PORT OF LONG BEACH
DEEP DRAFT NAVIGATION FEASIBILITY STUDY

Los Angeles County, California

Final Integrated Feasibility Report with Environmental Impact Statement / Environmental Impact Report

October 2021

US Army Corps of Engineers ®

Port of LONG BEACH
THE PORT OF CHOICE

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PORT OF LONG BEACH DEEP DRAFT NAVIGATION STUDY
LOS ANGELES COUNTY, CALIFORNIA
FINAL INTEGRATED FEASIBILITY REPORT
WITH
ENVIRONMENTAL IMPACT STATEMENT/ENVIRONMENTAL IMPACT REPORT

This Final Integrated Feasibility Report with Environmental Impact Statement/Environmental Impact Report (IFR) presents a summary of the planning process, describes the affected environmental resources and evaluates the potential impacts to those resources as a result of constructing, operating and maintaining the Port of Long Beach Deep Draft Navigation Project.

The Federal lead agency responsible for implementing the National Environmental Policy Act (NEPA) is the U.S. Army Corps of Engineers, Los Angeles District (USACE). The lead agency responsible for implementing the California Environmental Quality Act (CEQA) is the Port of Long Beach (POLB).

The POLB is on the coast of southern California in San Pedro Bay, approximately 20 miles south of downtown Los Angeles, California. The study area includes the waters in the immediate vicinity (and shoreward) of the breakwaters through the entire Port of Long Beach, including Outer Harbor, Inner Harbor, Cerritos Channel, West Basin, and the Back Channel. The primary problem is existing channel depths and widths that create limitations of the harbor, resulting in the inefficient operation of deep draft vessels in the Federal (Main) and secondary channels in the POLB, which increases the Nation's transportation costs.

A range of measures and preliminary alternatives were developed during the feasibility study process in coordination with the POLB, in addition to the No Action Alternative. Four action alternatives were evaluated and vary based on a range of depths for containers and for liquid bulk measures. For the container vessel measures, depths considered for each basin ranged between -53 feet and -57 feet mean lower low water (MLLW) to determine the net benefits yielded by each basin depth. Similar to the container vessel improvements, the liquid bulk measures considered depths for the Approach Channel ranging between -78 feet to -83 feet MLLW.

The National Economic Development plan is identified as Alternative 3, which includes the following navigation improvements:

- Deepen the entrance to the Main Channel (the Approach Channel through Queens Gate) from a project depth of -76 feet to -80 feet MLLW.
- Widen portions of the Main Channel (bend easing) to a depth of -76 feet MLLW.
- Construct an approach channel and turning basin to Pier J South from -50 feet MLLW to a depth of -55 feet MLLW.
- Deepen portions of the West Basin and West Basin Approach from -50 feet to a depth of -55 feet MLLW.
- Deepen the Pier J Basin and berths J266-J270 within the Pier J South Slip to a depth of -55 feet MLLW.
- Perform structural improvements on Pier J breakwaters at the entrance of the Pier J Slip to accommodate deepening of the Pier J Slip and Approach Channel to -55 feet MLLW.
- Place dredged material either at a nearshore placement site, an ocean-dredged material disposal site (LA-2 and/or LA-3), or a combination of the two.
- Construct a new dredge electric substation.

A notice of availability of a draft environmental impact statement (EIS) was published in the Federal Register on October 25, 2019 and was amended on November 29, 2019. The Draft IFR, which contains the EIS, was also published on the Los Angeles District's website October 25, 2019. The 45-day public comment period ended on December 9, 2019. All comments received were considered and incorporated into the Final IFR, as appropriate.

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This Final IFR serves as the Final EIR under CEQA. It has been posted to the State of California's Clearinghouse at the Governor's Office of Planning and Research at http://opr.ca.gov/clearinghouse/ceqa. The State Clearinghouse number for the EIR is SCH#: 2016111014. The State Clearinghouse may be contacted at (916) 445-0613 or state.clearinghouse@opr.ca.gov.

PORT OF LONG BEACH DEEP DRAFT NAVIGATION STUDY
FINAL INTEGRATED FEASIBILITY REPORT
AND
ENVIRONMENTAL IMPACT STATEMENT /
ENVIRONMENTAL IMPACT REPORT

Note: This Integrated Feasibility Report (IFR) includes a joint Environmental Impact Statement and Environmental Impact Report pursuant to the National Environmental Policy Act and California Environmental Quality Act. These documents were integrated to comprehensively meet USACE planning requirements as well as Federal and State environmental requirements.

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EXECUTIVE SUMMARY

Introduction

This Final Integrated Feasibility Report with Environmental Impact Statement/Environmental Impact Report (IFR) presents a summary of the planning process, describes the affected environmental resources and evaluates the potential impacts to those resources as a result of constructing, operating and maintaining the Port of Long Beach Deep Draft Navigation Project (Project).

The Federal lead agency responsible for implementing the National Environmental Policy Act (NEPA) is the U.S. Army Corps of Engineers, Los Angeles District (USACE). The lead agency responsible for implementing the California Environmental Quality Act (CEQA) is the City of Long Beach (acting through the Port of Long Beach (POLB)).

This study serves as an interim response to the Resolution of the House Committee on Public Works adopted 10 July 1968 and in response to the POLB's request to the USACE, seeking Federal assistance to address on-going operating constraints to the efficient movement of goods through the port. The Project is part of a continued effort to improve navigational efficiency and vessel safety throughout the POLB.

A Feasibility Cost Sharing Agreement was signed between the POLB, the non-Federal Sponsor for the study, and the Department of the Army on August 27, 2015, initiating the feasibility phase of the study. The cost of the feasibility phase study is shared equally between the USACE and the POLB.

This IFR includes documentation of the planning process conducted for this study, describes baseline conditions, the formulation and evaluation of alternative plans, and the identification of a Recommended Plan.

Study Area

The POLB is on the coast of southern California in San Pedro Bay, approximately 20 miles south of downtown Los Angeles, California. Clockwise from the west to north of San Pedro Bay are the cities of San Pedro, Wilmington, and Long Beach, and to the east the community of Seal Beach. The study area includes the waters in the immediate vicinity (and shoreward) of the breakwaters through the entire Port of Long Beach, including Outer Harbor, Inner Harbor, Cerritos Channel, West Basin, and the Back Channel. (See **Figure ES-1** for a POLB map and **Figure ES-2** for the study location**.**) The dotted line in **Figure ES-1** denotes the existing POLB boundary.

Located approximately 9 miles southwest and 22 miles southeast of Queen's Gate are two USEPA-approved ocean dredged material disposal sites (ODMDS), LA-2 and LA-3, respectively. These sites were created in 1991 and 2005, respectively, under authority 40 CFR Part 228. Located approximately 5.5 miles southeast of the breakwater entrance is the Surfside Borrow Site Nearshore Placement Area, which has been used as sources of sand for the San Gabriel River to Newport Bay Beach nourishment project since 1964. The nearshore placement area is under the jurisdiction of the California State Lands Commission.

Figure ES-1 Port of Long Beach Map

Figure ES-2 Study Location

Purpose and Need for Action

The purpose of the proposed Federal action (i.e., the navigation improvement project) is to improve navigation efficiencies and safety for existing and prospective commerce.

There is a need to address transportation inefficiencies at the POLB. Transportation inefficiencies occur when channels and maneuvering areas do not fully accommodate the vessels using them. Existing channel depths, and in some areas, channel widths, do not meet the draft requirements of the current and future fleet of larger container and liquid bulk vessels that call on POLB. Tide restrictions, light loading[1], lightering[2], and other operational inefficiencies result in increased transportation costs for the shipment of commodities at the Nation's second busiest port.

Problems and Opportunities

Past harbor development projects focused on providing large, modern container terminals with on-dock rail facilities to improve transportation efficiencies and to reduce truck traffic. Those terminals were designed to meet the current and forecast vessel fleet. Widening and enlargement of the Panama Canal has led to a new class of container vessels whose fully loaded drafts exceed current federal channel and berth depths. This has led the POLB to identify the primary problem facing current operations is the inefficient operation of deep draft vessels in secondary and Federal (main) channels, which increases the Nation's transportation costs. Larger container vessels must either ride the tides and enter and leave the West Basin and Pier J Basin only on high tides, or to light load the vessel in order to ensure a shallower draft required to safely enter and leave these areas of the Port of Long Beach. Additionally, liquid bulk vessels must enter and exit the two-mile long Approach Channel one at a time, which results in increased delays due to channel width limitations and/or they must delay entry during wave swells and other conditions or light load at point of origin due to depth limitations along the Approach Channel.

The POLB is a deep-water port. Existing channels serving container movements have controlling depths of -50 to -53 feet mean lower low water (MLLW), which limits containerships to 44-49-foot drafts with tide riding. With tide-riding, vessels can draft two to three more feet depending upon timing and pilot practices but can incur tidal delays. Light loading at the point of origin (typically Eastern Asia) also occurs. Due to limitations set by the bar pilots, larger liquid bulk vessels must wait several miles offshore until the main channel is cleared as the channel is restricted to one-way traffic and lacks a passing area near the POLB. This limitation has impacted 5-10 percent of crude oil imports, or 1-3 million tons per year, historically and the impact has increased to 15 percent more recently. In sum, the inventory and preliminary forecast done to date demonstrate that existing conditions create transportation inefficiencies for container and liquid bulk vessels, and that future fleet changes will exacerbate this problem.

PROBLEM STATEMENT: The primary problem is existing channel depths and widths that create limitations of the harbor, resulting in the inefficient operation of deep draft vessels in the Federal (Main) and secondary channels in the Port of Long Beach complex, which increases the Nation's transportation costs.

[1] Light loading is the process of not loading a vessel to its maximum capacity at the initial Port to reduce the draft.
[2] Lightering is the process of moving cargo from one vessel to another. Often this is done to reduce the draft of a larger vessel.

The following summarizes the problems:

1. Due to depth limitations along channels accessing the POLB's container terminals, existing container vessels cannot load to their maximum draft causing light-loading of vessels at the point of origin and tidal delays to an increasing number of container ships.

2. The dimensions of the worldwide fleet of container vessels have increased significantly, and it is anticipated that this trend will continue into the future. Delays and light-loading due to container vessel draft limits will increase as new, larger vessels are added to the fleet.

3. Due to channel width limitations liquid bulk vessels must enter and exit the two-mile-long Approach Channel one at a time resulting in increased delays.

4. Due to depth limitations along the Approach Channel, liquid bulk vessels must delay entry during wave swells and other conditions, or light-load at point of origin.

5. Ship simulation indicates issues with the width of the Main Channel, in certain areas, for the design vessels.

6. Due to vessel traffic, liquid bulk vessels must wait outside of the POLB (seaward side of the breakwaters), resulting in inefficiencies.

Opportunities

Opportunities are conditions that exist within the study area. Like problems, opportunities are among the first things to be identified in the planning process. Opportunities tend to focus on positive and future conditions.

1. Reduce the transportation cost of import and export trade through the Port of Long Beach and contribute to increases in national net income by reducing light-loading and delays for current and future container fleet calling on POLB. (relates to Problems 1 and 2)

2. Reduce the transportation cost of import and export trade through the Port of Long Beach and contribute to increases in national net income by reducing delays for current and future liquid bulk vessels calling on POLB. (relates to Problems 3 and 4)

3. Provide improved conditions for vessel operation and safety, including reducing constraints on harbor pilot operating practices and safety risks in the event of vessel malfunction or weather-related events. (relates to Problem 4)

Planning Constraints

Planning constraints represent restrictions that should not be violated. The constraints identified include those public concerns that, if violated by an alternative plan, would result in the plan not being acceptable to most public interests. It also includes those aspects of the study area generally regulated by government agencies that, if adversely impacted, would result in the plan being unacceptable. In general, the planning process needs to consider measures to avoid or mitigate any significant adverse impacts associated with the planning constraints. The planning constraints specific to this study are described below.

1. Plans must not violate environmental restrictions on dredging including sediment, water, and air quality standards.

2. Plans must not violate maritime safety requirements.

3. Avoid existing mitigation sites.

4. Plans will be consistent with the Port of Long Beach's Port Master Plan.

Planning Objectives and Criteria

Based on the analysis of the identified problems and opportunities and the existing conditions of the study area, planning objectives were identified to direct formulation and evaluation of alternative plans. These were established as objectives for the proposed action. During the period of analysis, two planning objectives were identified.

PLANNING OBJECTIVES: The primary objectives over the 50-year period of analysis (2027-2076) are as follows:

1. ***Increase transportation efficiencies for container and liquid bulk vessels operating in the Port of Long Beach, for both the current and future fleet.***

2. ***Improve conditions for vessel operation and safety, including reducing constraints of harbor pilot operating practices.***

Plan Formulation

General Navigation Features

A full array of structural and non-structural management measures was formulated to address identified problems and opportunities. Models and studies prepared for this study were used to evaluate and compare proposed alternative measures and plans. A list of structural and non-structural management measures and potential dredged material placement locations are included below.

Non-Structural
- High-Tide Riding
- Light-Loading/Lightering

Structural
- Removal of the End of the Navy Mole
- West Basin Channel Deepening and Construct a Turning Basin
- Southeast Basin Deepening
- Main Channel Widening at the Entrance to the Southeast Basin
- Widening of Approach to Southeast Basin
- Constructing an Approach Channel to Pier J South

- Creating Turning Basin at Entrance to Pier J South Channel
- Widening of Pier J South Breakwater Opening
- Standby/Passing Areas Deepening
- Approach Channel Deepening Seaward of Queens Gate
- Queens Gate Deepening (Outer Harbor Entrance)

Dredged Material Placement Locations

- United States Environmental Protection Agency (USEPA) approved Ocean Dredged Material Disposal Sites (ODMDS) LA-2 and LA-3
- North Energy Island Borrow Pit
- Surfside Borrow Site Nearshore Placement Area
- POLB slip fill sites

Measures and dredged material placement locations were screened based on Effectiveness, Efficiency and Acceptability metrics. The following measures proceeded forward for further evaluation within alternatives:

- Deepen the West Basin Channel and Construct a Turning Basin
- Construct an Approach Channel to Pier J South
- Construct Turning Basin at the Pier J South Entrance
- Deepen Standby Area
- Deepen Queens Gate (Outer Harbor Entrance)
- Deepen the Approach Channel Seaward of Queens Gate (Outer Harbor Entrance)
- USEPA ODMDS LA-2 and LA-3
- Surfside Borrow Site Nearshore Placement Area

In addition to a “no action” plan, four action alternatives were carried forward to address the planning objectives. Numerous scenarios were explored to determine the most prudent and practicable designs. Container terminal improvements for all action alternatives include constructing a new Pier J approach channel and turning basin and deepening the West Basin to identical depths. Liquid bulk terminal improvements for all action alternatives include deepening the Approach Channel (extending seaward from the Queens Gate) in conjunction with bend easing of the Main Channel to the authorized depth of -76 feet MLLW, which involves widening portions of the Main Channel. Sediment disposal options considered the two ODMDS (LA-2 and LA-3) as well as nearby beneficial reuse placement sites. Only Alternative 5 includes construction of a Standby Area.

Alternative 1: no action alternative.
Alternative 2: container terminal channels deepened to -53 feet MLLW; Approach Channel deepened to -78 feet MLLW.
Alternative 3: container terminal channels deepened to -55 feet MLLW; Approach Channel deepened to -80 feet MLLW.
Alternative 4: container terminal channels deepened to -57 feet MLLW; Approach Channel deepened to -83 feet MLLW.
Alternative 5: container terminal channels deepened to -55 feet MLLW; Approach Channel deepened to -80 feet MLLW, and construction of Standby Area adjacent to the Main Channel dredged to -67 feet MLLW, with a 300-foot diameter center anchor placement evaluated to a depth of -73 feet MLLW.

Local Service Facilities

Local Service Facilities[3] (LSF) include berth dredging and potential wharf improvements to account for the deepened channels. Specifically, the POLB would deepen the Pier J Basin, berths J266-J270 within the Pier J South Slip, and berth T140 along Pier T to -53, -55 or -57 feet MLLW, depending on the action alternative, plus two feet of overdredge. Wharf improvements would only be required for Alternative 4 for berths along Pier J South and Pier T and would be necessary to provide sufficient support to the existing wharf infrastructure to accommodate dredging along the berths. Structural improvements to the Pier J breakwaters would be required for Alternatives 2, 3, 4, and 5 to accommodate dredging in the Pier J Slip and Approach Channel. These activities are needed to fully implement the General Navigation Features (GNF) discussed above and to allow the POLB to fully realize all the economic benefits of the Project. These features are designed to prepare wharves for the selected channel depths and deepen berths to match the selected channel depths. Eliminating or reducing the scale of the LSF features would not fully enable the POLB to realize all the Project benefits and were not considered. Enhanced measures would result in greater costs with no increase in benefits and were also excluded from the alternatives analysis.

Alternatives Comparison

Table ES-1 summarizes the final array of alternatives that are fully analyzed for environmental impacts under NEPA and CEQA and included in this IFR. Cost and benefit summaries presented in this table used the FY 2019 Federal Discount Rate of 2.875 percent.

Table ES-1 Final Array of Alternatives (Oct 2018 Price Level; 2.875% Discount Rate)

	Dredge Volume (cy)	Total Project Cost	Total Annual Cost	Average Annual Benefits	Average Net Annual Benefits	Incremental Net Benefits[1]	Benefit-Cost Ratio
1 - No Action	-	-	-	-	-	-	-
2 - 53/78	4,881,000	$109,833,000	$4,770,867	11,758,000	6,987,133	(11,025,469)	2.5
3 - 55/80	**7,359,000**	**$150,703,000**	**$6,434,398**	**24,447,000**	**18,012,602**	**-**	**3.8**
4 - 57/83	11,855,000	$326,675,000	$13,657,987	25,510,000	11,852,013	(6,160,589)	1.9
5 - 55/80/67 (standby)	8,398,000	$197,510,000	$8,364,096	25,097,000	16,732,904	(1,279,698)	3.0
1. Net benefits as compared to the NED Plan							

Based on the results of the economic analysis summarized above, the National Economic Development (NED) Plan is Alternative 3 (highlighted), which maximizes net benefits.

As Project features were refined from the conceptual stage to the feasibility-level design stage, dredge quantities and project costs for the NED Plan were also updated. Construction costs, which were updated to FY 2021 (Oct 2020) price levels, were developed using the Corps of Engineers Dredge Estimating Program (CEDEP) and then transferred into the Micro-Computer Aided Cost Estimating System (MCACES), second generation (MII) software to generate estimates of total project costs. The project cost incorporates contingencies that were developed through performance of a Cost and Schedule Risk Analyses. Updated project costs and benefits are discussed in Section 9.4.

[3] Local service facilities are required to produce claimed Project benefits. These could include bulkheads, berthing areas, access channels, etc.

Summary of Potential Environment Effects and Proposed Mitigation

Affected Environment/Existing Condition

This IFR provides a description of the existing environmental conditions in the study area for the following resource categories: topography, geology and geography, oceanographic and coastal processes, water and sediment quality, biological resources, cultural resources, aesthetics, air quality, noise, socioeconomics, transportation, land use, recreation, public safety, and public utilities. Hazardous materials were eliminated from further review after determination that no hazardous materials are present in the study area.

Environmental Consequences/Environmental Impacts

Table ES-2 summarizes the potential effects under each of the alternatives, including the No Action Alternative.

Table ES-2 Summary of Potential Impacts

Impact Area	Alternative				
	1	2	3	4	5
Topography, Geology, and Geography	N	I	I	I	I
Oceanographic and Coastal Processes	N	I	I	I	I
Water and Sediment Quality	N	I	I	I	I
Biological Resources	N	I	I	I	I
Air Quality	N	S	S	S	S
Aesthetics	N	I	I	I	I
Cultural Resources	N	I	I	I	I
Noise	N	I	I	I	I
Socioeconomics and Environmental Justice	N	I	I	I	I
Transportation	N	I	I	I	I
Land Use	N	I	I	I	I
Recreation	N	I	I	I	I
Public Safety	N	I	I	I	I
Public Utilities	N	I	I	I	I
S=Significant impacts I=Insignificant impacts (Less than Significant) M=Insignificant impacts with mitigation N=No impact - No Action Alternative is not evaluated for Significance					

Effects Found Not to Be Significant

Based on the environmental review, as summarized in **Table ES-2**, no significant impacts in the following environmental issue areas are expected from implementation of any of the action alternatives: topography, geology and geography, oceanographic and coastal processes, water and sediment quality, biological resources, cultural resources, greenhouse gases, noise, socioeconomics, transportation, land use, recreation, public safety, and public utilities.

Significant Unavoidable Adverse Effects

Table ES-2 identifies unavoidable significant impacts to air quality associated with implementation of any of the action alternatives. Despite substantial mitigation efforts, potential impacts associated with air quality could not be reduced to less than significant levels. This is due to the types of equipment (i.e., hopper dredge, clamshell dredge, barges, tugs, etc.) that are necessary to perform the dredging and placement/disposal activities as well as the durations of use of that equipment required for each action alternative.

Cumulative Impacts

As detailed in Section 6 of this IFR, the proposed action was analyzed in conjunction with other past, present, and reasonably foreseeable future actions for the potential to contribute to significant cumulative impacts. The results of this analysis concluded that significant cumulative impacts regarding air quality would occur because of implementing any of the action alternatives, even with the implementation of mitigation measures.

Environmental Commitments and Mitigation Measures

The following lists the actions committed to be undertaken by the USACE for the proposed action to ensure environmental impacts are reduced to the extent possible. These actions may be part of design of the project as best management practices or specific features to reduce environmental impacts; they may be monitoring activities to alert the USACE and the contractor to potential environmental impacts; and they may be mitigation measures to compensate for actual impacts to the environment.

Environmental Commitments

1. It is the Contractor’s responsibility to obtain all applicable air permits and comply with federal, state, and local air and noise regulations.

2. If previously unknown cultural resources are discovered during the project, all ground-disturbing activities shall immediately cease within the area of the discovery until USACE has met the requirement of 36 C.F.R. 800.13 regarding post-review discoveries. USACE shall evaluate the eligibility of such resources for listing on the National Register of Historic Places and propose actions to resolve any anticipated adverse effects. Work shall not resume in the area surrounding the potential historic property until USACE re-authorizes project construction.

3. In the event human remains are discovered, all ground-disturbing activities shall be halted immediately within the area of the discovery, and a USACE archaeologist and the Los Angeles County Coroner must be notified. The coroner will determine whether the remains are of forensic interest. If human remains, funerary objects, sacred objects, or items of cultural patrimony are encountered during the proposed project, the USACE will follow the steps outlined in 36 C.F.R. 800.13 regarding post-review discoveries and shall notify the POLB who shall ensure that the process outlined in California Public Resources Code Section 5097.98 are carried out.

4. The Contractor shall keep construction activities under surveillance, management, and control to avoid pollution of surface and ground waters.

5. The Contractor shall implement a Water Quality Monitoring Plan at the dredge and nearshore placement sites. The plan shall include weekly monitoring of water quality parameters (salinity, pH, dissolved oxygen, temperature, and percent light transmissivity) with an instrument package at four stations. The four stations are sited relative to the dredge and will be 100 feet upcurrent of the dredge, 100 feet downcurrent of the dredge, 300 feet downcurrent of the dredge, and a control station located outside of any dredge plume. Monthly water samples will be taken from the station 300 feet downcurrent of the dredge for analysis of total suspended solids, Total Reportable Petroleum Hydrocarbons (TRPH), and for any contaminants of concern identified during sediment sampling and analysis to be conducted during the PED phase of the project. Similar monitoring would be conducted at the Surfside Borrow Site Nearshore Placement Area during sediment placement activities at that location relative to the placement site release point. Dredging will be controlled to keep water quality impacts to acceptable levels, controls will include modifying the dredging operation and the use of silt curtains (if feasible). Turbidity (NTUs), light transmittance will be limited to a 20 percent maximum change between the control station and 300 feet downstream station. Dissolved oxygen will not at any time be depressed more than 10 percent from that which occurs naturally, and will be maintained at a minimum of 5mg/l. The pH will be limited to a 0.2-unit change from that which occurs naturally.

6. All dredging and fill activities will remain within the boundaries specified in the plans. There will be no dumping of fill or material outside of the project area or within any adjacent aquatic community.

7. The Contractor shall keep construction activities under surveillance, management, and control to minimize interference with, disturbance to, and damage of fish and wildlife.

8. The Contractor shall mark the dredge and all associated equipment in accordance with U.S. Coast Guard (USCG) regulations. The Contractor must contact the USCG two weeks prior to the commencement of dredging. The following information shall be provided: the size and type of equipment to be used; names and radio call signs for all working vessels; telephone number for on-site contact with the project engineer; the schedule for completing the project; and any hazards to navigation.

9. The Contractor shall move equipment upon request by the USCG and Harbor patrol law enforcement and rescue vessels.

10. Construction equipment shall be properly maintained to minimize emissions of air pollutants.

11. Retarding injection timing of diesel-powered equipment to reduce NOx emissions will be implemented where practicable.

12. Equip all internal combustion engines with properly operating mufflers.

13. Pre-construction surveys for *Caulerpa taxifolia* will be conducted in the Main Channel and the proposed Pier J Channel and Turning Basin. The USACE would conduct Surveillance Level surveys for *Caulerpa taxifolia*. Surveys shall be completed not earlier than 90 days prior to the commencement of dredging and not later than 30 days prior to the onset of work. Surveys would systematically sample at least 20 percent of the bottom of the entire area to be dredged to assure that widespread of occurrences of *Caulerpa taxifolia* would be identified if present. Surveys would be accomplished using diver transects, remote cameras, or acoustic surveys with visual ground truthing. The USACE would submit survey results in standard format to the National Marine Fisheries Service (NMFS)/California

Department of Fish and Wildlife (CDFW) within 24 hours of first noting the occurrence. In the event that *Caulerpa taxifolia* is detected, dredging would be delayed until such time as the infestation has been isolated, treated, and the risk of spread from the proposed action eliminated. In the event that NMFS/CDFW determines that the risk of *Caulerpa taxifolia* infestation has been eliminated or substantially reduced, the requirement for *Caulerpa taxifolia* surveys may be rescinded, or the frequency or level of detail of surveys may be decreased.

14. The Contractor shall implement a Spill Prevention Plan including employee training and the staging of materials on site to clean up accidental spills.

15. Adhere to site use conditions for material disposal at the LA-2 and LA-3 ODMDS.

16. A sediment Sampling and Analysis Plan (SAP) will be conducted for all sediments to be dredged as part of the proposed project. The SAP will be prepared in consultation with the SC-DMMT and will comply with appropriate testing manuals (the Inland Testing Manual [USEPA & USACE 1998]) for sediments to be placed at the Surfside nearshore placement area and the Green Book (USEPA & USACE 1991) for sediments disposed of at the two ocean dredged material disposal sites, LA-2 and LA-3. The USACE will evaluate test results, make a suitability determination, and seek formal concurrence from member agencies of the SC-DMMT, including the USEPA.

17. USACE will apply to the Los Angeles Regional Water Quality Control Board for a Section 401 Water Quality Certification during PED and will comply with all conditions of the final Water Quality Certification.

18. USACE will seek concurrence from the California Coastal Commission with its determination that the project is consistent to the maximum extent practicable with the enforceable polices of the CCMP during PED and will comply with all conditions of the concurrence.

19. USACE will implement the following measures to avoid and minimize impacts to green sea turtles for hopper dredge operations.

    a. During dredging, transit to and from, and as placement of dredged material at the Surfside Borrow Site Nearshore Placement Area occurs, a qualified biologist with experience monitoring green sea turtles will be onboard the hopper dredge to monitor for the presence of green sea turtles. The green sea turtle monitor will have the authority to cease or alter operations to avoid impacts to green sea turtles.

    b. During dredging, the biological monitor will periodically check in the hopper for the presence of green sea turtles.

    c. Adequate lighting will be provided during nighttime operations (i.e., dredging, dredge material transport and placement) to allow the monitor to observe the surrounding area effectively.

    d. All vessels associated with the project will not exceed eight (8) knots inside the breakwater (most vessels will be transiting outside the breakwater).

e. If a green sea turtle is observed within the vicinity of the project site during project operations, all appropriate precautions shall be implemented to avoid or minimize unintended impacts. These precautions include, but are not limited to:
   i. Cessation of placement operations that is observed within 100 feet of a green sea turtle;
   ii. Operations may not resume until the green sea turtle has departed the monitoring zone by its own accord or has not been observed for a 15-minute period of time;
   iii. Maneuver the hopper dredge to avoid any free-swimming green sea turtles observed during transit.

f. Biological monitors will maintain a written log of all green sea turtle observations during project operations. This observation log will be provided by the biological monitors to the USACE for transmittal to NMFS within a reasonable period of time after completion of construction. Each observation log will contain the following information:
   i. Observer name and title;
   ii. Type of construction activity (dredging, etc.);
   iii. Date and time animal first observed (for each observation);
   iv. Date and time observation ended (for each observation). A green sea turtle observation will terminate if (1) an animal is observed exiting the monitoring zone or (2) after a 15-minute period of no observation (assumption is that animal has exited, but was not observed to do so);
   v. Location of monitor (latitude/longitude), direction of green sea turtle in relation to the monitor, and estimated distance (in meters) of green sea turtle to the monitor; and
   vi. Nature and duration of equipment shutdown.

g. Any observations involving the potential “take” of green sea turtles will be reported by the biological monitor(s) to the USACE within 10 minutes of the incident and to the NMFS stranding coordinator immediately thereafter.

h. The Contractor will implement an Environmental Protection Plan that will include a green sea turtle Monitoring and Avoidance Plan and an employee training program on green sea turtle observation protocols, avoidance, and minimization measures. The program will be conducted by the Biological Monitor and a record kept of dates of training, names and positions of attending employees, and an outline of the training presentation.

20. USACE will implement the following measures to avoid and minimize impacts to green sea turtle for clamshell dredge operations.

   a. During construction, a 100-foot (visually estimated) monitoring zone around all in-water equipment, vessels, and/or debris shall be implemented. Green sea turtle monitoring is not required for the transportation of material between dredging and disposal sites.

   b. Visual monitoring of the monitoring zone (visually estimated) shall commence at least 15 minutes prior to the beginning of in-water construction activities each day and after each break of more than 30 minutes. If a green sea turtle is observed within the monitoring zone, all in-water project activities shall cease as soon as possible, in consideration of worker safety. Project activities shall not commence or continue until the green sea turtle has either been observed having left the monitoring zone, or at least 15 minutes have passed since the last sighting whereby it is assumed the green sea turtle has voluntarily left the monitoring zone.

c. The visual monitor shall maintain a written log containing all observations of green sea turtles including:
    i. Observer name and title;
    ii. Type of activity (dredging, etc.);
    iii. Date and time animal first observed (for each observation);
    iv. Date and time observation ended (for each observation), including if the green sea turtle was observed exiting the monitoring zone or was assumed to have exited following a 15-minute period of no observation;
    v. Location of observer (latitude/longitude), direction, and estimated distance to green sea turtle;
    vi. Nature and duration of equipment shutdown.

d. The green sea turtle observation log shall be provided by the visual monitor to the USACE for transmittal to NMFS within a reasonable time after completion of construction. Any observations involving potential take of green sea turtle shall be reported to the USACE and NMFS within 24 hours.

e. Adequate lighting will be provided during nighttime operations to allow the monitor to observe the surrounding area effectively.

f. The visual monitor will be trained in how to conduct visual monitoring and in the identification of green sea turtles by the Biological Monitor proposed for monitoring hopper dredge operations.

g. The contractor will implement an Environmental Protection Plan that will include a green sea turtle Monitoring and Avoidance Plan and an employee training program on green sea turtle observation protocols, avoidance, and minimization measures. The training program will be conducted by the Biological Monitor and a record kept of dates of training, names and positions of attending employees, and an outline of the training presentation.

21. If other, unrelated projects occur that result in an exceedance of annual disposal limits at either LA-2 or LA-3 ODMDS, USACE will coordinate with USEPA to identify and implement additional monitoring at the disposal site[s].

22. Construction crews would be tasked in accordance with standard specification requirements to look for and avoid any marine mammals, including whales during dredging, transportation, and placement/disposal activities. A member of the bridge crew will be identified as a marine mammal monitor. The monitor will be trained in how to conduct visual monitoring and in the identification of marine mammals by the biological monitor proposed for monitoring hopper dredge operations. The visual monitor shall maintain a written log containing all observations of marine mammals including:
    a. Observer name and title;
    b. Type of marine mammal observed;
    c. Date and time animal first observed (for each observation);
    d. Date and time observation ended (for each observation);
    e. Location of observer (latitude/longitude), direction, and estimated distance to marine mammal; and
    f. Behavior of marine mammal.

Mitigation Measures

Mitigation measures include the following:

MM-AQ-1: Electric clamshell dredge. The use of an electric clamshell dredge shall be required for all clamshell dredging activities during the entire construction period of the project, and the construction of an electrical substation at Pier J is also required to provide electric power to the clamshell dredge.

MM-AQ-2: Construction-Related Harbor Craft. Construction-related harbor craft (tugboats, crew boats, and survey boats) with Category 1 or Category 2 marine engines shall meet USEPA Tier 3 emission standards for marine engines. In addition, the Contractor shall require all construction-related tugboats that home fleet in the San Pedro Bay Ports: 1) to shut down their main engines and 2) to refrain from using auxiliary engines while at dock and instead use electrical shore power, if feasible.

MM-AQ-3: Off-Road Construction Equipment. Self-propelled, diesel-fueled off-road construction equipment 25 hp or greater shall meet USEPA/CARB Tier 4 Final emission standards for non-road equipment.

MM-AQ-4: Additional Mitigation for Off-Road Construction Equipment. Off-road diesel-powered construction equipment shall comply with the following:

- Construction equipment shall be maintained according to manufacturer's specifications.
- Construction equipment shall not idle for more than 5 minutes when not in use.

Recommended Plan

Alternative 3, with a combination of management measures for container vessels (constructing the Pier J Approach Channel and Turning Basin and deepening the West Basin Channel to a new depth of -55 feet MLLW), liquid bulk vessels (deepening the Approach Channel to -80 feet MLLW, and bend easing in portions of the Main Channel to match the currently authorized depth in the Main Channel of -76 feet MLLW), and the LSF (deepening of Pier J Basin and berths to a new depth of -55 feet MLLW, and Pier J breakwaters improvements), provides the greatest contribution to net benefits and has been determined as the NED Plan. The NED Plan has also been identified as the Recommended Plan. Implementation of the Recommended Plan would require approximately 7.4 mcy of sediment to be dredged from the GNF and LSF.

GNF of the Recommended Plan for liquid bulk vessels includes:

- Deepening the Approach Channel from -76 feet MLLW to -80 feet MLLW
- Bend easing within portions of the Main Channel to -76 feet MLLW

GNF of the Recommended Plan for container ships includes:

- Constructing an approach channel to Pier J South from -50 feet MLLW to -55 feet MLLW
- Constructing a turning basin outside of Pier J South from -50 feet MLLW to -55 feet MLLW
- Deepening the West Basin from -50 feet MLLW to -55 feet MLLW
- Constructing a new dredge electric substation at Pier J South

The Recommended Plan includes LSF to be constructed by the POLB to fully realize all the benefits of the GNF discussed above. LSF are constructed by the POLB and thus require appropriate permits from the USACE Regulatory Division. Impacts from construction of LSF are included in this document as they are a part of the project without which the full economic benefits of the project cannot be realized.

The Recommended Plan is comprised of feasible dredging and placement/disposal measures in accordance with Federal and state guidelines, including POLB environmental protection guidelines. Sediments dredged by a hopper dredge from deepening of the Approach Channel would be placed in the nearshore disposal site, and sediments dredged by an electric clamshell dredge from the remaining areas would be placed at the two EPA-designated offshore dredged material disposal sites.

In keeping with the USACE commitment to maximize beneficial reuse of dredged sediments, the project will maximize beneficial reuse if future sites are identified during PED; these could include Port fill projects and use of sediments by the USACE's East San Pedro Bay Ecosystem Restoration Project (should that project be congressionally authorized, funded, and implemented concurrently with the Recommended Plan). In addition, options are available if unsuitable sediments are identified during sediment testing, including Port fill and the use of a borrow pit (North Energy Island) in San Pedro Bay, which has been used in the past for in-water disposal (with capping) of contaminated sediments. Should future beneficial reuse sites be identified, USACE will consider use of such sites in a supplemental document. Based on historical sediment quality data, none of the sediments are considered to be suitable for direct placement on the beach based on grain size compatibility issues. However, should sediments suitable for direct beach placement be identified during the sediment test program to be conducted in PED, USACE will identify suitable beach locations in the vicinity needing nourishment and evaluate in a supplemental document.

Approximately 7.1 mcy of dredged material for the GNF would be placed in a combination of a nearshore site and a USEPA-designated ODMDS. **Figure ES-3** shows the location of the GNF. To support dredging by an electric clamshell dredge at the Pier J berth, the Approach Channel, and Turning Basin, a new dredge electric substation is required to be constructed to mitigate for air quality impacts.

LSF includes deepening Pier J Basin and berths J266-J270 within the Pier J South Slip to -55 feet MLLW. Approximately 337,000 cy of dredged material would be placed in a USEPA-designated offshore disposal site for the LSF. In addition, structural improvements on the Pier J breakwaters at the entrance of the Pier J Slip would be necessary to accommodate deepening of the Pier J Slip and Approach Channel to -55 feet MLLW.

Figure ES-3 Recommended Plan

As detailed in **Table ES-3**, the Recommended Plan has an estimated project first cost of $136,780,000 for the GNF. The value of lands, easements, rights-of-way, and relocations (LERR), estimated to be $1,462,000, is 100 percent non-Federal expense. The estimated Federal and non-Federal shares for GNF is $67,659,000 and $69,121,000, respectively (FY 2021 Price Level). In addition to the non-Federal Sponsor's (POLB) estimated share of the project first cost for GNF, the non-Federal Sponsor must pay an additional 10 percent of the cost of the GNF of the project less credit for LERR, in cash over a period not to exceed 30 years with interest. The additional 10 percent payment is estimated to be $12,069,800.

Aids to navigation (ATONS), which have an estimated cost of $653,000, would be provided at 100 percent Federal cost (USCG). Associated LSF costs, estimated to be $18,316,000, will also be the responsibility of the non-Federal Sponsor. Project cost apportionment after the 10 percent payment of GNF and associated ATONS and LSF costs brings the estimated cost share to $56,242,000 Federal and $99,507,000 non-Federal (FY 2021 Price Level).

Operation, maintenance, repair, replacement and rehabilitation (OMRR&R) dredging expenses have been estimated to occur every 25 years at $3,434,500 per dredge cycle, totaling to about $6.9 million (equivalent annual costs estimated at $101,000) over the 50-year period of analysis (2027-2076).

Table ES-3 Detailed Project Costs (Oct 2020 Price Level; 2.5% Discount Rate)

	Total Project	Federal Share	Non-Federal Share
GENERAL NAVIGATION FEATURES (GNF)	> -50 feet	50%	50%
Construction Costs			
Year 1 (Dredging)	$57,225,000	$28,612,500	$28,612,500
Year 1 (Electric Substation)	$13,167,000	$6,583,500	$6,583,500
Year 2 (Dredging)	$30,471,000	$15,235,500	$15,235,500
Year 3 (Dredging)	$10,327,000	$5,163,500	$5,163,500
Preconstruction Engineering and Design (PED)	$16,678,000	$8,339,000	$8,339,000
Construction Management (CM)	$7,450,000	$3,725,000	$3,725,000
TOTAL CONSTRUCTION OF GNF	**$135,318,000**	**$67,659,000**	**$67,659,000**
Lands and Damages	$1,462,000	-	$1,462,000
TOTAL PROJECT FIRST COST GNF	**$136,780,000**	**$67,659,000**	**$69,121,000**
Additional 10% of GNF[1]	**-**	**($12,069,800)**	**$12,069,800**
ASSOCIATED COSTS			
Aids to Navigation (100% Federal—USCG)	**$653,000**	**$653,000**	**-**
Local Service Facilities[2] (100% Non-Federal)	**$18,316,000**	**-**	**$18,316,000**
PROJECT FIRST COST plus ASSOCIATED COSTS	**$155,749,000**	**$56,242,000**	**$99,507,000**
		36%	*64%*
OMRR&R Over 50 Years	$6,869,000	$3,434,500	$3,434,500

1. The non-Federal Sponsor shall pay an additional 10% of the costs of GNF in cash, pursuant to Section 101 of the Water Resources Development Act of 1986. The value of LERR shall be credited toward the additional 10% payment.
2. Includes PED and CM

Based on a FY 2021 discount rate of 2.5 percent and a 50-year period of analysis, the equivalent annual benefits and costs are estimated at $20,960,000 and $5,868,000, respectively. The project is estimated to provide annual net benefits of $15,092,000 and a benefit-to-cost ratio of 3.6.

Table ES-4 Cost and Benefits Summary (Oct 2020 Price Level)

Equivalent Annual Benefits and Costs	
FY 2021 Price Levels, 50-year Period of Analysis, 2.5% Discount Rate	
	Total
Investment Costs	
Total Project Construction Costs	$155,749,000
Interest During Construction	$7,827,000
Total Investment Cost	$163,576,000
Average Annual Costs	
Interest and Amortization of Initial Investment	$5,767,000
OMRR&R	$101,000
Total Average Annual Costs (A)	$5,868,000
Total Average Annual Benefits (B)	$20,960,000
Net Average Annual Benefits (B-A)	$15,092,000
Benefit-to-Cost Ratio (B/A)	**3.6**

1 INTRODUCTION

The U.S. Army Corps of Engineers, Los Angeles District (USACE), in conjunction with the Port of Long Beach (POLB, non-Federal Sponsor), acting by and through its Board of Harbor Commissioners, is conducting a feasibility study in the POLB.

This feasibility study uses the USACE six step planning process carried out in conjunction with the non-Federal Sponsor, interested stakeholders, resource agencies, and the public. Problems and needs related to the inefficient operation of deep draft vessels in the Port's secondary and Federal (main) channels, which increases the Nation's transportation costs, have been identified through the study process. Prior studies and reports were reviewed, and new information has been acquired to inventory current conditions and forecast future trends (which serve as the "baseline" conditions or the "no action" alternative) related to the public concerns, problems and needs of the study. Alternative plans have been formulated, evaluated and compared to each other as well as to the baseline conditions to select a recommended plan of action for navigation improvements. The study identifies the most cost-effective plan to address the problems and opportunities related to navigation improvements that complies with applicable laws, regulations, and policies of the USACE Civil Works program. This plan, which maximizes net national economic development (NED) benefits, is referred to as the NED Plan.

1.1 Report Organization and Guiding Regulations

This Final Integrated Feasibility Report (IFR) with joint Environmental Impact Study/ Environmental Impact Report (EIS/EIR) includes the alternatives analysis, which develops options that focus on navigation improvements along with an assessment of potential environmental impacts. The alternatives are evaluated, and preliminary recommendations are made. This IFR was conducted in accordance with current USACE policies including, but not limited to the Principles and Guidelines for Water and Related Land Resources Implementation Studies and ER 1105-2-100, Planning Guidance notebook. The IFR was also prepared in accordance with the requirements of the National Environmental Policy Act (NEPA) (42 USC 4321 et. seq), Council on Environmental Quality (CEQ) NEPA implementing regulations (40 C.F.R parts 1500-1508)[4], and USACE NEPA regulations (33 C.F.R. part 230).

This IFR provides the existing and future without-project (baseline) conditions, formulation and evaluation of alternatives and identification of a Recommended Plan for the Port of Long Beach Deep Draft Navigation Feasibility Study (Study). This IFR includes a combined EIS/EIR to address requirements of both NEPA and the California Environmental Quality Act (CEQA). The EIR evaluates the direct, indirect, and cumulative impacts of the proposed Project, and alternatives to the proposed Project that could lessen or avoid those impacts, in accordance with the provisions set forth in the CEQA Statutes and Guidelines. The IFR also includes technical appendices that support the plan formulation and evaluation process. Technical appendices provide detailed information on studies related to economics (including fleet and commodity forecast), coastal engineering (including ship simulation for navigation), geotechnical investigations, detailed cost estimates, and real estate investigations.

[4] The new NEPA regulations issued by CEQ apply to NEPA processes begun after 14 Sep 2020, but federal agencies have discretion to apply the new NEPA regulations to on-going NEPA processes or proceed to apply the prior CEQ regulations. The NEPA process in this instance started before 14 Sep 2020, and the USACE has decided to proceed to apply the prior CEQ regulations.

Because this IFR contains both the Feasibility Report and EIS/EIR, it appears slightly different in structure and content than stand-alone documents. To help the reader navigate this IFR, an overview of the contents and purpose of each section are contained in this Preface.

- Section 1 - Introduction identifies the authorizing legislation, project background, an overview of the study area and environmental setting, Purpose and Need (as required in an EIS), and prior studies and reports. The structure of this section is closely linked to the typical Feasibility Study contents but contains information necessary for an EIS/EIR.
- Section 2 – Existing and Future Without Project Conditions establishes the current and future without project conditions from an economics and port operations perspective. The structure of this section is also closely linked to the typical Feasibility Study contents.
- Section 3 - Affected Environment/Existing Environmental Setting describes the existing, potentially affected environment in the study area for a total of 15 issue areas. These include topography, water and sediment quality, aesthetics, recreation, air quality, noise, biological and cultural resources, etc. Regulations specifically applicable to each issue are noted. This section is consistent with NEPA terminology but corresponds to the description of Existing Conditions under CEQA.
- Section 4 - Plan Formulation sets out the with and without project conditions, identifies alternatives subject to preliminary screening and secondary screening, lists alternatives eliminated from further consideration and design features incorporated into alternatives. The final array of feasible alternatives to be fully evaluated in the EIS/EIR is described in more detail via text, tables, and figures. The full disclosure of alternatives considered but rejected and alternatives carried forward for further study is key to both the Feasibility Study and the EIS/EIR.
- Section 5 - Environmental Consequences/Environmental Impacts discloses the potential consequences of implementing each of the alternatives for each of the 15 issue areas. Mitigation measures are identified, if applicable. This section is consistent with NEPA terminology but corresponds to Impact Analysis under CEQA.
- Section 6 – Cumulative Project Impacts evaluates the potential impacts associated with implementation of each alternative in combination with other past, present and reasonably foreseeable projects. This section addresses requirement under both NEPA and CEQA.
- Sections 7-8, 10-13 include other NEPA/CEQA requirements such as effects found not to be significant, unavoidable significant impacts, environmental commitments, energy requirements, short-term uses versus long-term productivity, etc. Public involvement and agency coordination is documented in Section 13.
- Sections 9, 14-17 include conclusions and recommendations, list of preparers, glossary, references, and an index.
- A total of 15 Appendices are included with more detailed technical information.

1.2 Study Authority

This study serves as an interim response to the Resolution of the House Committee on Public Works adopted 10 July 1968 that reads as follows:

> *"That the Board of Engineers for Rivers and Harbors is hereby requested to review the reports on the Los Angeles and Long Beach Harbors, California, heretofore submitted to the Congress with a view to promoting and encouraging the efficient, economic, and logical development of the harbor complex. The scope will encompass investigation of current shipping problems, adequacy of facilities, delays in intermodal transfers, channel dimensions, storage locations, and capacities, and other physical aspects affecting*

waterborne commerce in the San Pedro Bay region, including the conduct of model studies as necessary to establish an efficient layout of the port complex and the design of navigation facilities."

A reconnaissance study, completed in 2014, concluded that there was a potential federal interest in pursuing navigation improvement at the POLB.

