nutrients, and pH would not cause water quality standards to be exceeded outside of the mixing zone because the relatively small amount of effluent would be quickly diluted by the volume of the harbor. The total quantity of BOD and nutrients that could be discharged into the harbor (the "load") would be specified by the NPDES permit. Regular monitoring in accordance with the requirements of the permit would take place to ensure that effluent limits and total loads were not exceeded. Accordingly, discharge of spent seawater from operation of the proposed Project would not cause pollution, contamination, or a nuisance in harbor waters.

Stormwater runoff from the proposed Project area would be collected by the storm drain system and discharged to the harbor in quantities and at locations similar to existing conditions. Implementation of the proposed Project would include structural (e.g. SUSMP requirements) and procedural (housekeeping) BMPs that are not part of the baseline. Because stormwater in the area currently receives no treatment, the stormwater treatment BMPs to be implemented under the proposed Project would likely result in a reduction in the concentrations of pollutants that are commonly present in stormwater runoff from industrialized areas, such as the proposed Project area. In addition, the facilities associated with the proposed Project would be operated in accordance with one or more industrial SWPPPs that would contain monitoring requirements to ensure that stormwater quality complies with permit conditions. The proposed Project would have the potential to also affect harbor water quality through discharges from vessels. Oceangoing vessels have the potential to discharge fuels, lubricants, waste oil, and gray water as a result of spills or illegal discharges. It is possible that NOAA research vessels up to 250 feet would be homeported at the proposed Project.

While there is some risk of accidental spills and illegal discharges, the additional calls would not appreciably increase that risk compared to baseline conditions. Even large research vessels are typically much smaller than cargo vessels which are frequently 3 to 4 times larger than what would be anticipated at the proposed project site. Accordingly, the amount of pollutants that could be released would be much smaller than would be expected for the same number of cargo vessels. Vessels calling at the City Dock No. 1 facility would be subject to the requirements of various federal and state regulations governing discharges to state waters (see, for example, POLB and POLA 2010), and the Port of Los Angeles Tariff No. 4 (see Section 3.13.3.3.2). These regulations prohibit a number of discharges in coastal waters, including oily bilge water, sewage, and various other wastes, and restrict the types of maintenance activities that can be performed in bays and harbors.

Furthermore, Los Angeles-Long Beach Harbor has a long-established spill response system, overseen by the US Coast Guard and the California Department of Fish and Game's Office of Oil Spill Response (OSPR; see www.dfg.ca.gov/ospr/Admin/). Under this program, vessels are required to maintain oil spill contingency plans and to have the financial resources to support a spill response. The US Coast Guard conducts regular inspections of vessels to ensure seaworthiness and verify that appropriate pollution control mechanisms are in place.

Impact Determination

Point source discharge of spent seawater from research facilities would be controlled by permit conditions protective of harbor water quality, and would be subject to monitoring and treatment to ensure compliance with those permits. Accordingly, the impacts of point source discharges to the harbor relative to water quality standards and discharge requirements would be less than significant.

Discharges of stormwater would comply with NPDES discharge permit limits and would, because of modern BMPs, likely have less impact on harbor water quality than under baseline conditions. Therefore, the impacts of stormwater discharges relative to water quality standards and discharge requirements would be less than significant.

Given the small size and number of vessels that might use the proposed Project facilities, and the mechanisms in place to control spills, operation of the proposed Project would result in minimal increases in discharges or other water quality impacts associated with vessel traffic. Impacts related to vessel discharges would be less than significant.

Consequently, the impact on water quality from operational discharges would be less than significant.

Mitigation Measures

No mitigation is required.

Residual Impacts

Impacts would be less than significant.

3.13.4.3.3 Summary of Impact Determinations

Table 3.13-4 summarizes the impact determinations of the proposed Project related to water quality, sediments, and oceanography, as described in the detailed discussion in Section 3.13.4.3.2. Identified potential impacts may be based on federal, state, and City of Los Angeles significance criteria, LAHD criteria, and the scientific judgment of the report preparers.

For each type of potential impact, the table describes the impact, notes the CEQA impact determination, describes any applicable mitigation measures, and notes the residual impacts (i.e., the impact remaining after mitigation). All impacts, whether significant or not, are included in this table.

Table 3.13-4. Summary Matrix of Potential Impacts and Mitigation Measures for Water Quality, Sediments, and Oceanography Associated with the Proposed Project

Environmental Impacts	*Impact Determination*	*Mitigation Measures*	*Impacts after Mitigation*
3.13 WATER QUALITY, SEDIMENTS, and OCEANOGRAPHY			
Construction			
WQ-1a: Construction of the proposed Project would not substantially reduce or increase the amount of surface water in a water body.	Less than significant	No mitigation is required.	Less than significant
WQ-2a: Construction of the proposed Project would not result in discharges that create pollution, contamination, or nuisance as defined in Section 13050 of the CWC or that cause regulatory standards to be violated, as defined in the applicable NPDES stormwater permit or Water Quality Control Plan for the receiving water body.	Less than significant	No mitigation is required.	Less than significant

Operations			
WQ-1b: Operation of the proposed Project would not substantially reduce or increase the amount of surface water in a water body.	No impact	No mitigation is required.	No impact
WQ-2b: Operation of the proposed Project would not result in discharges that create pollution, contamination, or nuisance as defined in Section 13050 of the CWC or that cause regulatory standards to be violated, as defined in the applicable NPDES stormwater permit or water quality control plan for the receiving water body.	Less than significant	No mitigation is required.	Less than significant

3.13.4.4 Mitigation Monitoring

No significant adverse impacts on water quality, sediments, and oceanography would occur as a result of the proposed Project; therefore, no mitigation is required.

3.13.4.5 Significant Unavoidable Impacts

No significant unavoidable impacts on water quality, sediments, and oceanography would occur during construction or operation of the proposed Project.