Appendix C3
Essential Fish Habitat Assessment

BERTHS 212-224 (YTI) CONTAINER TERMINAL IMPROVEMENTS PROJECT

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EFH Assessment

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EXECUTIVE SUMMARY

The proposed Project would improve marine shipping and commerce at the existing Yusen Terminals Inc. (YTI) container terminal located at Berths 212-224 on Terminal Island within Los Angeles Harbor. Essential Fish Habitat (EFH) is managed under the Magnuson-Stevens Fishery Conservation and Management Act, which is designed to protect waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity. This EFH Assessment was prepared pursuant to the Magnuson-Stevens Act to analyze potential impacts to federally managed fish and invertebrates from construction and operation of the proposed Project.

The primary project elements that could affect the marine environment, including EFH, include:

- Dredging and disposal of approximately 27,000 cy of sediment,
- Installation of king piles and approximately 2,600 linear feet of sheet piles to stabilize the wharf, and
- Operating the terminal until 2026.

Three alternatives to the proposed Project are also considered. There is no dredging or installation of piles proposed for Alternatives 1 and 2; therefore, potential impacts to EFH would only be related to runoff from the terminal and future vessel operations. Alternative 3 would include dredging and disposing of approximately 6,000 cy of sediment from Berths 217-220, and installing approximately 1,200 linear feet of sheet piles.

Impacts during construction would be localized and temporary. Potential impacts from dredging, pile installation, construction runoff, accidental spills, and shading would be less than significant. No habitat loss would occur. Acoustic impacts from pile driving could result in adverse effects to fish species in the construction area. However, due to the limited potential impact area, this is not considered a substantial disruption. Additionally, with implementation of Mitigation Measure BIO-1, the pile-driving would initiate with a soft start, which would minimize potential impacts to fish and marine mammals, as they would likely leave the area as pile driving commenced. This mitigation measure would also include the establishment of a 300-meter safety zone around pile driving operations that would be monitored by observers. If marine mammals are observed within the zone prior to commencement of pile driving, the observer would require the pile driving to cease. Avoidance of the area by aquatic species including federally managed species would be temporary; pile driving would occur intermittently over an approximately 10-month period, and occur mostly during daylight hours. There would be no physical barriers to movement, and the baseline condition for aquatic species would be essentially unchanged. Due to the limited potential impact area and with the implementation of Mitigation Measure BIO-1, this is not considered a substantial disruption.

Potential impacts resulting from operation of the YTI Terminal include effects to water quality resulting from accidental spills and runoff, disturbance from vessel movements, and introduction of invasive species through ballast water exchange or vessel fouling. Potential impacts resulting from accidental spills, runoff, and disturbance from vessel movements would be less than significant. Impacts to EFH resulting from the introduction of invasive species are considered significant. No mitigation, beyond implementation of measures required under existing regulations, is available to fully mitigate potential impacts related to the introduction of invasive species. No feasible mitigation is currently available to totally prevent introduction of invasive species via vessel hulls or even ballast water, due to the lack of a proven technology.

INTRODUCTION

The proposed Project would improve marine shipping and commerce at the existing Yusen Terminals Inc. (YTI) container terminal located at Berths 212–224 on Terminal Island within Los Angeles Harbor (the Harbor) (**Figure 1).** Essential Fish Habitat (EFH) is managed under the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act), which is designed to protect waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity (Magnuson-Stevens Act, 16 U.S.C. 1801 et seq.). There are two fishery management plans (FMPs) that include waters adjacent to the proposed project site: the Coastal Pelagics FMP and the Pacific Groundfish FMP. This EFH Assessment was prepared pursuant to the Magnuson-Stevens Act to analyze potential impacts to federally managed fish species and invertebrates from construction and operation of the proposed Project.

PROJECT DESCRIPTION

The proposed Project area encompasses approximately 185 acres at Berths 212–224 on Terminal Island (**Figure 1**). A summary of the improvements that would occur at the terminal, followed by a more detailed description, include:

- Extending the height and outreach of up to six existing cranes;
- Replacing up to four existing non-operating cranes;
- Dredging and installing sheet piles and king piles at Berths 214–216 and 217–220;
- Extending the existing 100-foot gauge landside crane rail at Berths 212–216 through Berths 217–220;
- Performing ground repairs and maintenance activities in the backlands area; and
- Expanding the TICTF on-dock rail by adding a single operational rail track.

The proposed Project would be constructed in two phases over an approximately 22-month schedule, and is expected to begin in mid-2015. Phase I is expected to last approximately 12 months and consists of deepening Berths 217–220 (including installation of sheet piles), extending the 100-foot gauge crane rail, expanding the Terminal Island Container Transfer Facility (TICTF), relocation of two Port-owned cranes, relocation and realignment of two YTI cranes, delivery and installation of up to four new cranes, raising and extending up to six YTI cranes, and backland surface improvements. Phase II is expected to take approximately 10 months and involves deepening Berths 214–216 (including installation of king piles and sheet piles), and backland surface improvements. No physical changes would occur at Berths 221–224 except for paving work in the backland area. The improvements to Berths 217–220, including the extension of the 100-foot gauge crane rail, would add a new operating berth at the YTI Terminal.

The proposed improvements to Berths 214–216 include: 1) dredging to increase the depth from -45 to -53 feet Mean Lower Low Water (MLLW) (with an additional two feet of overdredge depth, for a total depth of -55 feet MLLW), and 2) installing sheet piles and king piles to accommodate the dredging activities and help to support and stabilize the existing wharf structure. Dredging would remove approximately 21,000 cubic yards (cy) of sediment from the berths. The king piles would be installed approximately 35 feet below the mudline and the sheet piles would be installed 15 feet below the mudline, and would be installed over approximately 1,400 linear feet along the berth.

The proposed improvements at Berths 217–220 would include dredging to increase the depth from -45 to -47 feet MLLW (with an additional two feet of overdredge depth, for a total depth of -49 feet MLLW). Dredging would require the removal of approximately 6,000 cy of sediment. Sheet piles would be installed approximately 15 feet below the mudline and would be installed over approximately 1,200 linear feet along the berth.

Figure 1. Location of the YTI project boundary in Los Angeles Harbor.

All of the dredged material, approximately 27,000 cubic yards, will be disposed of at an approved site, which may include the LA-2 Ocean Dredged Material Disposal Site (ODMDS), the Berths 243–245 confined disposal facility (CDF), or another approved location. A sampling and analysis program was implemented to determine suitability for any offshore disposal of material at LA-2. Effects from sediment disposal at LA-2 were evaluated under Section 404 of the CWA and Section 102 of the Marine Protection, Research and Sanctuaries Act during the site designation process (EPA 1988), and subsequently evaluated in consideration of higher maximum annual disposal volume (EPA and USACE 2005). Biological impacts due to construction and fill of the CDF were evaluated in the Final Supplemental Environmental Impact Statement / Final Supplemental Environmental Impact Report (EIS/EIR) for the Port of Los Angeles Channel Deepening Project (USACE and LAHD 2009). This evaluation included mitigation for habitat loss at the Berths 243–245 CDF.

The proposed Project would be constructed in two phases; Phase I is expected to take approximately 12 months beginning in mid-2015, and Phase II is expected to take approximately 10 months beginning in mid-2016. During Phase I of construction, Berths 212–213 and Berths 214–216 would remain in operation. During Phase II of construction, Berths 212–213 and the newly improved Berths 217–220 would be in operation. The schedule assumes that all of the work on the cranes to be modified and replaced will take place during the 22-month construction period. It is possible that some of the cranes would not be modified or replaced until a later date.

The primary project elements that could affect the marine environment, including EFH, include:

- Dredging and disposal of approximately 27,000 cy of sediment,
- Installation of king piles and approximately 2,600 linear feet of sheet piles, and
- Operating the terminal until 2026.

Three alternatives to the proposed Project are also considered. There is no dredging or installation of piles proposed for Alternatives 1 and 2; therefore, potential impacts to EFH would only be related to runoff from the terminal and future vessel operations. Alternative 3 would include dredging and disposing of approximately 6,000 cy of sediment from Berths 217–220, and installing approximately 1,200 linear feet of king piles and sheet piles.

DESCRIPTION OF THE STUDY AREA

The site of the proposed Project is on Terminal Island in the Port of Los Angeles (**Figure 1**). The Los Angeles-Long Beach Harbor Complex (Port Complex) was historically an estuary formed at the mouth of the San Gabriel and Los Angeles Rivers with extensive mudflats and marsh areas. The natural mudflats and marshlands provided habitat for birds, fish, and invertebrates. Urbanization and development led to the construction and modifications associated with the Port Complex. Dredging, filling, channelization, and construction over the past 100 years has completely altered the local estuarine physiography. The Los Angeles River course and the harbor area are no longer true estuaries because they do not maintain significant year-round fresh water input, and the biota are not distributed along salinity gradients as in most estuarine systems.

The habitats available for plants and animals have also changed as a result of harbor modifications. Very little sandy beach, shallow subtidal, and salt marsh habitats remain. Dredge and fill activities have resulted in changes to the benthic (bottom) habitat. The placement of shoreline structures, such as bulkheads, riprap, and pier pilings, has greatly increased the hard substrate available for fouling organisms, including mussels and barnacles. The construction of the breakwaters greatly affected water movement patterns within the Port Complex, which in turn affected overall circulation and water quality.

PHYSICAL FEATURES

The Port Complex consists of Inner, Middle, and Outer Harbors. Just north of the breakwaters, the Outer Harbors consist of deeper, open water habitat, and channels that lead to basins and slips in the Middle and Inner Harbors. The channels, basins, and slips vary in size and distance from the harbor entrances. In Los Angeles Harbor, the navigation channels were recently dredged to -53 ft.