1.3 National Objectives

Federal and Federally assisted water and related planning activities attempt to achieve increases in NED, while preserving environmental resources consistent with established laws and policies. Contributions to NED are increases in the net value of the national output of goods and services, expressed in monetary units. The NED objective is differentiated from Regional Economic Development (RED) benefits, which only apply to a given region, and may be produced at the expense of another region in the U.S. NED benefits accrue nationally for a net gain in Gross Domestic Product. They represent return on the investment of Federal funds and are a useful tool in comparing the efficiency and effectiveness of alternative projects on a nationwide basis. Plans are formulated to take advantage of opportunities in ways that contribute to the NED objective. Additional information about contributions to NED is provided in Section 4, Plan Formulation, and in Appendix E, Economics.

To determine whether there is a federal interest in implementing navigation improvements at the POLB, the expected return to the national economy on the total investment to construct and maintain the improvements over a 50-year period of analysis must be calculated. Like most USACE navigation studies, the return to the national economy would be generated by reducing transportation costs by addressing inefficiencies in the existing transportation system. For there to be a federal interest, the contribution to NED must exceed the cost to construct and maintain the project over the period of analysis. The NED benefits associated with each of the alternatives considered are compared with the costs to implement and maintain the improvements and mitigate for adverse impacts. The results, including recommendations, are summarized in this IFR and the supporting appendices.

1.4 Purpose and Need of the Action

The purpose of the proposed Federal action (i.e., the navigation improvement project) is to improve navigation efficiencies and safety for existing and prospective commerce.

There is a need to address transportation inefficiencies at the POLB. Transportation inefficiencies occur when channels and maneuvering areas do not fully accommodate the vessels using them. Existing channel depths, and in some areas channel widths, do not meet the draft requirements of the current and future fleet of larger container and liquid bulk vessels that call on POLB. Tide restrictions, light loading[5], lightering[6], and other operational inefficiencies result in increased transportation costs for the shipment of commodities at the Nation's second busiest port. Container movements along the secondary channels serving Pier J and Pier T/West Basin, and liquid bulk vessel movements along the main channel have been identified as constrained by current conditions. Improvements to the main channel could improve conditions for vessel operations and safety by reducing the constraints of the harbor pilots' operating practices. As shipping vessels of all types increase in size and dead weight tonnage (DWT) they become

[5] Light loading is the process of not loading a vessel to its maximum at the initial Port to reduce the draft.
[6] Lightering is the process of moving cargo from one vessel to another. Often this is done to reduce the draft of a larger vessel.

more difficult to maneuver against the external forces applied by winds, waves and currents. Widening of shipping channels provides additional space in which changes in vessel direction, turning and course corrections to address external forces can be made safely. As well as increases to length and width to accommodate greater loads, vessel drafts can also increase, requiring the deepening of channels to prevent grounding. In inclement weather vessels heave and pitch due to wave action, this also increases their draft requiring channels to be deepened to allow safe passage.

1.5 Scope

The study includes (1) a survey of existing and future conditions; (2) an evaluation of related problems and opportunities; (3) development of potential alternatives; (4) evaluation of alternatives; (5) a comparison of costs, benefits, adverse impacts, environmental acceptability, and feasibility of those alternatives; and (6) identification of a Recommended Plan. Information for the analysis came from hydrographic surveys, ship simulation, socio-economic projections, existing sediment sampling, and numerous other data collection efforts that could be used for this study.

This study forecasts waterborne cargo volumes, traffic patterns and vessel fleets, and evaluates the need for navigation system improvements over a 50-year period of analysis. It considers a range of structural and some non-structural measures within and near the POLB that could address inefficiencies within the system. No project-induced increases in cargo throughput[7], based on potential water-based improvements to increase efficiency, are anticipated or forecasted.

1.6 Study Area (Location and Description) and Project Area (Location and Description)

The POLB encompasses the eastern part of the San Pedro Bay, located in the southwestern portion of the city of Long Beach, in southern Los Angeles County, approximately 20 miles south of downtown Los Angeles. The study area includes the waters in the immediate vicinity (and shoreward) of the breakwaters through the entire port, including Outer Harbor, Inner Harbor, Cerritos Channel, West Basin, and the Back Channel. Regional access to the project area is provided by the Long Beach Freeway (Interstate 710). **Figure 1-1** provides a map of the Los Angeles region in which the project area is located.

The general area of the POLB and adjacent portions of the cities of Long Beach and Los Angeles are characterized by diverse industrial and commercial land uses, including marine cargo terminals; light manufacturing and industry; recreational destinations; and commercial operations including sport fishing concessions, hotels, retail shops, and a public boat launch.

Residential areas near the harbor complex include the cities of San Pedro and Wilmington to the west and northwest of San Pedro Bay, respectively, in the city of Los Angeles; the city of Long Beach to the north, and the community of Seal Beach to the east; and the neighborhoods of West Long Beach and Downtown Long Beach in the city of Long Beach.

[7] Throughput is the average quantity of cargo that can pass through a port on a daily basis from arrival at the port to loading onto a ship, or from the discharge from a ship to the exit from the port complex.

Figure 1-1 Location Map

The project area is composed of portions of the POLB as shown on **Figure 1-2** including the channels serving Pier J and Pier T West Basin, the Approach Channel, the Main Channel, as well as a potential waiting (standby) area adjacent to the main channel. The Standby Area is outlined in a light blue circle. The approach channel, which extends seaward from the opening of the Long Beach Breakwater, is also partially shown. Located approximately 9 miles southwest and 22 miles southeast of Queen's Gate are two USEPA-approved ocean dredged material disposal sites, LA-2 and LA-3, respectively. Approximately 5.5 miles southeast of the breakwater entrance is the Surfside Borrow Site Nearshore Placement Area.

Figure 1-2 Project Area

1.7 Existing Federal Project

Los Angeles and Long Beach Harbors are authorized by the 1896 River and Harbor Act and subsequent River and Harbor Acts. There are 3 breakwaters: San Pedro Breakwater (not pictured in **Figure 1-3** below) is 11,150 feet long, Middle Breakwater is 18,500 feet long and the Long Beach Breakwater is 13,350 feet long. The Long Beach Harbor portion of the existing Federal Project (see **Figure 1-3**) includes the Approach Channel through Queens Gate, which is about 15,800 feet long, 1,200-1,300 feet wide and has a depth of -76 feet Mean Lower Low Water (MLLW). The Main Channel is about 16,700 feet long, with a varying width between 400-1,400 feet and an authorized depth of -76 feet MLLW.

Figure 1-3 Existing Federal Project

1.8 Prior Studies and Reports

There have been numerous studies and projects in the POLB by the USACE and other entities.

1.8.1 Previous USACE Studies, Reports, and Projects

Previous USACE studies, reports and projects are listed below.

- Deep Draft Navigation Improvements Los Angeles and Long Beach Harbors, San Pedro Bay, California (Final Feasibility Report)—Prepared by the US Army Corps of Engineers, Sept 1992.
- Port of Long Beach (Main Channel Deepening) Final Feasibility Study Long Beach, California (Sept 1995)—Prepared by the US Army Corps of Engineers

- Port of Long Beach Turning Basin Deepening Project (Main Channel Deepening), Long Beach, California. Final Supplemental Environmental Assessment—Prepared by the US Army Corps of Engineers, June 2009.
- Port of Long Beach High Spot Removal (Main Channel Deepening), Long Beach, California. Final Supplemental Environmental Assessment—Prepared by the US Army Corps of Engineers, March 2013.
- U.S. Army Corps of Engineers, 1987, "Comprehensive Condition Survey Los Angeles – Long Beach Breakwaters: Geotechnical Appendix."

1.8.2 Other Studies and Reports

The following reports from consultants and public entities have been reviewed as part of this study. This list contains only the reports that were most relevant and useful to this study; a comprehensive list may be found in the bibliography.

- Final Report Port of Long Beach Main Channel Deepening Project and Southeast Basin Borrow Site Sediment Characterization, Long Beach, California (July 2001)—Prepared by AMEC for the Port of Long Beach
- Final Report Middle Harbor Redevelopment Project Final Environmental Impact Statement (FEIS) Final Environmental Impact Report (FEIR) and Application Summary Report --Prepared by SAIC from Science to Solutions (April 2009) for Port of Long Beach
- Final Report Port of Long Beach Piers G and J Terminal Redevelopment Project Environmental Impact Assessment (EA) Final Environmental Impact Report (FEIR), Long Beach, CA (October 2001)
- Environmental Review (under development) for the Port of Long Beach Cruise Terminal Improvement Project
- Final Planning Aid Report for the Proposed Port of Long Beach Deep Draft Navigation Project, Los Angeles County, California. June 30, 2016. U.S. Fish and Wildlife Service, Carlsbad Fish and Wildlife Office.
- Final 2008 Biological Surveys of Los and Long Beach Harbors. April 2010. Prepared by SAIC for the Ports of Los Angeles and Long Beach.
- 2013-2014 Biological Surveys of Long Beach and Los Angeles Harbors. June 2016. Prepared by MBC Applied Environmental Sciences and Merkel & Associates for the Ports of Los Angeles and Long Beach.
- Port Master Plan Update, Draft Program Environmental Impact Report. August 2019.
- Draft Port Master Plan Update. August 2019.

1.8.3 Existing USACE Projects and Studies

- East San Pedro Bay Ecosystem Restoration Feasibility Study (in progress)
- Maintenance dredging in Port of Long Beach approach channel through Queens Gate
- Los Angeles River Estuary: dredged periodically (roughly every 3-5 years as funding allows and need requires), last dredged in 2015. Dredging currently being completed and expected to be completed in May 2021. Next dredge event is unlikely to occur during project construction. Dredging usually performed by clamshell dredge due to access issues for bridge crossing the channel.

1.8.4 Other Existing Coastal Structures/Projects

- POLB Pier G Redevelopment Program. The Pier G Redevelopment Program consolidated and modernized the existing Pier G terminal with more efficient, environmentally friendly truck gates, container yard, rail facilities and berths. Work for the Pier G Redevelopment Program was completed in 2016 and construction included new rail storage tracks, improved truck gate, wharf construction, new Leadership in Energy and Environmental Design (LEED) certified terminal administration buildings, berth deepening and partial slip fill projects.
- POLB Middle Harbor Terminal Redevelopment Project. The Middle Harbor Redevelopment Project combines two aging container terminals into a single state-of-the-art-terminal to improve cargo-movement efficiency and environmental performance. The $1.5 billion project was completed in August 2021 and feature upgraded wharfs, container storage yard, electrified cargo handling equipment, new LEED certified terminal administration buildings and greatly expanded on-dock rail yard.

2 EXISTING AND FUTURE WITHOUT PROJECT CONDITIONS

It is important to define the existing and future without project (FWOP) conditions for the study area to determine the benefits of the proposed alternatives. This section will describe the current and future conditions from an economics perspective. Section 3 will describe the existing conditions of the environmental setting. The FWOP condition is synonymous with the No Action Alternative for the NEPA analysis. It describes the anticipated conditions through the end of the study's 50-year period of analysis (2076).

In general, channels would remain at current authorized depths with those dimensions maintained by periodic maintenance dredging. Construction impacts would be avoided, however benefits to the POLB and to the Nation's economy would also not be realized.

2.1 General Setting

The POLB has undergone significant expansion in the past century and has become a major transportation and trade center, providing the shipping terminals for nearly one-third of the waterborne trade moving through the West Coast. Today, trade valued annually at more than $194 billion moves through the POLB, making it the second-busiest seaport in the United States. The POLB handles more than 8.1 million Twenty-foot Equivalent Units (TEUs) and 82 million tons of cargo and has over 2,000 vessels calls. To handle this high volume of trade, POLB facilities include 10 piers, 62 berths, and 68 Post-Panamax gantry cranes. There are 22 shipping terminals to process break bulk (lumber, steel), bulk (salt, cement, gypsum), containers, and liquid bulk (petroleum). Specialized terminals also move petroleum, automobiles, cement, lumber, steel, and other products. More than 51,000 jobs in Long Beach and over 576,000 jobs in southern California generate about $38.7 billion in wages in California that are associated with goods moving through the POLB. The POLB's top trading partners are China, South Korea, Hong Kong, and Japan. East Asian trade accounts for about 90 percent of the shipments through the Port of Long Beach. Top imports are crude oil, electronics, plastics, and furniture; top exports are petroleum products, chemicals, and agriculture.

Port development projects identified in the Port Master Plan Update currently undergoing review would still move forward under the Without Project Scenario.

2.2 Terminal Expansions

The Port's ability to accommodate large container ships and handle additional cargo is a key objective of the POLB. In preparation of the next generation of vessel, the POLB has a 10-year, $4.0 billion capital program to update infrastructure and facilities to improve the efficiency of cargo operations. The program has a plan for projected spending of $2.3 billion over the next 10 years. This includes the Middle Harbor Redevelopment Project, the Gerald Desmond Bridge Replacement, the Pier B Rail Support Facility, the Pier G and J modification project, and berth deepening.

2.2.1 Existing Container Terminal Facilities and Infrastructure

The existing container terminal facilities and infrastructure include:

- Pier A: SSA terminals
- Pier C: SSA Terminal
- Pier E: Long Beach Container Terminal Inc.
- Pier G: International Transportation Service
- Pier J: Pacific Container Terminal
- Pier T: Total Terminals International

As noted above, the POLB has an improvement plan of $2.3 billion projected capital spends over the next 10 years. This includes the following improvements:

- Middle Harbor Redevelopment Project: $1.5 billion to combine and modernize two aging shipping terminals. The project will quintuple dock rail capacity and was completed in August 2021.
- Gerald Desmond Bridge Replacement: A $1.5 billion project to build a new bridge that spans the port’s main channel. This will allow for better traffic management and is intended to be complete in 2021.
- Pier B Rail Support Facility: The Pier B support facility will provide a more efficient transfer of cargo between marine terminals and Class 1 railroads.
- Pier G and Pier J modernization: Berth and rail facility improvements.
- Berth deepening

Additionally, the Port is currently updating their Master Plan. This includes improvements to Pier G, which would allow larger vessels to call on that berth, and the eventual infill of Pier J South, which would allow greater landside terminal facilities and capacity for Pier J North. Other potential improvements include a berth extension at Pier T, the creation of a new berth and expansion of Pier T container terminal at Pier T Echo, and a new container terminal at the Navy Mole.

2.3 Throughput

2.3.1 Container Vessels

As noted, the POLB currently handles more than 8.1 million TEUs. Everything from clothing and shoes to toys, furniture and consumer electronics arrives at the POLB before making their way to store shelves throughout the country.

Historic and Existing Condition

As shown on **Figure 2-1**, from 1995 through 2020, total container throughput at the POLB increased from about 2.84 million TEUs to about 8.1 million TEUs, representing an increase of 185 percent. The decrease in throughput in 2008 and 2009 was due to global recession.

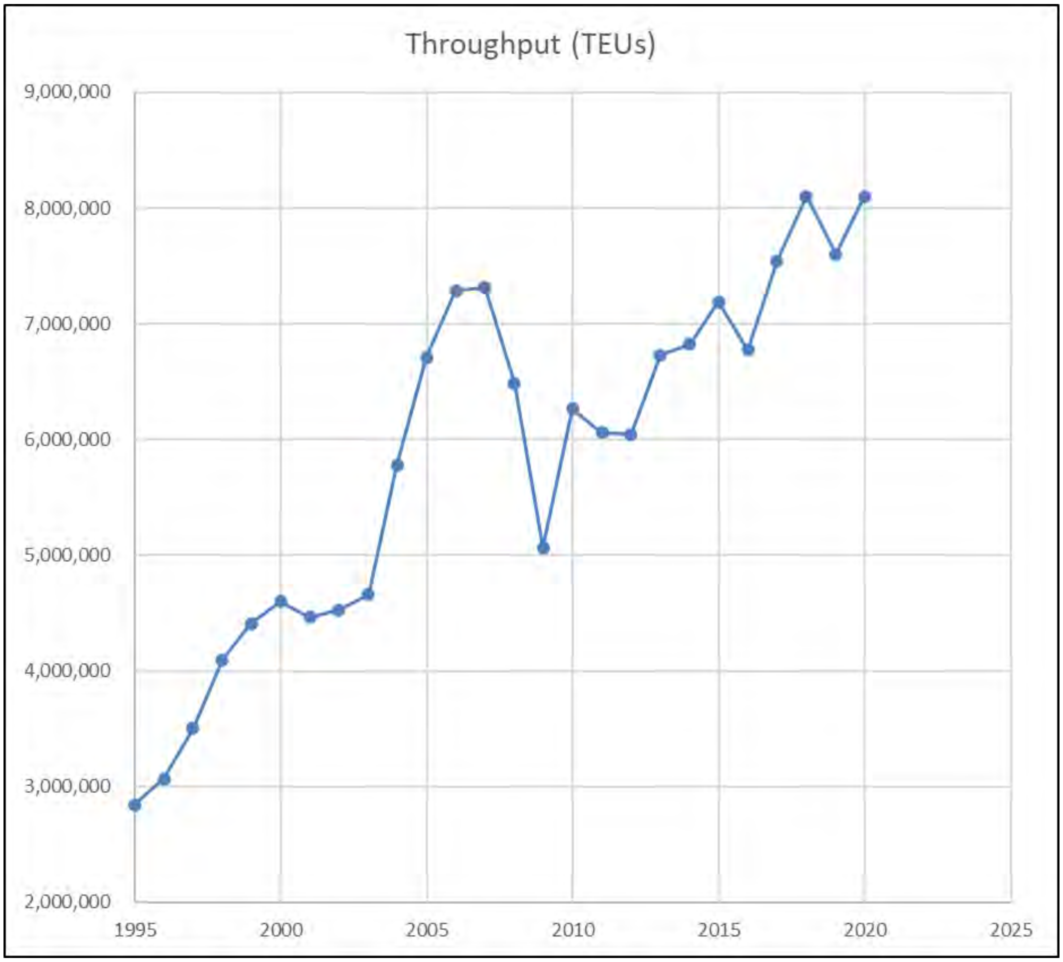


Figure 2-1 Port of Long Beach Historical Container Throughput

Future Without Project Condition

An essential step when evaluating navigation improvements is to analyze the types and volumes of cargo moving through the port. Trends in cargo history can offer insights into a port's long-term trade forecasts and thus the estimated cargo volume upon which future vessel calls are based. Under future without and future with project conditions, the same volume of cargo is assumed to move through the POLB. However, a deepening project will allow shippers to load their vessels more efficiently or take advantage of larger vessels. This efficiency translates to savings and is the main driver of NED. Strong growth in throughput is projected to continue until the POLB's facilities reach capacity, which is anticipated in around 2035, as shown in **Figure 2-2**.

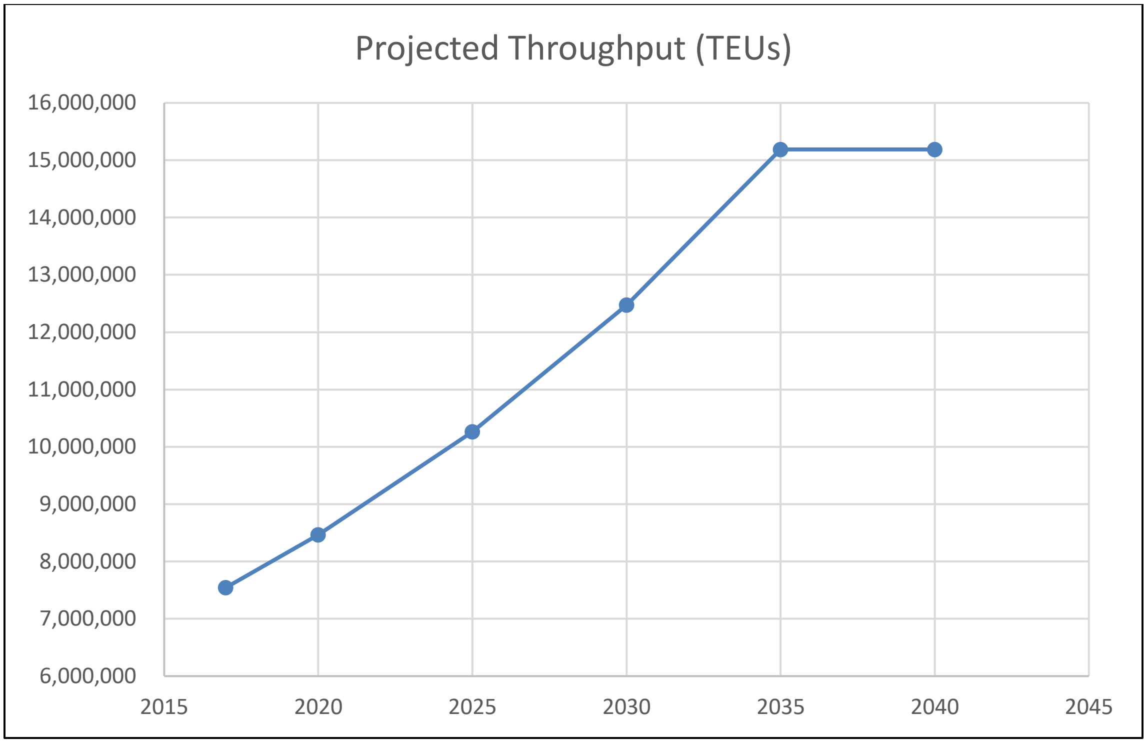


Figure 2-2 Port of Long Beach Projected Container Throughput

2.3.2 Liquid Bulk

Liquid forms of bulk cargo include crude oil, gasoline and miscellaneous chemicals. The primary liquid bulk commodity for the POLB is crude oil imports.

Historic and Existing Condition

Figure 2-3 illustrates the historic import tonnage of crude oil, the primary liquid bulk commodity for the POLB. From 2006 through 2016, there was no discernable trend in tonnage. In 2016, crude oil tonnage was above 17 million tons. On trend with the historic container throughput, there was a dip in crude oil tonnages from 2008-2010, likely for the same reason.

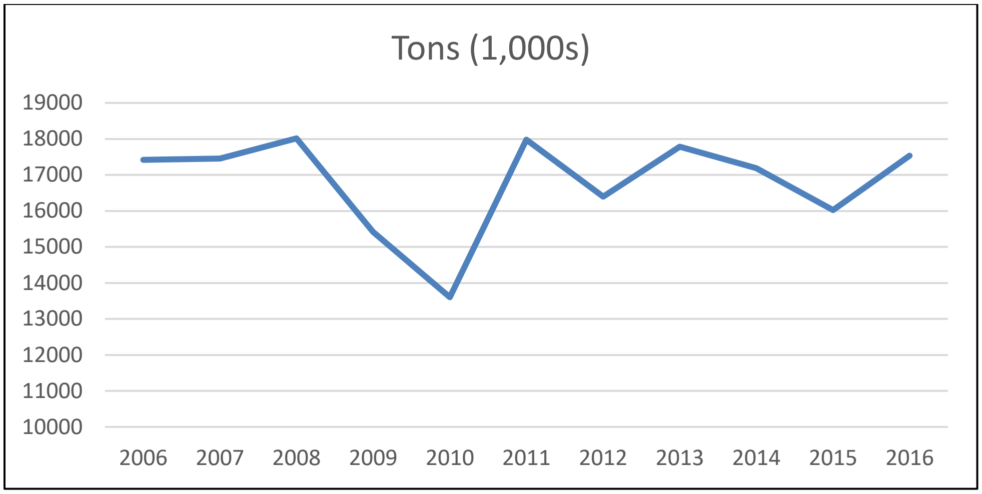


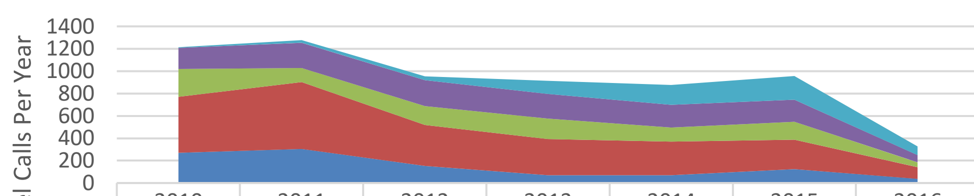
Figure 2-3 Port of Long Beach Historical Crude Oil Imports

Future Without Project Condition

Projected imports are not anticipated to be significantly different from historical volumes.

2.4 Container Vessel Fleet Composition

Data for the existing fleet was obtained from the POLB and a variety of container ships called to the port between 2010 and 2016. These ships are classified as sub-Panamax (SPX), Panamax (PX), Post-Panamax Generation 1 (PPX1), Post-Panamax Generation II (PPX2), Post-Panamax Generation III (PPX3), and Post-Panamax Generation IV (PPX4) depending on their capacity. The vessels are distinguished based on physical and operation characteristics, including lengths overall (LOA), design draft, beam, speed, and TEU capacity. It is common practice to separate the containership fleet in TEU bands or classes to analyze supply within the industry. However, due to the evolution of vessel design over time, these TEU bands do not correspond to a breakdown of the fleet by dimensions such as beam or draft. **Figure 2-4** shows the vessel calls at the POLB from 2010 - 2016, broken down by vessel class.



	2010	2011	2012	2013	2014	2015	2016
PPX4	0	0	0	0	0	0	1
PPX3	5	24	33	118	176	210	78
PPX2	190	225	232	220	202	197	64
PPX1	247	126	167	182	128	161	43
PX	500	597	367	324	298	262	105
SPX	271	305	153	70	71	125	37

Figure 2-4 POLB Container Vessel Calls by Class, 2010-2016

2.5 Design Vessel

"For deep-draft projects, the design ship or ships is/are selected on the basis of economic studies of the types and sizes of the ship fleet expected to use the proposed channel over the project life. The design ship is chosen as the maximum or near maximum size ship in the forecasted fleet" (USACE 1984, 1995, 1999).

The selection of vessel specifications for fleet service forecasts sometimes poses unique concerns given requirements to evaluate design and improvements for waterway systems over time. Generally, waterway improvements should be designed to be optimized across the entire forecasted fleet. In this case, it would include service by several forms or types of vessels (i.e., tankers and dry cargo carriers, etc.). Where vessel designs are relatively mature (tankers and dry bulk carriers), the task is straightforward. However, fully cellular containership designs are evolving. On a world fleet basis, containership designs continue to change with respect to size and cargo carrying capacity and have not reached a limiting threshold for rated carrying capacity as measured by weight (deadweight tonnage) or nominal intake for standard-unit slot capacity (i.e., nominal TEUs).

Building trends for the first two groupings (PPX1 and PPX2, with beams typically less than 150 to 152 feet) are reasonably well established with respect to physical dimensions and size relative to displacement. The PPX3 class of containership (beams exceeding 150 feet through 168 feet) is less defined. This class has dimensions designed to consider the specifications of the new locks under construction for the Panama Canal expansion. The length and beam limitations of the new locks for the Panama Canal are known and these parameters are considered fixed. Conversely, while the specification for draft typically does have a limit, actual immersed draft can be adjusted or allowed to vary based on variability in cargo density, loading, and utilization of weight carrying capacity of the hull. The Generation IV has a beam length between 172-200 feet and is less defined.

Table 2-1 shows the containerized design vessel specification that was recommended by the Economics team in collaboration with the USACE's Institute for Water Resources. **Table 2-2** shows the liquid bulk design vessel specifications.

Table 2-1 Containerized Design Vessel

Triple E ("Gen IV")	
Maximum Draft:	52 feet
LOA:	1,300 feet
Beam:	193 feet
DWT:	188,000
TEUs:	18,000 - 19,000

Table 2-2 Liquid Bulk Design Vessel

Very Large Crude Carriers (VLCC)	
Maximum Draft:	70 feet
LOA:	1,100 feet
Beam:	200-210 feet
DWT:	325,000

2.6 Shipping Operations – Underkeel Clearance

The measure of underkeel clearance (UKC) for economic studies is applied according to planning guidance (ER 1105-2-100; IWR Report 10-R-4). According to this guidance, UKC is evaluated based on actual vessel operator and pilot practice within a harbor and subject to present conditions, with adjustment as appropriate or practical for with-project conditions. Generally, practices for UKC are determined through review of written pilotage rules and guidelines, interviews with pilots and vessel operators, and analysis of actual past and present practices based on relevant data for vessel movements. Typically, UKC is measured relative to immersed vessel draft in the static condition (i.e., motionless at dockside). When clearance is measured in the static condition, explicit allowances for squat, trim, and sinkage are unnecessary. Evaluation of when the vessel moves, or initiates transit relative to immersed draft, tide stage, and commensurate water depth allows reasonable evaluation of clearance throughout the time of vessel transit.

Regarding vessel size under with-project conditions, it is understood that most Post-Panamax vessels need more clearance depending on blockage factors, currents, and relative confinement of the waterway. As such, most Post-Panamax containerships need about 4 to 5 feet for vessels with breadths of 120 to nearly 200 feet, lengths overall (LOA) approaching 1,300 feet and summer loadline drafts of 46 to approximately 55 feet. **Table 2-3** displays the UKC requirements for the Sub-Panamax through the Post-Panamax Generation IV.

Table 2-3 Containerized Vessel Underkeel Clearance

Vessel Class	Total Underkeel Clearance (feet)
Sub-Panamax (SPX)	4.0
Panamax (PX)	4.0
Post-Panamax Gen I (PPX1)	4.0
Post-Panamax Gen II (PPX2)	4.5
Post-Panamax Gen III (PPX3)	4.5
Post-Panamax Gen IV (PPX4)	5.0

2.7 Existing Navigation Configuration and Dimensions

2.7.1 Existing Conditions

Described in Section 1.7.

2.7.2 Future Without Project Conditions

It is assumed that without a project, the federal channels would continue to be maintained at their currently authorized depths and dimensions.

2.8 Port Facilities and Operations

2.8.1 Existing Conditions

The POLB is located on the shoreline of San Pedro Bay in southeastern Los Angeles County, adjacent to the Port of Los Angeles, which is operated by the City of Los Angeles Harbor Department. The Port is served by the Long Beach Freeway (Interstate [I]-710), which connects it to downtown Los Angeles, and by the Terminal Island Freeway (SR-47) connecting the Port with the ICTF in Carson. The Alameda Corridor, a fully grade-separated rail line, runs between the two San Pedro Bay Ports and downtown Los Angeles, connecting the ports with the nationwide rail network

The Port consists of approximately 3,500 acres of land and 4,600 acres of water. It includes berths for ocean going vessels (OGVs) on 10 piers designated by letters (A through G, J, S, and T). Pier H, located in Queensway Bay, supports recreational and visitor-serving activities within the Harbor District[8] and is administered through lease agreements with the City of Long Beach.

The Port leases land to approximately 22 marine terminals, including 5 break bulk terminals, 11 bulk terminals, and 6 container terminals, as well as numerous support and ancillary businesses such as trucking operations, warehouses, marine construction facilities, tugboat and pilot services, marine fuel providers, and a sport fishing operation. In addition, the Port includes a number of oil operating areas that are devoted to the continued production of oil from the Long Beach and Wilmington Oil Fields. Port operations support approximately 51,090 jobs in Long Beach and over 316,000 jobs in the five-county Southern California region (POLB 2018a).

Containers are the primary cargo moving through the Port. The Port’s six container terminals have 80 berths and 71 modern, large gantry cranes for loading and unloading container vessels. In 2018, the busiest year in its history, the Port handled a record 8.1 million TEUs, a measure of containerized cargo volume roughly equivalent to a twenty-foot long shipping container. Other major cargoes include liquid bulk such as crude oil, refined products, and chemicals; dry bulk cargoes such as gypsum, cement, aggregate, scrap metal, and petroleum coke; automobiles; and “break bulk” cargoes such as newsprint, forest products, fruit, steel coils and shapes, and other cargoes that require individualized handling.

Vessels calling at the Port transit through navigational channels within the harbor, to and from their berths at marine terminals where their cargo is loaded and unloaded. In 2017, there were approximately 2,805 calls by OGVs. Container vessels are loaded and unloaded by large, electric-powered gantry cranes mounted on rails along the wharf face. Other cargoes are loaded and unloaded with conveyors (for most dry bulk), pipelines (for liquid bulk), or dock cranes, although automobiles are driven off the vessels onto the wharf. The amount of cargo a marine terminal handles in a given time period is defined as its throughput. A terminal’s maximum practical throughput is its capacity, which is how much cargo the terminal could handle given its size, configuration, and equipment. A terminal’s capacity may be limited by how many vessels it can handle (“berth-constrained”), or by how much cargo its landside facilities (e.g., container yard, truck gate, pumps, pipelines, and storage tanks) can handle (“yard-constrained”), or by other factors.

[8] The Harbor District is a geographic reference that refers to a specific area of the City of Long Beach that includes land and water areas and the city’s port. The Harbor Department of the City of Long Beach manages nearly every portion of the Harbor District, and all affairs of the City’s port. The Port of Long Beach is simply a trade name for the Harbor Department.

Containers are sorted at the marine terminal container yards by a variety of diesel- or natural-gas-powered, diesel-electric hybrid, and electric-powered mobile cargo handling equipment (CHE). Import containers that are loaded onto trucks are transported to destinations in Southern California and adjacent states, such as regional distribution centers and transloading warehouses. Portions of the import containers that are destined for more distant points in the central and eastern U.S. are loaded onto trains, either directly in the marine terminals or by being trucked to local intermodal railyards. Export containers follow the reverse pathways, with the exception that very few are handled at transloading facilities. In 2018, the Port handled 8.1 million TEUs, approximately 23 percent of which were moved by on-dock rail and the rest by trucks. Liquid bulk cargoes are transported to and from the marine terminals primarily by pipeline, although some is handled by trucks and railcars. The remaining cargo types are moved to and from marine terminals by trucks and trains. Most container terminals operate five dayshifts, Monday through Friday; and typically, four to five off-peak shifts during weeknights and Saturdays.

2.8.2 Future Without Project Conditions

Cargo may vary in the future as investments are made in Port facilities and supporting infrastructure, and long-term leases are renewed or changed at individual terminals. The POLB's share of cargo, however, is expected to remain relatively consistent with growth in the future being attributed to Gross Domestic Product growth for the U.S. West Coast and associated hinterland based on information provided in the Mercator Report's commodity forecast completed for this study in 2016. Specifically, the analysis took into account that the POLB will receive a relatively similar share of regional cargo volumes with or without the project.

2.9 Maintenance Dredging

2.9.1 Existing Conditions

Since completion of the current federal channel in 2001, maintenance dredging has not been performed. As of 2019, there is one area that requires about 40,000 cy of maintenance dredging.

2.9.2 Future Without Project Conditions

Maintenance dredging is not anticipated to increase in a future without project condition.

3 AFFECTED ENVIRONMENT/EXISTING ENVIRONMENTAL SETTING

This section of the IFR describes the existing environmental conditions within the study area, including the two ocean disposal sites and the nearshore placement site. The environmental conditions are described for each environmental resource topic and issue. Additional details regarding the applicable laws and regulations are also provided in Section 11 of this IFR. The area of influence for each environmental topic/issue varies. This affected environment section defines the area of influence relevant for each environmental topic/issue, and the conditions within that area that may be affected, directly or indirectly, because of project implementation. For example, aesthetics has a local area of influence confined to the study area whereas air quality issues have a broader or more regional context.

Table 3-1 below summarizes the area of influence for each of the environmental topics/issues.

Table 3-1 Environmental Topics/Issues and Area of Influence

Environmental Topic/Issue	Area of Influence
3.1 Topography, Geology, and Geography	Study area
3.2 Oceanographic Characteristics and Coastal Processes	Study area
3.3 Water and Sediment Quality	Study area
3.4 Biological Resources	Study area, transit lanes
3.5 Air Quality	South Coast Air Basin
3.6 Greenhouse Gases	Study area
3.7 Aesthetics	Study area
3.8 Cultural Resources	Study area
3.9 Noise	Study area
3.10 Socioeconomics [and Commercial Fishing]	Study area
3.11 Transportation	Study area and City streets
3.12 Land Use	Study area
3.13 Recreation	Study area
3.14 Public Safety	Study area
3.15 Public Utilities	Study area

3.1 Topography, Geology, and Geography

3.1.1 Geographic Setting

The study area is located on the coast of the Los Angeles Basin, which lies within the seismically active southern California area. The Los Angeles Basin is a relatively flat alluvial plain bounded on the north by the Santa Monica Mountains, on the east by the Santa Ana Mountains and San Joaquin Hills, and on the south and west by the Pacific Ocean. The basin is underlain by a major structural depression that has been the site of deposition and subsidence since Miocene times (26 to 12 million years before present) and is notable for its relative complexity and prolific oil production (USACE 1995).

3.1.2 Local Marine Geology

The study area is located entirely within the San Pedro Shelf, which is a relatively flat, isolated, and narrow projection of the continental shelf. The bathymetry of the ocean surface at the shelf mimics this flat surface and slopes to the south at a rate of 10 feet per mile. The natural water depth of the Bay ranges from 20 to 50 feet. These depths have been increased from 50 to 70 feet locally due to dredging along the man-made channels and harbors and basins, as part of the creation of the marine infrastructure in the study area.

Based on background information, the uppermost 20 to 100 feet of material beneath the bay is unconsolidated Quaternary-aged marine sediments. Cobble and boulder sized rock is present seaward of the breakwaters and has been encountered during dredging within the Approach Channel. Sediments consist primarily of alternating layers of sand and silt, with very minor amounts of clay, gravel, and seashells. The shelf sediment is consistently found across the study area and all man-made features in the study area are founded upon it. The thickness of the sand and silt layer vary in thickness 5 to 50 feet and increases in density with depth. Clay, gravel, and seashells are relegated to the uppermost 50 feet of the sediment and are found as thin localized lenses mixed within the thicker layers of sand and silt. The very top of the ocean bottom sediment consists of a semi-floating, light layer of mud (suspended clay and silt) atop a very loose layer of sand to silt. The thickness of the floating layer is approximately 2 to 6 inches.

The Long Beach harbor and marina infrastructure in the San Pedro Bay is composed of an anthropogenic (man-made) fill. The fill consists of loose sand, silty sand and silt that was placed as a result of sediments dredged from the San Pedro Bay since the 1930s.

3.1.3 Faulting and Seismicity

All of southern California including the study area is seismically active. The study area is in the San Pedro Bay shelf, whose seismicity is characteristic of recurring small earthquakes with moment magnitudes less than 4.5. The Bay is located within the inner margin of the southern California Continental Borderland, and north of the Newport submarine canyon and south of the Palos Verdes Peninsula. This margin trends from southeast to northwest with a system of marine basins and ridges which are bound by several active faults.

Three major active faults in the vicinity of the study area are the San Andreas, Palos Verdes and Newport-Inglewood. They are all capable of producing a moment magnitude 7 earthquake. The San Andreas is the largest principal active fault in Southern California and is located approximately 65 miles north-northeast of the study area. The Newport-Inglewood and Palos Verdes are located approximately 2 miles northeast and 2 miles southeast of the study area, respectively. Portions of the Palos Verdes fault pass through the west side of port of Long Beach and are outside the study project limits. Historically, the study area has been subjected to seismic events with a Magnitude 6 (1933 Long Beach earthquake – Magnitude 6.3). A study by EMI (2015), presents the geography, source, and probabilistic seismic hazard parameters for the local faults.

Of the local faults discussed by Earth Mechanics, Inc. (2015), the THUMS-Huntington Beach and Compton Thrust faults are considered the most significant tectonic features from the San Pedro margin as they both pass directly through the POLB. Both faults are potentially active and can generate a moment magnitude 7 earthquake.

3.1.4 Topography and Bathymetry

Long Beach Harbor is in San Pedro Bay, a natural embayment formed by a westerly protrusion of the coastline and the dominant onshore topographic feature, the Palos Verdes Peninsula. Deep channels and basins have been created by dredge and fill operations in the otherwise gradually sloping sediments that underlie the harbor. Outside of the engineered alterations to the bathymetry of Long Beach Harbor, the gentle slope of the ocean floor does not reach depths of 70 to 75 feet until more than 2 miles from Queens

Gate. Throughout the study area, the extremely flat ocean floor slopes an average of one percent for the first 2,000 feet from the shoreline; slope then decreases to 0.3 percent for the next 3 miles seaward (USACE 1995).

3.1.5 Ocean Dredged Material Disposal Sites

Both the LA-2 and LA-3 study areas are located on the San Pedro Shelf, which is characterized by fairly flat, featureless topography out to a water depth of about 197 feet. Two prominent features offshore of Orange County are the Newport and San Gabriel submarine canyons, which incise the shelf and terminate in relatively shallow water. The LA-3 study area is situated over the slop of Newport Canyon. The Newport-Inglewood fault, located in the vicinity of the LA-3 site, is a narrow zone of deformation characterized by a northwest-trending chain of low hills and fault scarps. The fault extends over 60 kilometers (32.4 nautical miles) from just offshore Dana Point northwesterly through Newport Beach to just north of Culver City in Los Angeles County (USEPA and USACE 2005).

3.2 Oceanographic Characteristics and Coastal Processes

3.2.1 Coastal Processes

Water levels within the POLB consist of three primary factors: 1) astronomical tides, 2) storm surge and wave set-up, and 3) long-term changes in sea level. Each of these factors is briefly described in the following sections. These processes are similar for the study area within the POLB, including the nearshore placement site and the two ODMDS.

Tides

Tides along the southern California coastline are of the mixed semi-diurnal type. Typically, a lunar day (about 25 hours) consists of two high and two low tides, each of different magnitudes. A lower low tide normally follows the higher high tide by approximately seven to eight hours while the time to return to the next higher high tide (through higher low and lower high water levels) is usually approximately 17 hours. Annual tidal peaks typically occur during the summer and winter seasons following a solstice. The increased tidal elevations during the winter season can exacerbate the coastal impacts of winter storms. Tidal datum for the San Pedro Bay are listed in **Table 3-2**. The mean range of the tide is 3.81 feet, while the great diurnal range is 5.49 feet.

Table 3-2 Tidal Datum at Los Angeles, CA, NOAA Station 9410660

Datum Plane	Elevation, feet, MLLW
Highest Observed Water Level	7.92
Mean Higher High Water (MHHW)	5.49
Mean High Water (MHW)	4.75
Mean Tide Level (MTL)	2.84
Mean Sea Level (MSL)	2.82
Mean Low Water (MLW)	0.94
North American Vertical Datum 1988 (NAVD88)	0.20
Mean Lower Low Water (MLLW)	0.00
Lowest Observed Water Level	-2.73

Source: https://tidesandcurrents.noaa.gov/datums.html?id=9410660

Sea Level Change

Sea level change is an uncertainty, potentially increasing the frequency of extreme water levels. Planning guidance in the form of an USACE Engineering Regulation (ER), USACE ER 1100-2-8162 dated 15 June 2019 (USACE 2019), incorporates new information, including projections by the Intergovernmental Panel on Climate Change and National Research Council (IPCC 2007, NRC 2012), and USACE Engineering Pamphlet (EP) 1100-2-1. Planning studies and engineering designs are to evaluate the entire range of possible future rates of sea-level change (SLC), represented by three scenarios of "low," "intermediate," and "high" sea-level change. ER 1100-2-8162 also recommends that a National Oceanic and Atmospheric Administration (NOAA) water level station should be used with a period of record of at least 40 years. The use of sea level change scenarios as opposed to individual scenario probabilities underscores the uncertainty in how local relative sea levels will play out into the future. At any location, changes in local relative sea level (LRSL) reflect the integrated effects of global mean sea level (GMSL) change plus local or regional changes of geologic, oceanographic, or atmospheric origin.

The low, intermediate, and high scenarios at NOAA tide gauges were obtained through the USACE on-line sea level calculator at http://www.corpsclimate.us/ccaceslcurves.cfm. Using the USACE Institute of Water Resources (IWR) Sea Level Change calculator and data from Los Angeles, CA NOAA gage 9410660, provides an estimated sea level change of 0.00272 feet per year. **Figure 3-1** shows the relative sea level change projections for the three SLC scenarios. As shown in **Table 3-3**, projecting the three rates of change to the year 2076, which corresponds to a 50 year period of analysis, provides us with predicted low level rise of 0.14 feet, intermediate of 0.67 feet, and high level rise of 2.36 feet. Design of the Project is based on SLC at the Intermediate curve; of note, any increase in water lever through SLC would increase UKC in the project area and reduce the frequency of future maintenance dredging activities.

The POLB developed an extensive Climate Adaptation and Coastal Resiliency Plan (CACRP) (POLB 2016) in accordance with California Assembly Bill 691 (2014) to manage the direct and indirect risks associated with climate change and coastal hazards and to ensure continuity of Port operations within the Port's Harbor District. This plan identifies strategies for adaptation to climate change impacts throughout the port. Port guidelines and policies for future planning studies are influenced by adding sea level rise analysis to all future projects requiring a harbor development permit. The POLB CACRP has analyzed the impact from SLR to all LSF through the year 2100, including inundation modeling for a lea level rise of 55" (4.6 feet) in conjunction with a 100-year storm event. Presently, there are no POLB facilities that will be impacted within the planning horizon of this project (50-year period of analysis from 2027-2076 for any of the USACE SLR curves. LSF are similarly not at risk through the adaptation horizon of the project (2077-2127) for the low or intermediate SLR curves; however, the risk is uncertain beyond 2100 for the high SLR curve.

The POLB CACRP addresses the Port's plans to address future sea level rise through:

- Governance: By adding language to overarching policies/plans and in technical guidelines, both planners and designers will start thinking about climate change from the start of a project
- Initiatives: By introducing initiatives, stakeholders and Port staff can continue to evaluate impacts on operations and physical damage that are associated specifically with climate change
- Infrastructure: By modifying existing infrastructure, such as strengthening sea walls or raising electrical equipment, the Port can be more prepared for future climate-related events.

Further discussion of the CACRP and a secondary analysis of SLC performed by the POLB is discussed in Section 12.2.17, in accordance with CEQA certification for the state of California.

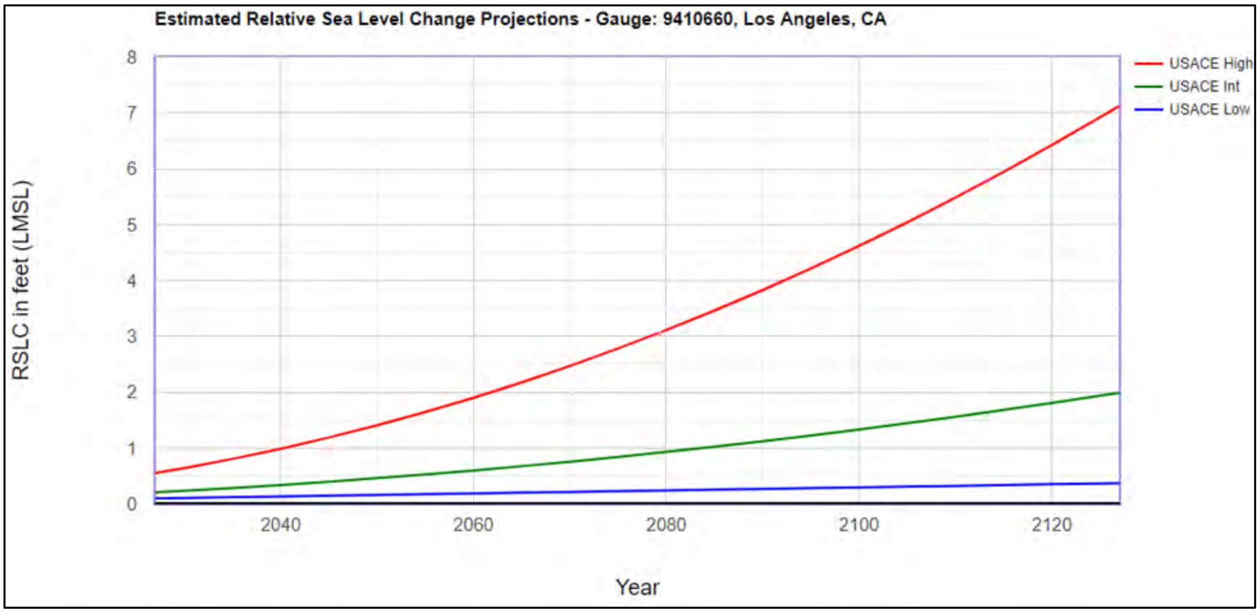


Figure 3-1 Sea Level Rise Projections, Los Angeles, CA, NOAA gage 9410660

Table 3-3 Predicted Relative Sea Level Change, Los Angeles, CA, NOAA gage 9410660

9410660, Los Angeles, CA
NOAA's 2006 Published Rate: 0.00272 feet/yr
All values are expressed in feet relative to LMSL

Year	USACE Low	USACE Int	USACE High
2027	0.10	0.20	0.55
2030	0.10	0.23	0.64
2035	0.12	0.28	0.80
2040	0.13	0.34	0.99
2045	0.14	0.39	1.19
2050	0.16	0.46	1.41
2055	0.17	0.52	1.64
2060	0.19	0.60	1.90
2065	0.20	0.67	2.17
2070	0.21	0.75	2.47
2075	0.23	0.84	2.78

Year	USACE Low	USACE Int	USACE High
2080	0.24	0.93	3.11
2085	0.25	1.02	3.46
2090	0.27	1.12	3.83
2095	0.28	1.22	4.21
2100	0.29	1.33	4.62
2105	0.31	1.44	5.04
2110	0.32	1.56	5.48
2115	0.34	1.68	5.94
2120	0.35	1.81	6.42
2125	0.36	1.94	6.92
2127	0.37	1.99	7.12

Waves

Due to the sheltering effect of Palos Verdes peninsula, Santa Catalina Island, and San Clemente Island, deepwater waves predominantly approach San Pedro Bay from the west and south. Extratropical storm waves approach from the west, while tropical and pre-frontal sea waves approach from the south. More frequent storm waves from the south occur primarily in the summer, while larger, more threatening storm waves occur less frequently in the winter and originate from the west. The Middle and Long Beach breakwaters provide protection for the port from approaching waves. Outside the breakwaters, waves of

10-12 feet are common. The typical swell that penetrates into the port have a period upwards of 10 seconds. When wind generated waves occur within the breakwaters, they are typically small (< 1 foot wave height) but can reach up to 4 feet with 4 second periods during extreme Santa Ana Winds conditions.

Currents

Offshore currents, including the California Current, the California Undercurrent, the Davidson Current, and the Southern California Countercurrent (also known as the Southern California Eddy), consist of major large-scale coastal currents, constituting the mean seasonal oceanic circulation with induced tidal and event specific fluctuations on a temporal scale of 3 to 10 days (Hickey 1979).

The California Current is the equator-ward flow of water off the coast of California and is characterized as a wide, sluggish body of water that has relatively low levels of temperature and salinity. Peak currents with a mean speed of approximately 25 to 49 feet per minute occur in summer following several months of persistent northwesterly winds (Schwartzlose and Reid 1972).

The California Undercurrent is a subsurface northward flow that occurs below the main pycnocline and seaward of the continental shelf. The mean speeds are low, on the order of 10 to 20 feet per minute (Schwartzlose and Reid 1972).

The Davidson Current is a northward flowing nearshore current that is associated with winter wind patterns north of Point Conception. The current, which has average velocities between 30 and 60 feet per minute, is typically found off the California coast from mid-November to mid-February, when southerly winds occur along the coast (Schwartzlose and Reid 1972).

The Southern California Countercurrent is the inshore part of a large semi-permanent eddy rotating cyclonically in the Southern California Bight south of Point Conception. Maximum velocities during the winter months have been observed to be as high as 69 to 79 feet per minute (Maloney and Chan 1974).

Maximum flood and ebb tidal velocities occur at Queens Gate, with surface velocities reaching up to 1.1 feet per second. Tidal circulation is generally clockwise within the Port of Long Beach, with flows of 0.2 - 0.3 feet per second in inner channels and 0.3 – 1.1 feet per second at the entrance channel near Queens Gate. Tidal flushing is the primary influence on water quality in the inner Port areas.

3.3 Water and Sediment Quality

3.3.1 Water Quality

Parameters that affect the quality of water in the environment can be based on physical, chemical or biological factors. Physical properties of water quality include temperature and turbidity. Chemical characteristics involve parameters such as pH and dissolved oxygen, but measures of toxicity and heavy metals in the water column are also related to chemical water quality. Biological indicators of water quality include algae, aquatic invertebrates, and phytoplankton.

Physical and Chemical Characteristics

Marine water quality in the Port is affected primarily by climate, circulation (including tidal currents), biological activity, surface runoff, and pollutant loadings related to industrial activities within the Port's Harbor District and the surrounding watershed. Suspension of bottom sediments, such as from dredging or ship propeller disturbance, can also affect water quality through release of contaminants and by reducing dissolved oxygen (DO) concentrations.

Water quality is typically characterized by salinity, pH, temperature, clarity, and DO. **Table 3-4** characterizes the overall water quality parameters for the study area, including the nearshore placement site and the two ODMDS.

Table 3-4 Water Quality Characteristics

Parameters	Study Area
Salinity (ppt)	33.5
Surface Temperature (F)	59.4-70.1
pH	7.74 - 8.19
Clarity (% transmittance)	28.8 – 82.5
D.O. (mg/l)	6.04-10.10

Source: MBC and Merkel & Associates 2016

Temperature

Temperature of waters in the Port shows seasonal and spatial variations (e.g., lower temperatures with increasing depth) that reflect the influence of the ocean, local climate, physical configuration of the harbor, and circulation patterns. General trends in water temperature consist of uniform, cooler temperatures throughout the water column in the winter and spring and warmer but stratified temperatures, with cooler waters at the bottom, in the summer and fall. At the two ODMDS, seasonal temperature structures are typical of the Southern California Bight. In winter, the water column is unstratified or weakly stratified, with temperature difference of less than 2°C (3.6°F) between the surface and 60 meters (197 feet) depth (MITECH 1990). In spring, seasonal upwelling leads to increasing stratification of the water column, and a thermocline forms.

Salinity

Salinity in harbor waters varies due to the effects of stormwater runoff, rainfall, and evaporation. Low surface water salinities (i.e., less than 10 practical salinity units) can occur during rain events (MBC and Merkel & Associates 2016). At the two ODMDS, salinity is more uniform; seasonal changes in surface salinity can be pronounced, with salinity reductions of up to 4 to 5 ppt noted in the upper 10 meters (32.8 feet) of the water column due to freshwater runoff during winter.

Dissolved Oxygen

DO is a principal indicator of marine water quality. DO concentrations may vary considerably based on the influence of a number of parameters such as respiration of plants and other organisms, waste (nutrient) discharges, surface water mixing through wave action, diffusion rates at the water surface, and disturbance of anaerobic bottom sediments. At the two ODMDS, the long-term range of DO concentrations is approximately 6-100 mg/l at the surface and 3-7 mg/l at a depth of 90 meters (295 feet).

pH

The pH of ocean water is affected by plant and animal metabolism, mixing with water with different pH values from external sources and, on a small scale, by disturbances in the water column that cause redistribution of waters with varying pH levels or the resuspension of bottom sediments.

Suspended Particulate Matter (Turbidity) and Light Transmission

Turbidity generally increases as a result of one or a combination of the following conditions: fine sediment from terrestrial runoff or resuspension of fine bottom sediments; planktonic bloom; and dredging activities. Historically, water clarity in the San Pedro Bay Port Complex has varied substantially with secchi disk readings ranging from 5 to 16 feet (MBC and Merkel & Associates 2016). At the two ODMDS, typical transmissivity is in the upper 80 percent range.

Contaminants

Contaminants in the water column can include metals, particularly cadmium, chromium, copper, lead, mercury, nickel, silver, and zinc; chlorinated pesticides (e.g., Dichlorodiphenyltrichloroethane [DDT] and chlordanes); polychlorinated biphenyls (PCBs); and petroleum hydrocarbons, including polycyclic aromatic hydrocarbons (PAHs), as well as fecal indicator bacteria. Water quality has improved considerably recently owing to better control of contaminants entering the harbor from the Port's Harbor District as well as the upland watershed of Dominguez Channel and the Los Angeles River. At the two ODMDS, contaminants in the water column are generally below detection levels, including hydrocarbons, nutrients, and hydrocarbons.

3.3.2 Sediment Quality

The Port consists of a network of upland/artificial fill areas, and deep channels and basins that have been created by dredge operations in the gradually sloping sediments that underlie the harbor. Outside of the harbor, the gently sloping ocean floor does not reach depths of 70 to 75 feet until more than two miles from Queens Gate. Sediments within the San Pedro Bay Port Complex vary spatially, but mainly consist of silt with smaller amounts of sand and clay (MBC and Merkel & Associates 2016).

Past dredging in the Approach Channel through Queens Gate to maintain authorized depths was accompanied by sediment testing programs. From November 1998 to December 2000, the POLB Approach Channel was deepened from -60 feet MLLW to -76 feet MLLW. The Approach Channel was sampled and tested in 1994. The only organic contamination detected in the core segments were phthalate compounds and low levels of tributyltin (USACE 2018). All detected metal concentrations were below NOAA effects range low (ERL) values. A second sediment testing program was conducted in 2018 in support of upcoming maintenance dredging in the Approach Channel to remove high spots. The POLB Approach Channel sediments showed moderate chemical contamination. Chemical data for some constituents were above ERL levels and human health objectives. In terms of ecological effects, total DDT and 4,4' Dichlorodiphenyldichloroethylene (DDE) were the only contaminants of concern in the POLB Approach Channel composite sample. None of the sediments from any of the composite areas were toxic to solid phase or suspended particulate phase tests. All sediments were determined to be suitable for ocean disposal (USACE 2018).

Portions of the Main Channel were dredged in 2014 to complete the Main Channel Deepening Project. Dredged materials were disposed of within Slip 1 of the Middle Harbor Project. This dredging was evaluated in 2013 (USACE 2013). Metals were detected at low levels. Contaminant concentrations were described as below levels suspected of causing biological effects.

Sediments in the West Basin were subject to several different testing efforts. One was in 2011 associated with cleanup of Installation Restoration (IR) Site 7 Areas of Ecological Concern (AOECs) requiring remediation located in the West Basin area of the Port, most of which were reverted to the Port after closure of the Long Beach Naval Complex (LBNC). The AOECs (AOEC-A and AOEC-C) were located outside and adjacent to the proposed dredge footprint in West Basin proposed for the proposed project (POLB 2011). Another recent sediment effort was in 2014 when sediments in the West Basin were evaluated as a source of fill material for the Middle Harbor Redevelopment Project as well as navigation safety improvements within the West Basin. This area includes the proposed deepening area within the West Basin and has been deepened to a considerable extent. Sediments showed moderate chemical contamination (POLB 2014).

Sediments in the proposed Pier J approach channel have not been dredged. This area was naturally deep enough to accommodate container vessels going to Pier J without dredging. Dredging in this area would be through sediments that have not historically been dredged and are expected to be suitable for open ocean disposal. Such sediments generally have not been exposed to anthropogenic sources of contamination. Dredging has occurred in the Turning Basin portion of the channel. Dredging likely last occurred in the mid-1990s. No records of sediment quality have been found or the disposal option used for these sediments. These sediments likely would have been disposed of at an ocean disposal site and were presumably uncontaminated.

Additional information on physical character, chemistry, and biotoxicity character of sediment are found in Appendix C, Geotechnical Engineering.

Concentrations of many sediment constituents were similar among regions sampled at LA-2 and LA-3, with two general differences being (1) slightly higher mean concentrations of most sediment metals at LA-3, and (2) higher mean PCB concentrations in sediments at LA-2. Higher total DDT concentrations at LA-2 resulted from high concentrations of DDT congeners in sediments at one station adjacent to the site boundary.

3.4 Biological Resources

3.4.1 Marine Shoreline and Offshore Habitats

Habitats

Habitats located in the study area include soft-bottom communities and hard bottom communities. Biological resources within the San Pedro Bay Port Complex have been studied since the 1950s. Cumulatively, these studies provide harbor-wide baseline and historical trend information. Comprehensive studies were conducted in the 1970s to characterize the harbor environment and evaluate impacts from dredging and San Pedro Bay Port Complex expansion projects (HEP 1980). Since then, substantial additional surveys of biological resources have been conducted to support various projects, including in the POLB in 1983−1984 (MBC 1984) and 1990−1993 (MBC 1994); in the Port of Los Angeles in 1986−1987 (MEC 1988); and throughout the entire San Pedro Bay Port Complex in 2000 (MEC 2002), 2008 (SAIC 2010), and 2013–2014 (MBC and Merkel & Associates 2016). Beginning with the 2000 baseline survey, the POLB, in collaboration with the Port of Los Angeles, has been conducting these San Pedro Bay Port Complex-wide assessments of biological resources and habitat conditions on a recurring basis. Hereafter, the three most recent San Pedro Bay-wide studies are referred to by the years of data collection, 2000, 2008, and 2013–2014. Data collected more recently (2018) are being analyzed and a report of the results and conclusions should be available in mid-2020.

Soft Bottom Communities

Two hundred sixty-four species of benthic infauna (species living within the sediments) were collected across the San Pedro Bay Port complex during surveys conducted in 2013−2014 (MBC and Merkel & Associates, 2016). The infaunal community was dominated by polychaete worms (47 percent of the individuals in summer and 54 percent in spring), followed by mollusks, arthropods, nemerteans, and echinoderms (MBC and Merkel & Associates 2016). Mollusks accounted for most of the infaunal biomass, and polychaete worms were the most diverse taxonomic group (accounting for approximately 43 percent of total species), followed by mollusks and crustaceans. Outer Harbor and shallow areas generally have a greater abundance of benthic species compared to the Inner Harbor and deep areas. This is likely because the Outer Harbor has greater water circulation and higher habitat quality (SAIC 2010; MBC and Merkel & Associates 2016).

Eelgrass beds are considered a special aquatic site (vegetated shallows) pursuant to the Clean Water Act Section 404(b)(1) Guidelines (40 CFR Part 230) and are considered essential habitat by National Marine Fisheries (NMFS) under Magnuson-Stevens Fishery Conservation and Management Act (MSA). Eelgrass (*Zostera marina*) is a rooted aquatic plant that can inhabit favorable shallow, soft-bottom habitats in bays, estuaries, and sheltered coastal areas. Eelgrass does not occur within the study area.

At the two ODMDS, polychaete annelids are the most abundant and diverse phylum (major taxonomic group), followed by arthropods and mollusks. A number of minor phyla also occur and may occasionally be abundant.

Hard-Bottom Communities

Hard substrate such as rock, riprap, pier pilings, dock floats, and sheet pile within the Harbor District provide habitat similar to that found on rocky coasts and reefs. These hard substrates offer firm attachment locations for sessile (organisms fixed in one place) and mobile invertebrates and algae and provide refuge for other species including fish. Within the intertidal zone (the area between the high and low tide line), a key physical factor that affects the distribution and abundance of organisms is the tide, because organisms are subject to varying degrees of submergence and exposure.

The dominant invertebrate species using hard substrates in the high intertidal zone are barnacles (e.g., *Balanus spp* and *Chthalamus fissus*) (SAIC 2010; MBC and Merkel & Associates 2016). Mid-low intertidal and subtidal riprap supported a wide diversity of mobile invertebrate species, including kelp crabs (*Pugettia spp*), shore crabs (*Hemigrapsus oregonensis* and *Pachygrapsus crassipes*), and California spiny lobster (*Panulirus interuptus*). Echinoderms included brittle stars (*Amphipholis squamata*), red sea urchins (*Strongylocentrotus franciscanus*), purple sea urchins (*S. purpuratus*), sea stars (*Patiria miniata*, *Pisaster brevispinus*, and *P. ochraceous*), and sea cucumbers (*Parastichopus parvimensis*). The most abundant mollusks are limpets (*Lottia spp*), chitons (e.g., *Mopalia muscosa*), gem murex (*Maxwellia gemma*), Norris's top shell (*Norrisia norrisi*), rock scallops (*Crassodoma gigantea*), scaled wormsnail (*Serpulorbis squamigerus*), sea slugs (e.g., *Hermissenda crassicornis*, *Navanax inermis*, and *Peltodoris nobilis*), oysters (*Crassostrea gigas* and *Ostrea lurida*), and wavy turban topsnail (*Megastraea undosa*). Several species of cnidarians have also been observed, including colonial cup corals, aggregating anemone (*Anthopleura elegantissima*), giant green anemone (*A. xanthogrammica*), burrowing anemones (*Pachycerianthus spp*), strawberry anemone (*Corynactis californica*), and sea fans (*Muricea californica* and *M. fruticosa*). Bryozoans (e.g., *Diaporecia californica*), sponges, and tunicates (unidentified colonial, *Styela montereyensis* and *S. clava*) were also common (SAIC 2010; MBC and Merkel & Associates 2016).

Plankton

Plankton are organisms that drift in the water and are comprised of three broad functional groups: phytoplankton, zooplankton, and bacterioplankton. Phytoplankton are small, free-floating organisms such as diatoms, blue-green algae, flagellates, and dinoflagellates that are capable of photosynthesis and comprise the first trophic level of the marine food chain. Zooplankton include tiny animals, such as protozoans and small crustaceans, and the larvae of many invertebrates and fishes. They generally consume phytoplankton, organic detritus, or other zooplankton. Bacterioplankton obtain energy by consuming organic material produced by other organisms, which plays an important role in converting organic material in the water column. Like other plankton, bacterioplankton are preyed upon by zooplankton.

Plankton abundance and distribution are strongly dependent on factors such as ambient nutrient concentrations and the physical state of the water column (e.g., stratification), as well as the abundance of other plankton. Distribution and abundance of phytoplankton in Inner Harbor areas are usually patchy (HEP 1980; MBC and Merkel & Associates 2016), with densities generally lowest in winter (most likely due to limited light and lower water temperatures) and highest in mid-spring and early autumn. Zooplankton communities in the Inner Harbor and Outer Harbor are distinct, with the Inner Harbor community characterized by high concentrations of the copepods *Acartia tonsa* and *Oithona oculata (*MBC and Merkel & Associates 2016).

At the two ODMDS, plankton distributions tend to be patchy, and individual stations sampled more than once exhibit great variation. In general, greatest concentrations of plankton are found in the Southern California Bight in early fall and spring months, and abundances are lowest in late fall and winter months.

Marine-Associated Birds

A total of 96 bird species representing 30 families were observed within the two harbors during monitoring conducted in 2013-2014 (MBC and Merkel & Associates 2016). Of these species, 68 are considered to be water associated and dependent on the marine habitats of the Port for food and shelter. Birds in the area are used to large volumes of vessel traffic related to recreational and commercial vessels frequenting the area day and night. Birds are highly mobile and can easily relocate. The footprint of the study area does not include any nesting or roosting areas, so effects would be limited to foraging over open water. A diversity of seabirds and other water-associated birds occurs at the two ODMDS, with more than 106 species recorded.

Marine Mammals

Marine mammals are another consideration for this study. Several species of marine mammals have been observed inside the breakwaters and in the general vicinity of San Pedro Bay, including California sea lions (*Zalophus californianus*), harbor seals (*Phoca vitulina*), Pacific bottlenose dolphins (*Tursiops truncatus*), Pacific white-sided dolphins (*Lagenorhynchus obliquidens*), and common dolphins (*Delphinus delphis*) (MBC and Merkel & Associates, 2016). The only marine mammals expected in the potential project area would be California sea lions (*Zalophus caliornianus*) and harbor seals (*Phoca vitulina*), which forage in the harbor and rest on the entrance breakwaters, and navigational buoys. These marine mammals are highly mobile and would be anticipated to be able to avoid the potential project area during construction activities. The noise generated by dredging activities is unlikely to impact these species given the noisy background resulting from existing commercial, recreational, and safety vessels. Marine mammals are subject to protection under the Marine Mammal Protection Act and potential effects on these species will be subject to further analysis.

There are a variety of marine mammals that occur at the two ODMDS. While some are year-round residents, others are only seasonal visitors or transients. Marine mammals know to occur include baleen whales, toothed whales, seals, and sea lions.

Invasive Marine Alga (Caulerpa taxifolia).

Caulerpa taxifolia is an invasive green alga native to tropical waters. *Caulerpa taxifolia* was a popular salt-water aquarium plant until its possession, sale, and transport was banned per Assembly Bill 1334 in 2001. In the summer of 2000, *Caulerpa taxifolia* was discovered in two separate southern California coastal embayments: Agua Hedionda Lagoon in northern San Diego County and Huntington Harbor in Orange County. Huntington Harbor is approximately 100 miles south of Port of Hueneme, and Agua Hedionda is an additional 50 miles further south. *Caulerpa taxifolia* poses a substantial threat to marine ecosystems in California, particularly to eelgrass meadows and other benthic environments. The NMFS and the California Department of Fish and Wildlife (CDFW) established provisions to eradicate the infestation and to prevent the spread and introduction of this species into other systems along the California coast from Morro Bay to the U.S./Mexican border, including surveys of suitable habitat prior to underwater construction activities, such as dredging. The Approach Channel is considered to be too deep and too rough for *Caulerpa taxifolia*, however, the Main Channel, proposed Pier J Channel and Turning Basin, and the Surfside Borrow Site Nearshore Placement Area are considered to be suitable habitat.

Essential Fish Habitat (EFH)

EFH is managed under the MSA, 16 U.S.C. 1801, *et seq*. The MSA protects waters and substrates necessary to fish for spawning, breeding, feeding, or growth to maturity. The entire coastal area ranging from the mean high tide level to offshore depths represents EFH within the study area. The Project is located within an area designated as EFH for three Fishery Management Plans (FMPs): Coastal Pelagics Plan, Pacific Groundfish Management Plan, and Highly Migratory Species Plan. Some of the species federally managed under these plans are known to occur in the study area.

EFH for species in the Pacific Groundfish FMP, which applies to 89 fish species (e.g., flatfish, rockfish, and sharks), is identified as all waters and substrate within the following areas:

- Depths less than or equal to 11,480 feet to mean higher high water level (MHHW) or the upriver extent of saltwater intrusion, defined as upstream and landward to where ocean-derived salts measure less than 0.5 ppt during the period of average annual low flow.
- Seamounts in depths greater than 11,482 feet as mapped in the EFH assessment GIS.
- Areas designated as Habitat Areas of Particular Concern (HAPCs, e.g., seagrass, kelp canopy, estuaries, rocky reef).

EFH for species in the Pacific Groundfish FMP also is relevant to species designated in the Nearshore Fishery Management Plan (NFMP), which are generally managed by the state (CDFG 2002). For instance, 16 of the 19 species designated in the NFMP are officially designated in the Pacific Groundfish FMP, including 13 species of rockfishes (black, black-and-yellow, blue, brown, calico, China, copper, gopher, grass, kelp, olive, quillback, and treefish – *Sebastes* spp.), spotted scorpionfish (*Scorpaena gutatta*), Cabezon (*Scorpaenichthys marmoratus*), and kelp greenling (*Hexagrammos decagrammus*). Three species designated in the NFMP are not specifically designated in the Pacific Groundfish FMP (rock greenling – *Hexagrammous lagocephalus*, California sheephead –*Pimelometropon pulchrun*, and monkeyfaceeel– *Cebidichthys violaceus*) and are actively managed by the state; however, designated groundfish EFH (including HAPC) generally is relevant because these three species are associated with rocky reef, kelp bed, or surfgrass habitats (CDFG 2002).

EFH for species in the Coastal Pelagic FMP, which applies to four fish and one invertebrate species (e.g., anchovy, sardine, Pacific mackerel, jack mackerel, and market squid) is identified as all waters and substrate within the following areas:

- All marine and estuarine waters from the shoreline to the limits of the Exclusive Economic Zone (EEZ), which extends approximately 200 nautical miles offshore; and
- Water surface boundary, which is the water column between the thermoclines where temperatures range from 10 to 26 degrees Centigrade.

EFH for the Highly Migratory Species FMP include tuna, some shark species, and billfish—species that range widely through the ocean, often crossing international borders. These pelagic species live in the water of the open ocean, although they may spend part of their life cycle in nearshore waters. Species managed under the Highly Migratory Species FMP may have EFH within the study area, however EFH has been broadly defined as distribution, depth, and prey for these species.

The two ODMDS are located within an area designated as EFH for three FMPs: Coastal Pelagics Plan, Pacific Groundfish Management Plan, and Highly Migratory Species Plan. Some of the species federally managed under these plans are known to occur in the area and could be affected by the proposed project.

3.4.2 Sensitive Species

This section, and its corresponding impact assessment section, will be broken down into two sections. The first, to address potential impacts to species listed under the federal Endangered Species Act (ESA) for purposes of NEPA and the second to address potential impacts to species under the California Endangered Species Act for purposes of CEQA.

Vegetation

For each of the sensitive plant species identified through the California Natural Diversity Database (CNDDB) and California Native Plant Society (CNPS) databases as occurring within the vicinity of the study area, the habitat was assessed and the following guidelines were used to assess each sensitive species' potential to occur:

- Absent – Species habitat requirements do not occur within the study area.
- Low – No recent or historical records exist of the species occurring within the study area or its immediate vicinity (approximately 5 miles), and/or habitats needed to support the species within the study area are of poor quality.

- Moderate – Either a historical record exists of the species within the immediate vicinity of the study area (approximately 5 miles) or the habitat requirements associated with the species occur within the study area.
- High – Both a historical record exists of the species within the study area or its immediate vicinity (approximately 5 miles), and the habitat requirements associated with the species occur within the study area.
- Observed – Species was observed within the study area at the time of the survey.

Wildlife

- Absent – Species habitat requirements do not occur within the study area.
- Low potential for occurrence – There are no recent or historical records/observations of the species occurring within the study area or its immediate vicinity (within approximately 5 miles), and the diagnostic habitat requirements strongly associated with the species do not occur within the study area or its immediate vicinity.
- Moderate potential for occurrence – There is a recent or historical record/observation of the species within the study area or its immediate vicinity (within approximately 5 miles), and a limited amount of suitable habitat associated with the species occurs within the study area or its immediate vicinity.
- High potential for occurrence – There is both a recent or historical record/observation of the species in or in the immediate vicinity of the study area (within approximately 5 miles), and the diagnostic habitat requirements strongly associated with the species occur in or in the immediate vicinity of the study area.
- Species present – The species was observed in the study area at the time of the survey.

3.4.3 Endangered Species Act

Species lists from the United States Fish and Wildlife Service (USFWS) and NMFS were used as the starting point for this discussion. Refer to section 13.1 for details.

Threatened and Endangered Plants

No listed species are present in the study area based on review of the CNDDB and CNPS databases.

Threatened and Endangered Wildlife

One species that is Federally-listed as endangered or threatened has the potential to occur within the study area based on literature review and an assessment of the habitat types within the study area is the California least tern (*Sternula antillarum browni*), which is listed as endangered. Species lists were requested from both the USFWS and the NMFS for the study area. The species lists are included in Appendix I. USACE has determined that the other species on the lists are not present in the study area. The rationale is included below.

California least tern (Strernula antillarum browni) nesting colony

The California least tern is known to occasionally forage in the study area only during its nesting season defined as April 15-September 15. Foraging normally takes place outside the study area in habitat closer to the Port of Los Angeles or in the open ocean outside the breakwaters of the two ports. The California least tern does not nest in the study area, and the closest nesting location is at site on Pier 400 in the Port of Los Angeles.

Other Bird Species Listed by USFWS

The species lists includes the following bird species: Coastal California gnatcatcher (*Polioptila californica californica*-threatened), Least Bell's vireo (*Vireo bellii pusillus*-endangered), Light-Footed Clapper rail (*Rallus longirostris levipes*) revised to Ridgway's rail (*Rallus obsoletus obsoletus*-endangered), and the western snowy plover (*Charadrius nivosus ssp. nivosus*-threatened). Habitat for these species that includes coastal sage, riparian, marsh, and beach habitat does not exist in the study area. Therefore, none of these species would occur within the study area.

Mammal Species Listed by USFWS

The Pacific Pocket mouse (*Perognathus longimembris pacificus*-endangered) is a marsh species. Habitat for this species does not exist in the study area. Therefore, the species would not occur in the study area.

Turtles Listed by NMFS

Federal-listed marine turtles occasionally are sighted in warm-water areas of estuaries and bays in the region. Turtle species listed by NMFS as having the potential to occur in the study area include leatherback sea turtle (*Dermochelys corieacea*- endangered), loggerhead turtle -North Pacific Ocean and South Pacific Ocean distinct population segment (DPS) (*Caretta*- endangered), olive ridley (*Lepidochelys olivacea*-endangered) and the Eastern Pacific DPS green sea turtle (*Chelonia mydas*-threatened). All four species have broad, worldwide ranges and are highly migratory. Three are considered absent from the study area with the East Pacific DPS of green sea turtle having a low probability of occurring in the study area. Most nearshore sightings of the green and loggerhead sea turtles appear to be associated with warm-water discharges from electric generating stations. For example, the nearest green sea turtle sightings were reported south of the Port in the San Gabriel River (associated with the warm-water discharge of the Haynes electric generating station) and in Alamitos Bay (associated with an extensive saltwater marsh, the Seal Beach National Wildlife Refuge; MBC 2003; NPR 2015; Crear, et al. 2016). Tracking has shown transits between the two locations (Bedvak et. al. 2019). This population is close to the Surfside Borrow Site Nearshore Placement Area; however, tracking does not show any presence in the study area, including the Surfside Borrow Site Nearshore Placement Area. Formal bio baseline studies conducted for the San Pedro Bay Port complex have not observed sea turtles; additionally, the POLB conducts visual monitoring for green sea turtles during maintenance dredging and pile driving activities, and no sightings of green sea turtles have been reported in the Los Angeles or Long Beach Harbors, either as a result of targeted monitoring or of anecdotal sightings. None of the four species are expected to occur in the study area. Waters in the POLB are cold and deep, ranging from -45 to -75 feet MLLW in the channels. Waters are typically colder than the preferred habitats in the rivers south of the study area including Anaheim and Alamitos Bays, are more turbid, have no submerged vegetation, and are heavily traversed by numerous, large vessels entering and leaving the port. The two bays represent the far northern extent of green sea turtle populations, most likely a thermal restriction. They are present in the bays due to warmer waters from an electrical generating plant and shallow marshes both of which also support submerged vegetation. The two ports periodically prepare bio baseline reports on the habitats and marine organisms found in San Pedro Bay. The last two reports (surveys in 2010 and 2014) do not mention sea turtles at all. These are some very thorough surveys of the bay and would have been expected to see and report sea turtles if they are present and/or to discuss them if their presence was possible.

The Navy, in collaboration with NMFS, has been implementing a green sea turtle satellite tagging study to help monitor and better understand impacts of the Navy actions on green sea turtles within the Anaheim Bay estuarine complex. Preliminary results from this effort indicate that habitat utilization is highest within the Seal Beach National Wildlife Refuge (SBNWR), but a limited number of forays have occurred in the adjacent nearshore within the study area (Bredvik et al. 2019; Hanna et al. 2020). Tagging study results indicate limited use of shallow nearshore habitat in East San Pedro Bay, which harbors eelgrass habitat in various locations. In addition, preliminary tagging study results also indicate limited movements within and adjacent to the Surfside Borrow Site Nearshore Placement Area. Only two turtles of the sixteen tagged turtles swam into the outer bay near where dredged material transport vessels would be operating. It appears that turtles predominately stay in the estuarine complex mentioned above and only rarely swim into the outer bay. Presence of green sea turtles in the transportation corridor for dredged sediments to be placed at the Surfside Borrow Site Nearshore Placement Area or at the placement area itself is low.

Green turtles are generally found in fairly shallow waters (except when migrating) inside reefs, bays, and inlets (NMFS, undated). The LA-2 and LA-3 ODMDS are located several miles offshore and in very deep water. LA-2 is approximately 9 miles from the entrance to Queen's Gate and is approximately 6 miles from the nearest coast. LA-3 is approximately 22 miles from the entrance to Queen's Gate and is approximately 4-3/4 miles from the nearest coast. The LA–2 site is located on the outer continental shelf, margin, and upper southern wall of the San Pedro Sea Valley at depths from approximately 360–1,115 feet. The depth of the center of the LA-3 site would be approximately 1,600 feet. Chances of green sea turtles occurring at either ODMDS are unlikely.

Marine Mammals Listed by NMFS

Four species of whales were listed by NMFS as having the potential to occur in the study area. They are the blue whale (*Balaenoptera musculus*-endangered), fin whale (*Balaenoptera physalus*-endangered), humpback whale (*Megaptera novaeangliae*-endangered), and the gray whale, western north Pacific population (*Eschrichtius robustus*-endangered). The blue, fin, and gray whale are migratory species that pass down the coast staying well outside the breakwaters. The humpback whale can be found in local waters, but generally stay outside the 50-meter isobaths (MLLW) line to forage. Both Ports report gray whale sightings in proximity to the breakwater with occasional occurrences inside the breakwater. Rare sightings within the breakwater are also reported for fin whales (Justin Luedy, POLB, personal communication).

Presence of any listed marine mammal species at either of the two ODMDS are considered to be unlikely or with a low potential for occurrence.

3.4.4 California Endangered Species Act (CESA)

This section discusses only those species listed in CESA, but not in ESA. Some ESA species are also listed under CESA; for a discussion of those species refer to section 3.4.3 above.

Threatened and Endangered Plants

No listed species are present in the study area based on our review of the CNDDB and CNPS databases.

Threatened and Endangered Wildlife

American Peregrine Falcon (Falco peregrinus anatum)

The American peregrine falcon is a USFWS Bird of Conservation Concern (BCC) and California state-listed species. It was also listed under the federal ESA in 1970 but was subsequently delisted by the USFWS in 1999 due to recovery of the species. Peregrines become specialist hunters based on their location and in the San Pedro Bay Port complex feed commonly on seabirds, occasionally including California least terns (KBC, 2007), and on bats (Byre, 1990). Peregrine populations are increasingly common in urban and industrial environments (Bell, Gregoire and Walton 1996, Cade 1996).

The Port historically supported a high density of peregrine falcons (Bell, Gregoire and Walton 1996, BioResource Consultants 1998). Peregrines have nested in the Los Angeles and Long Beach Harbor regions for more than a decade on both the Commodore Schuyler Heim Bridge and the Gerald Desmond Bridge (MEC 2002, SAIC 2010). In 1998, the greater harbor region supported four nesting pairs. During the 2014 surveys, one peregrine falcon was observed on three different occasions; however, there was no evidence of nesting, which may have been a result of ongoing construction on the Commodore Schuyler Heim and Gerald Desmond Bridges (MBC and Merkel, & Associates 2016). Recently, there has been a resident pair on the understory infrastructure of the Gerald Desmond Bridge for many years. The Port has been monitoring this pair since 2013 per biological mitigation requirements in the Gerald Desmond Bridge Replacement Project EIR/EA (Justin Luedy, POLB, personal communication).

Black Skimmer (Rynchops niger)

The black skimmer is a Bird of Conservation Concern (BCC) and a California state species of special concern (SSC). Black skimmers have been observed flying or foraging in several areas of the Outer Harbor. Black skimmers nest at Bolsa Chica and Upper Newport Bay, with an average of 98 skimmers nesting at Pier 400 in Los Angeles Harbor from 1998 through 2000; however, they have not nested in the San Pedro Bay Port complex since then (SAIC 2010). Those that nest at Bolsa Chica forage in waters of the Outer Harbor and sometimes the Inner Harbor. No suitable nesting habitat for black skimmers is present in the Port.

California Brown Pelican (Pelecanus occidentalis californicus)

The California brown pelican was a federally and California state-listed species but was subsequently delisted in 2008 due to recovery of the species. However, it is designated by the CDFW as a fully protected species. The California brown pelican is common along the coast of Southern California, especially within 12 miles of shore, but regularly out to 100 miles (Shields, 2002). This species roosts on rocky cliffs, jetties, sandy beaches, and mudflats, and forages over open water (Shields 2002). Brown pelicans do not nest within the San Pedro Bay Port Complex (the nearest nesting colonies are on west Anacapa and Santa Barbara Islands). However, the San Pedro Bay Port complex provides valuable roosting and foraging habitat, particularly the outer breakwater and open water (SAIC 2010). California brown pelicans were observed in large numbers within the San Pedro Bay Port complex during 2013−2014 surveys and accounted for 9.6 percent of total bird observations (MBC and Merkel & Associates 2016). This species was primarily observed in the Outer Harbor, with large concentrations of individuals roosting on the San Pedro and Middle Breakwaters. The brown pelican’s primary prey in Southern California is northern anchovy and other small fish, as well as crustaceans and carrion (Shields 2002). California brown pelicans have been observed foraging in the Port of Los Angeles’ West Basin and resting on piers/docks throughout the San Pedro Bay Port complex (SAIC 2010).

Caspian Tern (Hydroprogne caspia)

The Caspian tern is on the CDFW Watch List. This species has historically nested within the Port of Los Angeles, formerly on Pier 300 and more recently on Pier 400. The Port of Los Angeles site is one of only four breeding areas in Southern California for this species. From 1997 through 2005, an average of 165 Caspian terns nested each year at Pier 400. They abandoned the site in 2005 due to a nocturnal predator and have not returned (KBC 2007). However, those that nest at Bolsa Chica continue to forage in waters of the Outer Harbor and sometimes the Inner Harbor (SAIC 2010). In 2007, approximately 53 Caspian terns nested successfully on a barge in the Long Beach Harbor (Ross 2007). During the 2013–2014 surveys Caspian terns were observed during the spring and summer months, mainly adjacent to Pier 400 (MBC and Merkel & Associates 2016). No suitable nesting habitat is present in the Port.

Elegant Tern (Thalasseus elegans)

The elegant tern is on the CDFW Watch List. This species was one of the most abundant bird species overall (10.6 percent of total birds) during the 2013−2014 surveys (MBC and Merkel & Associates 2016). Elegant terns are a colonially nesting species with a relatively restricted distribution (MEC 2002). This species nested on Pier 400 in Los Angeles Harbor between 1998 and 2005 and at Pier 300 in 2008. Numerous observations of elegant tern flights over the breakwaters during 2007−2008 surveys suggest they forage primarily outside the harbor, although they occasionally were observed foraging within the San Pedro Bay Port complex (KBC, 2007). High numbers of elegant terns roosted on port breakwaters with newly fledged young from June to early August (SAIC 2010). Elegant terns have very rarely been observed foraging in the Inner Harbor. No suitable nesting habitat for elegant terns is present in the Port, although they may occasionally forage in the lower Los Angeles River or Dominguez Channel.

Osprey (Pandion haliaetus)

Ospreys are on the CDFW Watch List. They do not breed at the San Pedro Bay Port complex. This species was observed in the 2013–2014 surveys and during all 20 of the surveys conducted in the Los Angeles and Long Beach Harbors by SAIC in 2008 (SAIC 2010). The osprey was the most common raptor observed during those surveys, frequently occurring on riprap.

3.5 Air Quality

This section describes existing air quality conditions in the study area within the South Coast Air Basin (SCAB) and summarizes applicable federal regulations. This section also summarizes technical information presented in Appendix H.

3.5.1 Climate and Meteorology

The SCAB comprises the urbanized areas of Los Angeles, Riverside, San Bernardino, and Orange counties (an area of approximately 6,000 square miles), and the adjacent offshore waters (**Figure 3-2**).

The climate of the Project region is classified as Mediterranean, which is characterized by warm summers with very little precipitation and mild winters with moderate precipitation. The major influences on the regional climate are the Eastern Pacific High, a strong, persistent high-pressure system, and the moderating effects of the Pacific Ocean. Seasonal variations in the position and strength of the Eastern Pacific High are key factors in the weather changes in the area.

The Eastern Pacific High attains its greatest strength and most northerly position during the summer, when it is centered west of northern California. In this location, this high effectively shelters southern California from the effects of polar storm systems. Large-scale atmospheric subsidence associated with the high produces an elevated temperature inversion along the West Coast. The base of this subsidence inversion is generally 1,000 to 2,500 feet above sea level during the summer. Vertical mixing is often limited to the base of the inversion, and air pollutants are trapped in the lower atmosphere.

The mountain ranges that surround the SCAB constrain the horizontal movement of air and inhibit the dispersion of air pollutants out of the region. These two factors, combined with the air pollution sources from more than 15 million people plus businesses and industries, are responsible for the high pollutant conditions that can occur in the SCAB. In addition, high solar radiation during the summer months promotes the formation of ozone (O_3).

Marine air trapped below the base of the subsidence inversion is often condensed into fog and stratus clouds by the cool Pacific Ocean. This is a typical weather condition in the San Pedro Bay region during the warmer months of the year. Stratus clouds usually form offshore and move into the coastal plains and valleys during the evening hours. Clouds burn off to the immediate coastline when the land temperature increases the following morning, but they often reform again the following evening.

The proximity of the Eastern Pacific High and a thermal low-pressure system in the desert interior to the east produces a sea breeze regime that prevails within the Project region for most of the year, particularly during the spring and summer months.

Sea breezes at the Port typically increase during the morning hours from the southerly direction. They reach a peak in the afternoon as they blow from the southwest and then generally subside after sundown. During the warmest months of the year, however, sea breezes can persist well into the night. Conversely, during the colder months of the year, northerly land breezes increase by sunset and into the evening. Sea breezes transport air pollutants away from the coast and toward the interior regions in the afternoon hours for most of the year.

During the fall and winter months, the Eastern Pacific High can combine with high pressure over the continent to produce light winds and extended inversion conditions in the region. These stagnant atmospheric conditions often result in elevated pollutant concentrations in the SCAB. Excessive buildup of high pressure in the desert interior can produce a “Santa Ana” condition, characterized by warm, dry, northeast winds in the basin and offshore regions. Santa Ana winds often help clear the SCAB of air pollutants.

As winter approaches, the Eastern Pacific High begins to weaken and shift to the south, allowing storm systems to pass through the region. The number of days with precipitation varies substantially from year to year, resulting in wide variability in annual precipitation totals. The average annual precipitation at Long Beach Airport, approximately 6 miles northeast of the Project site, was 12 inches between 1958 and 2012 (WRCC 2019). Approximately 90 percent of the annual rainfall occurs November through April, with a monthly average maximum of 2.9 inches in February. This wet-dry seasonal pattern is characteristic of most of California. Infrequent precipitation during the summer months usually occurs from tropical air masses that originate from continental Mexico or tropical storms off the west coast of Mexico.

Locally, the Palos Verdes Hills have a major influence on wind flow in the San Pedro Bay (SCAQMD 1977). For example, during afternoon sea breeze conditions, the Palos Verdes Hills often block this flow and create a zone of lighter winds in the inner harbor area of the Port. During strong sea breezes, this flow can bend around the north side of the Palos Verdes Hills and end up as a northwest breeze in the inner harbor area. This topographic feature also deflects northeasterly land breezes that flow from the coastal plains to a more northerly direction through the Port.

Meteorological data, including temperatures and surface winds, are measured at meteorological stations operated by the National Weather Service. The average high and low air temperatures at Long Beach Airport (the closest National Weather Service station to the Project site that has a long-term record) in August are 84 degrees Fahrenheit (°F) and 65°F, respectively. January average high and low temperatures are 67°F and 46°F, respectively. Extreme high and low temperatures recorded from 1958 through 2010 were 111°F and 25°F, respectively (WRCC 2011). Temperatures in the San Pedro Bay area are generally less extreme than inland regions due to the moderating effect of the ocean.

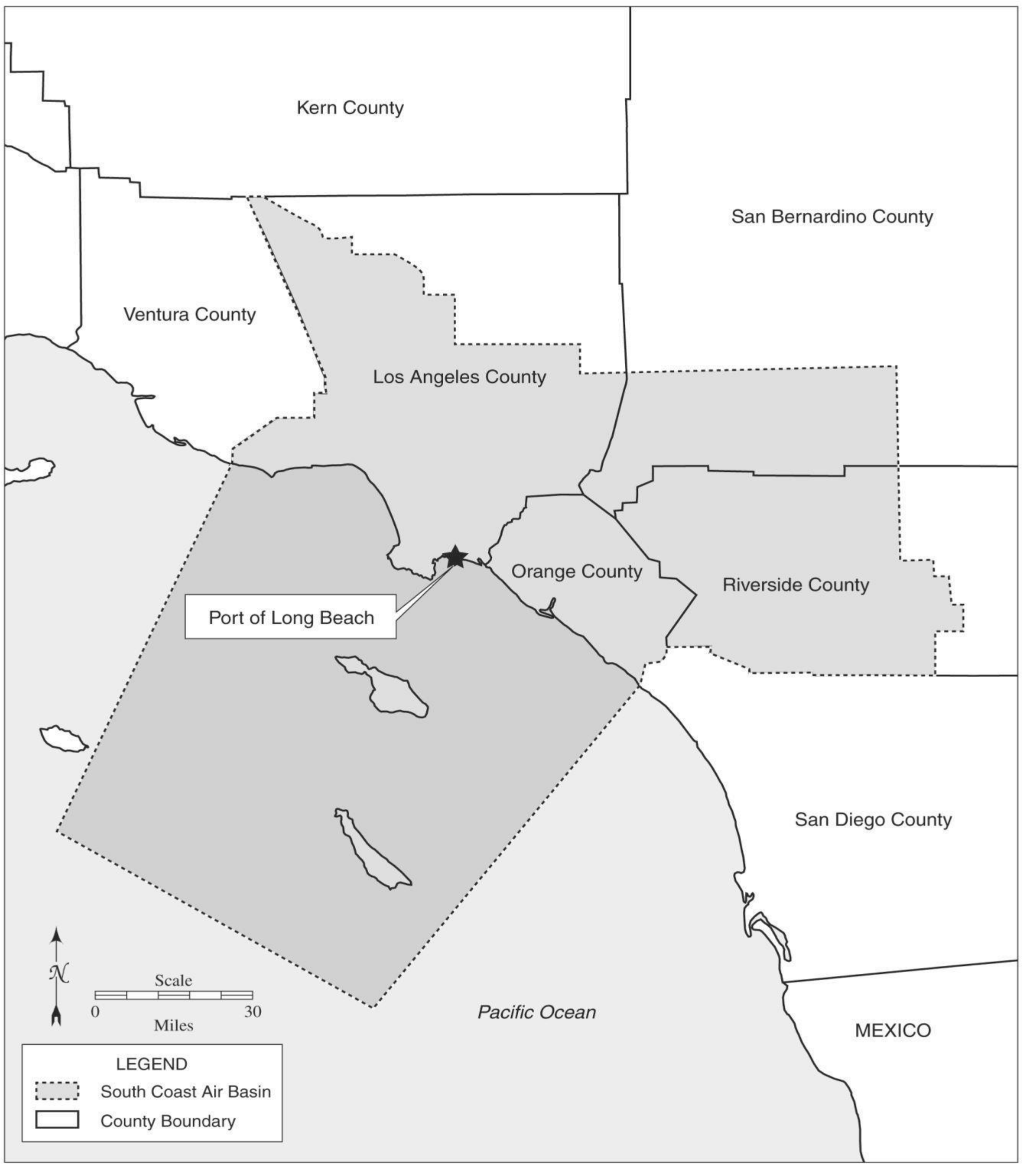


Figure 3-2 South Coast Air Basin

3.5.2 Existing Air Quality

Air pollutants are defined as two general types: (1) criteria pollutants, representing six pollutants for which USEPA and the California Air Resources Board (CARB) have set health- and welfare-protective national and state ambient air quality standards, respectively; and (2) toxic air contaminants (TACs), which may lead to serious illness or increased mortality even when present at relatively low concentrations. Generally, TACs do not have ambient air quality standards. The three TACs that do have ambient air quality standards (i.e., lead, vinyl chloride, and hydrogen sulfide) are not pollutants of concern for the No Action and Project action alternatives.