During the mid-1900s, three breakwaters (i.e., San Pedro, Middle, and Long Beach) were constructed to protect the harbors from damaging wave action. Combined, these structures are also referred to as the Federal Breakwater. From the mid-1900s on, the development of the Port Complex continued with a series of dredge and fill operations to deepen channels and accommodate deep draft vessels, and provide fill for additional shoreline areas necessary for terminal development.

Los Angeles Harbor is the number one port by container volume and cargo value in the United States, handling 7.9 million TEUs (twenty-foot equivalent units) in calendar year 2011. In addition, the Harbor provides berthing for cruise ships, sportfishing vessels, commercial fishing vessels, pleasure boats, and Harbor support vessels. The physical size of the Harbor, diversity of Harbor uses, and ongoing upgrade and development projects results in continuous Harbor modifications. Thus, Harbor waters are subjected to continuous vessel traffic and periodic construction or modification, such as dredging and filling. A recent baseline hydroacoustic study in Cerritos Channel (in both Los Angeles and Long Beach Harbors) recorded L_{90} values (sound levels that were exceeded 90% of the time during the measurement period) of 120 to 132 decibels (dB) (Tetra Tech 2011). By comparison, ambient underwater noise in the open ocean has been estimated at 74 to 100 dBPEAK on the central California coast.

Water Quality Parameters

Waters within the Port Complex are primarily marine (saline), though there are fresh water inputs from regulated discharges, urban runoff, and flows from Dominguez Channel and the Los Angeles River. The following is a summary of water quality parameters measured during monthly sampling between January and December 2012 at three stations off the YTI Terminal (LAHD 2013):

- Mean station temperatures ranged from 16.1°C to 16.3°C (61°F), with a range throughout the water column from 12.0°C to 20.2°C (54°F to 68°F);
- Salinity values ranged between 32.4 and 33.9 practical salinity units (psu), which is essentially equivalent to parts per thousand (ppt) in southern California;
- Dissolved oxygen (DO) concentrations ranged from 3.8 to 8.5 mg/L, with mean values at each station between 5.7 and 5.9 mg/L;
- Mean station pH ranged narrowly from 8.17 to 8.21, with a maximum range between 7.38 and 8.91 units; and
- Mean turbidity at the three stations ranged between 1.3 and 1.8 Nephelometric Turbidity Units (NTUs), with a range throughout the water column between 0.3 and 8.7 NTUs.

Tides and Currents

Tides in southern California are classified as mixed, semi-diurnal, with two unequal high tides (lower high water and higher high water) and two unequal low tides (higher low water and lower low water) each lunar day (approximately 24.5 hr). Since 2003, the highest tide measured at the Los Angeles Harbor tide station (NOAA No. 9410660) is +7.92 feet (+2.41 meters) MLLW, measured in January 2005, and the lowest was -2.34 feet (-0.71 meters) MLLW, measured in January 2009 (NOAA 2013).

To better understand circulation patterns and watershed inputs into the Port Complex, the Ports undertook a program to develop a hydrodynamic and water quality model for the Port Complex to improve their predictions of the effectiveness of current and future control measures (the WRAP Model) (POLA and POLB 2009). Circulation patterns are established and maintained by tidal currents. Flood tides in the Port Complex flow into the Harbor and up the channels, while ebb tides flow down the channels and out of the Harbor (POLA and POLB 2009). The Port Complex is protected from incoming waves by the Federal Breakwater. In addition to protecting the ports from waves, the Federal Breakwater reduces the exchange of the water between the Port Complex and the rest of San Pedro Bay, hence creating unique tidal circulation patterns. Modeled current direction and velocity throughout the Port Complex during both ebb and flood tides is summarized in **Figure 2**.

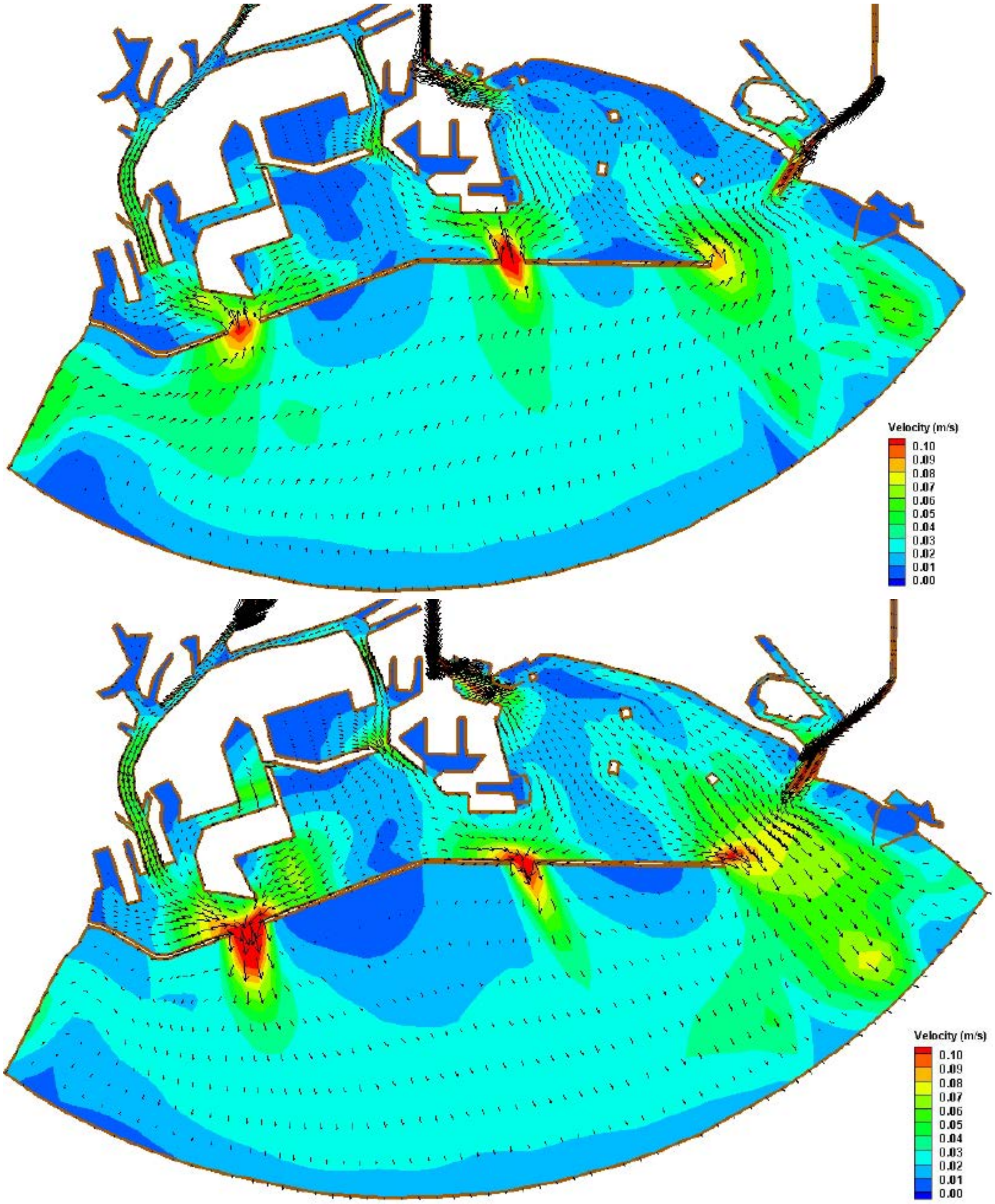

Figure 2. Current patterns in Los Angeles and Long Beach Harbors predicted by the WRAP Model (POLA and POLB 2009). Top: Typical flood tide currents**. Bottom:** Typical ebb tide currents**.**

Sediment Characterization

A sediment characterization study was performed at Berths 212–224 in 2013 to determine the suitability of sediments from the proposed dredge footprint for unconfined aquatic disposal (AMEC 2013). Sediments were collected and tested using standard EPA/USACE protocols according to an approved Sampling and Analysis Plan. Eight core samples were collected within the proposed dredge footprint and combined into to two samples (Composite Areas A and B) (**Figure 3**).

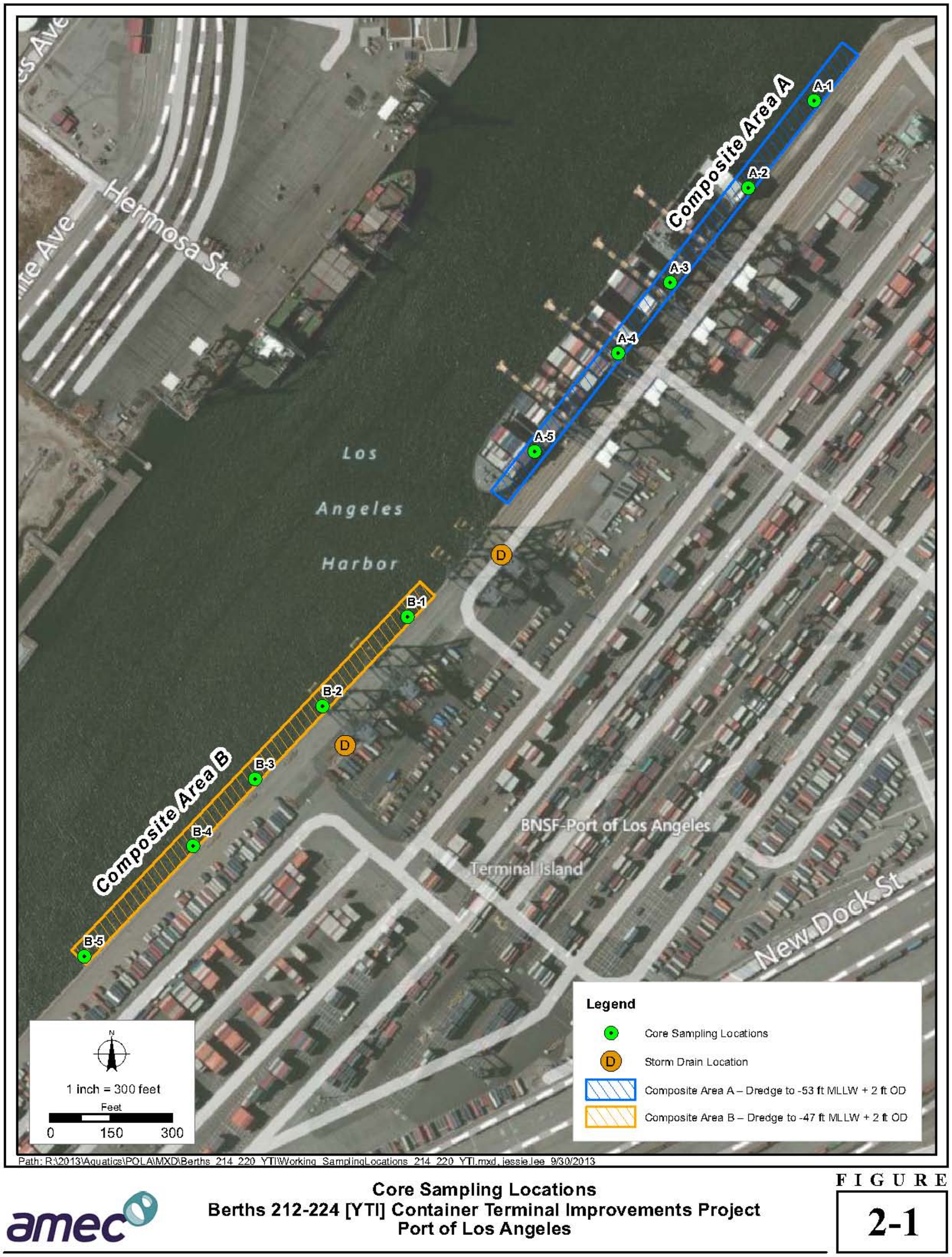

Figure 3. Sediment sampling stations and composite areas (AMEC 2013).

Testing indicated that sediment contaminant levels from the dredge footprint were relatively low, with only a few minor exceedances of "Effects Range-Low" (ERL) levels, concentrations above which effects to biota could occasionally occur. No concentrations exceeded "Effects Range-Median" (ERM) levels that represent a probable effects range within which effects to biota could frequently occur. In addition to chemical analysis, toxicity testing on sediments from the two composites showed no statistically or ecologically significant effects, while tissue bioaccumulation results were well below U.S. Food and Drug Administration action levels and the levels of concern reported in the Environmental Residue Effects Database.

The majority of sediments within the Berths 212–224 footprint complied with the chemistry, toxicity, and bioaccumulation suitability requirements for ocean disposal (Title 40 Code of Federal Regulations [CFR] Parts 220–228). Concentrations of most metals and PCBs, when detected, were higher in Composite Area A than in Area B. After review of the results, sediments from the bottom portion of Composite Area A were tested for sediment metals, polycyclic aromatic hydrocarbons (PAHs), chlorinated pesticides, pyrethroids, and polychlorinated biphenyls (PCBs). Results from this second phase of testing indicated generally lower levels of sediment contaminants, suggesting the higher levels were associated with unconsolidated surface (top-layer) sediments of Composite Area A (AMEC 2014). Therefore, the majority of dredged material (21,800 cubic yards) would be suitable for placement at the LA-2 ODMDS, and approximately two feet of surface sediments from Composite Area A (5,200 cubic yards) would be placed within the Berth 243–245 CDF.

Habitats of the Port Complex

The following sections describe the aquatic biological habitats and communities in the vicinity of the proposed project. The habitats available for plants and animals within the Port Complex have changed through time as a result of harbor modifications. Very little sandy beach and shallow subtidal habitats remain, and salt marsh habitat is essentially absent within the Port Complex. Dredge and fill activities have resulted in ongoing changes to the seafloor throughout the Port Complex. During Biological Baseline Studies of the Port complex conducted in 2000, sediments in the channel off Berth 212 were primarily silt (58 percent) and sand (23 percent) with a mean grain size of 33 μm (MEC and Associates, 2002). During the 2013 sediment characterization study, sediments in Composite Area A were mostly silt/clay (97 percent) with a mean grain size of 19 μm. Sediments in Composite Area B were also mostly silt/clay (80 percent) and mean grain size was slightly larger 33 μm (AMEC 2013).

Giant kelp (*Macrocystis pyrifera*) distribution in the Port Complex is limited to the outer breakwaters, and riprap structures in the Outer Harbors that face harbor entrances (SAIC, 2010). The placement of shoreline structures, such as bulkheads, riprap, and pier pilings, has greatly increased the hard substrate available for algae and sessile organisms, including mussels and barnacles. The construction of the breakwaters greatly affected water movement patterns within the Port Complex, which in turn affected overall circulation and water quality. Eelgrass (*Zostera marina*) occurs in a few places in Los Angeles Harbor (Cabrillo and Pier 300). Surveys of the Port Complex in 2000 and 2008 documented eelgrass beds along Cabrillo Beach and in three areas near Pier 300: the Seaplane Lagoon, a mitigation site at the Shallow Water Habitat, and on the northeastern side of Pier 300 (MEC and Associates, 2002; SAIC, 2010).

Pilings that support piers and wharves are prevalent along the edges of harbor channels. Many fish species are attracted to structures, such as surfperches and some rockfishes. Pier pilings support intertidal/subtidal invertebrate communities, such as algae, barnacles, and mussels that are fed upon by fishes and other invertebrates. Riprap provides similar habitat as natural reefs. As with pier pilings, riprap supports diverse invertebrate communities, but also provides habitat, shelter, and forage opportunities for fishes.

The role as a nursery grounds for juveniles of coastal fish species is probably the most widely recognized and accepted function of bays and estuaries (Allen et al., 2006). In southern California, harbors provide nearshore habitats that supplement, but do not adequately replace, the habitats of natural bays and estuaries (Cross and Allen 1993). The subtidal areas of the Port Complex provide several habitat types that support a diverse and abundant fish community. MEC and Associates (2002) found that juvenile white croaker (*Genyonemus lineatus*) prefer deepwater basins and slips within the Port Complex, although a greater variety of fish, such as bat rays (*Myliobatis californica*), California halibut (*Paralichthys californicus*), diamond turbot (*Pleuronichthys* *guttulatus*), queenfish (*Seriphus politus*), and topsmelt (*Atherinops affinis*) use the shallow waters of the harbors as nursery grounds.

Several features of bays and estuaries may be important to settling species, such as California halibut, including warmer water temperatures, decreased turbulence, finer sediments, and different biological communities compared with those on the open coast. MBC (1991) determined densities of recently settled California halibut in southern California increased with decreasing depth. The semi-protected waters of Queensway Bay and Outer Harbors are also important habitats for juvenile fishes and invertebrates. Recently transformed cheekspot goby (*Ilypnus gilberti*), California tonguefish (*Symphurus atricaudus*), white croaker, and queenfish were the most abundant juvenile fishes collected in seasonal surveys of Queensway Bay using beam trawls in 1990, 1991 and 1994 (MBC 1994).

FISH AND INVERTEBRATE COMMUNITIES

Fish Diversity

The 2000 Biological Baseline Study (MEC and Associates 2002), the Biological Surveys of 2008 (SAIC 2010), as well as long-term monitoring data from West Basin in Los Angeles Harbor (MBC 2013) have documented a fish community that appears to have changed little in decades. The 2000 and 2008 surveys used several gear types to adequately characterize different habitat types within the Port Complex. The long-term trawl surveys in Los Angeles and Long Beach Harbor used otter trawls, which target demersal (epibenthic) fish and invertebrates. In various biological studies, more than 130 fish species have been collected within the Port Complex, with 60 to 70 of those species commonly occurring (MEC 1988; MEC and Associates 2002; SAIC, 2010).

Ichthyoplankton

A comprehensive, year-long study of the ichthyoplankton (fish eggs and larvae) of the Port Complex was performed from January through December 2006 (MBC et al. 2007). The study also analyzed the abundance and distribution following larval shellfish taxa: crab megalopa, market squid (*Doryteuthis opalescens*) paralarvae, and California spiny lobster (*Panulirus interruptus*) phyllosoma (one of the larval stages of spiny lobster). As part of this study, one station in Inner Los Angeles Harbor (the entrainment station) was sampled weekly, and a total of six source water stations positioned throughout the Port Complex were sampled monthly (**Figure 4**).

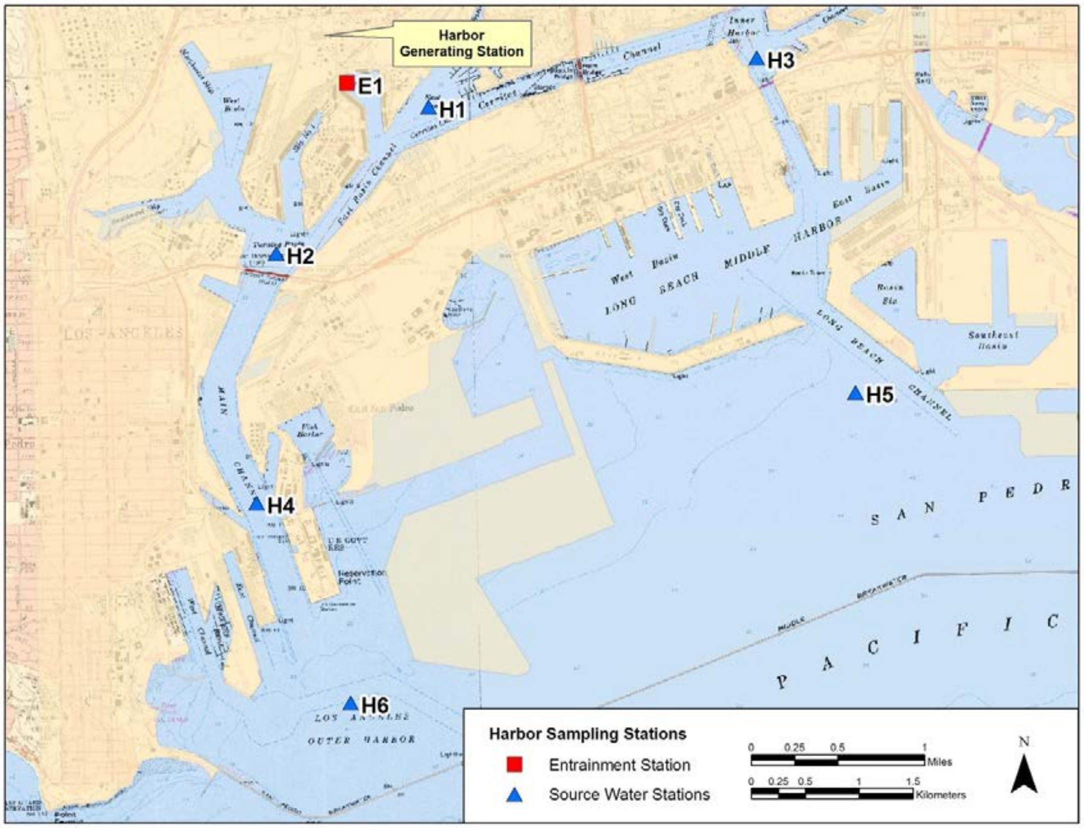

Figure 4. Entrainment and source water stations sampled January-December 2006. From: MBC et al. [2007]).