Criteria Pollutants

Air quality at a given location can be described by the concentrations of criteria air pollutants in the atmosphere near ground level. The significance of a pollutant concentration is determined by comparing it to an appropriate national and/or state ambient air quality standard. These standards represent the allowable atmospheric concentrations at which the public health and welfare are protected and include a reasonable margin of safety to protect the more sensitive individuals in the population.

Regional Air Pollutant Levels

The USEPA, CARB, and local air districts classify an area as attainment, unclassified, or nonattainment depending on whether the monitored ambient air quality data show compliance, lack of data, or noncompliance with the ambient air quality standards, respectively. The national ambient air quality standards (NAAQS) relevant to the No Action and Project action alternatives are provided in **Table 3-5**. **Table 3-6** summarizes the federal attainment status of criteria pollutants in the SCAB based on the NAAQS.

Air quality within the SCAB has improved substantially since the inception of the South Coast Air Quality Management District's (SCAQMD) air pollutant monitoring in 1976. This improvement is due primarily to the implementation of stationary source emission-reduction strategies by the USEPA, CARB, and SCAQMD and lower polluting on-road motor vehicles. This trend toward cleaner air has occurred despite continued population growth. For example, while the SCAB exceeded the current national 8-hour O_3 standard on 222 days in 1977, the number of O_3 exceedance days was 122 in 2017 (CARB 2019).

The Clean Air Act (CAA) requires the USEPA to set NAAQS for six common air pollutants (also known as "criteria air pollutants"). The criteria pollutants are O_3, particulate matter less than 10 microns in diameter (PM_{10}), particulate matter less than 2.5 microns in diameter ($PM_{2.5}$), carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), and lead. O_3 is unique among the criteria pollutants because it is not directly emitted from No Action and Project action alternatives sources. Rather, O_3 is a secondary pollutant, formed from precursor pollutants volatile organic compounds (VOC) and nitrogen oxides (NO_X) which photochemically react to form O_3 in the presence of sunlight. As a result, unlike inert pollutants, O_3 levels usually peak several hours after the precursors are emitted and many miles downwind of the source. Lead emissions from mobile sources have significantly decreased due to the near elimination of lead in fuels. Little to no quantifiable and foreseeable lead emissions would be generated by any of the alternatives. Therefore, lead is not considered as part of this evaluation.

Because of the complexity and uncertainty in predicting photochemical pollutant concentrations, O_3 impacts are indirectly addressed by comparing action alternatives emissions of VOC and NO_X to General Conformity applicability rates, discussed in Section 5.5, Environmental Consequences. Because most of the Project action alternatives emission sources would be diesel-powered, diesel particulate matter

(DPM) is a key pollutant evaluated in this analysis. DPM is one of the components of ambient PM_{10} and $PM_{2.5}$. DPM is also classified as a TAC by CARB. As a result, DPM is evaluated in this study both as a criteria pollutant (as a component of PM_{10} and $PM_{2.5}$) and as a TAC (for cancer and noncancer health effects).

Table 3-5 National and California Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards	National Standards	Health Effects
O_3	1-hour	0.09 ppm	—	Breathing difficulties, lung tissue damage
	8-hour [2]	0.070 ppm	0.070 ppm	
PM_{10}	24-hour	50 µg/m³	150 µg/m³	Increased respiratory disease, lung damage, cancer, premature death
	Annual	20 µg/m³	—	
$PM_{2.5}$	24-hour [3]	—	35 µg/m³	Increased respiratory disease, lung damage, cancer, premature death
	Annual	12 µg/m³	12 µg/m³	
CO	1-hour	20 ppm	35 pm	Chest pain in heart patients, headaches, reduced mental alertness
	8-hour	9.0 ppm	9 ppm	
NO_2	1-hour	0.18 ppm	0.100 ppm [1]	Lung irritation and damage
	Annual	0.030 ppm	0.053 ppm	
SO_2	1-hour	0.25 ppm	0.075 ppm [1]	Increases lung disease and breathing problems for asthmatics
	3-hour	—	0.5 ppm	
	24-hour	0.04 ppm	—	

Notes:
ppm = parts per million; µg/m³ = micrograms per cubic meter; "—" = no standards
[1] The federal 1-hour NO_2 and SO_2 standards are based on the 3-year average of the 98th and 99th percentiles of the annual distribution of daily maximum values, respectively.
[2] The federal 8-hour O_3 standard is based on the annual fourth-highest daily maximum 8-hour concentration, averaged over 3 years.
[3] The federal 24-hour $PM_{2.5}$ standard is based on the 3-year average of the 98th percentile of the daily values.

Table 3-6 SCAB Attainment Status

Pollutant	Attainment Status	
	Federal	State
O_3	Extreme Nonattainment	Nonattainment
PM_{10}	Maintenance	Nonattainment
$PM_{2.5}$	Serious Nonattainment	Nonattainment
CO	Maintenance	Attainment
NO_2	Maintenance	Attainment
SO_2	Attainment	Attainment

Source: USEPA 2019; CARB 2019.

Local Air Pollutant Levels

The POLB operates two air monitoring sites, one located in the Inner Harbor area near the intersection of Canal Avenue and 12th Street (Superblock site) and the other in the Outer Harbor area at the end of Navy Mole Road (Gull Park site). The stations collect ambient air pollutant and meteorological conditions within the Port region. The Gull Park air monitoring station is the site most representative of the Project vicinity because it is located in the Port's outer harbor, at the eastern end of Nimitz Road, a peninsula that terminates at the Long Beach Main Channel, and as such is proximal to the proposed dredging areas. Air quality impacts at the Gull Park site are due primarily to ships and terminal operations, rather than on-road trucks and distribution centers as is the case at the Superblock station (POLB 2017).

Table 3-7 presents the maximum pollutant concentrations measured at the POLB Gull Park monitoring station from 2016 to 2018, which is the most recent 3-year period available (POLB 2016, 2017, 2018). These data show that the monitoring station did not exceed any of the NAAQS during this period. The monitoring station exceeded the state 24-hour PM_{10} and annual standards in all 3 years. The Gull Park station does not have a filter based $PM_{2.5}$ monitor. However, none of the surrounding monitoring stations (Superblock, North Long Beach or South Long Beach) exceeded the $PM_{2.5}$ NAAQS or CAAQS during the same 3-year period.

Table 3-7 Maximum Pollutant Concentrations Measured at the POLB Gull Park Monitoring Station

Pollutant	Averaging Period	National Standard	Concentration [a]		
			2016	2017	2018
O_3 (ppm)	1-hour	--	0.071	0.081	0.075
	8-hour[b]	0.070	0.056	0.054	0.051
CO (ppm)	1-hour	35	2.0	2.1	1.9
	8-hour	9	1.7	1.7	1.5
NO_2 (ppm)	1-hour [c]	0.100	0.078	0.077	0.075
	Annual	0.053	0.018	0.018	0.017
SO_2 (ppm)	1-hour [d]	0.075	0.013	0.011	0.009
	24-hour	--	0.003	0.005	0.004
PM_{10} (µg/m^3)	24-hour [e]	150	51.2	66.4	56.1
	Annual	--	25.3	27.2	24.4
$PM_{2.5}$ (µg/m^3)[f]	24-hour	35	--	--	--
	Annual	12	--	--	--

Notes:

[a] Exceedances of the standards are shown in bold. All reported values represent the highest recorded concentration during the year unless otherwise noted.

[b] The monitored concentrations reported for the national 8-hour O_3 standard represent the 3-year average (including the reported year and the prior 2 years) of the 4th highest 8-hour concentration each year.

[c] The monitored concentrations reported for the national 1-hour NO_2 standard represent the 3-year average (including the reported year and the prior 2 years) of the 98th percentile of the annual distribution of daily maximum 1-hour average concentrations.

[d] The monitored concentrations reported for the national 1-hour SO_2 standard represent the 3-year average (including the reported year and the prior 2 years) of the 99th percentile of the annual distribution of daily maximum 1-hour average concentrations.

[e] The monitored concentrations reported for the national 24-hour PM_{10} standard represent the 2nd highest concentration recorded during each calendar year. The standard is attained when the number of days per calendar year exceeding 150 µg/m^3 is equal to or less than one.

[f] The Gull Park station does not have a filter based $PM_{2.5}$ Monitor. None of the surrounding monitoring stations (Superblock, North Long Beach or South Long Beach) exceeded the $PM_{2.5}$ NAAQS in the 3-year period.

Toxic Air Contaminants (TAC)

TACs are airborne compounds that are known or suspected to cause adverse human health effects after long-term (i.e., chronic) and/or short-term (i.e., acute) exposure. Cancer risk is associated with chronic exposure to some TACs, and noncancer health effects can result from either chronic or acute exposure to various TACs. Examples of TAC sources in the SCAB include diesel- and gasoline-powered internal combustion engines in mobile sources; industrial processes and stationary sources, such as dry cleaners, gasoline stations, and paint and solvent operations; and stationary fossil fuel-burning combustion sources, such as power plants.

Cancer risk due to TACs has declined in the SCAB as a result of federal, state and local regulations. SCAQMD initiated the first urban toxic air pollution study, Multiple Air Toxics Exposure Study (MATES) in 1998. The subsequent 2000 MATES-II study estimated a 44 percent to 63 percent decrease in cancer risk since 1990 (SCAQMD 2000). The 2008 MATES-III study reported a SCAB-wide decrease of 8 percent from MATES-II, and the 2015 MATES-IV study reported a SCAB-wide decrease of 57 percent from MATES-III (SCAQMD 2008; SCAQMD 2015). The MATES studies together show a steady decline in SCAB cancer risk despite continuing population growth.

Due to the prevalence of diesel-powered sources that operate at the Port of Long Beach and Port of Los Angeles (San Pedro Bay Ports), MATES-IV identified the San Pedro Bay Ports area as having the highest TAC-related cancer risks in the SCAB, with an average individual cancer risk of 480 chances per million. By comparison, MATES-IV estimated the average air toxics cancer risk in the SCAB to be 367 chances per million.

Ultrafine Particles

Traditionally, health concerns and air quality standards for particulates have focused on respirable particulate matter (i.e., PM_{10}) and fine particulate matter (i.e., $PM_{2.5}$); however, the smallest size fraction of particulate matter (PM), referred to as ultrafine particles (UFP), is also of concern for the following reasons: (1) studies have shown that smaller particles, which tend to absorb higher fractions of trace metals and organic compounds because of their relatively high surface area, can be inhaled and deposited deeper into the lungs than larger particles; and (2) UFP can be more easily transported from the lungs into the body, potentially increasing exposure to these particles and contaminants adsorbed on the particles. UFP continues to be an area of active research.

UFP is generally defined as ambient air particles less than or equal to 0.1-microns (μm) in diameter (100 nanometers). Due to their small size and cumulative mass, UFP generally contributes a small fraction of the ambient concentrations of either PM_{10} or $PM_{2.5}$. It takes approximately 15,000 UFP to equal the mass of a single $PM_{2.5}$ particle, and 1 million UFP to equal the mass of a single PM_{10} particle. UFP is very numerous, particularly in urban atmospheres. For example, typical urban air contains 10,000 to 40,000 UFP per cubic centimeter (cm^3), while near highways there can be between 40,000 and 1 million UFP per cm^3. UFP is not routinely measured in the United States, and there are no regulatory standards that address this category. The 2012 Air Quality Management Plan (AQMP) recommended that UFP issues be considered in the region's PM and air toxics control strategies and recommended possible control strategies (SCAQMD 2012). The 2016 AQMP is silent on UFPs apart from noting that USEPA is reviewing relevant scientific information regarding UFPs (SCAQMD 2017).

In the urban environment, motor vehicle exhaust is a major source of UFP, and for that reason, UFP is found in high numbers near highways. Measurements have shown that there is a sharp drop in UFP within 300 meters downwind of freeways due to particle growth and accumulation processes in the atmosphere after they have been emitted from vehicles, although higher concentrations can persist during nighttime hours, during conditions of atmospheric stability (SCAQMD 2012). Consequently, high particle concentrations are localized and tend to exhibit large geographical and temporal variations. Current research is underway to better characterize emissions and ambient levels of UFP in the environment. Other categories of internal combustion engines used in Port operations, such as trains and ships, may also be significant sources of UFP.

There is published evidence that UFP may have toxicological effects that are distinct from $PM_{2.5}$ or PM_{10}. UFP has been shown to rapidly enter the bloodstream following inhalation (Nemmar *et al.* 2002) and is able to enter individual cells. UFP may impact pulmonary and cardiac function directly through inflammatory and oxidative reactions (Hiura *et al.* 1999; Simkhovich *et al.* 2008). Studies have also suggested that organic chemicals adsorbed on the UFP surface lead to cellular damage and pose a risk to cardiovascular health (Traboulsi *et al.* 2017).

Secondary $PM_{2.5}$ Formation

Primary particles are emitted directly into the atmosphere by fossil fuel combustion sources and windblown soil and dust. Secondary $PM_{2.5}$ forms in the atmosphere by complex reactions of precursor emissions of gaseous pollutants, such as NO_X, SO_X, VOC, and ammonia. Secondary $PM_{2.5}$ includes sulfates, nitrates, and complex carbon compounds. Project action alternatives emissions of NO_X, SO_X, and VOC could contribute to secondary $PM_{2.5}$ formation some distance downwind of the emission sources. Because it is difficult to predict secondary $PM_{2.5}$ formation from an individual project, the air quality analysis in this document focuses on the effects of direct $PM_{2.5}$ emissions generated by the Project action alternatives. This approach is consistent with the recommendations of the SCAQMD (SCAQMD 2006).

Atmospheric Deposition

The fallout of air pollutants to the surface of the earth is known as atmospheric deposition. Atmospheric deposition occurs in both a wet and dry form. Wet deposition occurs in the form of precipitation and is associated with the conversion in the atmosphere of directly emitted pollutants into secondary pollutants such as acids. Dry deposition occurs in the form of directly emitted pollutants or the conversion of gaseous pollutants into secondary PM. Atmospheric deposition can produce watershed acidification, aquatic toxic pollutant loading, deforestation, damage to building materials, and respiratory problems.

Odors

Odors are generally regarded as a nuisance rather than a health hazard. Manifestations of a person's reaction to odors can range from psychological (e.g., irritation, anger, or anxiety) to physiological (e.g., circulatory and respiratory effects, nausea, vomiting, and headache). The ability to detect odors varies considerably among the population and is subjective. People may have different reactions to the same odor. An odor that is offensive to one person may be acceptable to another. An unfamiliar odor is more easily detected and is more likely to cause complaints than a familiar one. A person can become desensitized to odors and recognition occurs with an alteration in the intensity. The occurrence and severity of odor impacts depends on the nature, frequency, and intensity of the source; wind speed and direction; and the sensitivity of receptors.

Sensitive Receptors

The impact of air emissions on sensitive members of the population is a special concern. Sensitive receptor groups include children and infants, pregnant women, the elderly, and the acutely and chronically ill. According to SCAQMD guidance, sensitive receptor locations typically include schools, hospitals, convalescent homes, child-care centers, and other locations where children, chronically ill individuals, or other sensitive persons could be regularly exposed. Sensitive individuals could also be present at any residence.

The nearest residential receptors to the Project site are live-aboards, located approximately 1 mile to the north of the West Basin, in the Yacht Marina and Island Yacht Anchorage. The nearest school is Cesar Chavez Elementary, on W. 3rd Street, approximately 1.3 miles north-east of the Project site. The nearest hospital is St. Mary Medical Center, on Linden Ave, approximately 2.7 miles north of the Project site. The nearest convalescent home is Bay Breeze Care, on Santa Fe Ave, approximately 2.4 miles north of the Project site. The nearest child-care center is Childtime of Long Beach, at One World Trade Center, approximately 1.4 miles north-east of the project area.

The locations of the sensitive receptors are shown in **Figure 3-3.** A complete listing of the sensitive receptors (i.e., schools, hospitals, convalescent homes, and child-care centers) identified within approximately 2 miles of the project area is presented in Table H4.s in Appendix H4. Individual residences are not listed in the figure or table.

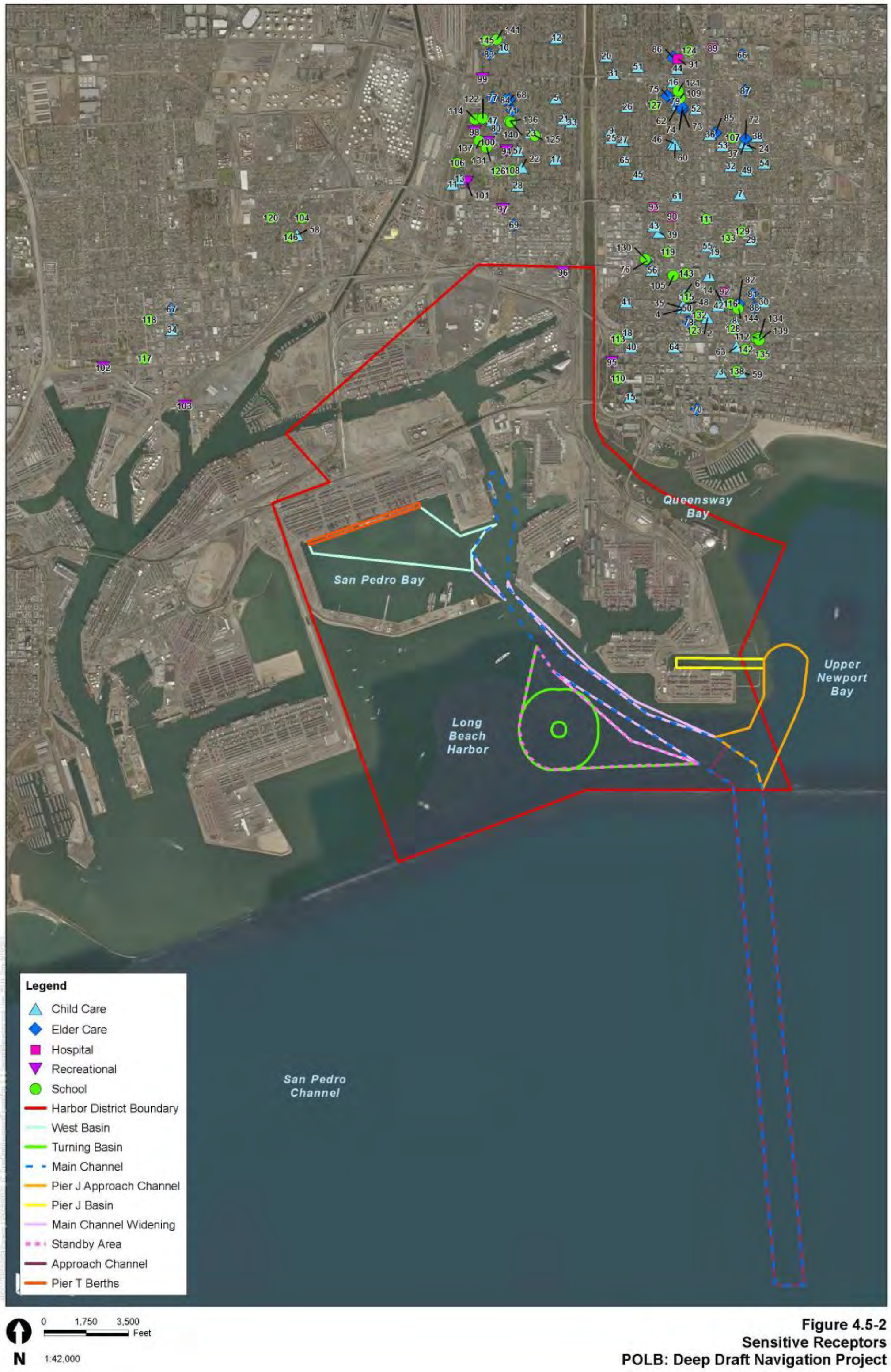


Figure 3-3 Sensitive Receptors

3.6 Greenhouse Gas

This section describes the affected environment pertaining to greenhouse gas (GHG).

3.6.1 Environmental GHG Setting

GHG Emissions and Effects

GHGs trap heat in the atmosphere and are emitted from both natural processes and human activities. Examples of GHGs produced both by natural processes and human activity include carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O). Examples of GHGs emitted through human activities alone include fluorinated gases and sulfur hexafluoride (SF_6). The natural balance of GHGs in the atmosphere regulates the Earth's temperature; without this natural greenhouse effect, the earth's surface would be approximately 60 degrees Fahrenheit (°F) cooler (USGCRP 2018).

Numerous studies document the recent trend of rising atmospheric concentrations of CO_2. The longest continuous record of CO_2 monitoring extends back to 1958 (Keeling 1960, Scripps Institution of Oceanography 2019). These data show that atmospheric CO_2 levels have risen an average of 1.6 parts per million (ppm) per year over the last 60 years (NOAA 2019). As of 2018, CO_2 levels are approximately 40 percent higher than the highest levels estimated for the 800,000 years preceding the industrial revolution, as determined from CO_2 concentrations analyzed from air bubbles in Antarctic ice core samples (USGCRP 2018).

USEPA has identified six GHGs generated by human activity that are believed to be the primary contributors to global warming: CO_2, CH_4, N_2O, hydrofluorocarbons (HFC), perfluorocarbons (PFC), and SF_6. Of these, CO_2, CH_4, and N_2O are GHGs of interest in this analysis, as only minor amounts of HFC, PFC, and SF_6 would be emitted by proposed activities.

Each GHG has a global warming potential (GWP), which is its ability to trap heat in the atmosphere. By convention, $CO_2$is assigned a GWP of one. In comparison, CH_4has a GWP of 25, which means that it has a global warming effect 25 times greater than CO_2on an equal-mass basis over a 100-year time horizon. N_2O has a GWP of 298. To account for GWP, GHG emissions are often reported as carbon dioxide equivalent (CO_2e). CO_2e is calculated by multiplying each GHG emission by its GWP and adding the results to produce a single, combined emission rate representing all GHG emissions. This document uses GWPs from the IPCC Fourth Assessment Report (AR4) (IPCC 2007), which is consistent with those used in the POLB 2017 Air Emissions Inventory (Starcrest Consulting Group 2018) and USEPA's Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990–2017 (USEPA 2019). CO_2e emissions are commonly presented in units of metric tons (MT). One MT equals 1,000 kilograms or 1.1 short tons.

Black Carbon

Black carbon (or soot) is a combustion byproduct of fossil fuels, biofuels, and biomass. Emissions of black carbon contribute to global warming due to its ability to absorb sunlight, which then enables it to warm the atmosphere and to melt snow and ice if deposited onto these surfaces. The United States Global Change Research Program (USGCRP) estimates that black carbon contributed about 1.4 percent of the total radiative forcing of all man-made GHGs in year 2011 (USGCRP 2017).

At present, there are no protocols for assessing the impacts of black carbon as a GHG. Therefore, this evaluate provides a qualitative assessment of this effect in that black carbon is a component of DPM that would occur from the range of diesel-powered sources associated with the action alternatives.

3.7 Aesthetics

The Port is a highly industrial setting consisting of artificial landforms and waterways, including breakwaters, dredged channels, open water slips that have been filled in to create berths and terminals, and infrastructure required to support Port operations. As a result, the Port represents an expansive and visually distinct industrial landscape. Major features of this landscape include piers, warehouses, stacks of shipping containers, processing plants, buildings, parking lots, and infrastructure including bridges, rail lines, oil derricks, pipelines, and gantry cranes as well as ships of all sizes underway, at anchor, or tied up at berth.

3.8 Cultural Resources

This section is an overview of cultural resources that may be present within the study area. Cultural resources are artifacts of human activity, occupation, or use of the landscape. They include archaeological resources, historic buildings and structures, or other culturally significant places. Archaeological resources refer to surface or buried material remains, features, or other items used, modified, or built by humans. Prehistoric archaeological resources predate European presence in southern California and can include villages, procurement areas, resource extraction sites, rock shelters, rock art, basketry fragments, shell and stone tools, and tool-making debris. Ethnohistoric or protohistoric archaeological resources are those that can be attributed to native cultures but include evidence of European contact, such as trade beads or metal artifacts, at a site that otherwise appears to be prehistoric. Historic archaeological sites include trash scatters, homesteads, railroads, ranches, logging camps, individual buildings or structures, and shipwrecks that are over 50 years old. Cultural resources also include places that are associated with cultural practices or beliefs of a living community that are both rooted in that community's history and are important in maintaining its cultural identity (Parker and King 1998). Examples can include natural landscape features, plant gathering places, sacred sites, and Native American burial locations. Commonly referred to as Traditional Cultural Properties (TCPs), these areas are afforded the same consideration as other cultural resources. Sacred resources are places or things that a Native American group explicitly ascribe cultural significance to. These may fit within the category of cultural resources (i.e., TCP) but can also more expansively include places and things that are not easily recognized as being important by those outside the culture.

The term "cultural resource" is not defined in NEPA and has no statutory definition, but the related term "historic property" is defined in law (54 U.S.C. § 300308) and regulation (36 C.F.R. § 800.16 - Definitions). In general, a historic property is defined as a cultural resource that has met standards of age (resources less than 50 years old are generally not eligible), significance, and integrity that qualify it as eligible for listing on the National Register of Historic Places (NRHP or National Register). The National Historic Preservation Act (NHPA) is the major piece of legislation that mandates that Federal agencies take into account the effects of their undertakings on historic properties.

This section describes general archeological and ethnohistoric information in the southern California coastal region, as well as specific information on the project area.

3.8.1 Affected Environment

The following cultural-historical narrative outlines the history of human occupation of the area surrounding the POLB for the last 12,000 years. Much of the following is derived from a report prepared for USACE entitled *East San Pedro Bay Ecosystem Restoration Study – Draft Integrated Feasibility Report/EIS/EIR* (2019*)* prepared by RECON Environmental.

The prehistory for the southern California coastal region, including Los Angeles County, is generally divided into four temporal periods: Paleo-Indian, Millingstone, Intermediate, and Late Prehistoric. This framework is based on data by Warren (1968), who introduced a chronologic sequence for coastal southern California, but the specifics of this framework have been and will continue to be modified and refined as new data emerge.

Paleo-Indian (12,000–8,000 B.P.)- The Paleo-Indian cultural tradition was characterized by small, mobile groups of big game hunters. Human occupation of North and South America prior to the Clovis Culture has recently become more widely accepted. Evidence of a pre-Clovis occupation is growing and includes the discovery of two sites (Arlington Man and Daisey Cave) on the Northern Channel Islands dating to as early as 10,900 B.P. and 10,700 B.P., respectively (Erlandson *et al*. 2007). A possible pre-Millingstone component has been identified at CA-ORA-64 at the head of Newport Bay (Drover *et al.* 1983). This component contained significant evidence for shellfish collecting and some evidence for fishing and bird procurement.

The Millingstone Period (8,000–3,000 B.P.)- Millingstone Period sites are characterized by abundant groundstone assemblages, including manos and metates. These milling tools permitted the processing of hard seeds and a wide range of plants. Subsistence strategies focused on collecting small plant seeds and hunting small and medium animals (Byrd and Raab 2007). Along the coast, shellfish collecting was an important aspect of the diet, with hunting and fishing being less important food sources.

Archaeological sites dating to the Millingstone Period have relatively extensive deposits and diverse artifact assemblages, which has led some researchers to argue that many of these sites were residential base camps (Glassow *et al*. 2007; Drover et al. 1983). Groups presumably established more permanent residential bases on the coast close to estuaries, lagoons, and streams where food was brought stored, but they also completed seasonal rounds inland (Byrd and Raab 2007; Drover et al. 1983, Koerper and Drover 1983). Mortuary practices include extended and loosely flexed burials with a few grave goods such as shell beads, metates, and manos (Wallace 1955; Warren 1968).

The Intermediate Period (3,000–1,000 B.P.)- The Intermediate Period is characterized by important settlement, subsistence, and technological changes, probably in part due to increased population. Settlements generally shifted from lagoons and bays to village locations near fresh water sources (Koerper *et al.* 2002). Large camps and habitation sites are first evident during this period, implying a more sedentary and possibly territorial settlement system (Mason and Peterson 1994). Broad technological innovations seem to signal intensification of subsistence strategies to accommodate a growing population (Erlandson 1994). The introduction of the mortar and pestle around 2000 B.P. suggests a diet with a greater variety of plants foods, including increased reliance on acorns (Glassow *et al.* 2007). The use of steatite also begins during this time, indicating trade across the ocean to Catalina Island, the local source for steatite (Wlodarski 1979).

The Late Prehistoric Period (1,000–250 B.P. /the Spanish Mission Era)- Population densities increased significantly beginning around 1,000 B.P., leading to complex social, political, and technological systems (Wallace 1955). Environmental fluctuations and stresses likely also helped drive cultural change. Most people settled into a relatively limited number of larger permanent settlements with satellite camps for specialized subsistence tasks. Subsistence focused on fishing and hunting of smaller game, while exploitation of larger mammals declined. Plant resource procurement focused on species requiring higher handling costs such as grasses and other small-seeded plants (Byrd and Raab 2007). Ceramics were introduced from the Colorado River. Mortuary practices changed from inhumations to cremations.

Anthropologists (e.g., Bean and Smith 1978; Kroeber 1925) have generally placed the project area within the traditional territory of the Native American group known as the Gabrieleño. Occupying the southern Channel Islands and adjacent mainland areas of Los Angeles and Orange counties, the Gabrieleño are reported to have been second only to their Chumash neighbors in terms of population size, regional influence, and degree of sedentism (Bean and Smith 1978). The Gabrieleño are estimated to have numbered around 5,000 in the pre-contact period (Kroeber 1976). Maps produced by early explorers indicate the existence of at least 40 Gabrieleño villages, but as many as 100 may have existed prior to contact with Europeans (Bean and Smith 1978; McCawley 1996; Reid 1939[1852]).

Protohistoric/Spanish Mission Era- The lifestyle patterns that emerged in the Late Prehistoric period appear to resemble those of the ethnohistoric Luiseño, Gabrieleño, and other southern California Shoshonean speakers (Mason and Peterson 1994). The Spanish called the Gabrieleño "Juaneño", after their mission at San Juan Capistrano, but they had essentially the same language and culture as the Luiseño (White 1963). Many contemporary Gabrieleño prefer the term Tongva (King 1983).

At the time of contact with the Spanish, Gabrieleño territory is thought to have extended from the San Fernando Valley to Aliso Creek, just south of Laguna Beach and from Topanga Canyon to present San Bernardino (Bean and Smith 1978; Kroeber 1925). The Gabrieleño lived in primary large villages situated near water sources, with secondary hunting and gathering camps occupied seasonally. Their houses were circular, semisubterranean, domed structures covered with tule or fern. Subsistence focused on hunting, gathering, and fishing. Trade was important, with the distribution of goods focused on shell beads, dried fish, sea-otter pelts, steatite, deerskins, and various kinds of seeds (Reid 1939[1852]).

Port of Long Beach Specific History

Much of the historical setting has been adapted from Aubrie Morlet, *Documenting the Port of Long Beach Administration Building: A Work of Art on the Water* (Morlet 2014).

First discovered in 1542, San Pedro Bay was not named until Cabrera Buena landed there in 1734 (Queenan 1986:9–10). The Spanish established several missions in Alta California in the 1760s and 1770s, and San Pedro Bay provided a safe harbor for ships bringing supplies in exchange for mission-produced goods from San Gabriel and San Juan Capistrano. Manuel Perez Nieto was granted 300,000 acres that included what is now the Port of Long Beach in 1784. The land was eventually sold and subdivided. Diego Sepulveda developed a stagecoach line and constructed a wharf and other development along San Pedro Bay circa 1850, around the same time that California was annexed into the United States (Queenan 1986:23).

The annexation generated rapid development in the Los Angeles area. Phineas Banning built a new wharf and other shipping facilities. The San Pedro Bay channel was dredged in 1881, and Congress approved a breakwater to be built in San Pedro Bay in 1897. There was eventually enough development in the area to support the establishment of an official port, and the Port of Long Beach received its first official cargo on Pier 1 in 1911. Several industrial companies soon built facilities at the new Port.

Rapid accumulation of sediment from the Los Angeles River hindered shipping, so the city of Long Beach acquired deeds to the channels and assumed responsibility for dredging. The Los Angeles Flood Control District constructed a silt diversion channel that reduced sedimentation, allowing the POLB to achieve deep water status in 1926. The discovery of oil in the 1920s led to the development of additional piers and wharves in the harbor and the construction of an additional breakwater. Piers A and B and additional improvements were constructed in the outer harbor in 1928.

The next major phase of development came in 1940, when the U.S. Navy took control of a portion of the Port. Nonmilitary construction halted until 1946. By 1950, Channels 2 and 3 made up the inner harbor, and the outer channel consisted of Piers A, B, and C.

Unfortunately, oil extraction had caused subsidence of several feet in and around the harbor. Operation Big Squirt, which consisted of saltwater injection, was begun in 1953. Many of the wooden wharfs were replaced with new concrete structures, and new piers and other facilities were constructed. A major expansion plan was approved in 1957, and the POLB began dredging Pier E in 1958 to create Piers F and G. By 1962, the old outer harbor, which had consisted of Piers A, B, C D, and E became the Middle Harbor, and Piers F and G constituted the new Outer Harbor.

The POLB went through another cycle of reconstruction and transformation as containerization became the new shipping norm beginning 1962. Pier J was constructed, and Pier F extended to accommodate the new technology of shipping containers. Pier J was again expanded in 1971 and 1975. Since this time, the POLB infrastructure has continued to be modified and improved to keep up with growing trade and changing technology.

Cultural Resources within the Study Area

A records search was performed by the South-Central Coastal Information Center (SCCIC) on July 25, 2018 in order to determine the presence of previously recorded cultural resources within the study area. Records on file at USACE's Los Angeles District Office were also reviewed. According to the SCCIC search results, 47 cultural resources studies have been conducted within a 0.5-mile buffer area surrounding the study area. At least 13 of these previous reports are archaeological surveys, but they also include records searches, site visits, eligibility evaluations, monitoring plans, and historic property management plans.

The records search identified 95 built structures and other historic resources within the 0.5-mile buffer of the study area. These include 85 buildings (mainly military properties, but also some commercial shipping and industrial manufacturing facilities), one (1) district (Terminal Island, an early Japanese community centered around "fish harbor"), the Spruce Goose, the Spruce Goose Hangar, the Queen Mary, the Sierra Nevada Ferry Boat, one (1) transmission line, three (3) other structures (a bridge, a sewage pumping station, and a sewer pit), and one (1) object (a combination of a machine and cistern). There are no known prehistoric sites within the search area. Given the Port's artificially constructed nature and its history of commercial and military use, it is not surprising that it is relatively rich in historic structures but not in prehistoric archaeological sites.

3.8.2 Area of Potential Effect

Compliance with regulations affecting cultural resources requires the definition of an area of potential effect (APE). The APE is the geographical area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties (36 C.F.R. 800.16). USACE considers the APE for this Project to be the footprint of the project area in which physical activities related to the Project are to be performed.

For the purposes of this analysis, the APE includes the areas to be dredged under all alternatives, placement/disposal areas, the new electrical substation and associated trenching, LSF (additional dredging and potential wharf improvements at Piers J and T), any necessary improvements to revetments or breakwaters (i.e., structural stabilization at the ends of the Pier J breakwaters), and the temporary staging area. Most of the proposed Project activities would occur below the surface of the water. The only activities that might be conducted above water would be the installation of an additional dredge electric substation on Pier J, potential wharf improvements at berths J266-J270 within the Pier J South Slip and at berth T140 along Pier T, and the creation of a temporary staging area. Use of any temporary staging area would not cause any ground disturbance, and the location identified would likely be located on existing pavement. Given the industrial nature of the Port and its history of reconfiguration/remodeling to keep up with rapidly changing shipping industry, no visual or other above-ground aesthetic effects are anticipated as a result of any proposed activities.

Cultural Resources within the APE

Only seven of the cultural sites reported within the search area are located within the APE. All of these were located within the West Basin or on Berth T140, but none is extant. Three (P-19-150287, P-19-15028, and P-19-15029) were military buildings located on Berth T140 at least as recently as 1994 but were removed for reconstruction of the Pier prior to 2002. P-19-150293 was a wooden and metal pier extending into the West Basin, but it was removed within the same period as the previous three sites. Site P-19-150176 was another military building located on Pier 2, but both it and Pier 2 were removed circa 2003. Site P-19-167314 is the former location of the early Japanese fishing village now known as Terminal Island. It was destroyed by Port development decades ago and formally determined not eligible by consensus with the SHPO in 1988. Site P-19-173042 is the wrecked ferry boat Sierra Nevada. In the 1980s, USACE found that the Sierra Nevada's propulsion system was eligible for the NRHP, conducted Historic American Engineering Record documentation of it, and subsequently removed it during a previous dredging project. Thus, there are no extant eligible historic properties within the APE.

The existing federal Main Channel and the initial 3-miles (approximate) of the Approach Channel have been previously dredged by USACE. The entire West Basin has been dredged at various times, beginning with a dredging project by the Navy that lowered most of the basin to -35 feet MLLW and continuing through 2017, when the POLB dredged most of the area included in the currently proposed Project beyond -55 feet MLLW to provide fill for the expansion of Pier E. The proposed Standby Area, the areas where the Main Channel would be widened, some of the Pier J Turning Basin (area outside the Pier J breakwaters), and Berths J266-J270 have also been dredged previously by either the Navy or the POLB. The California State Lands Commission shipwreck database and the Office of Coast Survey's Wrecks and Obstructions database maintained by NOAA indicate that a shipwreck is present in the Main Channel within the Middle Harbor near berth F201. However, the fact that this location is within the dredged Main Channel and nothing is indicated on the NOAA navigation charts (San Pedro Bay/18749 44th Ed. Oct. 2015, last correction 10/24/2018 and Los Angeles and Long Beach Harbors/18751 48th Ed. July 2016, last correction 9/19/2016) near this location suggests that, if this location is accurate, the remains of any vessel were removed by previous dredging. The *Final Report, Marine Archaeological Survey Pier J and the Southeast Basin Expansion* prepared by Ocean Surveys, Inc. (1985), which inventoried a portion of the area just south of the suggested wreck and found no indication of such, provides further evidence that there is no extant wreck within the Federal Channel near this location. Alternatively, this wreck may actually be misplotted and located outside of the APE. The NOAA navigation charts are the most recent subsurface data available and reflect the most recent condition. It is unlikely that any intact shipwrecks or other submerged cultural resources are present within any portion of the Federal Channel.

A remote sensing study carried out for USACE in 1989 (*A Cultural Resources Investigation of Southwest Outer Harbor Port of Long Beach, California* by Underwater Archaeological Consortium) identified an anomaly (Site No. 15) near the southwesterly margin of the Standby Area. This anomaly is described as “five sonar features with some magnetic indications” occupying an area 400 to 1,000 feet north of the east bend in the Middle Breakwater. Two of the features resemble rock piles. Because water depths in the northern portion of the area in which the anomaly is located approach 70 feet, any cultural materials would likely have been deposited since the area was dredged in the 1960s and would likely not have obtained sufficient age to constitute a historic property.

The areas that presumably have not been previously dredged include the additional 1-mile (approximate) that the Approach Channel will be lengthened to maintain the -80 feet MLLW depth, the Pier J Approach, and the un-dredged portion of the Turning Basin.

NOAA Navigation Charts 18749 and 18751 were reviewed for identified shipwrecks and other features that could represent submerged cultural resources within the areas of the APE to be dredged. An obstruction at a depth of approximately 46 feet is indicated along the southwesterly margin of the potential Standby Area, but it lies just outside the area to be deepened. Another obstruction is noted approximately 1,000 yards south of Queen’s Gate immediately adjacent to the east side of the Federal Channel, but it is presumably outside the established channel or would have been removed by previous dredging. Other sources plot the wreck of the Pierpoint Queen, sunk in 1951, to be located within the potential Standby Area, but no wreck is shown on the NOAA charts at this location. If it sunk in this area, it was likely removed by past dredging. Further, the 1989 study by Underwater Archaeological Consortium did not record any anomalies as this location.

Given that the Surfside Borrow Site Nearshore Placement Area has been used as a sand borrow source for the San Gabriel River to Newport Bay Beach Nourishment project since 1964, it is extremely improbable that any intact submerged resources exist within the nearshore disposal area. No subsurface features are noted on the navigation chart. Further, the nearshore area is highly energetic environment, and the ocean bottom tends to be mobile. It is unlikely that any cultural resources would have persisted in this area, even if it had not been excavated for beach nourishment material.

LA-2 and LA-3 are existing USEPA ODMDS that have been used to dispose dredged sediment for decades. The *Final Environmental Impact Statement for the Site Designation of the LA-3 Ocean Dredged Material Disposal Site off Newport Bay Orange County, California* prepared jointly by the USEPA and USACE in 2005 indicates that there are no known shipwrecks within 6 kilometers of either disposal site. Any cultural resources that may ever have existed in either site are presumably deeply buried in deposited sediment. Given the history of previous dredging and other disturbance, it is unlikely that any other intact submerged historic resources are extant anywhere in the APE.

Submerged Prehistoric Cultural Resources

Submerged prehistoric sites, either resulting from occupation during periods of lower sea levels or as a result of direct deposition into the ocean, are known to exist along the California coast. These sites are commonly situated on relic submerged landforms. Within the project area, these could include buried estuarine deposits and buried relict channel (s) associated with the ancestral Los Angeles and San Gabriel Rivers.

According to a technical synthesis report (*Underwater Archaeological Survey, Cabrillo Shallow Water Habitat Expansion Site Port of Los Angeles, California) prepared in 1999* by Macfarlane Archaeological Consultants, sea levels started falling about 30,000 years Before Present (B.P.) from levels near or slightly below modern levels. They may have reached a low approximately 400 feet below modern levels circa 18,000 B.P. This would have exposed several kilometers of the continental shelf and caused erosion of the exposed surface. Sea level drop reversed with the warming at the onset of the Holocene. The rise in sea levels probably slowed about 8,500 B.P. to a rate of 10-15 cm/100 years until it reached a standstill approximately 3,500 B.P. As the sea level rose, wave action and sedimentation would have reworked the coastline as it traveled inland.

However, the high-energy nature of the shoreline environment along the California coast makes preservation of intact submerged prehistoric cultural resources very unlikely except in specific locations that are fully or partially protected by natural features. San Pedro Bay does have environmental features that could have preserved prehistoric cultural resources, but no submerged resources have been reported in or near the project area. This indicates the likelihood of encountering such during the proposed Project to be low, particularly given the long history of disturbance and construction in and around the Port. This assessment is supported by the results reported in the *Final Report, Marine Archaeological Survey Pier J and the Southeast Basin Expansion* prepared by Ocean Surveys, Inc. (1985), which determined that, while bathymetric and sub-bottom profiler records do indicate that there are both transgressive and regressive coastal sequences displaying stratigraphy present in the project area, no discrete targets of probable cultural material or prehistoric coastal/riverine shoreline areas that would have been particularly favorable for habitation sites were identified. Thus, it is unlikely that any intact submerged prehistoric resources are extant in the APE.

Additionally, a search of the Native American Heritage Commission (NAHC) Sacred Lands File provided to the POLB on February 22, 2019 indicated there are no known sacred resources within the project area. USACE initiated consultation regarding the proposed Project and requesting assistance in identifying additional cultural resources by letter on August 1, 2019. The only information received to date was from the Gabrieleno Band of Mission Indians - Kizh Nation, who indicated that there were cultural resources located on particular landforms in the vicinity, but the APE does not extend to that area.

3.9 Noise

This section describes the existing noise setting within the project study area. Sound intensity and noise levels described in this EIS/EIR are measured in decibels (dBA) that are A-weighted to correct for the relative frequency response of the human ear. Unlike linear units (e.g., inches or pounds), dBA are measured on a logarithmic scale, representing points on a sharply rising curve (Caltrans 2009).

The decibel scale increases as the square of the change, representing the sound pressure energy. While 10 dBA are 10 times more intense than 1 decibel, 20 dBA is 100 times more intense and 30 dBA is 1,000 times more intense. A 10- dBA increase in sound level is perceived by the human ear as only doubling of the loudness of the sound. Ambient sounds generally range from 30 dBA (very quiet) to 100 dBA (very loud) (Caltrans 2009).

Sound levels are generated from a source and their dBA level decreases as the distance from that source increases. For a single point source, such as construction operations, sound level decays approximately 6 dBA for each doubling of distance from the source (Caltrans 2009).

Several rating scales (or noise "metrics") exist to analyze adverse effects of environmental noise on a community. These scales include the average equivalent noise level (L_{eq}), the community noise equivalent level (CNEL) and the day/night noise average level (L_{dn}). L_{eq} is a measurement of the sound energy level averaged over a specified time period, usually 1 hour (Caltrans 2009).

Unlike the L_{eq} metric, the CNEL and L_{dn} noise metrics are based on 24 hours of measurement. CNEL also differs from L_{eq} in that it applies a time-weighted factor designed to emphasize noise events that occur during the evening and nighttime hours (when quiet time and sleep disturbance is of particular concern). Noise occurring during the daytime period (7:00 a.m. to 7:00 p.m.) receives no penalty. Noise produced during the evening time period (7:00 p.m. to 10:00 p.m.) is penalized by 5 dBA, while nighttime (10:00 p.m. to 7:00 a.m.) noise is penalized by 10 dBA. The Ldn noise metric is similar to the CNEL metric except that the period from 7:00 p.m. to 10:00 p.m. receives no penalty. Both the CNEL and Ldn metrics yield approximately the same 24-hour value with the CNEL being the more restrictive (i.e., higher) of the two by approximately 0.3 dBA (Caltrans 2009).

The Port is characterized by industrial and Port-related facilities, visitor-serving commercial areas, marine services and support facilities, and open space and recreational areas. The average 24-hour daily noise levels across eight locations at the Port ranged from a low of 64.1 dBA (recorded on a Sunday) to a weekday high of 71.8 dBA (Khoo and Nguyen, 2014). Average 24-hour daily noise levels at the eight locations ranged from 65.8 dBA (at a point on South Harbor Scenic Drive between the cruise ship terminal at Pier H and the Pier J breakwaters) to 72.8 dBA (near the intersection of Pico Avenue and Seaside Freeway).

3.10 Socioeconomics

Under NEPA, “economic” and “social” effects are environmental consequences to be examined (40 C.F.R. § 1502.16 and 40 C.F.R. § 1508.8). Under CEQA, the focus of an EIR is primarily on potential changes to the “physical conditions” which include land, air, water, flora, fauna, population, housing, noise, and objects of historic or aesthetic significance (Cal. Pub. Res. Code § 21060.5; Cal. Code Regs. Title 14 § 15358(b) and § 15382).

In addition to examining potential social and economic impacts to local and regional populations as a whole, any NEPA document must consider the potential for disproportionately high and adverse human health or environmental effects to minority or low-income populations, as well as potential disproportionate environmental health and safety risks to children, in order to comply with relevant federal Executive Orders.

This section presents local and regional demographic and income information as well as information on commercial fisheries, the local social and economic sector most likely to be adversely impacted by the proposed project. Recreational fishing and diving is described as part of Section 4.10.5 in terms of economic value based on the estimated number of participants. Other information on tourism (based on number of beach visitors) and recreation services that are within the vicinity of the study area (on-shore, surfing and off-shore borrow sites) are described in Section 4.13 (Recreation).

3.10.1 Population

According to US Census, the city of Long Beach is the seventh most populous incorporated community in Los Angeles County, California. As of 2019, the city of Long Beach population was 462,628, which represents an increase of 0.1 percent from the 2010 population of 462,257. City of Los Angeles neighborhoods adjacent to the POLB include San Pedro and Wilmington, which had 2018 populations of about 78,900 and 52,910, respectively, according to statistical atlas website.

Table 3-8 Population of the City of Long Beach in Los Angeles County, CA

Census	Population	Change
2019	462,628	0.1%
2010	462,257	0.2%
2000	461,522	7.5%
1990	429,433	18.8%
1980	361,498	0.7%
1970	358,879	7.4%
1960	334,168	33.3%

3.10.2 Employment

Four primary areas of employment in the city of Long Beach are 1) government, 2) trade and transportation, 3) professional and business services, and 4) educational and health services. The local economy and employment are significantly influenced by local tourism. Primary sources of employment in the governmental sector include the Veterans Administration Medical Center, the United States Postal Service and the City of Long Beach. Trade and transportation sector employers include the POLB and Long Beach Transit. Professional and business services include Verizon Denso, Epson, Gulfstream Aerospace, Laserfiche, the Queen Mary, SCAN Health Plan, TABAC and Boeing. Educational and health services employees include St Mary's Medical Center, Long Beach City College, Long Beach Memorial Medical Center, California State University, College Medical Center, Molina Healthcare, and Long Beach Unified School District.

3.10.3 Income

Due to the continued strong economy subsequent to the Great Recession, local area unemployment rates are very low, as shown on **Table 3-9**. The city of Long Beach and the city of Los Angeles had unemployment rates at 12.1 and 10.6 percent, respectively, as of December 2020. Data for **Table 3-9** was obtained from the CA.gov website.

Table 3-9 City of Long Beach and the City of Los Angeles Labor Force Data

Area Name	Labor Force	Employment	Unemployment	
			Number	Rate
Long Beach City	232,800	204,600	28,200	12.1%
Los Angeles City	1,987,000	1,777,300	209,800	10.6%

The poverty rate for the city of Long Beach is 16.8 percent, which is slightly lower than Los Angeles City at 18.0 percent. Data for **Table 3-10** was obtained from community profile data found on the Census Bureau website for 2019.

Table 3-10 City of Long Beach and the City of Los Angeles Annual Income Data

Area Name	Median Household Income	Per Capita Income	Poverty Rate
Long Beach City	$63,017	$33,323	16.8%
Los Angeles City	$62,142	$35,261	18.0%

3.10.4 Race & Ethnicity

Table 3-11 provides a summary of race and Hispanic ethnicity for the Study Area. White alone represents the majority of the racial composition for the study area. Los Angeles and Long Beach have diverse populations, e.g., Black and Asian populations represent about 13 percent each for the city of Long Beach, with those identifying as having two or more races at 4.7 percent. Hispanic populations for Long Beach and Los Angeles are approximately 43 percent and 49 percent, respectively.

Table 3-11 Race and Hispanic Ethnicity

Area Name	Race (%)					Hispanic Ethnicity (%)
	White Alone	Black Alone	Asian Alone	Other	Two or More	
City of Long Beach	51.2	12.7	13.1	1.9	4.7	42.6
City of Los Angeles	52.1	8.9	11.6	0.9	3.8	48.5
Los Angeles County	70.7	9.0	15.4	1.8	3.1	48.6
Source: U.S. Census 2019						

3.11 Transportation

Ground access to the Port is provided by a transportation network, including freeways, arterial facilities and local streets. The study area includes 15 intersection in the vicinity of the proposed land-side work sites at Pier J and Pier T, and potential launch sites at Pier S, Pier T, and a site near Pier D Street & Pico Avenue. Vessel transportation within the San Pedro Bay may also be affected and is discussed herein.

3.11.1 Major Highways

Primary regional access to the study area is provided by three freeways Interstate 710 (I-710), I-110, and State Route (SR) 103/47.

The I-710 Freeway runs north/south along the eastern edge of the Port. This route also connects the Port to downtown Los Angeles and major intermodal railyards in East Los Angeles. Based on the latest available Caltrans data, the 2017 average annual daily traffic volume on the segment of I-710 between Anaheim Street and Pacific Coast Highway (PCH) ranges between 133,000 to 136,000 vehicles.

The I-110 Freeway runs north/south along the western side of the San Pedro Bay Port Complex. This route connects the Port to downtown Los Angeles. The year 2017 average annual daily traffic volume on the segment of I-110 between Anaheim Street and PCH ranges between 96,000 to 100,000 vehicles.

SR-47 merges with SR-103 (also called the Terminal Island Freeway) at Henry Ford Avenue. SR-47/SR-103 extend from Terminal Island across the Commodore Schuyler Heim Bridge to the north and terminate at Sepulveda Boulevard/Willow Street near a major intermodal yard. The year 2017 average annual daily traffic volume on the segment of SR-103 between SR-47 junction and Henry Ford Avenue ranges between 16,900 to 18,200 vehicles.

3.11.2 Local Streets/Coastal Access and Traffic Volumes

The key access streets serving the study area include Pico Avenue, Harbor Scenic Drive, Harbor Plaza and Ocean Boulevard.

Pico Avenue is a north-south corridor with two lanes in each direction and provides direct access to I-710 as well as to Broadway, Pier E Street, and Pier D Street. The August 2018 daily traffic volume on the segment of Pico Avenue between Pier D Street and Pier C Street was approximately 28,300 vehicles.

Harbor Scenic Drive provides access to the Project area. It connects the Project site and the Pier G-H-J portions of the harbor to I-710. It has from one to three lanes in each direction, depending on location. The August 2018 daily traffic volume on the segment of Harbor Scenic Drive south of Pier J Avenue was approximately 7,150 vehicles.

Harbor Plaza runs east/west and connects Harbor Scenic Drive with Pico Avenue/Pier G Avenue. It has one to two lanes in each direction, depending on location. The August 2018 daily traffic volume on the segment of Harbor Plaza west of Harbor Scenic Drive was approximately 4,400 vehicles.

Ocean Boulevard, the primary east-west corridor to the north of the Project site, to the west of I-710, connects the study area to Terminal Island with three lanes in each direction. The daily August 2018 traffic volume on the segment of Ocean Boulevard west of I-710 was approximately 50,500 vehicles. Heavy duty trucks are prohibited on Ocean Boulevard east of I-710.

On-street curbside parking is prohibited on all of the streets in the study area. Additionally, local streets providing access to the landside work sites and potential launch areas may include Pier D Street, Pier T Avenue, New Dock Street, and Pier S Avenue.

Available information on current and future (2040) traffic operations at 15 intersections in the vicinity of the proposed land-side work sites and potential launch sites was taken from a recent study published by the Port (Port Master Plan Update Draft Program EIR, August 2019). As shown in Appendix M (Fehr & Peers 2019), acceptable levels of service (LOS D or better) are shown under existing baseline and future conditions for the morning, midday, and afternoon peak hours (defined as occurring between 7:00 and 8:00 AM, 2:00 PM and 3:00 PM, and 4:00 and 5:00 PM, respectively).

3.11.3 Transit Services

Long Beach Transit (LBT) provides limited transit service to the Port area due to the non-typical nature of marine terminal work schedules. The only public transit service near the Project is LBT's Passport, which primarily serves visitors to the area and connects downtown Long Beach to waterfront attractions, such as the Queen Mary. There are no other regular LBT routes serving the harbor area.

3.11.4 Railroads

The Port is served by two Class I Railroads - Union Pacific Railroad (UPRR) and Burlington Northern Santa Fe (BNSF). Additionally, Pacific Harbor Line (PHL) a short line rail operator, provides maintenance, switching and dispatching services within the Port complex and connects with both Class I Railroads. Rail access between the Ports to the rest of the country is via the Alameda Corridor, which begins just north of the San Pedro Bay Ports, parallels Alameda Street and terminates in downtown Los Angeles railyards where several UPRR and BNSF rail lines converge.

3.11.5 Vessel Transportation

Vessel transportation occurs in the waters of San Pedro Bay, which includes the study area. Most commercial ship traffic generally approaches the POLB from the northwest, passing north of Catalina Island; traffic coming from the south passes east of the island. Both approaches use established commercial shipping lanes. San Pedro Bay is protected by three breakwaters – the San Pedro Breakwater, Middle Breakwater, and Long Beach Breakwater. The Queens Gate is the opening between the breakwater that provides entry to the POLB.

Los Angeles-Long Beach Vessel Navigation System

Several measures are in place to ensure the safety of vessel navigation in the harbor area. Restricted navigation areas and routes have been designated to ensure safe vessel navigation, and are regulated by various agencies and organizations, which are described below.

Vessel traffic in and near San Pedro Bay is regulated by the U.S. Coast Guard (USCG) Captain of the Port (COTP) and the Marine Exchange of Southern California via the Vessel Traffic Service (VTS). These entities ensure the total number of vessels transiting the Port does not exceed the physical and operational capacity of the system. Mariners are required to report their position to the COTP and the VTS prior to transiting through the Port; the VTS monitors the positions of all inbound and outbound vessels within the Precautionary Area and the approach corridor traffic lanes. In the event of scheduling conflicts and/or berth occupancy at capacity, vessels are required to anchor at the anchorages inside and outside the breakwater until mariners receive COTP authorization to initiate transit to the appropriate berth.

Marine Exchange of Southern California

The Marine Exchange is a non-profit organization that was originally affiliated with the L.A. Chamber of Commerce. Its mission is to enhance navigation safety in the Precautionary Area and harbor area of the San Pedro Bay ports. The organization is supported by subscriptions from Port-related organizations that use its service. The service consists of a coordinating office, specific reporting points, a radar system, and radio communications with participating vessels. The Marine Exchange also operates the Physical Oceanographic Real Time System (PORTS) (described below) to assist in the safe and efficient transit of vessels in the Port area.

Vessel Transportation Service

The VTS is a service owned by the Marine Exchange and operated jointly by the Marine Exchange and the USCG under the over-sight of the Office of Spill Prevention and Response (OSPR) and the Los Angeles/Long Beach Harbor Safety Committee. The VTS assists in the safe navigation of vessels approaching and leaving POLB and Port of Los Angeles (POLA). The VTS monitors traffic in the approach and departure lanes and inside the harbors. It uses radar, radio, and visual inputs to gather real time vessel traffic information and broadcast traffic advisories and summaries to assist mariners. The system provides information on vessel traffic and ship locations so that vessels can avoid allisions, collisions, and groundings (ACGs) in the approaches to the Los Angeles/Long Beach Harbor (an allision is an incident between a moving vessel and a stationary object, including another vessel).

Traffic Separation Schemes (TSSs)

A TSS is an internationally recognized vessel routing designation that separates opposing flows of vessel traffic into lanes, including a zone between lanes in which traffic is to be avoided. TSSs have been designated to help direct offshore vessel traffic along portions of the California coastline such as the Santa Barbara Channel. Vessels are not required to use any designated TSS, but failure to use one, if available, would be a major factor for determining liability in the event of a collision. TSS designations are proposed by the USCG but must be approved by the International Maritime Organization (IMO), which is part of the United Nations.

Safety Fairways

Offshore waters in high traffic areas are designated as safety fairways. USACE is prohibited from issuing permits for surface structures (e.g., oil platforms) within safety fairways, which are frequently located between a port and the entry into a TSS, to ensure safer navigation. The safety fairways for POLB are located within the designated Precautionary Area.

Precautionary and Regulated Navigation Areas

A Precautionary Area is designated in congested areas near the POLB harbor entrance to set speed limits or to establish other safety precautions for ships entering or departing the Harbor. A Regulated Navigation Area (RNA) is defined as a water area within a defined boundary for which federal regulations for vessels navigating within this area have been established under 33 CFR section 165.1109. In the case of the Los Angeles/Long Beach Harbor, RNA boundaries match the designated Precautionary Area. 33 CFR section 165.1152 identifies portions of the Precautionary Area as RNA.

The Precautionary Area for POLB/POLA is defined by a line that extends south from Point Fermin for approximately seven nautical miles (nm), continues due east approximately seven nm, continues northeast for approximately three nm, and then heads back northwest. Ships are required to cruise at speeds of 12 knots or less upon entering the Precautionary Area. A minimum vessel separation of 0.25 nm is also required in the Precautionary Area. The Marine Exchange of Southern California monitors vessel traffic within the Precautionary Area.

Pilotage

Use of a Port Pilot for transit in and out of the San Pedro Bay area and adjacent waterways is required for all vessels of foreign registry, and for those U.S. vessels enrolled as not having a federally licensed pilot onboard (some U.S.-flag vessels have a trained and licensed pilot onboard; those vessels are not required to take on a Port Pilot for navigating through the Port). In addition, the Port Tariffs require vessels greater than 300 gross tons to use a federally-licensed pilot whenever navigating inside the breakwater and require that a vessel notify the appropriate pilot station(s) in the rare instances when a pilot is not needed. Jacobsen Pilot Service and Los Angeles Harbor Pilots provide pilotage to POLB and POLA, respectively. Port pilots receive special training that is instituted by the pilot companies and overseen by the Harbor Safety Committee.

For POLB, pilots typically board the vessels outside the Queen's Gate entrance and then pilot the vessels to their destinations. Pilots normally leave the vessels after docking, and re-board the vessels to pilot them back to sea or to other destinations within the ports. Per the Port Tariffs, pilots stay on outbound vessels until clear of the breakwater entrance. The pilot service also manages the use of anchorages under an agreement with the USCG.

Tug Escort/Assist

"Tug Escort" refers to the stationing of tugs in proximity of a vessel as it transits into or out of port to provide immediate assistance should a steering or propulsion failure develop. "Tug Assist" refers to the positioning of tugs alongside a vessel and applying force to assist in making turns, reducing speed, providing propulsion, and docking.

Most ocean-going vessels are required to have tug assistance within the POLB harbor. However, some vessels have internal "tugs" (typically bow and stern thrusters) that provide propulsion without engaging the main engines, enabling them to accomplish maneuvers with the same precision as a tug-assisted vessel. These ships are not required to have external tug assistance.

Physical Oceanographic Real Time System (PORTS)

In partnership with NOAA, National Ocean Service (NOS), California Office of Spill Prevention and Response (OSPR), United States Geological Survey (USGS), and some businesses operating in the ports, the Marine Exchange operates PORTS as a service to those making operational decisions based on oceanographic and meteorological conditions in the vicinity of the ports. PORTS is a system of environmental sensors and supporting telemetry equipment deployed at strategic locations in and near the ports that gathers and disseminates accurate "real time" information on tides, visibility, winds, currents, and sea swell to maritime users to assist in the safe and efficient transit of vessels in the Port area. Locally, PORTS is designed to provide crucial information in real-time to mariners, oil spill response teams, managers of coastal resources, and others about POLA and POLB water levels, currents, salinity, and winds.

Navigational Hazards

Navigational hazards in the Ports include breakwaters protecting the Outer Harbor, anchorage areas, bridges, and various wharfs and other structures.

Vessels are required by law to report failures of navigational equipment, propulsion, steering, or other vital systems as soon as possible to the USCG via the COTP office or the COTP representative at VTS. According to VTS, approximately one in 100 vessels calling at the POLA or POLB experiences a mechanical failure during its inbound or outbound transit.

A variety of safety-related events can occur during vessel navigation, including vessel accidents, "close quarters," and "near misses." Accidents are subjected to a USCG marine casualty investigation, and the subsequent actions taken are targeted at preventing future occurrences. Oceangoing vessels are typically involved in about 11 percent of all marine accidents, and only 7.7 percent of ACG incidents. The largest number of accidents involved tugboats and barges. According to the USCG vessel accidents database, the POLB/POLA harbor area has one of the lowest accident rates among all U.S. ports.

Factors Affecting Vessel Safety

In addition to the navigational hazards described above, a variety of environmental conditions can affect vessel safety in the harbor area.

Fog

Fog is a well-known weather condition in southern California. Harbor area fog occurs most frequently in April and from September through January, when visibility over the bay is below 0.5 mile for seven to 10 days per month. Fog at the ports is mostly a land (radiation) type fog that drifts offshore and worsens in the late night and early morning. Smoke from nearby industrial areas often adds to fog's thickness and persistence. Along the shore, fog drops visibility to less than 0.5 miles on three to eight days per month from August through April and is generally at its worst in December. Reduced visibility raises the risk of ACGs by forcing mariners to rely on radar rather than visual cues.

Winds

Winds are strongest during fall and winter when the Santa Anas blow. This offshore desert wind, though infrequent, may be violent and often comes with little warning. It occurs when a strong high–pressure system sits over the plateau region and generates a northeasterly to easterly flow over southern California.

Winter storms produce strong winds over San Pedro Bay, particularly from the western quadrant. Winds of 17 knots or greater occur about one to two percent of the time from November through May. Southwesterly through westerly winds begin to prevail in the spring and last into early fall. Storm and Santa Ana winds represent a risk to vessel navigation because the force of the wind makes vessels more difficult to handle.

Currents and Surge

USACE ship navigation studies indicate that within the POLB channels, current magnitudes are essentially a negligible 1/3 knot or less. Tidal currents follow the axis of the channels, rarely exceed one knot, and do not have a major effect on vessel safety. According to Jacobsen Pilot Service, the pilots have never experienced a current greater than one knot in the area of Queen's Gate. The Harbor area is subject to seiche and surge, with the most persistent and conspicuous oscillation having about a one-hour period. Surges primarily affect the areas in restricted channels causing increased velocities, causing the hourly variation in current speed of 1.5 knots or more. At times the hourly surge, together with shorter, irregular oscillations, causes a very rapid change in water height and current direction/velocity, which may endanger vessels moored at the piers.

Water Depths

The Main Channel of the POLB has an authorized depth of -76 feet MLLW, which is much deeper than container vessels require for safe navigation. In places, however, the channels and basin depths are narrow, relative to the larger oceangoing vessels' length and width, which raises issues of safe navigation during passage to berths.

Vessel Traffic

The POLB handles more than 7.5 million TEUs and 82 million tons of cargo and has over 2,000 vessels calls. The arrivals are ships coming into Long Beach going to Berth or Anchor. The shift movements are from Anchor to Berth, Berth to Berth, or Berth to Anchor. Most ship movements to and from the berths are completed in two hours or less and very few movements are greater than three hours in duration. The pilot service and tug assistance can routinely handle up to 25 ship movements per day and can handle peaks of up to 40 movements per day.

3.12 Land Use

3.12.1 Coastal Plans and Local Policies

Under the federal Coastal Zone Management Act of 1972 (16 U.S.C. § 1451, *et seq*., as amended), long-range planning and management of California's coastal zone was conferred to the state with implementation of the California Coastal Act in 1977. The California Coastal Act (Cal. Code Regs. Title 14 § 30000) created the California Coastal Commission (CCC) who assist local governments in implementing local coastal planning and regulatory powers. Under that California Coastal Act, local governments are encouraged to adopt local coastal plans (LCPs). The LCP consists of a Land Use Plan (LUP) with goals and regulatory policies as well as a set of Implementing Ordinances.

Section 30235 of the California Coastal Act focuses on shoreline construction. All of these sections contain an element pertaining to the protection of existing structures and the protection of public beaches in danger of erosion. Under these sections, construction is allowed through revetments, breakwaters, groins, or other means that alter natural shoreline process; dredging of open coastal waters, lakes, wetlands, and other areas will be permitted only where less feasible environmentally damaging alternatives are not available. Section 30233 states that dredge materials suitable for beach replenishment should be transported to appropriate beaches or into suitable longshore current systems.

California State Lands Commission

The California State Lands Commission (CSLC) has exclusive jurisdiction over all of California's tide and submerged lands and the beds of naturally navigable rivers and lakes, which lands are sovereign lands, and swamp and overflow lands and State School Lands, which are proprietary lands.

Authority of the CSLC originates and is exercised from the state's position as a landowner. The CSLC has statutory authority (Division 6 of the California Resources Code) to approve appropriate uses of state lands under its jurisdiction and is the administrator of the Public Trust Doctrine over sovereign lands. The Public Trust is a sovereign public property right held by the State or its delegated trustee for the benefit of the people. This right limits the use of these lands to waterborne commerce, navigation, fisheries, open space, recreation, or other recognized Public Trust purposes. Sovereign lands may only be used for purposes consistent with this public trust; uses include commerce, navigation, fisheries, open space, wetlands and other related trust uses. The CSLC has an oversight responsibility for tide and submerged lands legislatively granted in trust to local jurisdictions (Public Resources Code [PRC] § 6301).

Management responsibilities of the CSLC extend to activities within submerged lands (from mean high tide line) and those within 3 nautical miles offshore. These activities include oil and gas developments; harbor development and management oversight; construction and operation of any offshore pipelines or other facilities; dredging; reclamation; use of filled sovereign lands; topographical and geological studies;

and other activities that occur on these lands. The CSLC also surveys and maintains title records of all state sovereign lands as well as settling issues of title and jurisdiction.

The federal government has the right to improve and protect navigation. The "federal navigational servitude," deriving from the Commerce Clause of the U.S. Constitution, gives the United States a dominant servitude which reflects the superior interest of the United States in navigation and the nation's navigable waters in the interests of commerce. U.S.C.A. Const. Art. 1, § 8, cl. 3; U.S.C.A. Const. Amend. 5; see Mildenberger v. United States, 91 Fed.Cl. 217, 247-55 (2010), affirmed on other grounds, 643 F.3d 938 (Fed .Cir. 2011). Under the Submerged Lands Act, the United States retains its navigational servitude and its rights in and powers to regulate and control lands and navigable waters for the purposes of commerce, navigation, national defense, and international affairs. According to the Act, these purposes shall be paramount to the proprietary rights of ownership, management, administration, leasing, use, and development of lands and natural resources recognized and vested in the states under the Act. Nothing in the Submerged Lands Act affects the use, development, improvement, or control of lands and waters, under the constitutional authority of the U.S., for navigation. Nothing shall relinquish the rights of the United States arising under its authority to regulate or improve navigation. Exceptions from the establishment of states' title, power and rights include all structures and improvements constructed by the United States in the exercise of its navigational servitude. See 43 U.S.C. §§ 1313 - 1314.

Marine Life Protection Act Initiative

In 1999, the California state legislature approved, and the governor signed the Marine Life Protection Act Initiative (MLPA) (codified at Section 2850 through 2863 of the Fish and Game Code). The purpose of MLPA is to ensure that the existing collection of Marine Preserve Areas (MPAs) are designed and managed according to clear, conservation-based goals and guidelines that take full advantage of the multiple benefits that can be derived from the establishment of marine life reserves by modifying the existing MPAs (URS 2010).

On December 15, 2010, the final MPA regulations were adopted for the South Coast Study Region, which extends from Point Conception to the California border with Mexico; and went into effect January 1, 2012 (CDFG 2012a). The regulations restrict specific activities within designated preserves but identify exceptions within specific MPA boundaries, including dredging and sand replenishment.

3.13 Recreation

Numerous marina and aquatic recreational facilities are located within and adjacent to the Port. These do not, however, include live-aboard services. Potential impacts to recreational uses would be limited to recreational vessel traffic in the Approach Channel, Main Channel, and Pier J Approach Channel/Turning Basin during construction. Recreational vessel traffic can be substantial, particularly on summer weekends and holidays.

3.14 Public Safety

3.14.1 Public Access

There would be no public access to construction sites, other than recreational vessels.

3.14.2 Access for Emergency Services

This section describes existing access points by emergency personnel (fire, police, ambulance, etc.).

Emergency Service Access

Emergency response/fire protection for the Port is provided by seven Long Beach Fire Department (LBFD) stations. Other organizations that provide emergency assistance include the Long Beach Police Department (LBPD), USCG, U.S. Department of Homeland Security (DHS), U.S. Customs and Border Protection (CBP), Federal Bureau of Investigation, and CDFW.

3.14.3 Safety for Commercial Fishing and Recreation Vessels and Personnel

Numerous marina and aquatic recreational facilities are located within and adjacent to the Port. These do not, however, include live-aboard services. Recreational vessels generally do not enter into the Inner Harbor but could be found in the Approach and Entrance Channels as well as the area proposed for the Pier J Channel and Turning Basin. Commercial fishing facilities exist at the neighboring POLA. Commercial fishing takes place outside the breakwater, except for small bait fish operations. These operations avoid the shipping channels to avoid larger cargo vessels that transit into and out of the harbor using the federal navigation channels.

The USCG maintains and operates navigational buoys and lights within the harbor. These are used by vessel operators to safely navigate in the harbor. The USCG also has vessels in place to respond to emergency calls with vessels berthed in the neighboring POLA. Commercial vessel-assist services are also available to commercial fishing and recreational vessels in case of non-emergency needs of assistance.

3.15 Public Utilities

This section identifies the location of the existing structures and utilities within the study area. The description of structures and utilities is based on limited field surveys and prior environmental documentation.

There are no public utilities, including pipelines, electrical lines, or telecommunications lines, in the project area, however, some of the wharves are serviced by electricity, natural gas, water and sewer.

4 PLAN FORMULATION

Plan formulation is the process of building alternative plans from management measures that meet planning objectives and avoid planning constraints. The process used for all planning studies conducted by USACE is a six-step structured approach to problem solving which provides a rational framework for sound decision making:

1. Identify Problems and Opportunities
2. Inventory and Forecast Conditions
3. Formulate Alternative Plans
4. Evaluate Alternative Plans
5. Compare Alternative Plans
6. Select a Recommended Plan

The sections that follow describe the standard process as applied to this study in a series of sequential steps. First, identification and specification of the problems and opportunities to be addressed are presented. Objectives and constraints, upon which the problems and opportunities are based, are discussed next. Planning objectives provide a clear statement of the purpose of this study, while constraints essentially describe the restrictions that limited the extent of the planning process for this particular effort.

Next, the process for the formulation of alternative plans is described. The first phase of formulation identifies the measures to be used. Measures can be either structural or nonstructural and are the individual pieces (or building blocks) of planning studies. Once preliminary measures are screened and final ones identified, they are mixed and matched into different preliminary alternative plans. This process is best served by observing the realities of combinability and dependency of the various measures. Only the best of the alternatives formulated need to be evaluated in more than a preliminary fashion, but all measures and plans require some level of evaluation initially. It begins with the first screening of measures and plans, with the detail and rigor increasing as planning moves closer to developing a final array of plans for full evaluation. Evaluation, like all other planning steps, is an iterative process. Alternative plans are then compared. The purpose of the comparison step is to identify the most important criteria plans were evaluated against and compare the various plans across those criteria. The final step of the process is to choose a Recommended Plan, which best meets the stated objectives and constraints of the study.

4.1 Navigation Inefficiencies

The goal of USACE deep draft navigation projects is to lower transportation costs. This is done by providing conditions that allow for better utilization of present vessels, or by use of larger, more efficient vessels. Currently, POLB has inadequate channel depth, which results in significant tide restrictions, light loading, or other operational inefficiencies, which are economic inefficiencies that translate into costs for the national economy.

4.2 Problems and Opportunities

The first step in the six-step planning process is the identification of problems and opportunities. A problem is an existing condition to be considered for change. An opportunity is a chance to create a future, more desirable condition. The identification and development of problems and opportunities specific to the POLB resulted from internal discussions, external communication with stakeholders and resource agencies, and public meetings.

4.2.1 Problems

Past harbor development projects focused on providing large, modern container terminals with on-dock rail facilities to improve transportation efficiencies and to reduce truck traffic. Those terminals were designed to meet the current and forecast vessel fleet. Widening and enlargement of the Panama Canal has led to a new class of container vessels whose fully loaded drafts exceed current federal channel and berth depths. This has led the POLB to identify the primary problem facing current operations is the inefficient operation of deep draft vessels in secondary and Federal (main) channels, which increases the Nation's transportation costs. Larger container vessels must either ride the tides and enter and leave the West Basin and Pier J Basin only on high tides, or to light load the vessel in order to ensure a shallower draft required to safely enter and leave these areas of the Port of Long Beach. Additionally, liquid bulk vessels must enter and exit the 2-mile long Approach Channel one at a time, which results in increased delays due to channel width limitations and/or they must delay entry during wave swells and other conditions or light load at point of origin due to depth limitations along the Approach Channel.

The POLB is a deep-water port. Existing channels serving container movements have controlling depths of -50 to -53 feet mean lower low water (MLLW), which limits containerships to 44-49-foot drafts with tide riding. With tide-riding, vessels can draft 2-3 more feet depending upon timing and pilot practices but can incur tidal delays. Light loading at the point of origin (typically Eastern Asia) also occurs. Due to limitations set by the bar pilots, larger liquid bulk vessels must wait several miles offshore until the main channel is cleared as the channel is restricted to one-way traffic and lacks a passing area near the POLB. This limitation has impacted 5-10 percent of crude oil imports, or 1-3 million tons per year, historically and the impact has increased to 15 percent more recently. In sum, the inventory and preliminary forecast done to date demonstrate that existing conditions create transportation inefficiencies for container and liquid bulk vessels, and that future fleet changes will exacerbate this problem.

PROBLEM STATEMENT: The primary problem is existing channel depths and widths that create limitations of the harbor, resulting in the inefficient operation of deep draft vessels in the Federal (Main) and secondary channels in the Port of Long Beach complex, which increases the Nation's transportation costs.

The following summarizes the problems:

1. Due to depth limitations along channels accessing the POLB's container terminals, existing container vessels cannot load to their maximum draft causing light-loading of vessels at the point of origin and tidal delays to an increasing number of container ships.
2. The dimensions of the worldwide fleet of container vessels have increased significantly, and it is anticipated that this trend will continue. Delays and light-loading due to container vessel draft limits will increase as new, larger vessels are added to the fleet.
3. Due to channel width limitations liquid bulk vessels must enter and exit the two-mile-long Approach Channel one at a time resulting in increased delays.

4. Due to depth limitations along the Approach Channel, liquid bulk vessels must delay entry during wave swells and other conditions, or light-load at point of origin.
5. Ship simulation indicates issues with the width of the Main Channel, in certain areas, for the design vessels.
6. Due to vessel traffic, liquid bulk vessels must wait outside of the POLB (seaward side of the breakwaters), resulting in inefficiencies.

4.2.2 Opportunities

Opportunities are conditions that exist within the study area. Like problems, opportunities are among the first things to be identified in the planning process. Opportunities tend to focus on positive and future conditions.

1. Reduce the transportation cost of import and export trade through the Port of Long Beach and contribute to increases in national net income by reducing light-loading and delays for current and future container fleet calling on POLB. (relates to Problems 1 and 2)
2. Reduce the transportation cost of import and export trade through the Port of Long Beach and contribute to increases in national net income by reducing delays for current and future liquid bulk vessels calling on POLB. (relates to Problems 3 and 4)
3. Provide improved conditions for vessel operation and safety, including reducing constraints on harbor pilot operating practices and safety risks in the event of vessel malfunction or weather-related events. (relates to Problem 4)

4.3 Planning Constraints and Considerations

Planning constraints represent restrictions that should not be violated. The constraints identified include those public concerns that, if violated by an alternative plan, would result in the plan not being acceptable to most public interests. It also includes those aspects of the study area generally regulated by government agencies that, if adversely impacted, would result in the plan being unacceptable. In general, the planning process needs to consider measures to avoid or mitigate any significant adverse impacts associated with the planning constraints. The planning constraints specific to this study are described below.

1. Plans must not violate environmental restrictions on dredging including sediment, water, and air quality standards.
2. Plans must not violate maritime safety requirements.
3. Avoid existing mitigation sites.
4. Plans will be consistent with the Port of Long Beach’s Port Master Plan.

Planning considerations included recommendations made by the USFWS initially in its Planning Aid Report (PAR) prepared in accordance with the Fish and Wildlife Coordination Act. While the USACE was unable to incorporate any of the six recommendations made in the PAR into the project, the recommendations were evaluated in the design process.

An additional consideration is to maximize beneficial reuse of dredged materials. Attempts were made to identify and implement feasible and foreseeable beneficial reuse options for dredged materials retaining ocean disposal for sediments unsuitable for beneficial reuse or for which beneficial reuse options could not be identified.

4.4 Planning Objectives and Criteria

Based on the analysis of the identified problems and opportunities and the existing conditions of the study area, planning objectives were identified to direct formulation and evaluation of alternative plans. These were established as objectives for the proposed action. During the period of analysis, two planning objectives were identified.

PLANNING OBJECTIVES: **The primary objectives over the 50-year period of analysis (2027-2076) are as follows:**

1. ***Increase transportation efficiencies for container and liquid bulk vessels operating in the Port of Long Beach, for both the current and future fleet.***

2. ***Improve conditions for vessel operation and safety, including reducing constraints of harbor pilot operating practices.***

There are three primary outcomes from channel deepening that would induce changes in the operations and composition of the future fleet mix at the POLB. The first is an increase in a vessel's maximum practicable loading capacity. Channel restrictions limit a vessels capacity by limiting its draft. Deepening the channel reduces this constraint and the vessel's maximum practicable capacity increases towards its design capacity. This increase in vessel capacity results in fewer vessel trips required to transport the forecasted cargo. The second effect is an increase in the reliability of water depth, which encourages the deployment of larger vessels to the POLB. The third effect is a consequence of the second; the increase in larger Post-Panamax vessels displaces the less economically efficient smaller Post-Panamax vessels and Panamax class vessels. This would decrease the number of vessel trips, overall, at the POLB.

The outcomes described above can be best put in terms of NED benefit categories. Contributions to the NED account represent the anticipated increase in the value of the national output of goods and services. This is one important criteria USACE uses to value an effort or determine to what extent it will likely be able to implement a solution for a problem and/or capitalize on a study opportunity.

In the case of navigation projects (such as the POLB), the increase in national output is in the form of reduced transportation costs (benefits). When consumers buy goods, the price includes the cost to have the goods transported from where they are produced to where they are sold. Where efficiencies are created, the lower cost of transporting the goods can be passed on to consumers in the form of lower prices. Efficiencies can also help promote exports. When goods made in the U.S. are transported more efficiently, they can be delivered to customers in other countries at a lower cost. This can make U.S. products more competitive and lead to greater employment in the U.S. The USACE does not attempt to predict what portion of project benefits would accrue to consumers versus shipping companies or manufacturers. Attributing benefits to specific entities would be extremely complex and speculative. Instead, the benefits are expressed in terms of transportation costs saved by all parties on all goods, whether they are imported or exported.

NED benefits are estimated by calculating the total costs to transport the forecasted cargo through the unmodified (without project) harbor system and through each alternative scenario using the HarborSym Modeling Suite of Tools. Benefits for each alternative are calculated by subtracting the total transportation costs for that alternative from the total transportation costs for the same cargo under the without-project conditions. Net benefits are then calculated by subtracting the total costs to implement each alternative from the benefits that would result from implementing that alternative. Positive net benefits (where cost savings exceed implementation costs) are considered contributions to the NED account. NED benefits and costs are normally expressed in terms of average annual values that are calculated over the 50-year period of analysis. The calculations consider the timing of the expenditures and benefits by applying a discount rate that converts the dollar value of costs and benefits received at different time periods to a present value.

NED benefits include origin-to-destination benefits, meeting area benefits (i.e., waiting time outside the Port due to traffic delays or wave conditions), and tide delay reduction benefits. Origin-to-destination benefits are primarily derived "at-sea" based on the ability to utilize different vessels or to load more cargo onto them based on differing harbor condition scenarios. For deepening alternatives, most origin-to-destination benefits result from efficiencies related to the ability to use the additional draft to deploy larger, more efficient vessels and/or to transport more cargo on the same vessels and reducing the total number of trips needed to transport a given volume of cargo. Meeting area and tide delay reduction benefits are derived near and within the harbor and result from a reduction in transit times needed to navigate the harbor. These benefits are normally smaller than the associated origin-to-destination benefits and are attributable to increased flexibility of harbor operations resulting from fewer tide delays, less concentrated traffic during high tides, and the ability of vessels to pass within the harbor (minimizing or eliminating the need for one-way traffic restrictions).

4.5 Assumptions

To facilitate analysis and screening, two sets of assumptions were used related to the FWOP conditions for this study: (1) standard USACE deep draft navigation assumptions, and (2) project-specific assumptions.

The assumptions related to the FWOP conditions described in the USACE Planning Guidance Notebook (ER 1105-2-100) for all deep draft navigation feasibility studies include:

- Nonstructural measures within the authority and ability of port agencies, other public agencies, and the transportation industry to implement are assumed to occur. These measures consist of reasonably expected changes in management and the use of existing vessels and facilities on land and water. Examples are lightering, tug assistance, use of favorable tides, split deliveries, topping-off, alternative modes and ports, and transshipment facilities, such as the USCG Vessel Separation Tracking System.
- Alternative harbor and channel improvements available to the transportation industry over the planning period include those in place and under construction at the time of the study, and those authorized projects that can reasonably be expected to be in place over the planning period.
- Authorized operation and maintenance is assumed to be performed in the harbors and channels over the period of analysis unless clear evidence is available that maintenance of the project is unjustified.
- In projecting commodity movements involving intermodal movements, sufficient capacity of the hinterland transportation and related facilities, including port facilities, is assumed unless there are substantive data to the contrary.
- A reasonable attempt should be made to reflect advancing technology affecting the transportation industry over the period of analysis. However, benefits from improved technology should not be credited to the navigation improvement if the technological change would occur both with and without the plan.

The following study-specific assumptions developed for the study include:

- Without a federal project, no channel deepening or widening would occur.
- Based upon the Port's Master Plan and information provided by the Port, it is likely that Pier J South will be filled in by 2047, or approximately 20 years after the Base Year[9]. Therefore, the benefits for that portion of the project are only accrued for 20 years of the period of analysis.

4.6 Development of Management Measures

A management measure is an activity that can be implemented at a specific geographic site to address one or more planning objectives. These are generally categorized as structural or non-structural. Preliminary alternatives are formulated and refined by combining, adapting, and scaling management measures to best address the following four criteria:

1. Completeness - Completeness is a determination of whether the plan includes all elements necessary to achieve the objectives of the plan. It is an indication of the degree that the outputs of the plan are dependent upon the action of others.
2. Effectiveness – All of the plans in the final array provide some contribution to the planning objectives. Effectiveness is defined as a measure of the extent to which a plan achieves its objectives.
3. Efficiency – All of the plans in the final array provide net benefits. Efficiency is a measure of the cost effectiveness of the plan expressed in net benefits.
4. Acceptability – All of the plans in the final array must be in accordance with Federal law and policy. Acceptability is the extent to which the alternatives plans are acceptable in terms of applicable laws, regulations, and public policies.

Management measures were developed through brainstorming sessions during the reconnaissance phase, the kickoff meeting, and a value engineering workshop. A feature is one or more management measures at a specific location. Due to the highly developed nature of the POLB complex, the application of structural management measures for widening channels, deepening channels, and creating turning basins described below are contextualized with dredged material placement locations, i.e., as features, to facilitate the understanding of the reader. A preliminary list of structural and non-structural management measures is included below. **Figure 4-1** shows the locations within the POLB.

Non-Structural

- **High-Tide Riding:** Delay until high tide to allow deeper drafting vessels to transit the harbor under existing conditions.
- **Light-Loading/Lightering:** Light-load or lighter to limit drafts to allow the fleet to transit the harbor under existing conditions.

[9] Common "base year" is established for calculating total NED benefits and costs, reflecting the year when the project is expected to be operational. In this case, Base Year (first year of period of analysis) is 2027.

Structural

- **Removal of the End of the Navy Mole:** This narrow land area constrains the width of a 1,000-foot portion of the main channel limiting larger vessels to one-way transit. Removal would allow two-way transit (liquid bulk and container).
- **West Basin Channel Deepening and Construct a Turning Basin:** Deepen the West Basin channel to reduce delays and light-loading for larger container vessels and construct a turning basin with the channel to improve efficiencies (container).
- **Southeast Basin Deepening:** Deepen the Southeast Basin channel to reduce delays and light-loading for larger container vessels (container).
- **Main Channel Widening at the Entrance to the Southeast Basin:** A widened channel at the entrance to the Southeast Basin could improve vessel maneuverability reducing transit times (container).
- **Widening of Approach to Southeast Basin:** Remove a portion of Pier F to allow for two-way traffic along the Southeast Basin channel (container).
- **Constructing an Approach Channel to Pier J South:** An approach channel to Pier J South to reduce delays and light-loading for larger container vessels (container).
- **Constructing a Turning Basin at Entrance to Pier J South Channel:** A turning basin at the entrance to Pier J would improve vessel maneuverability reducing transit times and delays on the Main Channel (container).
- **Widening of Pier J South Breakwater Opening:** Remove portions of the breakwater to shorten transit times to and from Pier J (container).
- **Standby/Passing Areas Deepening:** Provide a waiting and passing area within the breakwater for vessels drafting 61 feet or greater to reduce loading and unloading delays (liquid bulk).
- **Approach Channel Deepening Seaward of Queens Gate:** Deepen the 2.6-mile Approach Channel seaward of the breakwater to reduce delays and lightering during certain weather conditions and light-loading during normal conditions (liquid bulk).
- **Queens Gate Deepening (Outer Harbor Entrance):** Deepen the entrance to the outer harbor to reduce delays and lightering during certain weather conditions and light-loading during normal conditions (liquid bulk).

Dredged Material Placement Locations

- **USEPA-approved ODMDS LA-2 and LA-3:** LA-2 is located 9 miles southwest of Queens Gate--maximum cumulative allowable placement per calendar year from all sources is 1 million cubic yards (mcy). LA-3 is located 22 miles southeast of Queens Gate--maximum cumulative allowable placement per calendar year from all sources is 2.5 mcy. These are standard, non-beneficial reuse sites.
- **North Energy Island Borrow Pit:** 4 mcy capacity. Preferred for placement of dredged material unsuitable for ocean disposal or nearshore placement. Located 2.5 miles from Queens Gate.
- **Surfside Borrow Site Nearshore Placement Area:** Various sites off of Surfside-Sunset Beach in Orange County have been used as sources of sand for the San Gabriel River to Newport Bay Beach Nourishment project since 1964. There are no other known projects planning to use the site for sediment placement, including the Seal Beach Naval Weapons Station Redevelopment Project. A portion of the site would be used as a borrow source for the Surfside-Sunset Beach Nourishment Project, Stage 13 prior to construction of the proposed Project in the POLB. Approximately 2.5 mcy of sand may be placed here. Located 6 miles from Queens Gate.
- **POLB Slip Fill Sites:** The slip in Pier G South Slip may require fill as part of the POLB's Pier G Redevelopment Project and could be utilized if construction schedules are sufficiently aligned.

However, at this time, no available slip fill sites have been identified, and so it is not considered further. A slip fill site may be considered if the opportunity arises prior to construction and would be addressed in a supplemental document. A supplemental EA/EIS would be prepared to include the use of a POLB slip fill site as a placement site for the Project. The POLB would also be required to obtain a Department of the Army permit to construct the slip fill site and any special conditions in the permit would be met during any use of the site for the Project.

- **Beneficial Reuse:** USACE is committed to maximizing beneficial reuse of dredged sediments. Beneficial reuses include beach nourishment, habitat restoration, and port development. If additional beneficial reuse sites, beyond the Surfside Borrow Site Nearshore Placement Area and POLB Slip Fill Sites discussed above, are identified, USACE will consider use of such sites in a supplemental document. Based on historical sediment quality data, none of the sediments are suitable for direct placement on the beach based on grain size compatibility issues. However, should sediments suitable for direct beach placement be identified during the sediment test program to be conducted in PED, USACE will identify suitable beach locations in the vicinity needing nourishment and evaluate in a supplemental document.

Local Service Facilities

- **Wharf improvements at Piers J and T and the Southeast Basin:** Berth improvements within the Pier J South Slip, Pier T, and the Southeast Basin would be deepened to provide sufficient support to existing wharf infrastructure to accommodate the deepened channels.
- **Pier J Breakwaters Improvements:** Structural improvements would accommodate the deepened channels (i.e., turning basin and Pier J Basin). To protect these existing structures, the top of the deepened channel could be kept away from the toe of the existing marine structures by a "standoff" distance. It would be impractical to incorporate a standoff given the limited channel width and some type of improvement would be required to stabilize the structures. The most likely breakwater stabilization method would be submerged bulkhead walls of steel sheet pile structures with rock being required for scour protection in front of the wall and rock possibly being required for slope stability behind the wall.

Figure 4-1 Port of Long Beach

4.6.1 Screening of Measures

Each measure was assessed, and a preliminary determination made whether it should be retained for consideration and formulation of alternatives. To aid in evaluating the measures, metrics were selected for each as shown below. **Table 4-1** shows the results of the qualitative ratings developed for the measures (i.e., measures with a score of 3 as highly effective in meeting the formulation criteria and a score of 1 as ineffective).

- Effectiveness Metrics
  - Professional judgment of the harbor pilots on the extent the planning objectives would be met.
  - Preliminary benefit (proxies for transportation cost savings) for existing fleet.
  - Qualitative judgment of the Project Delivery Team[10] (PDT) on the extent the planning objective would be met.
- Efficiency Metrics
  - Past core boring information to characterize the type of materials requiring dredging and determine the potential placement sites for that material.

[10] A Project Delivery Team consists of individuals from one or more USACE districts and may include specialists, consultants, stakeholders, or representatives from other Federal and state agencies. Teams are chosen for their skills and abilities to successfully execute a project.

    - Sediment quantity calculations and preliminary costs based on widening and deepening measures.
    - Compare preliminary costs and proxies for benefits (vessel counts, drafts, etc.).
- Acceptability Metrics
    - Environmental concerns from past studies and available resource surveys to determine potential areas of impacts.
    - Past core boring information to characterize the type of materials requiring dredging.
    - Qualitative assessment of implementability.
    - Consistency with laws and regulations.

Table 4-1 Measure Screening Results

Measure	Effectiveness	Efficiency	Implementability (50% Weighted)	Satisfaction (50% Weighted)	TOTAL[1]
High-Tide Riding	1	1	2	1	4
Light-Loading/Lightering	1	1	2	1	5
Removal of the end of the Navy Mole	2	1	1	1	4
West Basin Channel Deepening and Construct a Turning Basin	3	3	3	3	8
Southeast Basin Channel Deepening	3	3	3	3	8
Main Channel Widening at the Entrance to Southeast Basin	2	2	2	2	5
Widening of the Approach to Southeast Basin	2	2	2	2	5
Creating an Approach Channel to Pier J South	3	2	3	2	8
Creating Turning Basin at Pier J Entrance	3	3	3	3	8
Widening of Pier J Breakwater Opening	2	3	2	2	5
Standby/Passing Areas Deepening	2	2	3	2	6
Approach Channel Deepening Seaward of Queens Gate	2	2	3	3	8
Queens Gate Deepening (Outer Harbor Entrance)	3	3	2	2	7

[1]Scores are averages and may not add up to total due to rounding. Scores for Implementability and Satisfaction are equal to half of the Effectiveness and Efficiency categories. For example, the Total Score for High-Tide Riding would be: 1+1+(2x.5)+(1x.5) = 3.5 (rounded to 4)

After scoring, the PDT reviewed the results and confirmed that measures with the highest total scores (i.e., 6 and above) would be carried forward for further analysis.