A total of 8,692 larval fishes representing 48 taxa were collected from entrainment Station E1 (in Inner Los Angeles Harbor) during 26 surveys in 2006. In addition, 14,845 fish eggs from 10 taxa were enumerated in the entrainment samples. Unidentified gobies (*Clevelandia*, *Ilypnus*, and *Quietula* [CIQ] goby complex), yellowfin goby (*Acanthogobius flavimanus*), white croaker, and bay goby (*Lepidogobius lepidus*) were the four most abundant taxa comprising nearly 90 percent of the specimens collected. Nearly 50 percent of the fish eggs could not be identified to species. Larval abundance peaked in March 2006 and was lowest in September, while fish eggs were most abundant in February 2006. Fish larvae were generally more abundant at night than during the daytime, but there was less of a diel difference with fish eggs.

A total of 14,025 larval fishes representing 72 taxa were collected from the six source water stations (Stations H1-H6) in the Port Complex during 12 monthly surveys in 2006 (MBC et al. 2007). White croaker, combtooth blennies (*Hypsoblennius* spp.), unidentified gobies (CIQ goby complex), anchovies (Engraulidae), bay goby, unidentified croakers (Sciaenidae) and yellowfin goby were the most abundant taxa and comprised nearly 90 percent of all specimens collected. The greatest concentrations of larval fishes occurred during May 2006 and the fewest in November 2006.

Three ichthyoplankton surveys were conducted at stations throughout the Port Complex in February, April, and July 2008 (SAIC 2010). A total of 71 different larval taxa were identified during the study, and the most abundant taxa were CIQ gobies (45 percent), combtooth blennies (34 percent), bay goby (9 percent), and clingfishes (Gobiesocidae; 3 percent). Overall, densities were lowest in surface waters (38.9 larvae per 100 m^3), and higher in the epibenthos (134 larvae per 100 m^3) and midwater (139 larvae per 100 m^3). The average weighted mean larval abundance was highest in shallow Outer Harbor areas (1,523 larvae per 100 m^2), lowest in the deeper Outer Harbor areas (1,157 larvae per 100 m^2), and intermediate in Inner Harbor areas (1,297 larvae per 100 m^2). Larval density was substantially higher in July (2,889 larvae per 100 m^2) than in February or April (566 and 426 larvae per 100 m^2, respectively).

Juvenile and Adult Fishes

MEC and Associates (2002) found little variability in the abundance of pelagic, schooling fishes, between the Inner and Outer Harbor areas of the Port Complex. In contrast, deepwater habitats of the Outer and Middle Harbors generally had greater number, biomass, and diversity of demersal fishes than Inner Harbor areas. However, species diversity was generally consistent throughout the year. In 2000, a total of 76 taxa representing 74 unique species were collected from the Port Complex using a combination of gear types designed to capture demersal, pelagic, and schooling fishes. Non-indigenous species comprised about 15 percent of the invertebrate species that inhabit the Port Complex. The most abundant fish species in the Port Complex, in order of decreasing abundance, were northern anchovy (*Engraulis mordax*), white croaker, queenfish, Pacific sardine (*Sardinops sagax*), topsmelt, specklefin midshipman (*Porichthys myriaster*), and California tonguefish.

Consistent with the 2000 studies, there was little variability in the abundance of pelagic fishes between Inner and Outer Harbor areas in 2008, and this was attributed to the highly mobile nature of most pelagic fishes (SAIC 2010). There were also no apparent spatial patterns in the demersal fishes. A total of 62 taxa representing at least 58 species were collected using multiple gear types in 2008. More species were collected with otter trawl (62) than with lampara (20) or beach seine (at least 8) in 2008. The lampara catch was highest in January, and the trawl catch was highest in July. Shallow water fishes sampled by beach seine were most abundant at Pier 300 in April and July, but at Cabrillo Beach abundance peaked in January.

Long-term surveys of demersal fishes and invertebrates have been conducted in the West Basin of Los Angeles Harbor (MBC 2013). At least 44 species of fishes have been collected since 1978, although only about 15 species are collected annually on average. Abundance has been dominated by white croaker, northern anchovy, bay goby, and queenfish, which combined account for nearly 94 percent of the long-term abundance. The most abundant fish species collected in 2013 included California lizardfish (*Synodus lucioceps*; 40 percent of the total), yellowchin sculpin (*Icelinus quadriseriatus*; 24 percent), spotted sand bass (*Paralabrax maculatofasciatus*; 14 percent), and white croaker (9 percent).

Invertebrate Diversity

Planktonic Invertebrates

A total of 2,262 larval target shellfishes (late-stage larvae of crabs, spiny lobsters, and market squid) representing 16 taxa were collected at the HGS entrainment station (Station E1) during 26 bi-weekly surveys in 2006 (**Figure 3**; MBC et al. 2007). The highest concentrations were collected in May 2006. The megalops stage of kelp crabs (*Pugettia* spp.), spider crabs (Majidae), and pea crabs (*Pinnixa* spp.) comprised over 90 percent of all specimens collected. Advanced larvae of species with commercial fishery value (i.e., cancer crabs [Cancridae], California spiny lobster, and market squid) each comprised less than 1 percent of the target shellfish collection.

A total of 6,942 larval target shellfishes representing 20 taxa (combined species designations) were collected from the six source water stations (Stations H1-H6) in the Port Complex during 12 monthly surveys in 2006 (**Figure 3**; MBC et al. 2007). The highest concentrations were collected during the May 2006 survey. Megalops of kelp crabs, pea crabs, spider crabs, unidentified megalops, California spiny lobster, and cancer crabs were the most abundant taxa and comprised over 90 percent of all specimens collected.

Juvenile/Adult Invertebrates

During the biological baseline surveys of 2000, a total of 63 epibenthic macroinvertebrate taxa representing 61 unique species were collected throughout the Port Complex (MEC and Associates 2002). Five species comprised 95 percent of total abundance: blackspotted bay shrimp (*Crangon nigromaculata*; 51 percent), tuberculate pear crab (*Pyromaia tuberculata*; 28 percent), Xantus swimming crab (*Portunus xantusii*; 10

percent), New Zealand bubble snail (*Philine auriformis*; 5 percent), and spotwrist hermit crab (*Pagurus spilocarpus*; 1 percent). On average, mean abundance was higher at deep-water stations than at shallow stations, and abundance and species richness were significantly greater in winter (February) than in any other season.

In 2008, at total of 61 epibenthic macroinvertebrate taxa were collected throughout the Port Complex (SAIC 2010). Five species accounted for 86 percent of total abundance: blackspotted bay shrimp (38 percent), ridgeback rock shrimp (*Sicyonia ingentis*; 16 percent), blacktail bay shrimp (*Crangon nigricauda*; 14 percent), Xantus swimming crab (11 percent), and unidentified shrimp (*Heptacarpus* spp.; 8 percent). No apparent patterns in the spatial or depth distributions of invertebrates were identified during the study, although Xantus swimming crab was generally more abundant in shallower habitats. Three of the five most abundant taxa were collected at every station. Abundance was higher in the winter and spring surveys than in summer.

In West Basin of Los Angeles Harbor, trawl-caught invertebrate abundance since 1978 has been dominated by bay shrimp (*Crangon* spp.; 53 percent), tuberculate pear crab (7 percent), New Zealand bubble snail (2 percent), and yellow crab (*Metacarcinus anthonyi*; <1 percent). The most abundant macroinvertebrates collected in 2013 included blackspotted bay shrimp (23 percent), Alaska bay shrimp (*Crangon alaskensis*; 20 percent) and target shrimp (*Sicyonia penicillata*) (MBC 2013).

Protected Species

Some fish and invertebrate species (e.g., abalone) in southern California are protected under California Department of Fish and Wildlife (CDFW) regulations, although few marine species are listed as either threatened or endangered. Special-status fish species that could occur in Los Angeles Harbor include garibaldi (*Hypsypops rubicundus*) and California grunion (*Leuresthes tenuis*); habitat in the Port Complex is unsuitable for the endangered tidewater goby (*Eucyclogobius newberryi*).

Garibaldi, designated as the California state marine fish, is a bright orange shallow-water species that is relatively common around natural and artificial rock reefs in southern California. Because of its territorial behavior it is an easy target for fishers and could be significantly depleted if not protected. Garibaldi spawn from March through October, and the female deposits demersal adhesive eggs in a nest that may contain up to 190,000 eggs deposited by several females (Fitch and Lavenberg 1975). Larval duration ranges 18–22 days (mean of 20 days) based on daily incremental marks on otoliths in recently settled individuals (Wellington and Victor 1989). Garibaldi larvae were collected in the Long Beach Outer Harbor and in Fish Harbor in 2008 (SAIC 2010).