Measures Screened Out

The PDT determined that measures with lower scores (i.e., below 6) either did not provide additional benefits or did not sufficiently meet the planning objectives. The measures screened out were:

- Non-Structural
    - High-Tide Riding (occurs under without project conditions)
    - Light Loading/Lightering (occurs under without project conditions)
- Structural
    - Remove the End of the Navy Mole
    - Widen the Main Channel at the Entrance to the Southeast Basin
    - Widen the Approach to Southeast Basin
    - Widen the Pier J South Entrance Breakwater Opening

4.6.2 Measures Carried Forward

The Measures Carried Forward are shown in **Figure 4-2**.

Deepen the West Basin Channel and Construct a Turning Basin - Expected to decrease delays and light loading for larger containerships, which have begun calling on the POLB, through improved operational efficiency and enhanced maneuverability. This measure would eliminate most tidal delays from larger container vessels riding the tides to enter and leave the West Basin only on high tides, or light load to ensure a shallower draft to safely enter and leave the basin. Amount of dredging and therefore cost are more substantial than several other measures, but preliminary, qualitative analysis suggests transportation savings could exceed corresponding costs to implement and construct. The turning basin is needed for design vessel in conjunction with deepening to realize reduced delays and light loading.

Deepen the Southeast Basin Channel – Expected to increase efficiency of the current and forecasted vessel fleet movement and navigation from the Main Channel into the Southeast Basin and will improve and enhance maneuverability, resulting in reduced transportation costs. Amount of material to dredge and therefore cost lower than several other measures increasing likelihood for economic justification. ***The Port of Long Beach asked that this measure be removed from consideration because of potential reconfiguration of the basin in accordance with proposed improvements outlined in their Master Plan.***

Construct an Approach Channel to Pier J South - Expected to decrease delays and light loading for larger containerships, which have begun to call on the POLB, through improved operational efficiency and enhanced maneuverability. This measure would eliminate most tidal delays from larger container vessels riding the tides to enter and leave the Pier J South Basin only on high tides, or light load to ensure a shallower draft to safely enter and leave the basin. Amount of dredging and therefore cost are more substantial than several other measures, but preliminary, qualitative analysis suggests transportation savings could exceed corresponding costs to implement and construct. According to the draft Port Master Plan update, the Pier J South Slip may not be operational about 20 years after the Project Base Year of 2027. This has been taken into account in the economic analysis.

Construct a Turning Basin at the Pier J South Entrance – Expected to improve and enhance maneuverability on approach and exit from Pier J South reducing delays. The amount of material to dredge and therefore the expected costs for this measure are lower than several other measures increasing likelihood for economic justification.

Deepen Standby Area – Waiting and passing areas landward of the breakwater would reduce delays for deeper drafting liquid bulk vessels and provide a safe area to anchor adjacent to the main channel during equipment failures; however, costs would be higher due to the large amount of material to be dredged. This measure has support from several stakeholders and could be economically justified.

Deepen Queens Gate (Outer Harbor Entrance) – Expected to reduce delays and light loading for deeper drafting liquid bulk vessels. Dredging is less substantial reducing cost and increasing the likelihood that transportation savings benefits exceed implementation and construction costs.

Deepen the Approach Channel Seaward of Queens Gate (Outer Harbor Entrance) – This requires dredging and placement of a large volume of sediment due to the length of the channel; however, deepening the approach channel seaward of Queens Gate could reduce or eliminate the need for Very/Ultra Large Crude Carriers to lighter offshore and would reduce or eliminate light loading and delays for shallower drafting liquid bulk vessels during winter and summer swell conditions.

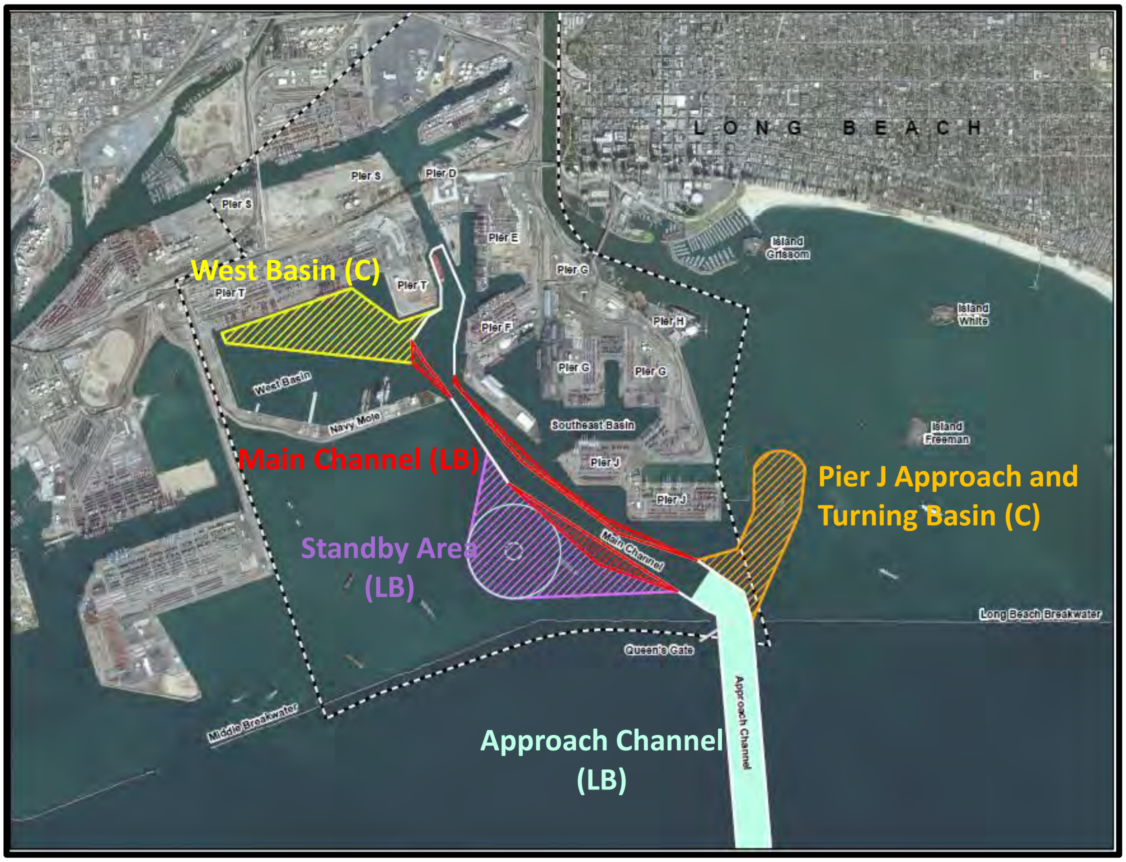


Figure 4-2 Measures Carried Forward

4.6.3 Value Engineering Activities

ER 11-1-321 Change 1 dated January 1, 2011, Appendix F, Section F.1, subsection 2(d) provides an example of the requirements needed for the capability of an in-house value engineering (VE) team based on an Annual VE Guidance Plan for USACE use. This section states that the "VE team must have an adequate amount of training and appropriate and sufficient experience" in the essential disciplines needed on projects, including "Architectural, Civil, Structural, Electrical, Mechanical Engineers, Cost Engineers, Environmental Scientists and other specialty consultants." The PDT members contributing on the Port of Long Beach Deep Draft Navigation Feasibility Study had an adequate amount of experience and training to cover this requirement.

A VE Study was conducted in November 2015. A list of items that the VE team felt should be considered during the feasibility study can be found below.

- Define the ship design to be used to determine the depth needed
- Remove the end of the Navy Mole
- Further investigate the dimensions of the Pier J breakwater opening to determine impact to the structure.
- Consider placement sites within POLB
- Change the West Basin – Pier T footprint
- Reduce the Pier J approach channel

- Accelerate getting the POLB's priorities for improvements to determine that they are in line with this project
- Contracting suggestions: Avoid specifying equipment to increase contractor competition; Package the project in such a way that promotes competition; Combine POLB berth deepening work with this project
- Phase the project to accommodate required structural modifications
- Perform VE at 30 percent design to capture lessons learned
- Complete a Geotechnical Baseline Report (GBR) to aid in the bidding process to better manage risk [Preconstruction, Engineering and Design (PED) phase]
- Economic analysis should include upstream infrastructure costs in comparing the alternatives – related to higher capacity ships
- Develop joint Public Outreach project approaches
- Have an internal Scoping/Partnering workshop between the USACE and POLB

4.6.4 Ship Simulation Study

A ship simulation was performed in accordance with ER 1110-2-1403 to evaluate channel navigability of the approach and main channels. A site visit to the Port was performed to observe navigation conditions and take photographs for the model's visual scenes. The ship simulations were conducted in Vicksburg, Mississippi at the Coastal and Hydraulics Laboratory of the Engineer Research and Development Center (ERDC). Two POLB pilots, experienced in navigating the POLB channels, participated in the effort. Various conditions of ship size, wave, and current conditions were tested. Model vessels readily available in the ERDC library were chosen for the feasibility level testing, including the containership *Superium Maersk* (length 1,300 feet, beam 191 feet, draft 53 feet) and the VLCC *Elizabeth I. Angelicoussi* (length 1089 feet, beam 190 feet, draft 70 feet). Both model vessels are similar to the design vessels and were good approximations for the simulation testing. As a result of the VE Study, based on feedback from the harbor pilots using the larger design vessels, bend easing of portions of the Main Channel was added to the scope of the project. The pilots also concurred, based on their experience in the simulator, that the recommended design depths (as seen in the following section) were acceptable for the new design vessel sizes.

4.7 Array of Alternatives

The measures carried forward are independent except for certain fixed costs for staging equipment and placement site constraints. This creates a relatively large number of potential alternatives. To address this the analysis will be separated initially into measures impacting liquid bulk movements and measures impacting container movements. The benefits and costs of deepening Queens Gate and the Standby Area for liquid bulk vessels will be evaluated for economic justification and optimization (efficiency) separately. Similarly, the measures impacting container movements will be evaluated for economic justification and optimization. Going forward, the alternatives will be developed by combining justified and optimized measures to meet the criteria for completeness, effectiveness, and acceptability as well as overall efficiency (net benefits).

The primary decision criteria for identifying the NED Plan includes reasonably maximizing net benefits while remaining consistent with the Federal objective of protecting the Nation's environment. Contribution to NED are increases in the net value of the national output of goods and services, expressed in monetary units. For this study, benefits were derived mainly from transportation cost savings (e.g., increased loads for existing vessels, switching to larger vessels, enhanced maneuverability, and delay reduction), or higher net income to commodity users or producers (as a result of lower transportation costs) during the economic period of analysis.

4.7.1 Dredged Material Placement Options

The disposal of the dredged material considered a wide range of options, which included careful consideration of beneficial uses of the material.

Placement of the dredged sediment in a permitted landfill within the POLB and the POLA was considered. Neither port has any current plans for needing the dredged material for landfill. A slip fill site may be considered if the opportunity arises prior to construction and would be addressed in a supplemental environmental document. Upland disposal was also considered. Under this option, material would be pumped into a dewatering contained area on land and then trucked to an upland disposal site. There are a few sites where the material would be accepted because of salt content. Depending on site distance and any special requirements, this option would be substantially higher than other options due to the cost of dewatering, double handling, and trucking to multiple upland sites. Other beneficial reuse sites are currently not available. The possibility of using sediments from the proposed project for USACE East San Pedro Bay Ecosystem Restoration Project was also considered. This option would be further evaluated during PED and a decision made based on sediment quality and the timing of construction for both projects. Development of a confined aquatic disposal (CAD) site was also considered. This would require considerable additional studies to demonstrate that such sites would be stable and provide physical isolation to any contaminated sediments placed within them. Development of a CAD site would only be beneficial if sediments not suitable for ocean disposal were identified during PED. Other options can include developing underwater material storage sites at strategic locations in the POLB to store dredge material for beneficial use at a later date. Ocean disposal of sediments dredged from the Approach Channel was considered. However, this option fails to comply with the ongoing USACE commitment to maximizing beneficial reuse of dredged sediments for all dredging conducted within the USACE. Additionally, this option would increase costs due to the substantially longer transit distance between the dredge and disposal site, which would increase the time necessary to dredge the Approach Channel due to increased time spent in transit during which the hopper dredge would not be dredging.

Placement of dredged sediments in the North Energy Island Borrow Pit (NEIBP) was also considered. However, this site is being reserved for the isolation placement of contaminated sediments at the request of the California Coastal Commission. Its use for clean sediments was, therefore, ruled out.

Ultimately, it was determined that placement of the dredged material at a nearshore placement site (Surfside Borrow Site Nearshore Placement Area) and disposal at two ODMDS (LA-2 and/or LA-3) would be the least-cost disposal methods. In keeping with the USACE commitment to maximize beneficial reuse of dredged sediments, the project will maximize beneficial reuse if future sites are identified during PED; these could include Port fill projects and use of sediments by the USACE's East San Pedro Bay Ecosystem Restoration Project (should that project be congressionally authorized, funded, and implemented concurrently with the Recommended Plan). In addition, options are available if unsuitable sediments are identified during sediment testing, including Port fill and the use of a borrow pit (North Energy Island) in San Pedro Bay, which has been used in the past for in-water disposal (with capping) of contaminated sediments. Should future beneficial reuse sites be identified, USACE will consider such sites in a supplemental document. Based on historical sediment quality data, none of sediments are suitable for direct placement on the beach based on grain size compatibility issues. However, should sediments suitable for direct beach placement be identified during the sediment test program to be conducted in

PED, USACE will identify suitable beach locations in the vicinity needing nourishment and evaluate in a supplemental documentation.

4.7.2 Container Terminal Improvements

The container design vessel drafts approximately -52 feet MLLW. Depths being analyzed range from -53 feet to -57 feet MLLW in the Pier J approach channel, (new) turning basin to Pier J, and Pier T/West Basin. The amounts of dredged material for each basin at each depth are shown in **Table 4-2**.

Table 4-2 Container Vessel Measures Dredge Volume

Container Measures	Dredge Volume (cy)		
	West Basin	Pier J Basin	TOTAL
C1: -53 ft	500,000	1,471,000	1,971,000
C2: -54 ft	610,000	1,818,000	2,428,000
C3: -55 ft	720,000	2,177,000	2,897,000
C4: -56 ft	900,000	2,541,000	3,441,000
C5: -57 ft	1,450,000	2,911,000	4,361,000

The proposed improvements were examined to determine the net benefits yielded by each channel/basin depth. Project costs developed include dredging costs, OMRR&R costs, interest during construction, berthing deepening, and project-dependent terminal expansion costs to accommodate deeper berths, if necessary. Container annualized benefits were calculated separately for Pier J (for 20 years, as previously described per the Port Master Plan) and Pier T/West Basin. Cost Estimating figures were allocated appropriately between each and subsequently annualized. Each pier is economically justified as a separable element of subsequent alternatives (see **Table 4-3** and **Table 4-4**). Once both container terminals were shown to be separately justified, annualized costs were updated (thus, they may not match exactly the costs presented in the previous table) and combined to show that the overall container analysis was also economically justified. An analysis of the preliminary costs and benefits for the container measures shown for different disposal locations, offshore and nearshore, is shown in **Table 4-5**.

Table 4-3 Preliminary Economic Benefit/Cost Summary for Pier J (Oct 2018 Price Level; 2.875% Discount Rate)

Alternative	Avg Annual Benefits Pier J	Ave Annual Costs Pier J	Net Annual Benefits	Benefit-Cost (B/C) Ratio
Containers 53 Offshore	$2,752,936.08	$2,015,000	$737,936	1.4
Containers 55 Offshore	$6,184,171.13	$2,557,000	$3,627,171	2.4
Containers 57 Offshore	$6,468,887.54	$3,569,000	$2,899,888	1.8
Containers 53 Nearshore	$2,752,936.08	$1,832,000	$920,936	1.5
Containers 55 Nearshore	**$6,184,171.13**	**$2,283,000**	**$3,901,171**	**2.7**
Containers 57 Nearshore	$6,468,887.54	$3,267,000	$3,201,888	2.0

Table 4-4 Preliminary Economic Benefit/Cost Summary for Pier T (Oct 2018 Price Level; 2.875% Discount Rate)

Alternative	Avg Annual Benefits Pier T	Avg Annual Costs Pier T	Net Annual Benefits	B/C Ratio
Containers 53 Offshore	$6,076,565	$685,000	$5,391,565	8.9
Containers 55 Offshore	$13,650,343	$846,000	$12,804,343	16.1
Containers 57 Offshore	$14,278,798	$1,778,000	$12,500,798	8.0
Containers 53 Nearshore	$6,076,565	$623,000	$5,453,565	9.8
Containers 55 Nearshore	**$13,650,343**	**$755,000**	**$12,895,343**	**18.1**
Containers 57 Nearshore	$14,278,798	$1,628,000	$12,650,798	8.8

Table 4-5 Container Vessel Measures Preliminary Costs and Benefits (Oct 2018 Price Level; 2.875% Discount Rate)

Container Measures	Preliminary Costs and Benefits – Offshore Disposal (Rounded $)						
	Dredging Costs	Local Service Facilities	Total Costs	Average Annual Benefits	Average Annual Costs	Net Annual Benefits	B/C Ratio
C1: -53 ft	36,287,000	21,249,000	57,536,000	8,830,000	2,700,000	6,130,000	3.3
C2: -54 ft	43,092,000	23,366,000	66,458,000	14,332,000	3,048,000	11,284,000	4.7
C3: -55 ft	50,060,000	25,516,000	75,576,000	19,835,000	3,402,000	16,432,000	5.8
C4: -56 ft	58,359,000	43,588,000	101,947,000	20,291,000	4,417,000	15,874,000	4.6
C5: -57 ft	83,214,000	84,280,000	167,494,000	20,748,000	6,961,000	13,787,000	3.0
Container Measures	Preliminary Costs and Benefits – Nearshore Disposal (Rounded $)						
	Dredging Costs	Local Service Facilities	Total Costs	Average Annual Benefits	Average Annual Costs	Net Annual Benefits	B/C Ratio
C1: -53 ft	30,234,000	20,954,000	51,188,000	8,830,000	2,455,000	6,375,000	3.6
C2: -54 ft	35,634,000	22,997,000	58,632,000	14,332,000	2,743,000	11,589,000	5.2
C3: -55 ft	**41,156,000**	**25,072,000**	**66,228,000**	**19,835,000**	**3,038,000**	**16,797,000**	**6.5**
C4: -56 ft	58,333,000	43,068,000	101,401,000	20,291,000	4,388,000	15,903,000	4.6
C5: -57 ft	72,899,000	83,683,000	156,582,000	20,748,000	6,509,000	14,239,000	3.2

As shown above, the net benefits for all container alternatives are all positive, but the -55 feet MLLW scale (highlighted) produces the highest net benefits for both disposal scenarios. Thus, for container vessels, -55 feet MLLW scale is the NED depth. Please refer to Appendix E, Economics, for further details.

4.7.3 Liquid Bulk Improvements

The measures considered to address the planning objectives associated with liquid bulk vessels includes deepening the Approach Channel (extending seaward from the Queens Gate) with depths ranging from -78 feet to -83 feet MLLW. The proposed improvement also includes widening of the Main Channel at certain reaches, which would be necessary to safely operate fully loaded very large crude carriers. The dredged volumes for these measures are presented in **Table 4-6**.

Table 4-6 Liquid Bulk Vessel Measures Dredge Volume

Liquid Bulk Measures	Dredge Volume (cy)*		
	Main Channel	Approach Channel	TOTAL
LB1: -78 ft	1,065,000	1,145,000	2,210,000
LB2: -79 ft		1,790,000	2,855,000
LB3: -80 ft		2,600,000	3,665,000
LB4: -81 ft		3,575,000	4,640,000
LB5: -82 ft		4,495,000	5,560,000
LB6: -83 ft		5,450,000	6,515,000
***Includes two-foot overdredge allowance.**			

Similar to the container vessel improvement measures, the proposed liquid bulk measures were examined foot-by-foot to determine the net benefits yielded by each channel. **Table 4-7** presents the preliminary benefits and costs associated with the liquid bulk measures, including 2 disposal locations, offshore and nearshore.

Table 4-7 Liquid Bulk Vessel Measures Preliminary Costs and Benefits (Oct 2018 Price Level; 2.875% Discount Rate)

Liquid Bulk Measures	Preliminary Costs and Benefits – Offshore Disposal (Rounded $)					
	Dredging Costs	Electric Substation	Average Annual Benefits	Average Annual Costs	Net Annual Benefits	B/C Ratio
LB1: -78 ft	45,532,000	5,720,000	2,928,000	1,972,000	956,000	1.5
LB2: -79 ft	57,504,000		3,584,000	2,441,000	1,142,000	1.5
LB3: -80 ft	**69,518,000**		**4,613,000**	**2,919,000**	**1,694,000**	**1.6**
LB4: -81 ft	85,175,000		4,713,000	3,547,000	1,166,000	1.3
LB5: -82 ft	98,852,000		4,763,000	4,100,000	663,000	1.2
LB6: -83 ft	113,059,000		4,763,000	4,679,000	84,000	1.0
Liquid Bulk Measures	Preliminary Costs and Benefits – Nearshore Disposal (Rounded $)					
	Dredging Costs	Electric Substation	Average Annual Benefits	Average Annual Costs	Net Annual Benefits	B/C Ratio
LB1: -78 ft	37,977,000	5,720,000	2,928,000	1,677,000	1,251,000	1.7
LB2: -79 ft	46,123,000		3,584,000	1,995,000	1,589,000	1.8
LB3: -80 ft	**55,778,000**		**4,613,000**	**2,375,000**	**2,238,000**	**1.9**
LB4: -81 ft	66,461,000		4,713,000	2,797,000	1,916,000	1.7
LB5: -82 ft	75,659,000		4,763,000	3,164,000	1,598,000	1.5
LB6: -83 ft	85,345,000		4,763,000	3,554,000	1,209,000	1.3

As shown above, the net benefits for all liquid bulk alternatives are all positive, but the -80 feet MLLW scale (highlighted) produces the highest net benefits for both disposal scenarios. Thus, for liquid bulk vessels, -80 feet MLLW measure is the NED depth.

An additional measure evaluated includes constructing a waiting/passing area (Standby Area) landward of the Middle Breakwater. Depth increments were evaluated between -67 feet to -73 feet MLLW, with a 300-foot-diameter-center anchor placement evaluated at a proposed depth of -79 feet MLLW. The Standby Area would provide additional benefits of reducing loading and unloading delays for deeper drafting liquid bulk vessels and providing a safe area to anchor adjacent to the Main Channel during equipment failures, in conjunction with the proposed improvements on the Approach and Main Channels. The volumes for these measures are presented in **Table 4-8**.

Table 4-8 Standby Area Measures Dredge Volume

Standby Area Measures	Dredge Volume (cy)*
	TOTAL
SB1: -67 ft	1,039,000
SB2: -68 ft	1,402,000
SB3: -69 ft	1,852,000
SB4: -71 ft	2,854,000
SB5: -72 ft	3,382,000
SB6: -73 ft	3,917,000

*Includes two-foot overdredge allowance.

The proposed Standby Area measures were examined to determine the net benefits yielded by each waiting area depth. **Table 4-9** presents the preliminary benefits and costs associated with the standby, including 2 disposal locations, offshore and nearshore.

Table 4-9 Standby Area Measures Preliminary Costs and Benefits (Oct 2018 Price Level; 2.875% Discount Rate)

Standby Measures	Preliminary Costs and Benefits – Offshore Disposal with Clamshell Dredge (Rounded $)				
	Dredging Costs (Clamshell)	Average Annual Benefits	Average Annual Costs	Net Annual Benefits	B/C Ratio
SB1: -67 ft	48,737,000	650,000	1,879,000	-1,229,000	0.35
SB2: -68 ft	50,175,000	776,000	1,934,000	-1,158,000	0.40
SB4: -71 ft	65,021,000	1,030,000	2,519,000	-1,489,000	0.41
SB5: -72 ft	71,895,000	1,093,000	2,795,000	-1,702,000	0.49
SB6: -73 ft	78,876,000	1,155,000	3,074,000	-1,919,000	0.38
Standby Measures	Preliminary Costs and Benefits – Nearshore Disposal with Clamshell Dredge (Rounded $)				
	Dredging Costs (Clamshell)	Average Annual Benefits	Average Annual Costs	Net Annual Benefits	B/C
SB1: -67 ft	46,199,000	650,000	1,781,000	-1,131,000	0.36
SB2: -68 ft	46,928,000	776,000	1,809,000	-1,033,000	0.43
SB4: -71 ft	58,950,000	1,030,000	2,283,000	-1,253,000	0.45
SB5: -72 ft	64,799,000	1,093,000	2,519,000	-1,426,000	0.43
SB6: -73 ft	70,740,000	1,155,000	2,756,000	-1,601,000	0.42
Standby Measures	Preliminary Costs and Benefits – Offshore Disposal with Hopper Dredge (Rounded $)				
	Dredging Costs (Hopper)	Average Annual Benefits	Average Annual Costs	Net Annual Benefits	B/C Ratio
SB1: -67 ft	24,248,000	650,000	928,000	-278,000	0.70
SB2: -68 ft	29,984,000	776,000	1,147,000	-371,000	0.68
SB4: -71 ft	52,818,000	1,030,000	2,041,000	-1,011,000	0.50
SB5: -72 ft	61,093,000	1,093,000	2,366,000	-1,336,000	0.46
SB6: -73 ft	69,498,000	1,155,000	2,701,000	-1,546,000	0.43

Standby Measures	Preliminary Costs and Benefits – Nearshore Disposal with Hopper Dredge (Rounded $)				
	Dredging Costs (Hopper)	Average Annual Benefits	Average Annual Costs	Net Annual Benefits	B/C Ratio
SB1: -67 ft	17,585,000	650,000	671,000	-21,000	0.97
SB2: -68 ft	21,430,000	776,000	818,000	-42,000	0.95
SB4: -71 ft	36,784,000	1,030,000	1,413,000	-383,000	0.73
SB5: -72 ft	42,357,000	1,093,000	1,631,000	-601,000	0.67
SB6: -73 ft	48,017,000	1,155,000	1,853,000	-698,000	0.62

As shown above, all depths of dredging for the Standby Area resulted in negative net benefits. Thus, a Standby Area measure by itself is not economically justified. However, it should be noted that the -67 feet MLLW depth using the hopper dredge with nearshore disposal was marginally not justified.

4.8 Final Array of Alternatives

Four action alternatives were carried forward to address the planning objectives. Numerous scenarios were explored to determine the most prudent and practicable designs. The full range of depths considered for containers, from -53 feet to -57 feet MLLW was justified, and same for the liquid bulk, with depths ranging from -78 feet to -83 feet MLLW. It was determined that net benefits were maximized at a depth of -55 feet and -80 feet MLLW for container and liquid bulk measures, respectively. Therefore, the final array of alternatives were formulated as combined plans at three scales that include both container and liquid bulk measures, representing a smaller scale, the middle scale (corresponding with the tentative NED scale) and a larger scale plan. An additional plan based upon the NED scale was also carried forward into the Final Array; this plan includes the measure of constructing a Standby Area to a depth of -67 feet MLLW. Although the Standby Area was not economically justified, it was carried forward as it may be considered as a locally preferred plan by the POLB. A detailed analysis of NED benefits can be found in Appendix E. From this analysis, the range of alternatives was pared down to those listed below. Container terminal improvements for all action alternatives include constructing a new Pier J approach channel and turning basin and deepening the West Basin to identical depths. Liquid bulk terminal improvements for all action alternatives include deepening the Approach Channel (extending seaward from the Queens Gate) in conjunction with bend easing of the Main Channel to the authorized depth of -76 feet MLLW, which involves widening portions of the Main Channel. Widening of the Main Channel to accommodate two-way traffic was not considered, as this is limited by the channel widths at Queen's Gate and the Navy Mole; the distance between these is short, which results in no efficiency gain if designing for two-way traffic.

Alternative 1: no action alternative.
Alternative 2: container terminal channels deepened to -53 feet MLLW; Approach Channel deepened to -78 feet MLLW.
Alternative 3: container terminal channels deepened to -55 feet MLLW; Approach Channel deepened to -80 feet MLLW.
Alternative 4: container terminal channels deepened to -57 feet MLLW; Approach Channel deepened to -83 feet MLLW.
Alternative 5: container terminal channels deepened to -55 feet MLLW; Approach Channel deepened to -80 feet MLLW, and construction of Standby Area adjacent to the Main Channel dredged to -67 feet MLLW, with a 300-foot diameter center anchor placement evaluated to a depth of -73 feet MLLW.

The developed alternatives were verified against the four principles and guidelines (P&G) formulations criteria of completeness, effectiveness, efficiency, and acceptability (CEEA) defined in Section 4.6 above **(Table 4-10)**.

All action alternatives in the final array meet the CEEA criteria except for the without project condition or No Action Alternative. However, this alternative is carried forward through evaluation phase as required by NEPA.

Table 4-10 Principles and Guidelines Criteria – Final Array of Alternatives

Alternative	Completeness	Effectiveness	Efficiency	Acceptability
	Includes all actions (including those of others) to achieve outputs	Provides navigation transportation cost savings	Likely cost-effective means of achieving objectives	Plan is viable with respect to applicable laws and regulations
No Action	No	No	No	Yes
Alternative 2	Yes	Yes	Yes	Yes
Alternative 3	Yes	Yes	Yes	Yes
Alternative 4	Yes	Yes	Yes	Yes
Alternative 5	Yes	Yes	Yes	Yes

The volumes for the alternatives were refined after the measures were analyzed so they may differ slightly from those presented in the sections above. The volumes also include basin and berth dredging work at Pier J Basin considered part of the Project but is the responsibility of the POLB. The updated volumes can be found in **Table 4-11**.

Table 4-11 Approximate Dredge Quantity by Location for Each Alternative

Dredge Location	Alternative 2 Dredge Quantity (cy)	Alternative 3 Dredge Quantity (cy)	Alternative 4 Dredge Quantity (cy)	Alternative 5 Dredge Quantity (cy)
Approach Channel	1,144,000	2,600,000	5,447,000	2,600,000
Main Channel bend easing	1,065,000	1,065,000	1,065,000	1,065,000
Standby Area	0	0	0	1,039,000
West Basin	501,000	717,000	1,488,000	717,000
Pier J Approach	1,969,000	2,673,000	3,403,000	2,673,000
Pier J Basin and Berths (POLB responsibility)	202,000	337,000	452,000	304,000
Total Dredge Volume:	**4,881,000**	**7,392,000**	**11,864,000**	**8,398,000**

4.8.1 Local Service Facilities

LSF include berth dredging and potential wharf improvements to account for the deepened channels. Specifically, the POLB would deepen Pier J Basin, berths J266-J270 within the Pier J South Slip, and berth T140 along Pier T to -53, -55 or -57 feet MLLW, depending on the action alternative, plus two feet of overdredge. The over-dredge will be limited to -55 feet MLLW with a maximum allowable over-dredge of six inches. Wharf improvements would only be required for Alternative 4 for berths within Pier J South

Slip and along Pier T and would be necessary to provide sufficient support to the existing wharf infrastructure to accommodate dredging along the berths. Structural improvements to the Pier J breakwaters would be required for Alternatives 2, 3, 4, and 5 to accommodate dredging in the Pier J Slip and Approach Channel. These features are designed to prepare wharves for the selected channel depths and deepen berths to match the selected channel depths. Eliminating or reducing the scale of the LSF features would not fully enable the POLB to realize all project benefits and were not considered.

4.8.2 Types of Dredge Equipment

Under each of the alternatives evaluated the equipment for dredging and placement of dredged material would be selected from the following two types of dredges.

Hopper Dredge

The hopper dredge is a self-contained vessel that loads sediment from dredge sites then moves to a receiver site for placement. Approximately 17,500 cubic yards of sediment can be removed and transported to the placement site per day using a hopper dredge, although this can vary depending on the trip length to the placement/disposal site. The hopper dredge contains two large arms that can drag along the ocean floor and collect sediment. The hopper dredge moves along the ocean surface with its arms extended, passing back and forth in the designated dredge site until the hull is fully loaded with sediment. The hopper dredge can generally reach within approximately 0.5 mile of shore to offload to a nearshore site or dispose of sediments in deeper water via a split hull. For the purposes of this evaluation, it is assumed that the hopper dredge places all of its dredged material at the Surfside Borrow Site Nearshore Placement Area, which would allow about 17,500 cy of sediment to be removed daily.

Clamshell Dredge

This method consists of a derrick mounted on a barge outfitted with a clamshell bucket. Dredged materials are placed on a separate barge for transport to the placement site. Approximately 6,000 cubic yards of sediment can be removed and transported to the placement site per day using a clamshell dredge. Additional construction equipment typically required to support dredging activities include three support boats (two tugboats to move the barge and/or reposition the dredge, and a crew boat). Clamshell dredges are generally diesel-powered, however electric clamshell dredges are available. Both power supplies have been evaluated and an electric clamshell will be used as mitigation for air quality impacts. For the purposes of this evaluation, it is assumed that the sediments dredged by the clamshell dredge go to an ODMDS. Sufficient barges are assumed to allow the dredge to operate 24-hours per day, although some down time is incorporated into the assumption to account for repairs and shift changes.

4.8.3 General Description of Construction Activities

Dredging and Placement

Dredged material will be disposed of in a combination of a nearshore site (i.e., Surfside Borrow Site Nearshore Placement Area) and a USEPA-designated ODMDS (LA-2 and/or LA-3) (**Figure 4-3**). The nearshore placement site can accommodate about 2.5 mcy of dredged material. LA-2 and LA-3 have annual disposal volumes of 1.0 and 2.5 mcy, respectively, from all sources. It is assumed that 0.9 mcy for LA-2 and 2.2 mcy for LA-3 is available for use by this project annually. If other, unrelated projects occur that result in an exceedance of annual disposal limits at either LA-2 or LA-3, USACE will coordinate with USEPA to identify and implement additional monitoring at the disposal site[s].

Options are available if unsuitable sediments are identified during sediment testing, including Port fill and the use of a borrow pit (North Energy Island) in San Pedro Bay, which has been used in the past for in-water disposal (with capping) of contaminated sediments.

It is assumed that dredging will be performed using a hopper dredge as well as an electric clamshell dredge. To minimize transit time, disposal of material from the hopper dredge will maximize use of the nearshore site, while a clamshell dredge will be evaluated for disposal at an ODMDS. To reduce air quality emissions, the construction of an electrical substation, on Pier J, will also be required for each alternative.

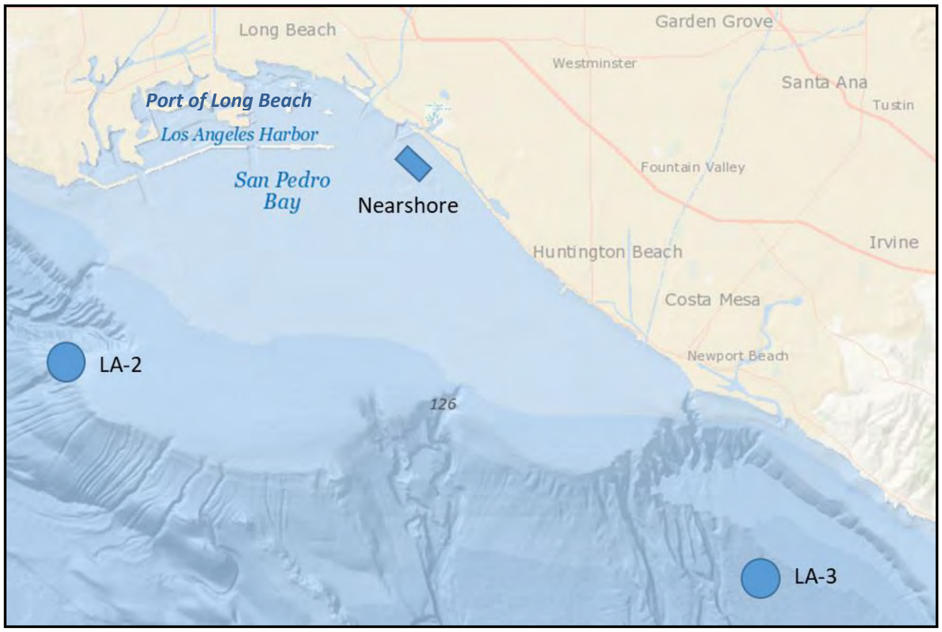


Figure 4-3 Location of Potential Placement Sites

Construction Sequence and Duration

Sequence and duration will depend on the depth selected. This evaluation assumes that a hopper dredge and a clamshell dredge will be operating simultaneously to perform the work. A single hopper dredge is proposed as there are few, large hopper dredges available in the U.S., so that having two available is highly unlikely. A single clamshell dredge is proposed owing to the annual disposal limitations of LA-2 and LA-3 as described in the section above. The approximate durations, in months, for the clamshell and hopper dredges can be found in **Table 4-12** and more details can be found in **Table 4-13**, **Table 4-14**, **Table 4-15**, and **Table 4-16**. Estimated dredge volumes have increased slightly in the Final IFR due to the availability and use of recent bathymetric surveys.

Table 4-12 Approximate Duration by Dredge Type

	Clamshell (approximate months)	Hopper (approximate months)
Alternative 1	0	0
Alternative 2	21	2
Alternative 3	27	5
Alternative 4	36	13
Alternative 5	36	5

Construction of Landside Electrical Substation at Pier J

As a mitigation measure for air quality impacts (see Section 5.5), an electric clamshell dredge will be used for the portions that a hopper dredge is not used. Currently, a dredge electric substation that can support dredging operations is located on the southeast corner of the Pier T Marine Terminal. The Pier T Marine Terminal substation can support dredging by electric dredges in parts of the Inner Harbor area and the Outer Harbor. To support dredging at the Pier J berth, the approach channel and turning basin, an additional dredge electric substation is required. Two schemes were evaluated for the additional substation, a highest cost option and a lowest cost option.

Scheme 1 represents the lowest cost option. It assumes that the 66 kilovolt (kV) Pier J Substation is the source of power and that it has enough transformer capacity [1,000-kV (kVA)] to provide the required power (12.47 kV) for the dredger. While being the lower cost option for constructing the substation, it would require the longest cable (14,000 feet) for the dredge submarine. Additional assumptions for this scheme are as follows:

- Construction of a 12.47 kV switchgear is required to provide 15 megavolt ampere (MVA) power capacity for the electric dredge. This switchgear is to be located near Berth J260 and is the point of connection of the submarine cables to power the dredge.
- POLB will construct the 12.47 kV underground line from the existing 66 kV substation to the dredging switchgear, including the 12.47 kV switchgear.
- An approximately 14,500-foot submarine cable is for required dredging operation.
- Connecting to the existing 12.47 kV switchgear portion of the 66 kV Pier J.
- The Southern California Edison (SCE) revenue meter is currently on the 66 kV side of this substation. Metering requirements at the existing 66 kV Pier J substation will be modified or supplemented to account for the energy usage of the 12.47 kV dredging switchgear. It is expected that the revenue metering for the dredge will be at 12.47 kV side.

Scheme 2 represents the highest cost option. It assumes the existing substation transformer at Pier J does not have the capacity to provide the necessary power (12.47 kV) to the dredge. While this is a higher cost option, as it requires construction of an additional substation, it presents the shortest dredge submarine cable length (9,400 feet). Additional assumptions for this scheme are as follows:

- This scheme will require SCE to modify the existing 66 kV Pier J Substation to extend a 66 kV loop feeder to the dredging substation, to be located south of Berth J266. The loop feed and the substation become part of SCE's infrastructure.
- SCE will be responsible for building the substation and for running the 66 kV cables from the existing 66 kV Pier J Substation to the dredging substation.
- The meter can be provided at the 12.47 kV level. This is subject to negotiation between POLB and SCE.

Furthermore, for both above options, it is assumed that the substation would occupy an area measuring 50 feet by 70 feet approximately 700 feet west of berth J266. This area would contain transformers and switchgears required to provide power for the dredging equipment in later stages of the Project. Construction of this facility would require that a 4,250-foot-long trench be cut from the existing substation at the north end of Pier J, which would extend to the proposed substation location. This trench would contain the electrical duct bank for the substation power lines.

Construction Access and Staging Areas

A staging area would be required to support the channel-deepening construction. This staging area would then form the base for the construction operation support. The proposed area for construction laydown and staging would be an unused portion of Pier Echo, located along the east side of Pier T, which would consist of both landside and waterside areas.

The landside area would be an L-shaped fenced area of approximately 12 acres. The following operational elements would be found within this contained area:

- Field offices and facilities for the contractor and USACE. The field offices would consist of prefabricated trailer-type structures. Sizes of the office facilities would be determined based on the requirements of the Project.
- Laydown areas for equipment such as dredge pipe and spare equipment parts.
- Parking for land-based vehicles.
- Staff parking.
- Maintenance workshop for equipment maintenance.
- Staging areas for marine-based equipment.

The waterside area would consist of a floating dock to service small support boats. The floating dock would have a gangway for pedestrian access. Existing berthing areas along Pier Echo would be used to berth marine equipment such as tugs, dump and flat-top barges, floating crane equipment, and dredges when not in use.

Public Access

Dredging will be conducted in a way to avoid limiting public access via recreational boating activities. There is no other public access to the dredge or placement sites. Construction of the electrical substation would be done in an area with restricted access due to high voltage installation. Once completed, the electrical substation would also be fenced for safety and security reasons. The staging area would be fenced and patrolled for security reasons and would be isolated from public access.

Table 4-13 Alternative 2 Approximate Construction Equipment, Disposal Locations, and Duration

Year	Dredge Location	Dredge Quantity (CY)	Dredge Material Disposal Location	Dredge Disposal Location Capacity (CY)	Dredge Type	Dredge Rate (CY/day)	Dredging Days Required (days)	Total Dredge Volume per Disposal Location
1	Approach Channel	1,144,000	Nearshore	1,144,000	Hopper	17,500	66	Nearshore: 2,500,000 LA2: 682,000
	Main Channel Widening	1,065,000	Nearshore	1,065,000	Clamshell	6,000	178	
	West Basin	501,000	Nearshore	291,000	Clamshell	6,000	49	
			LA2	210,000	Clamshell	6,000	35	
	Pier J Basin	202,000	LA2	202,000	Clamshell	6,000	34	
	Pier J Approach	270,000	LA2	270,000	Clamshell	6,000	45	
2	Pier J Approach	1,699,000	LA2	900,000	Clamshell	6,000	150	LA2 & LA3: 1,699,000
			LA3	799,000	Clamshell	6,000	133	

Table 4-14 Alternative 3 Approximate Construction Equipment, Disposal Locations, and Duration

Year	Dredge Location	Dredge Quantity (CY)	Dredge Material Disposal Location	Dredge Disposal Location Capacity (CY)	Dredge Type	Dredge Rate (CY/day)	Dredging Days Required (days)	Total Dredge Volume per Disposal Location
1	Approach Channel	2,600,000	Nearshore	2,500,000	Hopper	17,500	143	Nearshore: 2,500,000 LA2 & LA3: 2,140,000
			LA2	100,000	Hopper	15,100	7	
	Main Channel Widening	1,065,000	LA2	800,000	Clamshell	6,000	133	
			LA3	265,000	Clamshell	6,000	44	
	West Basin	717,000	LA3	717,000	Clamshell	6,000	120	
	Pier J Basin	258,000	LA3	258,000	Clamshell	6,000	43	
2	Pier J Basin	46,000	LA2	46,000	Clamshell	6,000	8	LA2 & LA3: 2,040,000
	Pier J Approach	1,994,000	LA2	854,000	Clamshell	6,000	142	
			LA3	1,140,000	Clamshell	6,000	190	
3	Pier J Approach	679,000	LA2	679,000	Clamshell	6,000	113	LA2: 679,000

Table 4-15 Alternative 4 Approximate Construction Equipment, Disposal Locations, and Duration

Year	Dredge Location	Dredge Quantity (CY)	Dredge Material Disposal Location	Dredge Disposal Location Capacity (CY)	Dredge Type	Dredge Rate (CY/day)	Dredging Days Required (days)	Total Dredge Volume per Disposal Location
1	Approach Channel	5,447,000	Nearshore	2,500,000	Hopper	17,500	143	Nearshore: 2,500,000 LA2 & LA3: 2,055,000
			LA2	900,000	Hopper	15,100	60	
			LA3	1,155,000	Hopper	8,400	138	
2	Approach Channel		LA2	892,000	Hopper	15,100	59	LA2 & LA3: 2,932,000
	Main Channel Widening	1,065,000	LA3	900,000	Clamshell	6,000	150	
			LA3	165,000	Clamshell	6,000	28	
	West Basin	975,000	LA3	975,000	Clamshell	6,000	163	
3	West Basin	513,000	LA2	513,000	Clamshell	6,000	86	LA2 & LA3: 2,031,000
	Pier T Berths	44,000	LA2	44,000	Clamshell	6,000	7	
	Pier J Basin	408,000	LA2	343,000	Clamshell	6,000	57	
			LA3	65,000	Clamshell	6,000	11	
	Pier J Approach	1,066,000	LA3	1,066,000	Clamshell	6,000	178	
4	Pier J Approach	2,040,000	LA2	900,000	Clamshell	6,000	150	LA2 & LA3: 2,040,000
			LA3	1,140,000	Clamshell	6,000	190	
5	Pier J Approach	297,000	LA2	297,000	Clamshell	6,000	50	LA2: 297,000

Table 4-16 Alternative 5 Approximate Construction Equipment, Disposal Locations, and Duration

Year	Dredge Location	Dredge Quantity (CY)	Dredge Material Disposal Location	Dredge Disposal Location Capacity (CY)	Dredge Type	Dredge Rate (CY/day)	Dredging Days Required (days)	Total Dredge Volume per Disposal Location
1	Approach Channel	2,600,000	Nearshore	2,500,000	Hopper	17,500	143	Nearshore: 2,500,000 LA2 & LA3: 2,140,000
			LA2	100,000	Hopper	15,100	7	
	Main Channel Widening	1,065,000	LA2	800,000	Clamshell	6,000	133	
			LA3	265,000	Clamshell	6,000	44	
	West Basin	717,000	LA3	717,000	Clamshell	6,000	120	
	Pier J Basin	258,000	LA3	258,000	Clamshell	6,000	43	
2	Pier J Basin	46,000	LA2	46,000	Clamshell	6,000	8	LA2 & LA3: 2,040,000
	Pier J Approach	1,994,000	LA2	854,000	Clamshell	6,000	142	
			LA3	1,140,000	Clamshell	6,000	190	
3	Pier J Approach	679,000	LA2	679,000	Clamshell	6,000	113	LA2 & LA3: 1,600,000
	Standby Area	921,000	LA2	221,000	Clamshell	6,000	37	
			LA3	445,000	Clamshell	6,000	74	
			LA3	255,000	Clamshell	2,200	116	
4	Standby Area	118,000	LA2	118,000	Clamshell	2,200	54	LA2: 118,000

4.8.4 Additional Design Measures

Port Wharf Improvements and Other Structural Modifications

Under Alternative 4, wharf improvements would be required on Pier J and Pier T to provide sufficient support to the existing wharf infrastructure to accommodate dredging along the berth. More specifically, wharf improvements at Berths J266, J268, J270, and T140 would be needed and may require the installation of a steel sheet pile or steel king pile system underwater bulkhead. These proposed modifications are LSF improvements and will be borne in full by the POLB.