California grunion is a species with special status not because the population is threatened or endangered, but because their spring-summer spawning activities on southern California beaches put them at risk of overharvesting, and CDFW actively manages the fishery to ensure sustainability. Spawning occurs only three or four nights following each full or new moon, and then only for one to three hours immediately after the high tide, from late-February to early-September (Walker 1949). The female grunion swims onto the beach, digs tail-first into the wet sand, and deposits her eggs, which are then fertilized by the male. Normally, the eggs are triggered to hatch at the high tide of the subsequent new or full moon by the waves that reach high enough on shore to wash out the sand and carry the eggs to the ocean, approximately 10 days after fertilization (Walker 1952). California grunion were collected at most of the lampara stations during the 2008 biological surveys of the Port Complex (SAIC 2010). No spawning is known to occur in the immediate vicinity of the proposed Project.

The tidewater goby is a fish species endemic to California and is listed as federally endangered. The tidewater goby is threatened by modification and loss of habitat resulting primarily from coastal development. It appears to spend all life stages in lagoons, estuaries, and river mouths (Swift et al. 1989), but may enter marine environments when flushed out of these preferred habitats during storm events. Adults or larvae may not survive for long periods in the marine environment, but larval transport over short distances may be a natural mechanism for local dispersal. In Los Angeles County the only known location where a population is extant (by re-establishment) is Malibu Creek (Swift et al. 1993), and habitat near the proposed Project is not suitable for this species.

EFH AND MANAGED SPECIES

Off southern California, species managed under the Magnuson-Stevens Fishery Conservation and Management Act are listed in the Coastal Pelagics FMP and the Pacific Groundfish FMP. A discussion of these species is provided in the following section. Essential Fish Habitat is managed under the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act). This act protects waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity (Magnuson-Stevens Act, 16 U.S.C. 1801 et seq.). Substrates include sediment, hard bottom, structures underlying waters, and associated biological communities (NMFS 2002).

NMFS (2002) defines specific EFH terms as follows (50 CFR. 600.05–600.930):

- “Waters” include all aquatic areas and their associated biological, chemical, and physical 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; and “Spawning, breeding, feeding, or growth to maturity” covers a species’ full life cycle”.

A description of the fish and invertebrate communities of the study area is provided in the previous section. Under the Magnuson-Stevens Act, the federal government has jurisdiction to manage fisheries in the U. S. Exclusive Economic Zone (EEZ), which extends from the outer boundary of state waters (3 nautical miles (5.6 km) from shore) to a distance of 200 nautical miles (370 km) from shore. Fishery Management Plans (FMPs) are extensive documents that are regularly revised and updated. The goals of the management plans include, but are not limited to: the promotion of efficient and profitable fisheries, achievement of optimal yield, provision of adequate forage for dependent species, prevention of overfishing, and development of long-term research plans (PFMC 2011a, b). There are two FMPs that include waters adjacent to the proposed project site: the Coastal Pelagics FMP (6 species) and the Pacific Groundfish FMP (89 species) (**Appendix**).

Coastal Pelagics FMP

Until 2008, the Coastal Pelagics FMP covered one invertebrate (market squid) and four fish species (northern anchovy, jack mackerel [*Trachurus symmetricus*], Pacific [chub] mackerel [*Scomber japonicus*], and Pacific sardine). Amendment 12 to the FMP was finalized in 2009 “to ensure the preservation of a key trophic relationship between fished and unfished elements in the California Current ecosystem by protecting krill resources off the U. S. West Coast” (PFMC 2011a; FR 74[132]33372-3). Krill (euphausiids) are small, shrimp-like crustaceans that serve as the basis of the marine food chain. They are eaten by many species of fish, whales, and seabirds. Although there was no fishery for krill off the U.S. West Coast, krill are fished in Antarctica, Japan, and off the west coast of Canada. They are used in aquaculture and livestock feed and for fish bait and pet foods. EFH for Coastal Pelagics is defined as all marine and estuarine waters from the shoreline of the coasts of California, Oregon, and Washington offshore to the limits of the EEZ and above the thermocline. The thermocline is the portion of the water column where water temperature changes rapidly, usually warmer surface waters transitioning to cooler subsurface waters. The habitat for the Coastal Pelagics is primarily above the thermocline.

Pacific Groundfish FMP

There are 89 fish species covered under the Pacific Groundfish FMP, including: ratfish (*Hydrolagus colliei*), finescale codling (also known as Pacific flatnose; *Antimora microlepis*), Pacific rattail (also known as Pacific grenadier; *Coryphaenoides acrolepis*); three species of sharks, three skates; six species of roundfish; 62 species of scorpionfishes and thornyheads; and 12 species of flatfishes. For Pacific Groundfish, EFH includes all waters off southern California between Mean Higher High Water (MHHW) and depths less than or equal to 11,483 ft (3,500 m). The FMP also considers EFH to include areas of the upriver extent of saltwater intrusion. Lastly, specific Habitat Areas of Particular Concern (HAPCs) have been identified as: estuaries, canopy kelp, seagrass, rocky reefs, and other specific areas (such as seamounts).

Relevant Species

Although there are nearly 100 fish/invertebrate species covered under the Coastal Pelagics and Pacific Groundfish FMPs, not all occur near the proposed project site. **Table 1** lists species that have been collected or observed during studies near the project site, including the Port Complex.

Coastal Pelagics

Pacific sardine were not abundant during 2006 ichthyoplankton sampling throughout the Port Complex; two sardine larvae were collected in the Outer Harbor in April 2006 (MBC et al. 2007). This species is also found less frequently than northern anchovy near the project site (MEC and Associates 2002; SAIC 2010). Pacific sardine is epipelagic, occurring in loosely aggregated schools (Wolf et al. 2001). Jack mackerel and Pacific mackerel have been collected in Los Angeles Harbor, but in much lower frequency and numbers than northern anchovy and Pacific sardine. While no mature market squid have been reported in recent surveys, market squid paralarvae were collected in Inner and Outer Harbor areas in 2006 (MBC et al. 2007). All coastal pelagics are associated with the water column (as opposed to the seafloor like many of the groundfish); however, female squid also lay egg masses on sandy bottoms during spawning (at depths of about 16 to 180 ft [5 to 55 m], with most occurring between 66 and 115 ft [20 and 35 m]) (PFMC 2011a).

Pacific Groundfish

None of the species covered under the Pacific Groundfish FMP are considered abundant in the proposed Project area. However, many are associated with hard substrate, kelp, and/or eelgrass, which are less frequently sampled habitats than soft bottoms. Pacific sanddab (*Citharichthys sordidus*) is considered common in the study area since it was collected by trawl in all three of the harbor-wide biological studies, though not in great numbers (MEC 1988; MEC and Associates 2002; SAIC, 2010). One individual was collected in 1986, 51 were collected in 2000, and 171 were collected in 2008. English sole (*Parophrys vetulus*) has also been collected during all three trawl studies, but in relatively low numbers: one individual in 1986, three individuals in 2002, and 24 individuals in 2008. Larvae of English sole were also collected in 2008. English sole prefer soft bottoms from 60 to 1,000 ft (18 to 305 m), while Pacific sanddab are found between 30 and 1,800 ft (9 and 549 m) (Miller and Lea 1972).

A 2010 review of bycatch species in Coastal Pelagic fisheries confirmed that incidental catch and bycatch in these fisheries is dominated by other Coastal Pelagics and that bycatch/incidental catch of non-Coastal Pelagics is extremely low. However, jacksmelt (*Atherinopsis californiensis*) and Pacific herring (*Clupea pallasii pallasii*) are infrequently caught were therefore added to the FMP under Amendment 13 to ensure continued monitoring of incidental catch and bycatch of these species (PFMC 2011a). The distribution of Pacific herring does not normally extend southward beyond San Francisco Bay (Fitch and Lavenberg 1975). Jacksmelt are common in nearshore waters of southern California (Miller and Lea 1972), but were relatively uncommon in the 2000 and 2008 fish surveys of the Port Complex (MEC and Associates 2002; SAIC 2010).

Table 1. Managed fish species found in Los Angeles Harbor based on past occurrences.

Species	Potential Habitat Use	Larval[1,2,4]	Juvenile/Adult[2,3,4,5]
Coastal Pelagics			
northern anchovy (*Engraulis mordax*)	Open water.	Abundant	Abundant
Pacific sardine (*Sardinops sagax*)	Open water.	Uncommon	Common
Pacific (chub) mackerel (*Scomber japonicus*)	Open water, juveniles off sandy beaches and around kelp beds.	-	Uncommon
jack mackerel (*Trachurus symmetricus*)	Open water, young fish over shallow banks and juveniles around kelp beds.	Rare	Uncommon
Pacific Groundfish			
English sole (*Parophrys vetulus*)	Soft bottom habitats.	Rare	Uncommon
Pacific sanddab (*Citharichthys sordidus*)	Soft bottom habitats.	Rare	Common
black rockfish (*Sebastes melanops*)	Along breakwater, near deep piers and pilings. Associated with kelp, eelgrass, high relief reefs.	-	Rare
bocaccio (*Sebastes paucispinis*)	Multiple habitat associations, including soft and hard bottom, kelp, eelgrass, etc.	-	Rare
calico rockfish (*Sebastes dallii*)	Multiple habitat associations but prefer hard substrata and rocky interfaces.	-	Rare
California scorpionfish (*Scorpaena guttata*)	Benthic, on soft and hard bottoms, as well as around structures.	-	Uncommon
grass rockfish (*Sebastes rastrelliger*)	Common on hard substrate, kelp, and eelgrass habitats.	-	Rare
kelp rockfish (*Sebastes atrovirens*	Common on hard substrate, kelp; reported along breakwater.	-	Rare
olive rockfish (*Sebastes serranoides*)	Common around hard substrate, kelp; reported along breakwater.	-	Rare
vermilion rockfish (*Sebastes miniatus*)	Juveniles over soft-bottom and kelp, adults associated with hard substrate.	-	Uncommon
lingcod (*Ophiodon elongatus*)	Multiple habitat associations but prefer hard substrata and rocky interfaces.	-	Rare
cabezon (*Scorpaenichthys marmoratus*)	Multiple habitat associations but prefer hard substrata and rocky interfaces.	Rare	Rare
leopard shark (*Triakis semifasciata*)	Multiple habitat associations, including soft bottoms, and near structure, kelp, and eelgrass.	N/A	Rare
big skate (*Raja binoculata*)	Soft bottom habitat.	N/A	Rare
California skate (*Raja inornata*)	Soft bottom habitat.	N/A	Uncommon

Sources: 1 – MBC et al. (2007), 2 – MEC and Associates (2002), 3 – MBC (2013), 4 – SAIC (2010), 5 – MEC (1999).
N/A = Not applicable, internal fertilization. Abundant>Common>Uncommon>Rare.

Note - Most rockfish larvae not identifiable to species.

A total of 23 California skate (*Raja inornata*) were collected by trawl during the biological surveys of the Port Complex in 2008. Although they have been collected in other studies of the Port Complex, no big skate (*Raja binoculata*) were collected in 2008 (MEC and Associates 2002). Like English sole, California skate has been collected in all three harbor-wide biological surveys, whereas big skate was only collected in 2002. Both skate species prefer soft bottom habitat, although California skate occurs in much deeper waters (60 to 2,200 ft [18 to 671 m]) than big skate (10 to 360 ft [10 to 110 m]) (Miller and Lea 1972). California scorpionfish (*Scorpaena guttata*) is another species collected in all three harbor-wide surveys, and 11 individuals were collected in 2008. Vermilion rockfish (*Sebastes miniatus*) was only collected in 2002 (four individuals) and 2008 (20 individuals). Vermilion rockfish occur between 20 and1,440 ft (6 and 436 m), but are most common between 165 and495 ft (50 and50 m). Juveniles are common in shallower water (20 to 120 ft, or 6 to 36 m), where they hover over sand patches near alga or structures, including pier pilings (Love et al., 2002). The remaining species in **Table 1** have only been collected sporadically and in low numbers.

ASSESSMENT OF POTENTIAL IMPACTS

The following section includes a discussion of potential impacts resulting from both the construction and operation of the proposed Project. Potential effects to the marine environment could result from:

- Dredging and disposal of approximately 27,000 cy of sediment alongside Berths 214–220 to achieve the desired depths,
- Installation of sheet piles and king piles alongside Berths 214–220;
- Construction and operational noise;
- Spills from shore or from vessels at the terminal; and
- Introduction of invasive species.

The assessment of impacts is based on the assumption that the proposed Project or alternative (as applicable) would adhere to the following:

- Coverage under the General Construction Activities Stormwater Permit (GCASP) for the onshore portions of the proposed Project will be obtained by the Los Angeles Harbor Department (LAHD) as the “Legally Responsible Person” that will delegate applicable responsibilities to the tenant. The associated Stormwater Pollution Prevention Plan (SWPPP) will contain the following measures:
    - Equipment will be inspected regularly (daily) during construction, and any leaks found will be repaired immediately.
    - Refueling of vehicles and equipment will occur in a designated, contained area.
    - Drip pans will be used under stationary equipment (e.g., diesel fuel generators), during refueling, and when equipment is maintained.
    - Drip pans that are in use will be covered during rainfall to prevent washout of pollutants.
    - Appropriate containment structures will be constructed and maintained to prevent off-site transport of pollutants from spills and construction debris.
    - Monitoring will occur to verify that the best management practices (BMPs) are implemented and kept in good working order.
- Other relevant standard operating procedures and BMPs for Port construction projects will be followed. This includes adherence to a SWPPP during operation of the proposed Project or alternatives as part of the General Industrial Activities Stormwater Permit (GIASP).
- The LAHD will incorporate Standard Urban Stormwater Mitigation Plan/Low Impact Development (SUSMP/LID) measures into the project design for review and approval by the City of Los Angeles Department of Building and Safety.

- All onshore contaminated upland soils will be characterized and remediated in accordance with LAHD, Los Angeles Regional Water Quality Control Board (RWQCB), Department of Toxic Substances Control, and Los Angeles County Fire Department protocol and cleanup standards.
- The tenant will obtain and implement the appropriate stormwater discharge permits for operations.
- Sediments from the proposed dredging area have been evaluated using standard EPA/USACE protocols to determine the suitability of the material for unconfined, aquatic disposal. Unsuitable dredged material will be disposed of at the Port's approved confined disposal facility at Berths 243–245. Suitable material may be disposed of at the LA-2 disposal site, at Berths 243–245, or at another suitable location.
- A Rivers and Harbors Act (Section 10) permit will be required from the USACE for dredging, crane installation, and pile installation activities in waters of the United States. A previously approved Section 404 permit for the Port of Los Angeles Channel Deepening Project (Corps Permit No. SPL-2008-00662-AOA) allows for in-harbor disposal of dredged material at the Berths 243–245 CDF. A Marine Protection, Research, and Sanctuaries Act (MPRSA) (Section 103) permit will be required for ocean transport and disposal of qualifying material at a designated ocean disposal site (LA-2).
- A Clean Water Act (CWA) Section 401 Water Quality Certification from the Los Angeles RWQCB would be required for activities related to construction dredging, potentially pile driving, and any in-water disposal activities may require a standard Waste Discharge Requirements (WDRs).
- A Debris Management Plan and Oil Spill Contingency Plan (OSCP) will be prepared and implemented prior to the start of demolition, dredging, and construction activities associated with the proposed Project. The OSCP will specifically identify in-water containment and spill management in the event of an accidental spill. The plan will require that emergency cleanup equipment is available on site to respond to such accidental spills. All pollutants will be managed in accordance with all applicable laws and regulations.
- During dredging, LAHD will implement an integrated multi-parameter water quality monitoring program in conjunction with both USACE and Los Angeles RWQCB permit requirements. The objective of the monitoring program will be adaptive management of the dredging operation, whereby potential exceedances of water quality objectives can be measured and dredging operations subsequently modified. If turbidity levels exceed the threshold established in the WDRs issued by the Los Angeles RWQCB, water chemistry analysis will be conducted and LAHD will immediately meet with the construction manager to discuss modifications of dredging operations to reduce turbidity to acceptable levels. This could include alteration of dredging methods, and/or implementation of additional BMPs such as a silt curtain.

Construction Impacts

In-water and over-water construction activities would extend over approximately 12–13 months. Phase I of construction would take approximately four months for installation of sheet piles at Berths 217–220 and approximately one month for dredging and disposal. Phase II of construction involves approximately six months for installation of king piles and sheet piles at Berths 214–216 and approximately two months for dredging and disposal.

Impacts on water quality could occur from dredging, installation of sheet piles and king piles, backland improvements, and potential construction-related spills. Impacts to water quality could result from the suspension of sediments and/or the introduction of contaminants to the water column. Suspension is the dislodgement and dispersal of sediment into the water column (where finer sediments are subject to transport and dispersion by currents). Sediment suspension can also result in the short-term release of contaminants in the water column through release of pore water (water between individual sediment particles) and by desorption, or separation, from suspended particles. The potential water quality effects from construction of each of the major project components are described separately below.

They types of water quality impacts from proposed Project construction could include:

- Increased turbidity (reduced water clarity and light transmittance),
- Increased sediment suspension (or suspended solids),
- Increased dissolved or particulate contaminants (that were previously bound to dredged sediments or in pore water),
- Reduced dissolved oxygen (from suspension of sediments with low oxygen),
- Reduced pH, and
- Plankton blooms (from suspension of nutrient-laden sediments).

There are no projected effects to salinity or temperature from construction and operation of the proposed Project.

Effects to Water Quality during Dredging and Pile Installation

Dredging would resuspend some bottom sediments and create localized and temporary turbidity plumes over a relatively small area. Dredging would disturb bottom sediments, and suspend sediments over a relatively small area. The extent of disturbance would depend on the method of dredging. Suspension of sediments during clamshell dredging occurs during bucket impact, penetration, and removal of the bucket from the sediment, as well as during bucket retrieval through the water column. During cutterhead dredging, suspended sediments are limited to the immediate vicinity of the dredge.

For continuous dredging operations, elevated turbidity would occur in the immediate vicinity of the dredge for periods of days to several weeks. The majority of suspended sediments settle within one hour of dredging (Palermo et al. 2008). Transport of suspended particles by tidal currents would result in some redistribution of sediment contaminants. The amount of contaminants redistributed in this manner would be small, and the distribution would be localized in the channel adjacent to the work area. Monitoring efforts associated with previous dredging projects in the Harbor have shown that resuspension followed by settling of sediments is low (generally 2 percent or less) (Anchor Environmental 2003).

Dredging sediments adjacent to the YTI Terminal would likely generate a relatively small turbidity plume. While sediments at Berths 212-224 are fine-grained, receiving water monitoring studies at other dredge sites in the Harbor and other water bodies have documented a relatively small, turbid dredge plume that dissipates rapidly with distance from dredging operations (MBC 2001, 2002; USACE and LAHD 2008; POLA 2009a–i, 2010a–d; Parish and Wiener 1987; Jones & Stokes 2007a–b, 2008). Water quality was measured during dredging at Berths 212–215 in 2001 (MBC 2001). During dredging, light transmittance was reduced by about 15 percent in the bottom half of the water column 300 ft downcurrent from the dredge.

Sheet piles and king piles would be lowered through the water column, and then driven into the seafloor by both vibratory and impact driving methods. Some sediment would be suspended during this process, but over a much smaller area than during dredging, and any turbidity would be limited to waters near the seafloor.