The underwater bulkhead systems are further described below:

- **Steel Sheet Pile:** This type of bulkhead consists of using steel sheet pile sections only. Steel sheet piles are long structural sections of a continuous Z-shape in cross section. The sheets are connected with a vertical interlocking system that creates a continuous wall. The sheet piles are installed using a vibratory impact hammer.
- **Steel King Pile System:** A steel king pile system is a heavier system than the sheet pile. The king pile system consists of a combination of a steel H-piles and intermediate Z-shape sheet piles. The king pile system is constructed by installing alternating H-pile sections and Z-shape sections along the length of the bulkhead. The H-piles and Z-shape sheets are connected with a vertical interlocking system for continuity. As with the sheet pile system, the king piles and intermediate sheeting are installed using a vibratory impact hammer.

In addition to the structural systems described above, ground improvement may be required. Ground improvement would consist of injecting cement grout at high pressures into the soils behind the wall. The intent of the grout is to strengthen the soil behind the wall, relieving pressure on the bulkhead. The injection of the grout would be accomplished by land-based equipment working on the wharf.

Some of these improvements would take place from a barge and some from the wharf. The barge work would consist of driving piles and removing slope protection armor while the wharf-based work would include the temporary removal and reinstallation of the fenders, bollards, and other marine fixings to the wharf structure. It is anticipated that at least two construction barges would be required. An excavator with extended reach capabilities would be positioned on the first barge. The excavator would then clear debris and slope protection armor at the toe of slope in preparation for pile driving. The spoils would be deposited onto a scow barge for removal from the site. A small tug or push boat would then be required to maneuver the barges as necessary. Another tug would be required to tow the scow barges. The primary barge-based equipment on the second construction barge would consist of a 140-ton crane, diesel impact hammer, and hydraulic vibratory hammer. The crane would be used to hoist and position piles into place on a prefabricated driving frame. Additionally, the crane would be used in the various pile driving operations. A small tug or push boat would be required to maneuver the barges as necessary

Port Improvements Along Existing Pier J Breakwaters

Structural improvements to the Pier J breakwaters would be required for Alternatives 2, 3, 4, and 5 to accommodate dredging in the Pier J Slip and Approach Channel. At the entrance to Pier J, the new deepened channel would pass adjacent to existing breakwaters. These types of structures are considered “soft” types of marine structures, constructed of rock dikes and fill. To protect these existing structures, the top of the deepened channel could be kept away from the toe of the existing marine structures by a “standoff” distance. In some instances, it would be impractical to incorporate a standoff and some type of improvement would be required to stabilize the structures. The types of improvements could consist of placing additional rock at the base of the existing structure, placing rock on the dredge slope and stepping it, or in extreme cases using ground improvement methods, or submerged bulkhead walls of steel sheet pile structures. The most likely ground improvement method would be injection grouting of cement grout at the base of the existing structure. These structural modifications are LSF improvements and will be borne in full by the POLB.

4.9 Comparison of the Final Array of Alternatives

The Planning P&Gs, which replaced the 1972 "Principles and Standards," directs the studies of major water projects by Federal water resources development agencies. A stated purpose of the P&Gs is to ensure that the formulation and evaluation of water resource studies are done properly and consistently by federal agencies. The federal objective in project planning is to contribute to NED while protecting the environment. NED contributions are increases in the net values of national goods and services outputs, both marketed and non-marketed. A plan, consistent with federal objectives and which maximizes NED benefits, is the "NED Plan."

In addition to NED, the P&Gs includes three other accounts: RED, environmental quality (EQ), and other social effects (OSE). Collectively, the four accounts are required to include all significant effects of a plan on the human environment. The RED account includes the regional incidence of NED effects, income transfers, and employment effects. The EQ account shows the non-quantifiable effects of a plan on ecological, cultural, and aesthetic attributes of significant natural and cultural resources. The OSE account displays the effects of a plan on urban and community settings and on life, health, and safety.

The P&Gs require only that the NED account be developed for the selection of a plan. However, information on the other three accounts, which may bear significantly on selection of a plan, should be included in the alternative assessment.

To comply with the January 2021 "Policy Directive — Comprehensive Documentation of Benefits in Decision Document" from the Assistant Secretary of the Army (Civil Works), benefits associated with the RED, EQ, and OSE categories were also evaluated. Analysis of RED account can be found in Appendix E, Economics; additional EQ considerations are documented in this IFR; OSE considerations are discussed throughout the document and are summarized in Section 4.9.4.

4.9.1 National Economic Development

Based on the results presented above, the combination of measures in Alternative 3 (Container areas to a depth of -55 feet MLLW and Liquid Bulk areas to a depth of -80 feet MLLW) provides the greatest contribution to net benefits and has been determined as the NED Plan. Preliminary analysis assumed that dredged material from the channels and basins would use the nearshore placement site (Surfside Borrow Site Nearshore Placement Area) to its maximum capacity; this placement site is closer than LA-2/LA-3, resulting in a substantial cost savings by the reduced hauling distance for disposal (5.5 miles outside the breakwater entrance as opposed to 9/22 miles for LA-2/LA-3, respectively). The nearshore site, however, can only accommodate 2.5 mcy of dredged material. Further analysis on disposal site options would be necessary to determine the volume allocation.

Table 4-17 summarizes the final array of plans that will be fully analyzed for environmental impacts under NEPA and CEQA and included in this IFR. Final Array Alternative 5 was added, which is the same as Alternative 3 (NED Plan), but also includes a -67 feet Standby Area. Although the economic analysis did not show that the Standby Area is economically justified, it has been carried forward into the Final Array as an option that may be considered as a locally preferred project by the POLB. The benefit-to-cost analysis shown in **Table 4-17** includes cost estimates that factor in the costs of implementing the complete alternatives and incorporate contingency estimates based upon an abbreviated cost risk analysis. Therefore, the combined costs do not equal the sum of the costs presented in the prior sections.

Table 4-17: Final Array of Alternatives (Oct 2018 Price Level; 2.875% Discount Rate)

	Dredge Volume (cy)	Total Project Cost	Total Annual Cost	Average Annual Benefits	Average Net Annual Benefits	Incremental Net Benefits[2]	B/C Ratio
1 – No Action	-	-	-	-	-	-	-
2 – 53/78	4,881,000	$109,833,000	$4,770,867	11,758,000	6,987,133	(11,025,469)	2.5
3 – 55/80	**7,359,000**	**$150,703,000**	**$6,434,398**	**24,447,000**	**18,012,602**	**-**	**3.8**
4 – 57/83	11,855,000	$326,675,000	$13,657,987	25,510,000	11,852,013	(6,160,589)	1.9
5 – 55/80/67 (standby)	8,398,000	$197,510,000	$8,364,096	25,097,000	16,732,904	(1,279,698)	3.0

[1] Nearshore disposal site – 2.5 mcy limit; Offshore disposal site (LA-2 – 0.9 mcy year limit; LA-3 – 2.2 mcy year limit)
[2] Net benefits as compared to the NED Plan

4.9.2 Regional Economic Development Account

The RED account shows the effects of plan alternatives on the distribution of regional economic activity in the area where the plan will have significant income and employment effects. The effects on regional income are the sum of 1) the NED income benefits and 2) transfers from outside the region. Income transfers comprise income from implementation outlays, transfers of economic activities, and indirect and induced effects. Indirect effects are those that result from the changed outputs of goods and services in industries which help meet changes in final products and export demands. Induced effects result from changes in consumer expenditures stimulated by changes in personal income. The effects of a plan on regional employment parallel those on regional income. Typically, employment impacts of a plan are developed for individual industries at some level of aggregation to discern the distributional impacts on business sectors. The total project first cost is approximately $151 million. Of this total project expenditure about $127 million will be captured within the regional impact area. The rest will be leaked out to the state or the nation. The expenditures made on the project for various services and products are expected to generate additional economic activity that can be measured in jobs, income, sales and gross regional product includes impacts to the region, the State impact area, and the Nation. The analysis shows that the NED Plan will generate approximately $165 million in gross regional product, nearly $120 million in labor income, and will support over 2,100 jobs during project construction within the region. A detailed analysis of the RED account can be found in Appendix E.

4.9.3 Environmental Quality Account

The EQ account is another means of evaluating the alternatives. The EQ account is intended to display long-term effects that the alternatives may have on significant environmental resources. Significant environmental resources are defined by the Water Resources Council as those components of the ecological, cultural, and aesthetic environments, which, if affected by an alternative, could have a material bearing on the decision-making process. An evaluation of impacts under the EQ account are documented in Section 6.

4.9.4 Other Social Effects Account

OSE include the effects that are not covered in the NED, RED, and EQ accounts. Key categories of this account include: (a) life, health, and safety; (b) material well-being (economic development and standard of living; housing; built environment; natural environment; job security); (c) social connectedness (urban and community impacts; effects on population distribution and composition; displacement of people, businesses); and (d) distributive justice, fairness, participation (effects on employment distribution, especially the share to minorities; effects on educational, cultural, and recreational opportunities; and other effects as relevant.

Any of the deepening alternatives would not create a health hazard, expose people to a health hazard, or result in a navigation hazard. Instead, the maneuverability for larger vessels through the Approach Channel, Main Channel, West Basin and Pier J South Basin would improve.

The amount of cargo moving through the POLB is predicted to increase with or without navigation improvements. Without improvements, more vessels would be required to transport the forecasted increase in cargo volumes. With implementation of any of the deepening alternatives, the total number of vessels would decrease, and transportation costs would be reduced in comparison with the FWOP conditions. Similarly, channel improvements would not induce additional growth including additional traffic, noise, or lighting compared to the FWOP conditions. Because the total throughput is not predicted to change as a result of deepening, no landside changes in overall air pollutant emissions would result from channel improvements. Implementation of any of the action alternatives would reduce the number of vessel calls used to transport cargo. As a result, total air emissions within the harbor and at each terminal could decrease. In addition, increased depths would reduce congestions and allow vessels more flexibility of movement than under the FWOP conditions. This would allow traffic to be spread over longer time ranges rather than concentrating all the largest vessel traffic during high tides. Implementation of any of the action alternatives would allow for fuel deliveries to arrive on larger vessels and reduce the need for lightering. Each lightering operation and each vessel transit and offloading carries a risk of spillage. These effects would reduce the potential for petroleum product spills into the region's waters.

No significant construction or operational impacts to the human environment are expected; populations of minority and low-income people would not experience disproportionately high and adverse effects from any of the proposed action alternatives. Schools/childcare facilities and hospitals are dispersed throughout the area and are not disproportionately located near the harbor. Thus, no disproportionately high and adverse impacts to children are expected.

Given that no expected change in overall cargo or significant construction or operational impacts to the human environment, OSE are expected to be relatively the same among the alternatives analyzed.

4.10 Plan Selection

As shown in **Table 4-17**, Alternative 3 with a combination of measures for container vessels (constructing an Approach Channel to Pier J South and deepening the West Basin Channel to a new depth of -55 feet MLLW) and liquid bulk vessels (deepening the Approach Channel from -76 feet MLLW to -80 feet MLLW, and widening portions of the Main Channel through bend easing to match the currently authorized depth in the Main Channel of -76 feet MLLW) provides the greatest contribution to net benefits and has been determined as the NED Plan. The POLB, as the non-Federal Sponsor, has also expressed support for this plan. Accordingly, Alternative 3 has been identified as the Recommended Plan. Preconstruction and construction environmental commitments and mitigation measures associated with the Recommended Plan are provided in Section 10. Pre-construction, construction, and post-construction project implementation actions are listed in Section 9, including OMRR&R action.

5 ENVIRONMENTAL CONSEQUENCES/ENVIRONMENTAL IMPACTS

The environmental consequences of the various action alternatives, as well as the no action alternative, are evaluated in this section. Several federal and state regulations and local ordinances and policies were considered in the assessment of environmental consequences. Federal, state, and local regulations are described in Section 10.

Environmental commitments, which include project design features and best management practices, that are incorporated into all action alternatives to avoid and/or reduce potential impacts for certain resources are listed after the discussion of significance thresholds.

Consistent with federal and state regulations and guidelines (40 C.F.R. § 1508.27; CEQA Guidelines § 15064,15126.2[a]); direct and indirect effects were evaluated in this Section 5. Cumulative impacts are evaluated in Section 6.

5.1 Topography, Geology, and Geography

5.1.1 Impact Significance Criteria

The project would result in a potentially significant impact if it would:

- Substantially and adversely modify any unique geologic or physical features.
- Substantially and adversely modify beach or nearshore bottom topography.

5.1.2 Alternative 1 (No Action)

Under the No Action Alternative, the USACE and Port would not construct an Approach Channel to Pier J South, deepen the West Basin Channel, deepen the Approach Channel, widen portions of the Main Channel, or construct the LSF. However, maintenance dredging of existing channel depths would continue, when and where needed. This alternative would not increase ship calls or throughput and would not modify any unique geologic or physical features, modify beach or nearshore bottom topography within the study area. Maintenance dredging of the federal channels would be subject to separate detailed evaluation under NEPA and maintenance dredging of the berths would be subject to separate detailed evaluation under both NEPA and CEQA.

5.1.3 Alternative 2

Dredging

Dredging of 4.7 mcy of sediments associated with Alternative 2 would result in moderate alterations of the bottom topography of the harbor. Container channels would be deepened from an average water depth of –50 feet to –53 feet MLLW and the Approach Channel would be deepened to -78 feet MLLW. The POLB is an industrial, predominantly disturbed area, where previous dredging has been completed. Dredging would temporarily disrupt underwater depositional processes; however, similar to prior dredging episodes in this area, depositional equilibrium would be reestablished within a short period of time. No regional, long-term depositional disruptions would occur because of dredging in this area. Proposed dredging would not substantially and adversely modify unique geologic or physical features within the harbor.

Electrical Substation

Construction of the electrical substation would have negligible impacts because the substation would be built on an existing paved area with no excavation required. Therefore, such construction would not substantially and adversely modify unique geologic or physical features.

Staging Area

Use of potential areas within Port boundaries would have negligible impacts because the staging area would be built on an existing paved area with no excavation required. Therefore, the staging areas would not substantially and adversely modify unique geologic or physical features.

Placement/Disposal

Placement of 2.5 mcy of dredged material at the Surfside Borrow Site Nearshore Placement Area would fill in an underwater pit resulting in a flatter, more natural topography. Bottom depth in the Surfside Borrow Site Nearshore Placement Area currently ranges from -65 to -70 feet MLLW. Bottom depth after project construction is expected to be at -45 feet MLLW. The disposal of 2.2 mcy of dredged material at the LA-2 and LA-3 ODMDS will result in sediment accumulation at each site. In some cases, disposal mounds will accumulate on the seafloor. Placement at these sites would not substantially and adversely modify unique geologic or topographic features. Restoring a more natural topography would not result in adverse modifications to the topography of the nearshore placement area, nor would these modifications be considered substantial.

Local Service Facilities

Dredging of 202,000 cy of sediments associated with Alternative 2 from the Pier J and Basin would result in negligible alterations of the bottom topography of the harbor; these areas would be deepened from an average water depth of -50 feet MLLW to -53 feet MLLW. Wharf improvements are not required for this alternative. Placement of a submerged sheet pile structure with associated rock protection to stabilize the Pier J breakwaters would have no effect on unique geologic or physical features or nearshore bottom topography because none are present. Construction of local service facilities would not substantially and adversely modify unique geologic or topographic features. Deepening the berth areas would not result in adverse modifications to the topography of the Port, nor would these modifications be considered substantial.

Significance Determination

Project dredging, the placement of dredged materials, Pier J breakwater stabilization, electrical substation construction, and construction and use of staging area would not adversely modify any unique geologic features. Placement of dredged materials into the Surfside Borrow Site Nearshore Placement Area would not adversely modify beach or nearshore bottom topography. Pier J breakwater stabilization would not adversely modify beach or nearshore bottom topography. Electrical substation construction would have no effect on beach or nearshore bottom topography. Impacts to Topography, Geology, and Geography would be less than significant.

5.1.4 Alternative 3 (Preferred Alternative)[11]

Dredging

Dredging of approximately 7.1 mcy of sediments associated with Alternative 3 would result in moderate alterations of the bottom topography of the harbor. Container channels would be deepened from an average water depth of -50 feet to -55 feet MLLW and the Approach Channel would be deepened to -80 feet MLLW. The POLB is an industrial, predominantly disturbed area, where previous dredging has been completed. Dredging would temporarily disrupt underwater depositional processes; however, similar to prior dredging episodes in this area, depositional equilibrium would be reestablished within a short period of time. No regional, long-term depositional disruptions would occur because of dredging in this area. Proposed dredging would not have any short- or long-term impacts on unique geologic features within the harbor.

Electrical Substation

Construction of the electrical substation would have negligible impacts because the substation would be built on an existing paved area with no excavation required. Therefore, such construction would not substantially and adversely modify unique geologic or physical features.

Staging Area

Use of potential areas within Port boundaries would have negligible impacts because the staging area would be built on an existing paved area with no excavation required. Therefore, staging areas would not substantially and adversely modify unique geologic or physical features.

Placement/Disposal

Placement of 2.5 mcy of dredged material at the Surfside Borrow Site Nearshore Placement Area would fill in an underwater pit resulting in a flatter, more natural topography. Bottom depth in the Surfside Borrow Site Nearshore Placement Area currently ranges from -65 to -70 feet MLLW. Bottom depth after project construction is expected to be at -45 feet MLLW. The disposal of 3.6 mcy of dredged material at the LA-2 and LA-3 ODMDSs will result in sediment accumulation at each site. In some cases, disposal mounds will accumulate on the seafloor. Placement at these sites would not substantially and adversely modify to unique geologic or topographic features. Restoring a more natural topography would not result in adverse modifications to the topography of the nearshore placement area, nor would these modifications be considered substantial.

Local Service Facilities

Dredging of 337,000 cy of sediments associated with Alternative 3 from the Pier J and Basin would result in negligible alterations of the bottom topography of the harbor; these areas would be deepened from an average water depth of –50 feet to –55 feet MLLW. Wharf improvements are not required for this alternative. Placement of a submerged sheet pile structure with associated rock protection to stabilize the Pier J breakwaters would have no effect on unique geologic or physical features or nearshore bottom topography because none are present. Construction of local service facilities would not substantially and

[11] For purposes of this study and to conform to NEPA requirements, the recommended plan may also be referred to as the preferred alternative.

adversely modify unique geologic or topographic features. Deepening the berth areas would not result in adverse modifications to the topography of the port, nor would these modifications be considered substantial.

Significance Determination

Project dredging, the placement of dredged materials, Pier J breakwater stabilization, electrical substation construction, and construction and use of the staging area would not adversely modify any unique geologic features. Placement of dredged materials into the Surfside Borrow Site Nearshore Placement Area would not adversely modify beach or nearshore bottom topography. Pier J breakwater stabilization would not adversely modify beach or nearshore bottom topography. Electrical substation construction would have no effect on beach or nearshore bottom topography. Impacts to Topography, Geology, and Geography would be less than significant.

5.1.5 Alternative 4

Dredging

Dredging of approximately 11.4 mcy of sediments associated with Alternative 4 would result in moderate alterations of the bottom topography of the harbor. Container channels would be deepened from an average water depth of -50 feet to -57 feet MLLW and the Approach Channel would be deepened to -83 feet MLLW. The POLB is an industrial, predominantly disturbed area, where previous dredging has been completed. Dredging would temporarily disrupt underwater depositional processes; however, similar to prior dredging episodes in this area, depositional equilibrium would be reestablished within a short period of time. No regional, long-term depositional disruptions would occur because of dredging in this area. Proposed dredging would not substantially and adversely modify unique geologic or physical features within the harbor.

Electrical Substation

Construction of the electrical substation would have negligible impacts because the substation would be built on an existing paved area with no excavation required. Therefore, such construction would not substantially and adversely modify unique geologic or physical features.

Staging Area

Use of potential areas within Port boundaries would have negligible impacts because the staging area would be built on an existing paved area with no excavation required. Therefore, staging areas would not substantially and adversely modify unique geologic or physical features.

Placement/Disposal

Placement of 2.5 mcy of dredged material at the Surfside Borrow Site Nearshore Placement Area would fill in an underwater pit resulting in a flatter, more natural topography. Bottom depth in the Surfside Borrow Site Nearshore Placement Area currently ranges from -65 to -70 feet MLLW. Bottom depth after project construction is expected to be at -45 feet MLLW. The disposal of 8.9 mcy of dredged material at the LA-2 and LA-3 ODMDSs will result in sediment accumulation at each site. In some cases, disposal mounds will accumulate on the seafloor. Placement at these sites would not substantially and adversely modify to unique geologic or topographic features. Restoring a more natural topography would not result in adverse modifications to the topography of the nearshore placement area, nor would these modifications be considered substantial.

Local Service Facilities

Dredging of 452,000 cy of sediments associated with Alternative 4 from the Pier J and Basin would result in negligible alterations of the bottom topography of the harbor; these areas would be deepened from an average water depth of –50 feet to –57 feet MLLW. Placement of a submerged sheet pile structure with associated rock protection to stabilize the Pier J breakwaters would have no effect on unique geologic or physical features or nearshore bottom topography because none are present. Construction of local service facilities would not substantially and adversely modify unique geologic or topographic features. Deepening the berth areas would not result in adverse modifications to the topography of the port, nor would these modifications be considered substantial.

Significance Determination

Project dredging, the placement of dredged materials, Pier J breakwater stabilization, wharf improvements, electrical substation construction, and construction and use of the staging area would not adversely modify any unique geologic features. Placement of dredged materials into the Surfside Borrow Site Nearshore Placement Area would not adversely modify beach or nearshore bottom topography. Pier J breakwater stabilization would not adversely modify beach or nearshore bottom topography. Wharf improvements and electrical substation construction would have no effect on beach or nearshore bottom topography. Impacts to Topography, Geology, and Geography would be less than significant.

5.1.6 Alternative 5

Dredging

Dredging of 8.1 mcy of sediments associated with Alternative 5 would result in moderate alterations of the bottom topography of the harbor. Container channels would be deepened from an average water depth of -50 feet to -55 feet MLLW, the Approach Channel would be deepened to -80 feet MLLW, and construction of Standby Area adjacent to the Main Channel to a depth of -67 feet MLLW with a 300-foot diameter-center anchor placement at a depth of about -79 feet MLLW. The POLB is an industrial, predominantly disturbed area, where previous dredging has been completed. Dredging would temporarily disrupt underwater depositional processes; however, similar to prior dredging episodes in this area, depositional equilibrium would be reestablished within a short period of time. No regional, long-term depositional disruptions would occur because of dredging in this area. Proposed dredging would not substantially and adversely modify unique geologic or physical features within the harbor.

Electrical Substation

Construction of the electrical substation would have negligible impacts because the substation would be built on an existing paved area with no excavation required. Therefore, such construction would not substantially and adversely modify unique geologic or physical features.

Staging Area

Use of potential areas within Port boundaries would have negligible impacts because the staging area would be built on an existing paved area with no excavation required. Therefore, staging areas would not substantially and adversely modify unique geologic or physical features.

Placement/Disposal

Placement of 2.5 mcy of dredged material at the Surfside Borrow Site Nearshore Placement Area would fill in an underwater pit resulting in a flatter, more natural topography. Bottom depth in the Surfside Borrow Site Nearshore Placement Area currently ranges from -65 to -70 feet MLLW. Bottom depth after project construction is expected to be at -45 feet MLLW. The disposal of 5.6 mcy of dredged material at the LA-2 and LA-3 ODMDSs will result in sediment accumulation at each site. In some cases, disposal mounds will accumulate on the seafloor. Placement at these sites would not substantially and adversely modify to unique geologic or topographic features. Restoring a more natural topography would not result in adverse modifications to the topography of the nearshore placement area, nor would these modifications be considered substantial.

Local Service Facilities

Dredging of 304,000 cy of sediments associated with Alternative 5 from the Pier J and Basin would result in negligible alterations of the bottom topography of the harbor; these areas would be deepened from an average water depth of –50 feet to –55 feet MLLW. Wharf improvements are not required for this alternative. Placement of a submerged sheet pile structure with associated rock protection to stabilize the Pier J breakwaters would have no effect on unique geologic or physical features or nearshore bottom topography because none are present. Construction of local service facilities would not substantially and adversely modify unique geologic or topographic features. Deepening the berth areas would not result in adverse modifications to the topography of the port, nor would these modifications be considered substantial.

Significance Determination

Project dredging, the placement of dredged materials, Pier J breakwater stabilization, electrical substation construction, and construction and use of the staging area would not adversely modify any unique geologic features. Placement of dredged materials into the Surfside Borrow Site Nearshore Placement Area would not adversely modify beach or nearshore bottom topography. Pier J breakwater stabilization would not adversely modify beach or nearshore bottom topography. Electrical substation construction would have no effect on beach or nearshore bottom topography. Impacts to Topography, Geology, and Geography would be less than significant.

5.1.7 Summary of Potential Impacts to Geology and Topography

No significant unavoidable impacts were identified.

5.1.8 Mitigation Measures

No mitigation would be required as no significant impacts have been identified.

5.2 Oceanographic Characteristics and Coastal Processes

5.2.1 Impact Significance Criteria

The project would result in a potentially significant impact if it would:

- Substantially and adversely alter nearshore wave characteristics.
- Substantially impact nearshore currents.
- Block or substantially interfere with nearshore sediment transport.

5.2.2 Alternative 1 (No Action)

Under the No Action Alternative, the USACE and Port would not construct an Approach Channel to Pier J South, deepen the West Basin Channel, deepen the Approach Channel, widen portions of the Main Channel, or construct the LSF. However, maintenance dredging of existing channel depths would continue, when and where needed. This alternative would not increase ship calls or throughput and would not incrementally increase operational emissions within the study area. Selection of this alternative would minimize the potential for short- and long-term water quality impacts at the project area. The No Action Alternative is not expected to substantially and adversely alter nearshore wave characteristics, substantially impact nearshore currents, or block or substantially interfere with nearshore sediment transport. Maintenance dredging of the federal channels would be subject to separate detailed evaluation under NEPA, and maintenance dredging of the berths would be subject to separate detailed evaluation under both NEPA and CEQA.

5.2.3 Alternative 2

Dredging

Dredging of 4.7 mcy of sediments associated with Alternative 2 would result in moderate alterations of the bottom topography of the harbor. Container basins would be deepened from an average water depth of -50 feet to -53 feet MLLW and the Approach Channel would be deepened to -78 feet MLLW. The extent of deepening is relatively small and is not expected to result in any changes to nearshore wave characteristics or currents and would not interfere with nearshore sediment transport.

Electrical Substation

Construction of the electrical substation would have negligible impacts because the substation would be built on an existing paved area with no impacts to oceanographic or coastal processes.

Staging Area

Use of potential areas within Port boundaries would have negligible impacts because the staging area would be built on an existing paved area with no impacts to oceanographic or coastal processes.

Placement/Disposal

Placement of 2.5 mcy of dredged material at the Surfside Borrow Site Nearshore Placement Area would fill in an underwater pit resulting in a flatter, more natural topography. Placement at this site is not expected to result in any changes to nearshore wave characteristics or currents and would not interfere with nearshore sediment transport. Impacts of disposal of 2.2 mcy of dredged material at the deep ocean LA-2 and LA-3 ODMDS would have no impact on nearshore wave characteristics or currents and would not interfere with nearshore sediment transport.

Local Service Facilities

Dredging of 202,000 cy of sediments associated with Alternative 2 from the Pier J Basin would result in negligible alterations of the bottom topography of the harbor. The extent of deepening is negligibly small and is not expected to result in any changes to nearshore wave characteristics or currents and would not interfere with nearshore sediment transport. Wharf improvements are not required for this alternative. Placement of a submerged sheet pile structure with associated rock protection to stabilize the Pier J breakwaters would have negligible effect on nearshore wave characteristics, nearshore currents, or nearshore sediment transport because the structure would largely be below the harbor bottom immediately adjacent to the associated breakwater.

Significance Determination

Project dredging, the placement of dredged materials, Pier J breakwater stabilization, electrical substation construction, and construction and use of the staging area is not expected to substantially and adversely alter nearshore wave characteristics or substantially impact nearshore currents and would not substantially interfere with nearshore sediment transport. Impacts to Oceanographic Characteristics and Coastal Processes would be less than significant.

5.2.4 Alternative 3 (Preferred Alternative)

Dredging

Dredging of 7.1 mcy of sediments associated with Alternative 3 would result in moderate alterations of the bottom topography of the harbor. Container channels would be deepened from an average water depth of -50 feet to -55 feet MLLW and the Approach Channel would be deepened to -80 feet MLLW. The extent of deepening is relatively small and is not expected to result in any changes to nearshore wave characteristics or currents and would not interfere with nearshore sediment transport.

Electrical Substation

Construction of the electrical substation would have negligible impacts because the substation would be built on an existing paved area with no impacts to oceanographic or coastal processes.

Staging Area

Use of potential areas within Port boundaries would have negligible impacts because the staging area would be built on an existing paved area with no impacts to oceanographic or coastal processes.

Placement/Disposal

Placement of 2.5 mcy of dredged material at the Surfside Borrow Site Nearshore Placement Area would fill in an underwater pit resulting in a flatter, more natural topography. Placement at this site is not expected to result in any changes to nearshore wave characteristics or currents and would not interfere with nearshore sediment transport. Impacts of disposal of dredged material at the deep ocean LA-2 and LA-3 ODMDS would have no impact on nearshore wave characteristics or currents and would not interfere with nearshore sediment transport.

Local Service Facilities

Dredging of 337,000 cy of sediments associated with Alternative 3 from the Pier J Basin would result in negligible alterations of the bottom topography of the harbor. The extent of deepening is negligibly small and is not expected to result in any changes to wave characteristics or currents and would not interfere with sediment transport. Wharf improvements are not required for this alternative. Placement of a submerged sheet pile structure with associated rock protection to stabilize the Pier J breakwaters would have negligible effect on nearshore wave characteristics, nearshore currents, or nearshore sediment transport because the structure would largely be below the harbor bottom immediately adjacent to the associated breakwater.

Significance Determination

Project dredging, the placement of dredged materials, Pier J breakwater stabilization, electrical substation construction, and construction and use of the staging area is not expected to substantially and adversely alter nearshore wave characteristics or substantially impact nearshore currents and would not interfere with nearshore sediment transport. Impacts to Oceanographic Characteristics and Coastal Processes would be less than significant.

5.2.5 Alternative 4

Dredging

Dredging of 11.4 mcy of sediments associated with Alternative 4 would result in moderate alterations of the bottom topography of the harbor. Container channels would be deepened from an average water depth of -50 feet to -57 feet MLLW and the Approach Channel would be deepened to -83 feet MLLW. The extent of deepening is relatively small and is not expected to result in any changes to nearshore wave characteristics or currents and would not interfere with nearshore sediment transport.

Electrical Substation

Construction of the electrical substation would have negligible impacts because the substation would be built on an existing paved area with no impacts to oceanographic or coastal processes..

Staging Area

Use of potential areas within Port boundaries would have negligible impacts because the staging area would be built on an existing paved area with no impacts to oceanographic or coastal processes.

Placement/Disposal

Placement of 2.5 mcy of dredged material at the Surfside Borrow Site Nearshore Placement Area would fill in an underwater pit resulting in a flatter, more natural topography. Placement at this site is not expected to result in any changes to nearshore wave characteristics or currents and would not interfere with nearshore sediment transport. Impacts of disposal of dredged material at the deep ocean LA-2 and

LA-3 ODMDS would have no impact on nearshore wave characteristics or currents and would not interfere with nearshore sediment transport.

Local Service Facilities

Dredging of 452,000 cy of sediments associated with Alternative 4 from the Pier J Basin and Pier T (West Basin) berth would result in negligible alterations of the bottom topography of the harbor. The extent of deepening is negligibly small and is not expected to result in any changes to nearshore wave characteristics or currents and would not interfere with nearshore sediment transport. Wharf improvements are required for this alternative but would result in any impacts to nearshore wave characteristics or currents and would not interfere with nearshore sediment transport because the structure would largely be below the harbor bottom immediately adjacent to the associated breakwater. Placement of a submerged sheet pile structure with associated rock protection to stabilize the Pier J breakwaters would have negligible effect on nearshore wave characteristics, nearshore currents, or nearshore sediment transport because the structure would largely be below the harbor bottom immediately adjacent to the associated breakwater.

Significance Determination

Project dredging, the placement of dredged materials, Pier J breakwater stabilization, wharf improvements, electrical substation construction, and construction and use of the staging area is not expected to substantially and adversely alter nearshore wave characteristics or substantially impact nearshore currents and would not substantially interfere with sediment transport. Impacts to Oceanographic Characteristics and Coastal Processes would be less than significant.

5.2.6 Alternative 5

Dredging

Dredging of 8.1 mcy of sediments associated with Alternative 5 would result in moderate alterations of the bottom topography of the harbor. Container channels would be deepened from an average water depth of -50 feet to -55 feet MLLW, the Approach Channel would be deepened to -80 feet MLLW, and construction of Standby Area adjacent to the Main Channel to a depth of -67 feet MLLW with a 300-foot diameter-center anchor placement at a depth of about -79 feet MLLW. The extent of deepening is relatively small and is not expected to result in any changes to nearshore wave characteristics or currents and would not interfere with nearshore sediment transport.

Electrical Substation

Construction of the electrical substation would have negligible impacts because the substation would be built on an existing paved area with no impacts to oceanographic or coastal processes.

Staging Area

Use of potential areas within Port boundaries would have negligible impacts because the staging area would be built on an existing paved area with no impacts to oceanographic or coastal processes.

Placement/Disposal

Placement of 2.5 mcy of dredged material at the Surfside Borrow Site Nearshore Placement Area would fill in an underwater pit resulting in a flatter, more natural topography. Placement at this site is not expected to result in any changes to nearshore wave characteristics or currents and would not interfere with nearshore sediment transport. Impacts of disposal of dredged material at the deep ocean LA-2 and LA-3 ODMDS would have no impact on nearshore wave characteristics or currents and would not interfere with nearshore sediment transport.

Local Service Facilities

Dredging of 304,000 cy of sediments associated with Alternative 5 from the Pier J Basin would result in negligible alterations of the bottom topography of the harbor. The extent of deepening is negligibly small and is not expected to result in any changes to nearshore wave characteristics or currents and would not interfere with nearshore sediment transport. Wharf improvements are not required for this alternative. Placement of a submerged sheet pile structure with associated rock protection to stabilize the Pier J breakwaters would have negligible effect on nearshore wave characteristics, nearshore currents, or nearshore sediment transport because the structure would largely be below the harbor bottom immediately adjacent to the associated breakwater.

Significance Determination

Project dredging, the placement of dredged materials, Pier J breakwater stabilization, electrical substation construction, and construction and use of the staging area is not expected to substantially and adversely alter nearshore wave characteristics or substantially impact currents and would not substantially interfere with nearshore sediment transport. Impacts to Oceanographic Characteristics and Coastal Processes would be less than significant.

5.2.7 Summary of Potential Effects to Oceanographic and Coastal Processes

No significant unavoidable impacts were identified.

5.2.8 Mitigation Measures

No mitigation would be required as no significant impacts have been identified.

5.3 Water and Sediment Quality

5.3.1 Impact Significance Criteria

The project would result in a potentially significant impact if it would:

- result in the release of toxic substances that would be deleterious to human, fish, or plant life;
- result in substantial impairment of beneficial recreational use of the project area; or
- result in pollution, contamination, or nuisance as defined in Section 13050 of the California Water Code.

Environmental Commitments

1. The Contractor shall keep construction activities under surveillance, management, and control to avoid pollution of surface and ground waters.

2. The Contractor shall implement a Water Quality Monitoring Plan at the dredge and nearshore placement sites. The plan shall include weekly monitoring of water quality parameters (salinity, pH, dissolved oxygen, temperature, and percent light transmissivity) with an instrument package at four stations. The four stations are sited relative to the dredge and will be 100 feet upcurrent of the dredge, 100 feet downcurrent of the dredge, 300 feet downcurrent of the dredge, and a control station located outside of any dredge plume. Monthly water samples will be taken from the station 300 feet downcurrent of the dredge for analysis of total suspended solids, total reportable petroleum hydrocarbons (TRPH), and for any contaminants of concern identified during sediment sampling and analysis to be conducted during the PED phase of the project. Similar monitoring would be conducted at the Surfside Borrow Site Nearshore Placement Area during sediment placement activities at that location relative to the placement site release point. Dredging will be controlled to keep water quality impacts to acceptable levels, controls will include modifying the dredging operation and the use of silt curtains (if feasible). Turbidity (NTUs), light transmittance will be limited to a 20 percent maximum change between the control station and 300 feet downstream station. Dissolved oxygen will not at any time be depressed more than 10 percent from that which occurs naturally, and will be maintained at a minimum of 5mg/l. The pH will be limited to a 0.2-unit change from that which occurs naturally.

3. The Contractor shall mark the dredge and all associated equipment in accordance with U.S. Coast Guard (USCG) regulations. The Contractor must contact the USCG two weeks prior to the commencement of dredging. The following information shall be provided: the size and type of equipment to be used; names and radio call signs for all working vessels; telephone number for on-site contact with the project engineer; the schedule for completing the project; and any hazards to navigation.

4. The Contractor shall move equipment upon request by the USCG and Harbor patrol law enforcement and rescue vessels.

5. The Contractor shall implement a Spill Prevention Plan including employee training and the staging of materials on site to clean up accidental spills.

6. Adhere to site use conditions for material disposal at the LA-2 and LA-3 ODMDS.

7. If other, unrelated projects occur that result in an exceedance of annual disposal limits at either LA-2 or LA-3 ODMDS, USACE will coordinate with USEPA to identify and implement additional monitoring at the disposal site[s].

8. A sediment Sampling and Analysis Plan (SAP) will be conducted for all sediments to be dredged as part of the proposed project. The SAP will be prepared in consultation with the SC-DMMT and will comply with appropriate testing manuals (the Inland Testing Manual (USEPA & USACE 1998) for sediments to be placed at the Surfside nearshore placement area and the Green Book (USEAP & USACE 1991) for sediments disposed of at the two ocean dredged material disposal sites, LA-2 and LA-3). The USACE will evaluate test results, make a suitability determination, and seek formal concurrence from with member agencies of the SC-DMMT, including the USEPA.

9. Additional water quality monitoring parameters (e.g., contaminants of concern present in the sediments that could impact water quality at the dredged or placement site) may be added based on the results of a sediment sampling and testing program to be conducted during the PED phase. The sediment sampling and testing program would be used to ensure that only suitable sediments are placed in the nearshore or disposed of at the USEPA-approved ODMDS. Sediment suitability determinations based on the results of the sediment sampling and testing program, compliance with section 103 of the Marine Protection, Research and Sanctuaries Act for the transportation of dredged material for the purpose of ocean disposal at a USEPA-approved ODMDS, and consideration of alternative disposal options should any sediments be determined unsuitable for nearshore or ocean disposal would be accomplished during PED through an appropriate supplement to the IFR.

5.3.2 Alternative 1 (No Action)

Under the No Action Alternative, the USACE and Port would not construct an Approach Channel to Pier J South, deepen the West Basin Channel, deepen the Approach Channel, widen portions of the Main Channel, or construct the LSF. However, maintenance dredging of existing channel depths would continue, when and where needed. This alternative would not increase ship calls or throughput. The No Action Alternative is not expected to result in the release of toxic substances that would be deleterious to human, fish, or plant life, to result in substantial impairment of beneficial recreational use of the project area, or to result in discharges that create pollution, contamination, or nuisance as defined in Section 13050 of the California Water Code. Maintenance dredging of the federal channels would be subject to separate detailed evaluation under NEPA, and maintenance dredging of the berths would be subject to separate detailed evaluation under both NEPA and CEQA.

5.3.3 Alternative 2

Dredging

Water quality of the San Pedro Bay would be temporarily impacted during the dredging operation. Types of impacts that could occur include short-term increases in turbidity, decreases in DO, increases in nutrients, and increases in contaminants in areas where contaminated sediments (e.g., heavy metals and organic chemicals) are adsorbed on suspended sediments or dissolved in the water in the sediments. Historic sediment testing has not indicated any contaminants at levels sufficient to cause concern for dissolved partitioning at high enough levels to result in potential impacts during dredging. These impacts would generally be confined to the immediate vicinity of the dredging activities. Periodic monitoring of the water column would be conducted to ensure that turbidity increases and/or decreases in DO does not result in significant impacts. Should water quality monitoring show an increase in turbidity or a decrease in DO, management procedures would be implemented to reduce the impacts. These measures may include slowing the dredge cycle, ensuring that the bucket is completely emptied over the disposal barge, or, in extreme cases, the use of silt curtains to control turbidity. Therefore, dredging activities would not result in pollution, contamination, or nuisance. There are no beneficial recreational uses in the dredge areas.

Accidents resulting in spills of fuel, lubricants, or hydraulic fluid from the equipment used during dredging could occur during the project. Impacts would depend on the amount and type of material spilled as well as specific conditions (i.e., currents, wind, temperature, waves, tidal stage, and vessel activity). In such cases, spills would be cleaned up immediately, thereby not resulting in a release of toxic substances that would be deleterious to human, fish, or plant life. A larger spill that could result in a release of toxic substances that would be deleterious to human, fish, or plant life is not expected to occur, even under reasonable worst-case conditions.

Electrical Substation

Construction of the electrical substation would have negligible impacts because the substation would be built on an existing paved area with measures taken to prevent the introduction of any toxic substances, pollutant, or contaminant into ocean waters.

Staging Area

Use of potential areas within Port boundaries would have negligible impacts because the staging area would be built on an existing paved area with measures taken to prevent the introduction of any toxic substances, pollutant, or contaminant into ocean waters.

Placement/Disposal

The disposal of 2.2 mcy of dredged material at the LA-2 and LA-3 ODMDS will result in short-term, localized effects to water quality parameters. Effects to water quality parameters from disposal operations are predicted to be localized and temporary. . The placement of dredged material in the Surfside Borrow Site Nearshore Placement Area could create local turbidity impacts and/or reduce levels of DO during placement operations. Material to be placed at this site would be clean, nearshore-compatible sand. Turbidity plumes would be limited to the immediate vicinity of the placement operations because of the sandy nature of the sediments and the lack of long-shore currents and/or a mild wave climate at the site. Material placed in the nearshore would be composed of nearshore-compatible sand. As a result, the dredged material is expected to settle out of the water column quickly. Water quality monitoring would be conducted to ensure that turbidity and/or DO problems do not occur and to allow for implementation of best management practices should problems occur. Therefore, placement/disposal activities would not result in pollution, contamination, or nuisance. There are no beneficial recreational uses in either of the two ODMDS. The Surfside Borrow Site Nearshore Placement Area is located far enough away from beach areas to have no impact on recreational uses.

Accidents resulting in spills of fuel, lubricants, or hydraulic fluid from the equipment used during placement/disposal could occur during the project. Impacts would depend on the amount and type of material spilled as well as specific conditions (i.e., currents, wind, temperature, waves, tidal stage, and vessel activity). In such cases, spills would be cleaned up immediately, thereby not resulting in a release of toxic substances that would be deleterious to human, fish, or plant life. A larger spill that could result in a release of toxic substances that would be deleterious to human, fish, or plant life is not expected to occur, even under reasonable worst-case conditions.

Local Service Facilities

Dredging of 202,000 cy of sediments associated with Alternative 2 from the Pier J Basin would result in impacts similar to those described above for dredging and placement/disposal. Wharf improvements are not required for this alternative. Placement of a submerged sheet pile structure with associated rock protection to stabilize the Pier J breakwaters would have negligible localized effect on water quality by increasing turbidity during sheet pile installation and placement of rocks, therefore, it would not result in pollution, contamination, or nuisance. Rocks would be quarry-run rocks that are expected to be free of contaminants and/or fine sediments, therefore, it would not result in the release of toxic substances that would be deleterious to humans, fish, or plant life. There are no beneficial recreational uses in the area of the local service facilities.

Significance Determination

Project dredging, the placement of dredged materials, Pier J breakwater stabilization, electrical substation construction, and construction and use of the staging area are not expected to result in the release of toxic substances as the dredged materials are expected to be clean enough to be placed in the nearshore or disposed of at one of two nearby ODMDS. The project would not result in impairment of beneficial recreational use in the project area. Pollution, contamination, or nuisance would not occur. Impacts to Water and Sediment Quality would be less than significant.

5.3.4 Alternative 3 (Preferred Alternative)

Dredging

Impacts would be similar to Alternative 2, except that conditions of turbidity and resuspended sediments would occur over a period of approximately an additional six months.

Electrical Substation

Construction of the electrical substation would have negligible impacts because the substation would be built on an existing paved area with measures taken to prevent the introduction of any toxic substances, pollutant, or contaminant into ocean waters.

Staging Area

Use of potential areas within Port boundaries would have negligible impacts because the staging area would be built on an existing paved area with measures taken to prevent the introduction of any toxic substances, pollutant, or contaminant into ocean waters.

Placement/Disposal

Impacts would be similar to Alternative 2. Placement impacts at the Surfside Borrow Site Nearshore Placement Area would be identical to Alternative 2 as the volumes are the same. Impacts from ocean disposal at LA-2 and/or LA-3 would be the same as Alternative 2.

Local Service Facilities

Dredging of 337,000 cy of sediments associated with Alternative 3 from the Pier J Basin would result in impacts similar to those described above for dredging and placement/disposal. Wharf improvements are not required for this alternative. Placement of a submerged sheet pile structure with associated rock protection to stabilize the Pier J breakwaters would have negligible localized effect on water quality by increasing turbidity during sheet pile installation and placement of rocks, therefore, it would not result in pollution, contamination, or nuisance. Rocks would be quarry-run rocks that are expected to be free of contaminants and/or fine sediments, therefore, it would not result in the release of toxic substances that would be deleterious to humans, fish, or plant life. There are no beneficial recreational uses in the area of the local service facilities.

Significance Determination

Project dredging, the placement of dredged materials, Pier J breakwater stabilization, electrical substation construction, and construction and use of the staging area are not expected to result in the release of toxic substances as the dredged materials are expected to be clean enough to be placed in the nearshore or disposed of at one of two nearby ODMDS. The project would not result in impairment of beneficial recreational use in the project area. Pollution, contamination, or nuisance would not occur. Impacts to Water and Sediment Quality would be less than significant.

5.3.5 Alternative 4

Dredging

Impacts would be similar to Alternative 2, except that conditions of turbidity and resuspended sediments would occur over a period of approximately an additional twenty-six months.

Electrical Substation

Construction of the electrical substation would have negligible impacts because the substation would be built on an existing paved area with measures taken to prevent the introduction of any toxic substances, pollutant, or contaminant into ocean waters.

Staging Area

Use of potential areas within Port boundaries would have negligible impacts because the staging area would be built on an existing paved area with measures taken to prevent the introduction of any toxic substances, pollutant, or contaminant into ocean waters.

Placement/Disposal

Impacts would be similar to Alternative 2. Placement impacts at the Surfside Borrow Site Nearshore Placement Area would be identical to Alternative 2 as the volumes are the same. Impacts from ocean disposal at LA-2 and/or LA-3 would be similar to Alternative 2 with an increase in dredge volume to 8.9 mcy.

Local Service Facilities

Dredging of 452,000 cy of sediments associated with Alternative 4 from the Pier J Basin and Pier T (West Basin) berth would result in impacts similar to those described above for dredging and ocean disposal. Wharf improvements are required for this alternative but are not expected to result in impacts to Water and Sediment Quality. Placement of a submerged sheet pile structure with associated rock protection to stabilize the Pier J breakwaters would have negligible localized effect on water quality by increasing turbidity during sheet pile installation and placement of rocks, therefore, it would not result in pollution, contamination, or nuisance. Rocks would be quarry-run rocks that are expected to be free of contaminants and/or fine sediments, therefore, it would not result in the release of toxic substances that would be deleterious to humans, fish, or plant life. There are no beneficial recreational uses in the area of the local service facilities.