Within areas of sediment resuspension, DO and pH could be slightly reduced. Reductions in DO concentrations, however, would be brief and are not expected to persist or cause detrimental effects to biological resources. During dredging at Berths 212–215 in 2001, there was little difference in DO and pH between Station C (300 ft downcurrent of dredging) and Station D (the control station, located at Berth 195 in East Basin) (MBC 2001). Contaminants, including metals and organics, could be released into the water column during the dredging and pile installation. However, any increase in contaminant levels in the water is expected to be localized and of short duration. The magnitude of contaminant releases would be related to the sediment particle sizes, sediment organic content, and contaminant concentrations associated with the disturbed sediments. Sediment grain size affects the binding capacity of sediments for contaminants. Most of the sediments in the proposed dredge footprint are suitable for unconfined aquatic disposal (AMEC 2013).

Therefore, contaminant concentrations associated with any potentially disturbed or resuspended sediments during dredging are not expected to result in any long-term effects in the waters near the YTI Terminal.

Nutrients could be released into the water column during the dredging and pile installation. Release of nutrients may promote nuisance growths of phytoplankton if operations occur during warm water conditions. Phytoplankton blooms have occurred during previous dredging projects, including the Deep Draft Navigation Improvement Project (USACE and LAHD 1992). However, there is no evidence that the plankton blooms observed were not a natural occurrence or that they were exacerbated by dredging activities. The Basin Plan limits on biostimulatory substances are defined as "…concentrations that promote aquatic growth to the extent that such growth causes nuisance or adversely affects beneficial uses" (LARWQCB 1994). Given the limited spatial and temporal extent of proposed project activities with the potential for releasing nutrients from bottom sediments, adverse effects on beneficial uses of Harbor waters are not anticipated to occur in response to the proposed Project.

Underwater Sound during Dredging and Pile Installation

Sound pressure waves in the water from pile driving can affect fish, particularly those with a swim bladder, with the level of effect influenced by factors such as species, size of fish (smaller fish are affected more), physical condition of fish, peak sound pressure and frequency, shape of the sound wave, depth of water at the piles, location of fish in the water column, amount of air in the water, size and number of waves on the water surface, bottom substrate composition and texture, tidal currents, and presence of predators (NMFS 2004). Types of effects on fish can include mortality from swim bladder rupture or internal hemorrhaging, changes in behavior, and hearing loss (permanent or temporary) (Vagle 2003). The most common behavioral changes include temporary dispersal of fish schools.

The sound pressure waves from pile-driving could result in temporary avoidance of the construction areas as well as cause mortality of some fish in the Coastal Pelagics FMP, but these species are abundant in the Harbor and due to the limited area of potential effect, the numbers of fish exposed to harmful pressure waves would represent a very small proportion of the number of fish in the Port Complex at any given time. Because smaller fish are more susceptible to acoustic injury, the species most likely to suffer mortality would be northern anchovy, Pacific sardine, and topsmelt. These species play important roles in the cycling of energy and nutrients in the Harbor, which has been designated as EFH for both northern anchovy and Pacific sardine.

Sound transmission in the underwater environment can be affected by local bathymetry, substrates, currents, and stratification of the water column. Based on underwater studies of gray whale behavior, a disturbance threshold (Level B harassment) of 160 decibels Root Mean Square (dB_{RMS}) has been identified for marine mammals based on previous research on cetaceans (*Federal Register* 2006). Exposure to sound at this level would likely cause avoidance, but not injury, for marine mammals. The current Level A harassment (injury) threshold for non-explosive sounds is 180 dB_{RMS} for cetaceans and 190 dB_{RMS} for pinnipeds. Sheet pile and king pile installation at the proposed Project site is anticipated to result in disturbance (Level B harassment) to marine mammals in the vicinity of construction operations, and could potentially result in Level A harassment during impact driving of sheet piles and king piles. As a result of this, Mitigation Measure BIO-1 has been proposed to reduce the potential for impacts to marine mammals.

Mitigation Measure BIO-1

Although it is expected that marine mammals will voluntarily move away from the area at the commencement of the vibratory or "soft start" of pile-driving activities, as a precautionary measure, pile-driving activities occurring as part of the sheet pile and king pile installation will include establishment of a safety zone, and the area surrounding the operations will be monitored for pinnipeds and cetaceans by a qualified marine mammal observer. A 300-meter-radius safety zone will be established around the pile-driving site and monitored for marine *mammals. The pile-driving site will move with each new pile, therefore the 300-meter safety zone will move accordingly.*

Prior to commencement of pile driving, observers on shore or by boat will survey the safety zone to ensure that no marine mammals are seen within the zone before pile driving of a pile segment begins. If a marine mammal is observed within 10 meters of pile-driving operations, pile driving will be delayed until the marine mammal moves out of the 10-meter zone. If a marine mammal in the 300-meter safety zone is observed, but more than 10 meters away, the contractor will wait at least 15 minutes to commence pile driving. If the marine mammal has not left the 300-meter safety zone after 15 minutes, pile driving can commence with a "soft start." This 15-minute criterion is based on a study indicating that pinnipeds dive for a mean time of 0.50 to 3.33 minutes; the 15-minute delay will allow a more than sufficient period of observation to be reasonably sure the animal has left the proposed project vicinity.

If marine mammals enter the safety zone after pile driving of a segment has begun, pile driving will continue. The qualified observer will monitor and record the species and number of individuals observed, and make note of their behavior patterns. If the animal appears distressed, and if it is operationally safe to do so, pile driving will cease until the animal leaves the area. Prior to the initiation of each new pile-driving episode, the area will again be thoroughly surveyed by the qualified observer.

Implementation of Mitigation Measure BIO-1 would also reduce the likelihood of impacts to fish as a result of pile driving. Mitigation Measure BIO-1 would require that pile-driving initiate with a soft start, which would minimize potential impacts to fish, since they would likely leave the area as pile driving commenced. Avoidance of the area would be temporary; construction would take place for approximately 10 months, and occur mostly during daylight hours. There would be no physical barriers to movement, and the baseline condition for fish and wildlife access would be essentially unchanged.

Habitat Loss

No permanent loss of marine habitat would occur because the proposed Project would not result in fill being discharged into the marine environment that could eliminate marine habitat functions. Dredging would temporarily impact benthic habitat within the project area. In addition, sheet pile and king piles would be installed to stabilize the wharf. These structural elements would be installed within a few feet of the existing wharf. The sheet pile and king piles would protrude slightly above the seafloor, and would provide hard substrate usable as habitat by marine organisms.

Effects to Special Aquatic Habitats

There are no special aquatic habitats or other sensitive natural communities identified at the proposed Project site that would be affected by proposed Project construction. There are no wetlands, giant kelp beds, or eelgrass beds in the vicinity of the YTI Terminal. Water quality effects are expected to be transitory and are not expected to significantly affect any wetlands, kelp beds, or eelgrass beds. There are no mudflats or marshes near the proposed project site that would be affected by proposed project construction. Impacts on EFH during construction would be localized and temporary.

Effects of Backlands Improvements

Ground disturbances and construction activities related to backlands improvements could result in temporary impacts on surface water quality if uncontrolled runoff of exposed soils, asphalt leachate, concrete washwater, and other construction materials enter Harbor waters. No upland surface bodies of water currently exist within the proposed project boundaries. Thus, proposed Project-related impacts on surface water quality would be limited to potential non-stormwater discharges or discharges of stormwater runoff to Harbor waters that receive runoff from the proposed Project site. Runoff from the upland portions of the proposed Project site would flow into the Harbor, along with runoff from other adjacent areas of the Harbor's subwatershed. Runoff at the proposed project site is collected by the on-site storm drain system and is managed in compliance with applicable permits and ordinances (including SUSMP requirements) prior to discharge to the Harbor (to the East Basin Channel). In addition to soils, runoff from a construction site could contain a variety of contaminants, including metals and PAHs associated with construction materials, and spills of oil or other petroleum products. Impacts on surface water quality from accidental spills are addressed below.

Backlands improvement would not directly introduce sediments to the waters off the YTI Terminal; however, stormwater runoff could carry sediments to the Harbor waters without intervention. Accidental spills could also introduce contaminants to Harbor waters.

Accidental Spills

Accidents resulting in spills of fuel, lubricants, or hydraulic fluid from equipment used during dredging, pile installation, backlands improvement, and/or disposal of dredged material, could occur during proposed project construction. Based on the 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.

Shading and Nighttime Illumination

Shade from construction vessels, and lights to support construction activities at night, would have temporary influences on the distribution of water column species. Certain zooplankton, fish, and squid are attracted to light. Other species may be attracted by concentrations of zooplankton and squid associated with night lighting. Conversely, daytime shading from construction vessels or localized turbidity during in-water construction may reduce algal productivity. Certain fish species are attracted to shade and cover that construction vessels provide, while vibration and activity may frighten certain species from the area. However, because construction activities and locations would be constantly changing, the effects would be similar to those that occur under normal Port operations with vessels constantly coming and going, and night lighting provided for Port operations. Therefore, no substantial disruption of biological communities would occur.

Operational Impacts

Increased Vessel Activity

Although the proposed Project vessels would add to the number of noise events (through more ship calls and potentially larger ship size), they would not substantially add to the overall underwater noise level. The addition of up to 44 ship calls per year under CEQA would not adversely affect FMP species present in the Harbor or in the vicinity of the YTI Terminal because the additional trips proposed are infrequent. Schooling fish, such as sardines and anchovy, likely would ignore the ship movements and sound, or temporarily move out of the way. Other federally managed species are rare in the harbor, and vessel noise would result in only temporary effects on their distribution in the Port despite a projected additional 44 visits annually compared to the CEQA baseline. In recent history, the Port has witnessed an improvement in fish abundance and EFH for federally managed species (MEC and Associates 2002; SAIC 2010) even though there has been increased vessel traffic in the harbor. Therefore, it is unlikely that additional ship calls would affect federally managed species, and additional ship calls would not adversely affect EFH for any species in the harbor.

Effects from Runoff and Spills

Runoff from the project site would not substantially reduce or alter EFH in harbor waters because water quality standards for protection of marine life would not be exceeded. Operation of proposed project facilities would have minimal effects on EFH. Accidents resulting in spills of fuel, lubricants, or hydraulic fluid could occur during proposed project operation. 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 the YTI Terminal.

No Significant Ecological Areas (SEAs) or natural plant communities are present that could be affected by operation of proposed project facilities. No wetlands or mudflats are present at the proposed project site, and those in other areas of the harbor are not located in or near the channels that would be used by vessels transiting to or from the YTI Terminal. The nearest giant kelp beds to the proposed project site are near the Main Channel entrance (adjacent to the USCG Base and Berth 72) and are located more than 1.8 miles from the YTI Terminal. There are no eelgrass beds near the YTI Terminal. Eelgrass beds are located in the Cabrillo Shallow Water Habitat and Pier 300 Shallow Water Habitat/Seaplane Lagoon, and would not be affected by operations at the proposed project site. Runoff from the re-paved areas of the proposed project site would be routed to existing onsite storm drains, treated via BMP devices, and discharged to the Main Channel. The runoff is not expected to adversely affect eelgrass beds present in the Cabrillo Shallow Water Habitat and Pier 300 Shallow Water Habitat/Seaplane Lagoon due to the large separation distance.

Nonnative/Invasive Species

The amount of ballast water discharged into the Main Channel area and, thus, the potential for introduction of invasive exotic species could increase because more and larger container ships would use the Port as a result of the proposed Project. These vessels would come primarily from outside the U.S. EEZ and would be subject to regulations to minimize the introduction of nonnative species in ballast water. In addition, container ships coming into the Port loaded would be taking on local water while unloading and discharging when reloading. This would also diminish the opportunity for discharge of nonnative species. Thus, it is unlikely but possible that ballast water discharges during cargo transfers in the Port would contain nonnative species.

Nonnative invertebrate species can also be introduced via vessel hulls. The CSLC has issued a report on commercial vessel fouling in California (CSLC 2006), recommending that the state legislature broaden the state program and adopt regulations to prevent non-indigenous species introductions by ship fouling. Of particular concern is the introduction of the alga *Caulerpa taxifolia*. However, this species is most likely introduced from disposal of aquarium plants and water and is spread by fragmentation rather than from ship hulls or ballast water discharges. Therefore, risk of introduction is associated with movement of plant fragments from infected to uninfected areas through activities such as dredging and/or anchoring. The LAHD conducts surveys, consistent with the Caulerpa Control Protocol (NMFS and CDFG 2008) prior to water-related construction projects to verify that *Caulerpa* is not present. This species has not been detected in the Port Complex and has been eradicated from known localized areas of occurrence in southern California. Therefore, there is little potential for additional vessel operations from the proposed Project to introduce these species.

Undaria pinnatifida, which was discovered in the Port Complex in 2000 (MEC and Associates 2002), and *Sargassum filicinum* (or *S. horneri*), discovered in October 2003 (MBC 2004), may be introduced and/or spread as a result of hull fouling or ballast water and, therefore, might have the potential to increase in the harbor via vessels traveling between ports in the EEZ. Invertebrates that attach to vessel hulls could be introduced in a similar manner.

The proposed Project would result in an increase of an additional 44 vessels per year as early as 2015 (compared to 162 ship calls in the CEQA baseline year at the YTI Terminal), which represents an approximately two percent increase in vessel traffic compared to the total number of vessels entering the Port (approximately 2,180 vessels in 2012). Considering, the limited discharges of non-local water from container ships (see above) and the ballast water regulations currently in effect, the potential for introduction of additional exotic species via ballast water would be low from vessels entering from outside the EEZ. The potential for introduction of exotic species via vessel hulls would be increased in proportion to the increase in number of vessels. However, vessel hulls are generally coated with antifouling paints and cleaned at intervals to reduce the frictional drag from growths of organisms on the hull (Global Security 2007), which would reduce the potential for transport of exotic species.

The Port of Los Angeles and Port of Long Beach, California State Lands Commission, and the University of Maryland are collaborating with American President Lines to test a shipboard ballast water treatment system designed to remove non-native species from ballast water, and prevent their introduction into Harbor waters. If methods become available in the future, they would be implemented as required at that time. The proposed

Project has a low potential to increase the introduction of nonnative species into the harbor that could substantially disrupt local biological communities, but such effects could still occur.

ASSESSMENT SUMMARY

Impacts construction would be localized and temporary. Potential impacts from dredging, pile installation, construction runoff, accidental spills, and shading would be less than significant. No habitat loss would occur. Acoustic impacts from pile driving could result in adverse effects to fish species in the immediate construction area. However, due to the limited potential impact area, this is not considered a substantial disruption. Additionally, with implementation of Mitigation Measure BIO-1, the pile-driving would initiate with a soft start, which would minimize potential impacts to fish and marine mammals, as they would likely leave the area as pile driving commenced. This mitigation measure would also include the establishment of a 300-meter safety zone around pile driving operations that would be monitored by observers. If marine mammals are observed within the zone prior to commencement of pile driving, the observer would require the pile driving to cease. Avoidance of the area would be temporary; pile driving occur intermittently over a period of approximately 10 months, and occur during daylight hours. There would be no physical barriers to movement, and the baseline condition for fish and wildlife access would be essentially unchanged. Due to the limited potential impact area and with the implementation of Mitigation Measure BIO-1, this is not considered a substantial disruption.

Potential impacts resulting from operation of the YTI Terminal include effects to water quality resulting from accidental spills and runoff, disturbance from vessel movements, and introduction of invasive species through ballast water exchange or vessel fouling. Potential impacts resulting from accidental spills, runoff, and disturbance from vessel movements would be less than significant. Impacts to EFH resulting from the introduction of invasive species are considered significant. No mitigation, beyond implementation of measures required under existing regulations, is available to fully mitigate potential impacts related to the introduction of invasive species. No feasible mitigation is currently available to totally prevent introduction of invasive species via vessel hulls or even ballast water, due to the lack of a proven technology.

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APPENDIX

Coastal Pelagic Species

Pacific Groundfish Species

Coastal Pelagic Species

Common Name
Managed Species
Northern Anchovy
Pacific Sardine
Pacific (chub) Mackerel
Jack Mackerel
Market Squid
Krill (euphausiids)
Ecosystem Component Species
Jacksmelt
Pacific Herring

Pacific Groundfish Species

Common Name	Category	Common Name	Category
Leopard Shark	Sharks	Kelp Rockfish	Rockfish
Soupfin Shark	Sharks	Longspine Thornyhead	Rockfish
Spiny Dogfish	Sharks	Mexican Rockfish	Rockfish
Big Skate	Sharks	Olive Rockfish	Rockfish
California Skate	Sharks	Pacific Ocean Perch	Rockfish
Longnose Skate	Sharks	Pink Rockfish	Rockfish
Spotted ratfish	Ratfish	Pinkrose Rockfish	Rockfish
Pacific Flatnose	Morid	Pygmy Rockfish	Rockfish
Pacific Grenadier	Grenadier	Quillback Rockfish	Rockfish
Lingcod	Roundfish	Redbanded Rockfish	Rockfish
Cabezon	Roundfish	Redstripe Rockfish	Rockfish
Kelp Greenling	Roundfish	Rosethorn Rockfish	Rockfish
Pacific Cod	Roundfish	Rosy Rockfish	Rockfish
Pacific Hake	Roundfish	Rougheye Rockfish	Rockfish
Sablefish	Roundfish	Sharpchin Rockfish	Rockfish
Aurora Rockfish	Rockfish	Shortbelly Rockfish	Rockfish
Bank Rockfish	Rockfish	Shortraker Rockfish	Rockfish
Black Rockfish	Rockfish	Shortspine Thornyhead	Rockfish
Black-and-Yellow Rockfish	Rockfish	Silverygray Rockfish	Rockfish
Blackgill Rockfish	Rockfish	Speckled Rockfish	Rockfish
Blue Rockfish	Rockfish	Splitnose Rockfish	Rockfish
Bocaccio	Rockfish	Squarespot Rockfish	Rockfish
Bronzespotted Rockfish	Rockfish	Starry Rockfish	Rockfish
Brown Rockfish	Rockfish	Stripetail Rockfish	Rockfish
Calico Rockfish	Rockfish	Tiger Rockfish	Rockfish
California Scorpionfish	Rockfish	Treefish	Rockfish
Canary Rockfish	Rockfish	Vermilion Rockfish	Rockfish
Chameleon Rockfish	Rockfish	Widow Rockfish	Rockfish
Chilipepper	Rockfish	Yelloweye Rockfish	Rockfish
China Rockfish	Rockfish	Yellowmouth Rockfish	Rockfish
Copper Rockfish	Rockfish	Yellowtail Rockfish	Rockfish
Cowcod	Rockfish	Arrowtooth Flounder	Flatfish
Darkblotched Rockfish	Rockfish	Butter Sole	Flatfish
Dusky Rockfish	Rockfish	Curlfin Sole	Flatfish
Dwarf-red Rockfish	Rockfish	Dover Sole	Flatfish
Flag Rockfish	Rockfish	English Sole	Flatfish
Gopher Rockfish	Rockfish	Flathead Sole	Flatfish
Grass Rockfish	Rockfish	Pacific Sanddab	Flatfish
Greenblotched Rockfish	Rockfish	Petrale Sole	Flatfish
Greenspotted Rockfish	Rockfish	Rex Sole	Flatfish
Greenstriped Rockfish	Rockfish	Rock Sole	Flatfish
Harlequin Rockfish	Rockfish	Sand Sole	Flatfish
Honeycomb Rockfish	Rockfish	Starry Flounder	Flatfish