Significance Determination

Project dredging, the placement of dredged materials, Pier J breakwater stabilization, electrical substation construction, construction and use of the staging area, and wharf improvements are not expected to result in the release of toxic substances as the dredged materials are expected to be clean enough to be placed in the nearshore or disposed of at one of two nearby ODMDS. The project would not result in impairment of beneficial recreational use in the project area. Pollution, contamination, or nuisance would not occur. Impacts to Water and Sediment Quality would be less than significant.

5.3.6 Alternative 5

Dredging

Impacts would be similar to Alternative 2, except that conditions of turbidity and resuspended sediments would occur over a period of approximately an additional fifteen months.

Electrical Substation

Construction of the electrical substation would have negligible impacts because the substation would be built on an existing paved area with measures taken to prevent the introduction of any toxic substances, pollutant, or contaminant into ocean waters.

Staging Area

Use of potential areas within Port boundaries would have negligible impacts because the staging area would be built on an existing paved area with measures taken to prevent the introduction of any toxic substances, pollutant, or contaminant into ocean waters.

Placement/Disposal

Impacts would be similar to Alternative 2. Placement impacts at the Surfside Borrow Site Nearshore Placement Area would be identical to Alternative 2 as the volumes are the same. Impacts from ocean disposal at LA-2 and/or LA-3 would be similar to Alternative 2 with an increase in dredge volume to 5.6 mcy.

Local Service Facilities

Dredging of 304,000 cy of sediments associated with Alternative 5 from the Pier J Basin would result in impacts similar to those described above for dredging and placement/disposal. Wharf improvements are not required for this alternative. Placement of a submerged sheet pile structure with associated rock protection to stabilize the Pier J breakwaters would have negligible localized effect on water quality by increasing turbidity during sheet pile installation and placement of rocks, therefore, it would not result in pollution, contamination, or nuisance. Rocks would be quarry-run rocks that are expected to be free of contaminants and/or fine sediments, therefore, it would not result in the release of toxic substances that would be deleterious to humans, fish, or plant life. There are no beneficial recreational uses in the area of the local service facilities.

Significance Determination

Project dredging, the placement of dredged materials, Pier J breakwater stabilization, electrical substation construction, and construction and use of the staging area are not expected to result in the release of toxic substances as the dredged materials are expected to be clean enough to be placed in the nearshore or disposed of at one of two nearby ODMDS. The project would not result in impairment of beneficial recreational use in the project area. Pollution, contamination, or nuisance would not occur. Impacts to Water and Sediment Quality would be less than significant.

5.3.7 Summary of Potential Impacts to Water Quality

No significant unavoidable impacts were identified.

5.3.8 Mitigation Measures

No mitigation would be required as no significant impacts have been identified.

5.4 Biological Resources

5.4.1 Impact Significance Criteria

An impact to biological resources would be considered significant if:

- The population of a threatened, endangered, or candidate species is directly affected, or its habitat lost or disturbed.
- If there is a net loss in value of a sensitive biological habitat including a marine mammal haul out site or breeding area, seabird rookery, or Area of Special Biological Significance (ASBS).
- If the movement or migration of fish is impeded.
- If there is a substantial loss in the population or habitat of any native fish, wildlife, or vegetation (a substantial loss is defined as any change in a population which is detectable over natural variability for a period of 5 years or longer).

Environmental Commitments

1. All dredging and fill activities will remain within the boundaries specified in the plans. There will be no dumping of fill or material outside of the project area or within any adjacent aquatic community.

2. The Contractor shall keep construction activities under surveillance, management, and control to minimize interference with, disturbance to, and damage of fish and wildlife.

3. Pre-construction surveys for *Caulerpa taxifolia* will be conducted in the Main Channel and the proposed Pier J Channel and Turning Basin. The USACE would conduct Surveillance Level surveys for *Caulerpa taxifolia*. Surveys shall be completed not earlier than 90 days prior to the commencement of dredging and not later than 30 days prior to the onset of work. Surveys would systematically sample at least 20 percent of the bottom of the entire area to be dredged to assure that widespread of occurrences of *Caulerpa taxifolia* would be identified if present. Surveys would be accomplished using diver transects, remote cameras, or acoustic surveys with visual ground truthing. The USACE would submit survey results in standard format to the National Marine Fisheries Service (NMFS)/California Department of Fish and Wildlife (CDFW) within 24 hours of first noting the occurrence. In the event

that *Caulerpa taxifolia* is detected, dredging would be delayed until such time as the infestation has been isolated, treated, and the risk of spread from the proposed action eliminated. In the event that NMFS/CDFW determines that the risk of *Caulerpa taxifolia* infestation has been eliminated or substantially reduced, the requirement for *Caulerpa taxifolia* surveys may be rescinded, or the frequency or level of detail of surveys may be decreased.

4. The Contractor shall implement a Spill Prevention Plan including employee training and the staging of materials on site to clean up accidental spills.

5. Adhere to site use conditions for material disposal at the LA-2 and LA-3 ODMDS.

6. If other, unrelated projects occur that result in an exceedance of annual disposal limits at either LA-2 or LA-3 ODMDS, USACE will coordinate with USEPA to identify and implement additional monitoring at the disposal site[s].

7. USACE will implement the following measures to avoid and minimize impacts to green sea turtle for hopper dredge operations.

    - During dredging, transit to and from and as placement of dredged material at the Surfside Borrow Site Nearshore Placement Area occurs, a qualified biologist with experience monitoring green sea turtles will be onboard the hopper dredge to monitor for the presence of green sea turtles. The green sea turtle monitor will have the authority to cease or alter operations to avoid impacts to green sea turtles.

    - During dredging, the biological monitor will periodically check in the hopper for the presence of green sea turtles.

    - Adequate lighting will be provided during nighttime operations (i.e., dredging, dredge material transport and placement) to allow the monitor to observe the surrounding area effectively.

    - All vessels associated with the project will not exceed eight (8) knots inside the breakwater (most vessels will be transiting outside the breakwater).

    - If a green sea turtle is observed within the vicinity of the project site during project operations, all appropriate precautions shall be implemented to avoid or minimize unintended impacts. These precautions include, but are not limited to:
        - Cessation of placement operations that is observed within 100 feet of a green sea turtle.
        - Operations may not resume until the green sea turtle has departed the monitoring zone by its own accord or has not been observed for a 15-minute period of time.
        - Maneuver the hopper dredge to avoid any free-swimming green sea turtles observed during transit.

    - Biological monitors will maintain a written log of all green sea turtle observations during project operations. This observation log will be provided to the USACE and NMFS within a reasonable time after completion of construction. Each observation log will contain the following information:
        - Observer name and title
        - Type of construction activity (dredging, etc.)
        - Date and time animal first observed (for each observation)

   - Date and time observation ended (for each observation). A green sea turtle observation will terminate if (1) an animal is observed exiting the monitoring zone or (2) after a 15-minute period of no observation (assumption is that animal has exited but was not observed to do so).
   - Location of monitor (latitude/longitude), direction of green sea turtle in relation to the monitor, and estimated distance (in meters) of green sea turtle to the monitor.
   - Nature and duration of equipment shutdown

- Any observations involving the potential "take" of green sea turtles will be reported by the biological monitor(s) to the USACE within 10 minutes of the incident and to the NMFS stranding coordinator immediately thereafter.

- The Contractor will implement an Environmental Protection Plan that will include a green sea turtle Monitoring and Avoidance Plan and an employee training program on green sea turtle observation protocols, avoidance, and minimization measures. The program will be conducted by the biological monitor and record kept of dates of training, names and positions of attending employees, and an outline of the training presentation.

8. USACE will implement the following measures to avoid and minimize green sea turtle for clamshell dredge operations. POLB agrees to apply these same measures to LSF and they are expected to be included as requirements as part of any permit issued for LSF by the USACE Regulatory Division.

   - During construction, a 100-foot (visually estimated) monitoring zone around all in-water equipment, vessels, and/or debris shall be implemented. Green sea turtle monitoring is not required for the transportation of material between dredging and disposal sites.

   - Visual monitoring of the monitoring zone (visually estimated) shall commence at least 15 minutes prior to the beginning of in-water construction activities each day and after each break of more than 30 minutes. If a green sea turtle is observed within the monitoring zone, all in-water project activities shall cease as soon as possible, in consideration of worker safety. Project activities shall not commence or continue until the green sea turtle has either been observed having left the monitoring zone, or at least 15 minutes have passed since the last sighting whereby it is assumed the green sea turtle has voluntarily left the monitoring zone.

   - The visual monitor shall maintain a written log containing all observations of green sea turtles including:
     - Observer name and title
     - Type of activity (dredging, etc.)
     - Date and time animal first observed (for each observation)
     - Date and time observation ended (for each observation), including if the green sea turtle was observed exiting the monitoring zone or was assumed to have exited following a 15-minute period of no observation
     - Location of observer (latitude/longitude), direction, and estimated distance to green sea turtle
     - Nature and duration of equipment shutdown

   - The green sea turtle observation log shall be provided by the visual monitor to the USACE and NMFS within a reasonable time after completion of construction. Any observations involving potential take of green sea turtle shall be reported to the USACE and NMFS within 24 hours.

- Adequate lighting will be provided during nighttime operations to allow the monitor to observe the surrounding area effectively.

- The visual monitor will be trained in how to conduct visual monitoring and in the identification of green sea turtles by the Biological Monitor proposed for monitoring hopper dredge operations.

- The Contractor will implement an Environmental Protection Plan that will include a green sea turtle Monitoring and Avoidance Plan and an employee training program on green sea turtle observation protocols, avoidance, and minimization measures. The training program will be conducted by the Biological Monitor and a record kept of dates of training, names and positions of attending employees, and an outline of the training presentation.

9. The USACE will implement the following measure to ensure that GNF would not affect marine mammals protected under the MMPA. POLB agrees to apply this same measure to LSF and is expected to be included as requirements as part of any permit issued for LSF by the USACE Regulatory Division.

10. Construction crews would be tasked in accordance with standard specification requirements to look for and avoid any marine mammals, including whales during dredging, transportation, and placement/disposal activities. A member of the bridge crew will be identified as a marine mammal monitor. The monitor will be trained in how to conduct visual monitoring and in the identification of marine mammals by the biological monitor proposed for monitoring hopper dredge operations.

    - The visual monitor shall maintain a written log containing all observations of marine mammals including:
        - Observer name and title;
        - Type of marine mammal observed;
        - Date and time animal first observed (for each observation);
        - Date and time observation ended (for each observation);
        - Location of observer (latitude/longitude), direction, and estimated distance to marine mammal; and
        - Behavior of marine mammal.

5.4.2 Alternative 1 (No Action)

Under the No Action Alternative, the USACE and Port would not construct an Approach Channel to Pier J South, deepen the West Basin Channel, deepen the Approach Channel, widen portions of the Main Channel, or construct the LSF. However, maintenance dredging of existing channel depths would continue, when and where needed. This alternative would not increase ship calls or throughput. The No Action Alternative is not expected to result in a significant impact to biological resources in the project area. Maintenance dredging of the federal channels would be subject to separate detailed evaluation under NEPA, and maintenance dredging of the berths would be subject to separate detailed evaluation under both NEPA and CEQA.

5.4.3 Alternative 2

Dredging

Temporary increase in turbidity and suspended solids may decrease the amount of DO near the dredge site, thus affecting fish and other marine life within the area. Motile species are expected to relocate out of the immediate area until dredging activities are finished. Some benthic marine populations will be destroyed by dredging but are expected to recolonize the area within 1-2 years once dredging has ceased. Thus, there would not be any substantial loss in the population or habitat of any native fish, wildlife, or vegetation nor would there be any impedance to fish migration. There are no sensitive biological habitats in the dredge area.

Electrical Substation

Construction of the electrical substation would have negligible impacts because the substation would be built on an existing paved area. Therefore, construction of the electrical substation would not result in any substantial loss in the population or habitat of any native fish, wildlife, or vegetation nor would there be any impedance to fish migration. There are no sensitive biological habitats in the project area. There would be no effect to threatened, endangered, or candidate species.

Staging Area

Use of potential areas within Port boundaries would have negligible impacts because the staging area would be built on an existing paved area. Therefore, the staging area would not result in any substantial loss in the population or habitat of any native fish, wildlife, or vegetation nor would there be any impedance to fish migration. There are no sensitive biological habitats in the project area. There would be no effect to threatened, endangered, or candidate species.

Placement/Disposal

The habitat that will be affected directly by the proposed placement of dredged material in the Surfside Borrow Site Nearshore Placement Area is the soft bottom habitat of the nearshore placement site. This area is expected to rapidly recover from the impact. The placement area does not contain any known eelgrass beds. Impacts from ocean disposal at LA-2 and/or LA-3 is expected to be limited to burial of benthic habitat, resulting in mortality to benthic organisms. Placement/disposal would not result in any substantial loss in the population or habitat of any native fish, wildlife, or vegetation nor would there be any impedance to fish migration. There are no sensitive biological habitats in the placement/disposal area. There would be no effect to threatened, endangered, or candidate species.

Local Service Facilities

Dredging of 202,000 cy of sediments associated with Alternative 2 from the Pier J Basin would result in impacts similar to those described above for dredging and placement/disposal. Wharf improvements are not required for this alternative. Placement of a submerged sheet pile structure with associated rock protection to stabilize the Pier J breakwaters would have localized effects on marine biota, including marine mammals. Sheet pile installation would be by either a hammer or vibratory method, to be determined during design based on sediment characteristics. The channel is relatively narrow and busy, so marine mammals are not expected to be present. Likewise, other motile organisms are expected to leave during construction. Rock placement would bury soft bottom habitat, replacing it over time with a rocky reef type of habitat after colonization of the placed stone. Rocks would be quarry-run rocks that are expected to be free of contaminants and/or fine sediments. Stabilization would not result in any effects to listed species and EFH impacts would be adverse, but not substantial. The use of a soft start methodology[12] would be utilized to reduce impacts to motile marine species, providing them the opportunity to leave the area prior to full sheetpile driving impacts. Construction of local service facilities would not result in any substantial loss in the population or habitat of any native fish, wildlife, or vegetation nor would there be any impedance to fish migration. There are no sensitive biological habitats in the project area. There would be no effect to threatened, endangered, or candidate species.

Significance Determination

The project would not affect any listed species or its habitat lost or disturbed. There would be no net loss in value of a sensitive biological habitat including a marine mammal haul out site or breeding area, seabird rookery, or Area of Special Biological Significance (ASBS) as there are none present in the project area. The movement or migration of fish would not be impeded. There would not be any substantial loss in the population or habitat of any native fish, wildlife, or vegetation. Benthic populations removed during dredging or buried at the placement/disposal sites are expected to recover within 1-2 years following disturbance. Impacts to Biological Resources would be less than significant.

Threatened and Endangered Species

Endangered Species Act (ESA)

California least tern

The USACE has determined that the proposed project would not affect the California least tern. This determination is based on the absence of this species outside their nesting season (September 15-April 15). For dredging that would occur during the least tern nesting season (April 15 to September 15) a determination of no effect applies because no direct effects to nesting birds would occur as the nearest known nesting site is located at Pier 400, a distance of 2-1/4 miles from the project area. Terns tend to forage within one mile from the nest site, particularly during sensitive periods when chicks are on the nest (USACE, 2016). California least terns from the Pier 400 nest site typically forage over the nearby Seaplane Lagoon shallow water habitat, Outer Harbor areas, and offshore areas outside the breakwater and not in the POLB (KBC, 2003). Given this, and the fact that the area of effect from dredging is small in area, and alternative foraging areas are available within the Port complex closer to the nest site, a determination of no effect is justified. There would be no effect to California least terns as a result of placement of dredged material at the Surfside Borrow Site Nearshore Placement Area because terns would be expected at the Surfside Borrow Site Nearshore Placement Area in low numbers due to distance from nearest nesting colony (approximately 2-1/4 miles) and California least terns would be able to forage in the general area having to avoid only the immediate placement area during infrequent placement events. USACE conducted a study (USACE 2016) that shows that in these conditions, dredging and nearshore placement activities do not affect the foraging of the species and thus supports the no affect determination. California least terns do not forage at either of the two ODMDS.

[12] Soft start means that pile driving would be initiated at reduced energy to give marine wildlife the opportunity to vacate the vicinity of the pile-driving activity.

Green Sea Turtle

The USACE has determined that the proposed project may affect, but is not likely to adversely affect, Eastern Pacific DPS green sea turtles. This determination is based on the low likelihood of the species in the proposed dredge and construction areas and avoidance and minimization measures included in the environmental commitments listed at the start of this section.

Recent information has shown a low probability of green sea turtles in the vicinity of the Surfside Borrow Site Nearshore Placement Area (Bredvik et al., 2019; Hanna et al. 2020). Dredged sediments from the Approach Channel are the only sediments currently planned for placement in this area. All dredging in the Approach Channel would be conducted by a hopper dredge. Hopper dredges are slow moving vessels with maximum speed of 8-10 knots depending on load and sea conditions. This activity is short term with an estimated duration of six months. While green sea turtles are not shown at the actual placement site, there is a low probability that transiting hopper dredges may encounter individual sea turtles. As a precautionary measure, the USACE will be requiring green sea turtle monitors to be present on the hopper dredge during transit to and from the Surfside Borrow Site Nearshore Placement Area and while placing sediments at the Surfside Borrow Site Nearshore Placement Area. The hopper dredge will also be required to actively avoid any green sea turtles sighted and to immediately report any sightings. USACE considers that the likelihood of direct contact with vessels and/or dredging equipment resulting in severe injury or mortality as a result of the proposed project is discountable. This determination echoes that made by the NMFS for the project proposed by East San Pedro Bay Restoration Feasibility Study (NMFS 2020): "the likelihood of collisions between sea turtles and project vessels moving at such slow speeds is remote, as we expect alert vessel operators, biological monitors, and turtles to be able to avoid collisions". Avoidance and minimization measures included in the environmental commitments listed at the start of this section (e.g., Environmental Commitment #7) ensure that the project is not likely to affect listed green sea turtles.

Presence of green sea turtles in the remaining areas to be dredged by clamshell with ocean disposal is considered unlikely. This includes transit to the ODMDS for disposal of dredged sediments as well as construction areas for LSF. Duration of these activities is expected to be long with an estimated construction period of 39 months. As a precautionary measure, the USACE will be requiring monitoring of dredging. Avoidance and minimization measures included in the environmental commitments listed at the start of this section (e.g., Environmental Commitment #8) ensure that the project is not likely to adversely affect listed green sea turtles.

Marine Mammals

The primary danger to listed whale species (blue whale, fin whale, humpback whale, and the gray whale, western north Pacific population) in the study area (considered to be a rare occurrence) is ship strikes by fast moving, large vessels. The rare occurrences of whales in the study area reduces the risk considerably. Some studies (Silber, et. al. 2010; Laist, et.al. 2001) demonstrate that it takes a combination of high speed and large vessel size to injure or kill large whales. Operating dredges are stationary (clamshell dredges) or moving at speed of 1-3 knots (dredging hopper dredges). Neither represent a threat to any of the listed whale species. Vessels going to placement/disposal areas (tug and barge from clamshell dredging; the hopper dredge) move at relatively slow speeds of 5-10 knots, depending on sea conditions. The relatively slow speeds and vessel size (in comparison to container, bulk, and liquid bulk vessels) results in these vessels also being no threat to any of the listed whale species. Tugs and barges towing sediment out to the ODMDS would have a slightly higher chance of encountering the listed whale species, particularly during seasonal migrations. Vessel speed is the primary determinator of ship strike incidents. Most lethal or severe injuries involve ships travelling 14 knots or faster (Laist, et al. 2001). Vessel traffic associated with construction is expected to be substantially slower than the 14-knot limitation recommended by Laist. The ODMDS site designation EIS (USACE and USEPA 2005) concluded that, "Marine mammals in the vicinity of the LA-3 and LA-2 ODMDSs during disposal operations will potentially be disturbed by the noise and activity of the disposal tug and barge, and by the turbid plume from the disposed sediments. Disposal operations at both the LA-3 and LA-2 ODMDSs are not expected to affect breeding or nursing of any marine mammal species. The migratory path of gray whales may be temporarily deflected as gray whales are fairly tolerant of noise from ships and are likely to deviate their migratory course just enough to avoid ships …". Construction crews would be tasked in accordance with standard specification requirements to look for and avoid any marine mammals, including whales during dredging, transportation, and placement/disposal activities. The USACE has determined that the proposed project would not affect any of the listed whale species.

Marine Mammal Protection Act

The only marine mammals expected to occur in the dredge areas are California sea lions and harbor seals. These species are highly mobile and would be able to avoid the dredge areas. The noise generated by the dredge is unlikely to impact these species given the noisy background resulting from existing commercial, recreational, and safety vessels. Dredging activities would not adversely affect marine mammals. Furthermore, the dredge areas would represent a small percentage of available resources, and project activities are considered to be localized. Negative and positive impacts on marine mammals would occur. In terms of direct effects, collisions are possible, but unlikely, given the slow speed of dredges. Noise emitted is broadband, with most energy below 1 kHz and unlikely to cause damage to marine mammal auditory systems, but masking and behavioral changes are possible, not reaching the level of harassment, as defined by the implementing regulations of the Marine Mammal Protection Act. Sediment plumes are generally localized, and marine mammals reside often in turbid waters, so significant impacts from turbidity are improbable (Todd, et al. 2015). Operating dredges are stationary (clamshell dredges) or moving at speed of 1-3 knots (dredging hopper dredges). Neither represent a threat to marine mammals encountered in the harbor. Vessels going to placement/disposal areas (tug and barge from clamshell dredging; the hopper dredge) move at relatively slow speeds of 5-10 knots, depending on sea conditions. The relatively slow speeds and vessel size (in comparison to container, bulk, and liquid bulk vessels) results in these vessels also being no threat to marine mammals, including whales, that may be encountered in transit or at the placement/disposal sites. Tugs and barges towing sediment out to the ODMDS would have a slightly higher chance of encountering marine mammals but would have no effect as the vessels would be transiting highly disturbed waters with substantial traffic involving commercial and recreational vessels at a relatively slow speed. Vessel speed is the primary determinator of ship strike incidents. Most lethal or severe injuries involve ships travelling 14 knots or faster (Laist, et al. 2001). Vessel traffic associated with construction is expected to be substantially slower than the 14-knot limitation recommended by Laist. No marine mammal haul out sites or breeding area, seabird rookery, or Area of Special Biological Significance (ASBS) are located within the immediate vicinity of the dredging areas. Dredging would not cause a net loss in value of a sensitive biological habitat including a marine mammal haul out site or breeding area, seabird rookery, or ASBS. Marine mammals may occur at the LA-2 and LA-3 ODMDS (although due to the short durations of disposal events this is considered to be improbable); however, they are likely to deviate their migratory course just enough to avoid ships at the site so that disposal activities would not adversely affect marine mammals or cause a net loss in value of a sensitive biological habitat. The USACE will implement the environmental commitment listed at the start of this section (e.g., Environmental Commitment #9) to ensure its action will not affect marine mammals protected under MMPA.

Work to perform structural improvements on Pier J breakwaters at the entrance of the Pier J Slip to accommodate deepening of the Pier J Slip and Approach Channel are not expected to adversely affect marine mammals. However, this is an LSF and is subject to reevaluation during the permitting process by the USACE's Regulatory Division once a specific methodology is identified for this work during design. POLB agrees to apply the same measure listed in Environmental Commitment #9 to ensure its action will not affect marine mammals protected under the MMPA.

California Endangered Species Act (CESA)

The six species listed under state regulation are bird species that could be found in the project area foraging for prey. None of the six nests in the area. The six species are the American peregrine falcon, black skimmer, California brown pelican, Caspian tern, elegant tern, and osprey. The California least tern is also listed under state regulations and is discussed separately above. A determination of no effect applies based on no direct effects to nesting birds and the small area rendered unavailable for foraging during construction. Dredging operations, from the birds' perspectives, would only be additional vessels in a crowded harbor environment. They should be able to easily avoid vessels without any impact to foraging efficiency.

Essential Fish Habitat (EFH) Assessment

Project activities related to deepening of the channel within the area of the proposed action, nearshore placement activities, and ocean disposal activities would directly affect the identified FMP species in the following ways: (1) temporary disturbance and displacement of fish species; (2) increased sediment loads and turbidity in the water column; (3) temporary loss of food items to fisheries (vis-à-vis temporary loss of soft-bottom habitat and associated benthic invertebrates); (3) limited disruption or destruction of soft bottom habitats; (4) limited sediment transport and re-deposition; and (4) temporary degradation of the water quality due to dredging and construction activities. Most of the above effects are temporary and are negligible considering the localized effect of the actions compared to the area of the Port that would be unaffected. In this sense, the environmental degradation resulting from the proposed action would have minor effects on designated EFH or commercial fisheries. Direct loss to fish populations, if any, are likely to be undetectable. Recovery of EFH and commercial fisheries is expected to occur quickly (one growing season) for the majority of the affected environment. In addition, soft bottom benthic communities are more resilient to temporary disturbance than other types of marine habitats (e.g., rocky substrate) and are expected to recolonize to pre-project conditions within a few seasons. EFH impacts would be adverse, but not substantial. The USACE has determined that the proposed project will not result in any significant, adverse impacts to any species on the Fishery Management Plans or their habitat at either of the two ODMDS.

Impacts associated with structural improvements to the Pier J breakwater may adversely impact habitat areas of particular concern (HAPC) that occur primarily on the outside of the breakwaters in the form of canopy kelp. While a specific design has not yet been identified, impacts from the feasible options can be addressed. Placement of a submerged sheet pile structure with associated rock protection to stabilize the Pier J breakwaters would have localized effects on marine biota. Sheet pile installation would have temporary impacts associated with underwater noise resulting in most motile organisms leaving the project area for the duration of sheet pile driving activities. Installation of additional rock would bury soft bottom habitat, replacing it over time with a rocky reef type of habitat, but would have little effect on existing canopy kelp and is likely to provide for expansion of this HAPC over time. The use of concrete grouting could adversely affect canopy kelp HAPC via direct disturbances to the macroalgal and associated biogenic community. Once completed, colonization is expected to restore the canopy kelp with no net loss given the abundant canopy kelp communities existing in the vicinity that would not be affected by construction activities. Additional EFH consultation would be completed during design to fully assess the effects of these structural improvements and identify appropriate conservation recommendations as part of the permitting process for LSF.

The USACE has determined that the proposed project would not have a substantial, adverse impact to any species in the FMPs or to their habitat. Impacts, such as turbidity associated with dredging and placement of dredged materials would be insignificant. Pre-construction surveys for *Caulerpa taxifolia* would be conducted at the dredge site in the Main Channel and, in the area where the Pier J Approach Channel and Turning Basin would be constructed, prior to the start of construction. Construction shall not begin should *Caulerpa taxifolia* be identified until cleared to do so by the NMFS.

5.4.4 Alternative 3 (Preferred Alternative)

Dredging

Impacts would be similar to Alternative 2, except that conditions of turbidity and resuspended sediments would occur over a period of approximately an additional fifteen months.

Electrical Substation

Construction of the electrical substation would have negligible impacts because the substation would be built on an existing paved area. Therefore, construction of the electrical substation would not result in any substantial loss in the population or habitat of any native fish, wildlife, or vegetation nor would there be any impedance to fish migration. There are no sensitive biological habitats in the project area. There would be no effect to threatened, endangered, or candidate species.

Staging Area

Use of potential areas within Port boundaries would have negligible impacts because the staging area would be built on an existing paved area. Therefore, the staging area would not result in any substantial loss in the population or habitat of any native fish, wildlife, or vegetation nor would there be any impedance to fish migration. There are no sensitive biological habitats in the project area. There would be no effect to threatened, endangered, or candidate species.

Placement/Disposal

Impacts would be similar to Alternative 2.

Local Service Facilities

Impacts would be similar to Alternative 2 with an increase in berth dredging increased to 337,000 cy of sediments.

Significance Determination

Impacts to Biological Resources would be less than significant. Refer to the discussion of significance for Alternative 2 for details.

Threatened and Endangered Species

Effects determinations are the same as Alternative 2.

Essential Fish Habitat

The EFH determination is the same as for Alternative 2.

Marine Mammal Protection Act

Effects determinations are the same as Alternative 2.

5.4.5 Alternative 4

Dredging

Impacts would be similar to Alternative 2, except that conditions of turbidity and resuspended sediments would occur over a period of approximately an additional twenty-six months.

Electrical Substation

Construction of the electrical substation would have negligible impacts because the substation would be built on an existing paved area. Therefore, construction of the electrical substation would not result in any substantial loss in the population or habitat of any native fish, wildlife, or vegetation nor would there be any impedance to fish migration. There are no sensitive biological habitats in the project area. There would be no effect to threatened, endangered, or candidate species.

Staging Area

Use of potential areas within Port boundaries would have negligible impacts because the staging area would be built on an existing paved area. Therefore, the staging area would not result in any substantial loss in the population or habitat of any native fish, wildlife, or vegetation nor would there be any impedance to fish migration. There are no sensitive biological habitats in the project area. There would be no effect to threatened, endangered, or candidate species.

Placement/Disposal

Impacts would be similar to Alternative 2.

Local Service Facilities

Impacts would be similar to Alternative 2 with an increase in berth dredging increased to 452,000 cy of sediments. Construction of wharf upgrades to Piers T and J as part of this alternative could use pile driving techniques with similar effects to the sheet pile driving. However, these wharves are located in relatively restricted inner harbor areas. No effect to listed species or marine mammals would occur as a result. The use of a soft start methodology would be utilized to reduce impacts to motile marine species, providing them the opportunity to leave the area prior to full sheetpile driving impacts. This would also be applied to wharf modification required for Piers T and J for this alternative. Construction of local service facilities would not result in any substantial loss in the population or habitat of any native fish, wildlife, or vegetation nor would there be any impedance to fish migration. There are no sensitive biological habitats in the dredge area.

Significance Determination

Impacts to Biological Resources would be less than significant. Refer to the discussion of significance for Alternative 2 for details.

Threatened and Endangered Species

Effects determinations are the same as Alternative 2.

Essential Fish Habitat

The EFH determination is the same as for Alternative 2.

Marine Mammal Protection Act

Effects determinations are the same as Alternative 2.

5.4.6 Alternative 5

Dredging

Impacts would be similar to Alternative 2, except that conditions of turbidity and resuspended sediments would occur over a period of approximately an additional fifteen months. That would also include dredging in the Standby Area, which is not included in any of the other action alternatives.

Electrical Substation

Construction of the electrical substation would have negligible impacts because the substation would be built on an existing paved area. Therefore, construction of the electrical substation would not result in any substantial loss in the population or habitat of any native fish, wildlife, or vegetation nor would there be any impedance to fish migration. There are no sensitive biological habitats in the project area. There would be no effect to threatened, endangered, or candidate species.

Staging Area

Use of potential areas within Port boundaries would have negligible impacts because the staging area would be built on an existing paved area. Therefore, the staging area would not result in any substantial loss in the population or habitat of any native fish, wildlife, or vegetation nor would there be any impedance to fish migration. There are no sensitive biological habitats in the project area. There would be no effect to threatened, endangered, or candidate species.

Placement/Disposal

Impacts would be similar to Alternative 2.

Local Service Facilities

Impacts would be similar to Alternative 2 with an increase in berth dredging increased to 304,000 cy of sediments.

Significance Determination

Impacts to Biological Resources would be less than significant. Refer to the discussion of significance for Alternative 2 for details.

Threatened and Endangered Species

Effects determinations are the same as Alternative 2.

Essential Fish Habitat

The EFH determination is the same as for Alternative 2.

Marine Mammal Protection Act

Effects determinations are the same as Alternative 2.

5.4.7 Summary of Potential Impacts to Biological Resources

No significant unavoidable impacts were identified.

5.4.8 Mitigation Measures

No mitigation would be required as no significant impacts have been identified.

5.5 Air Quality

The environmental consequences of the various action alternatives, as well as the No Action Alternative, are evaluated in this section. Regulatory initiatives are described in Section 10 and existing environmental conditions are described in Section 3.5 (Affected Environment).

5.5.1 Impact Significance Criteria

Air quality impacts would be considered significant if:

- AQ1: Emissions would result in off-site ambient air pollutant concentrations that exceed the National Ambient Air Quality Standards (NAAQS) in **Table 5-1**.
- AQ2: Emissions would create an objectionable odor at the nearest sensitive receptor.
- AQ3: Emissions would expose the public to significant levels of Toxic Air Contaminants (TACs). The determination of significance is based on the following thresholds:
  - Maximum incremental cancer risk greater than or equal to 10 in one million (1E-05 or 10×10^{-6}).
  - Noncancer (chronic or acute) hazard index greater than or equal to 1.0 (Project increment).

  - Population cancer burden greater than 0.5 excess cancer cases in areas equal to or exceeding 1 in one million (1×10^{-6}) cancer risk.
- AQ4: Emissions equal or exceed General Conformity applicability rates in **Table 5-2.**

Table 5-1 Thresholds for Ambient Air Pollutant Concentrations

Air Pollutant and Averaging Period	NAAQS
NO_2 1-hour Annual	 0.100 ppm (188 µg/m^3) 0.053 (100 µg/m^3)
PM_{10} 24-hour	 150 µg/m^3
$PM_{2.5}$ 24-hour Annual	 35 µg/m^3 12 µg/m^3
SO_2 1-hour average	 0.075 ppm (196 µg/m^3)
CO 1-hour 8-hour	 35 ppm (40,000 µg/m^3) 9.0 ppm (10,000 µg/m^3)
Source: National Ambient Air Quality Standards (NAAQS) Key: CO = carbon monoxide; µg/m^3 = microgram per cubic meter; NO_2 = nitrogen dioxide; PM_{10} = particulate matter less than 10 microns in diameter; $PM_{2.5}$ = particulate matter less than 2.5 microns in diameter; ppm = parts per million; SO_2 = sulfur dioxide	

Table 5-2 General Conformity Applicability Rates

Pollutant	Emissions (tons/year)
CO	100
NO_2	100
Ozone (VOC as precursor)	10
Ozone (NOx as precursor)	10
PM_{10}	100
$PM_{2.5}$	70

5.5.2 Air Quality Assessment Methodology

Action alternatives 2 through 5 would result only in construction activities (i.e., both land-based construction and dredging) that would affect air quality within the Harbor District and surrounding region. While the action alternatives may accommodate changes in the vessel fleet calling at the Port, they would not increase cargo or liquid bulk throughput. Therefore, operational emissions have not been assessed in this analysis. This section describes the analysis methodology used for assessing the air quality effects of construction and applying the significance criteria.

AQ-1 Methodology: The USACE and the Port developed an integrated construction schedule for each action alternative based on dredging requirements and equipment limitations. The schedule and equipment utilization used in this analysis are anticipated to result in conservatively high emission estimates because assumptions reflect an accelerated schedule and the earliest foreseeable start date. Should construction activities be deferred or take place over a longer period of time, lower impacts would likely result as increasingly stringent regulatory requirements are implemented compared to those assumed in the analysis years. The anticipated construction schedule and equipment utilization for each action alternative are included in Appendix H1.

Emissions from dredging equipment, construction-related harbor craft, off-road construction equipment, on-road construction vehicles, and construction worker vehicles were quantified. Fugitive dust emissions are typically associated with activities that involve grading, excavation and handling of relatively dry soil. Because most of the material handling associated with the action alternatives would involve the dredging and placement of wet sediment rather than dry soil, activities would result in very small emissions of fugitive dust associated with minimal land-side construction. The following methodologies and key assumptions were used to quantify criteria pollutant emissions for each action alternative:

- Dredging Equipment: Hopper dredges would be used to dredge sediment in the Approach Channel and transport and place the dredged sediment at offshore placement sites. Clamshell dredges would be used to dredge the Main Channel, West Basin, Pier J Basin, Pier J Approach Channel, and Pier T Berths. Assumptions regarding dredge utilization, schedule, activity, and engine size were based on project-specific dredging requirements and dredging rates and are detailed in Appendix H1. Hopper dredge engines are large marine engines used for propulsion and operation of the dredging equipment. Emission factors for hopper dredge propulsion and auxiliary engines therefore reflect existing USEPA marine engine standards (USEPA 2016a). Hopper dredge propulsion and auxiliary engines were assumed to be Tier 2 marine diesel engines, per USACE. Clamshell dredges are not self-propelled, and emission factors for these engines reflect existing USEPA non-road engine standards and California engine fleet requirements per the California Air Resources Board (CARB) OFFROAD2017 Inventory (CARB 2017a). Clamshell dredge engines were assumed to be Tier 3 off-road diesel engines, per USACE and the Port.
- Harbor Craft: Construction-related tugboats would be used to position clamshell dredges and transport sediment-laden barges to off-shore and near-shore sediment placement sites. Crew boats and survey boats would also be used to support dredging activities. Assumptions regarding harbor craft utilization and engine size were based on project-specific dredging requirements and dredging rates and are presented in Appendix H1. Emission factors for harbor craft reflect existing USEPA marine engine standards as documented in the Port's 2017 Air Emissions Inventory (USEPA 2016a; POLB 2017). This analysis conservatively assumed USEPA Tier 2 harbor craft emission factors for both propulsion and auxiliary diesel engines.
- Off-road Construction Equipment: Off-road diesel construction equipment would be used during non-dredging activities such as construction of the electrical substation[13], structural improvements to the Pier J breakwater, and wharf upgrades. Assumptions regarding equipment type, utilization and engine size were based on project-specific engineering requirements and are presented in Appendix H1. Emission factors for off-road construction equipment reflect existing USEPA non-road engine standards (USEPA 2016b) and SCAQMD-wide fleet mix per CARB's OFFROAD2017 Inventory (CARB 2017a).
- On-Road Construction Vehicles and Worker Vehicles: A few construction vehicles would be used during non-dredging activities to deliver construction materials, such as piles and concrete, and haul away waste. Assumptions regarding vehicle activity for construction vehicles and worker vehicles were based on engineering requirements and are presented in Appendix H1. Exhaust, brake wear and tire wear emission factors reflect existing USEPA on-road engine standards per

[13] The electrical substation would supply electricity to the clamshell dredge, which would be electric after application of Mitigation Measure AQ-1. Therefore, the unmitigated construction emission calculations assume a diesel clamshell dredge and no electrical substation construction. The mitigated construction emission calculations assume an electric clamshell dredge and electrical substation construction.

CARB's On-Road EMFAC Database (CARB 2017b). Entrained road dust emissions were quantified per CARB's methodology for entrained road dust (CARB 2016).

Ambient air concentration impacts were analyzed using emissions quantification methodology described above and USEPA's AERMOD dispersion modeling software (USEPA 2018). Appendix H2 includes a comprehensive description of the dispersion modeling methodology, source parameters, and receptor grid configuration. AERMOD dispersion modeling results were compared to the NAAQS in **Table 5-1** for determination of significance.

AQ-2 Methodology: Land uses likely to result in odor nuisance complaints include agriculture, wastewater treatment plants, food processing plants, chemical plants, composting, refineries, landfills, dairies, and fiberglass molding (SCAQMD 1993). Since the action alternatives would not result in construction of the facilities listed above or produce concentrated odorous emissions in close proximity to sensitive receptors, odor impacts would be less than significant. Brief, qualitative discussions of the potential odors associated with each alternative are included in environmental consequences analysis.

AQ-3 Methodology: Cancer risk associated with ambient TAC levels has declined in the South Coast Air Basin (SCAB), as a result of federal, state and local regulations described in detail in Section 10.1.3. Cancer risk in the Port area is driven by emissions of diesel particulate matter (DPM), a TAC, from mobile sources such as trucks, locomotives, cargo handling equipment, and ships. Concentrations of DPM are higher near heavily traveled highways and rail lines where trucks and trains are in proximity to residential and other sensitive receptors.

CARB and SCAQMD have determined that TAC impacts, and DPM impacts in particular, are localized in nature and that exposure from DPM declines by approximately 90 percent at 300 to 500 feet from an emissions source (OEHHA 2015, CARB 2005, SCAQMD 2005). The closest sensitive receptors to the project area are live-aboards in the Yacht Marina and Island Yacht Anchorage, located approximately 1 mile (5,280 feet) to the north of the West Basin dredging area, more than 10 times the distance referred to by CARB and SCAQMD. In addition, construction emissions in any given location would be short-term (approximately 12 months or less for most dredging tasks, and less 4 months in the West Basin, the element closest to sensitive receptors), which would limit the risk at any given location.

Because the action alternatives would produce TAC emissions only temporarily during construction activities and because emissions would occur at a considerable distance from the nearest residential and sensitive receptors, a detailed health risk assessment was not performed. Instead, maximum results of the PM_{10} dispersion modeling, detailed in Appendix H2, and CARB's Hotspots Analysis and Reporting Program (HARP) were used to estimate potential maximum cancer risks and chronic non-cancer hazard indices. Analysis details and assumptions are presented in Appendix H4. Potential impacts related to acute non-cancer hazard indices and population cancer burden are discussed qualitatively in Impact AQ-3.

AQ-4 Methodology: A Federal action is exempt from a general conformity analysis and considered to conform to the State Implementation Plan (SIP) if an applicability analysis shows that total direct and indirect emissions of criteria or precursor pollutants in a nonattainment or maintenance area caused by a Federal action would equal or exceed any of the rates, known as applicability rates (also known as *de minimis* levels), specified in 40 CFR 93.153(b). The SCAB is designated as extreme nonattainment for ozone, moderate nonattainment for $PM_{2.5}$, and maintenance for CO, NO_2, and PM_{10}. Annual emissions from each of the action alternatives were compared to the General Conformity applicability rates, presented in **Table 5-2**, to assess General Conformity applicability under the CAA. The final CAA General Conformity Determination for Alternative 3 is included in Appendix H5.

The federal actions evaluated under AQ-4 include the GNF and the LSF within the USACE's regulatory purview. Per 40 CFR 93.152, USACE's federal authority would extend only to construction emissions associated with the Alternatives. The only reasonably foreseeable activities extending beyond the construction period and subject to USACE authority would be maintenance dredging, which is exempt from conformity applicability per 40 CFR 93.153(c). Hence, the USACE would have no continuing program responsibility for activities beyond construction.

Environmental Commitments

- It is the Contractor's responsibility to obtain all applicable air permits and comply with federal, state, and local air and noise regulations.
- Construction equipment shall be properly maintained to minimize emissions of air pollutants.
- Retarding injection timing of diesel-powered equipment to reduce NOx emissions will be implemented where practicable.

5.5.3 Air Quality Environmental Consequences

No Action Alternative

Under the No Action Alternative, the USACE and Port would not construct an Approach Channel to Pier J South, deepen the West Basin Channel, deepen the Approach Channel, widen portions of the Main Channel, or construct the LSF. However, maintenance dredging of existing channel depths would continue, when and where needed. This alternative would not increase ship calls or throughput and would not incrementally increase operational emissions within the study area. The No Action Alternative is not expected to result in off-site ambient air pollutant concentrations that exceed the NAAQS, expose the public to substantial TACs, or create objectionable odors affecting sensitive receptors. Maintenance dredging is exempt from general conformity analysis per 40 CFR 93.153(c). Future maintenance dredging and disposal of dredged material would be subject to separate detailed analysis under CEQA and/or NEPA.

Alternative 2

All action alternatives include bend easing of the Main Channel[14] to the authorized depth of -76' MLLW, construction of structural improvements to the Pier J breakwater as described in Section 4.6.5, deepening Pier J Basin, and berth dredging at the Pier J South Slips in the Pier J Basin and along Pier T. Dredged material would be disposed at the Surfside Borrow Site Nearshore Placement Area, LA-2, and/or LA-3. In addition, Alternative 2 includes constructing an approach channel to Pier J South to -53 feet MLLW; constructing a turning basin outside of Pier J South to -53 feet MLLW; deepening the West Basin to -53 feet MLLW; and the deepening of the Approach Channel to -78 feet MLLW.

AQ-1: Construction of Alternative 2 would result in ambient air pollutant concentrations that exceed the NAAQS in **Table 5-1**, prior to mitigation.

[14] Bend easing of the Main Channel is also referred to as widening of the Main Channel in Appendices H1 and H2.

Table 5-3 presents the maximum offsite pollutant concentrations associated with construction of Alternative 2, prior to mitigation. **Table** 5-3 shows that, without mitigation, the total 1-hour NO_2 concentration would exceed the NAAQS. Figure H2.2 in Appendix H2 shows the location of the maximum 1-hour NO_2 concentration and the significant impact area. Should construction activities be deferred or take place over a longer period of time, lower impacts would likely result as increasingly stringent regulatory requirements are implemented compared to those assumed in the analysis years. **The NO_2 exceedance would represent a significant air quality impact without mitigation.**

Table 5-3 Maximum Pollutant Concentrations Without Mitigation – Alternative 2

Pollutant	Averaging Time	Maximum Modeled Project Concentration (ug/m3)	Background Concentration (ug/m3)	Total Concentration (ug/m3)	NAAQS (ug/m3)	Concentration Exceeds NAAQS?
NO_2	1-Hour	133.0	141.4	274	188	Yes
	Annual	2.0	33.9	36	100	No
SO_2	1-Hour	0.4	23.6	24	196	No
CO	1-Hour	197.1	2,410.7	2,608	40,000	No
	8-Hour	57.9	1,951.5	2,009	10,000	No
PM_{10}	24-Hour	1.9	66.4	68	150	No
$PM_{2.5}$	24-Hour	1.7	27.2	29	35	No
	Annual	0.09	9.2	9.3	12.0	No

AQ-2: Construction of Alternative 2 would not create an objectionable odor at the nearest sensitive receptor.

Alternative 2 construction activities would generate odorous air pollutants due to the combustion of diesel fuel and possibly the exposure of dredged sediment. The mobile nature of most emission sources would help to decentralize, disperse, and dilute emissions over the relatively large project area. Furthermore, the distance between the construction activities and the nearest sensitive receptor is nearly 1 mile and as such is expected to be far enough to allow for adequate dispersion of these emissions to below objectionable odor levels. In addition, dredged sediment would be transported to offshore disposal sites several miles away from sensitive receptors. Finally, the existing industrial setting represents an already complex odor environment. For example, existing nearby container terminals include freight and goods movement activities that use ships, diesel trucks and diesel cargo-handling equipment that generate similar odors as would this Alternative. Within this context, this Alternative would not likely result in changes to the overall odor environment in the Port vicinity. Therefore, Alternative 2 would not produce objectionable odors that would affect a sensitive receptor. Mitigation measures are not required. **Impacts would be less than significant.**

AQ-3: Construction of Alternative 2 would not expose the public to significant levels of TACs.

Alternative 2 construction activities would result in temporary emissions of DPM, a TAC, from the combustion of diesel fuel in marine engines, off-road construction equipment engines, harbor craft, and a minimal number of on-road construction vehicles. More than 99 percent of the DPM emissions would occur over water. The nearest sensitive receptors would be residences located approximately 1 mile north of the West Basin. The closest offsite workers would be located at nearby Port terminals, approximately 50 meters from the nearest construction activity.

Alternative 2 construction activities would occur over a period of approximately 34 months and would be spread out over a total area of approximately 1,700 acres. Activities in a given dredging area are unlikely to impact the same receptors impacted by activities in a different dredging area (e.g., dredging activities in the West Basin, the area closest to sensitive receptors, are unlikely to impact the same receptors impacted by dredging of the 4.2-mile long Approach Channel, which is separated from the West Basin by 2.5 miles or more). In addition, the activity closest to sensitive receptors, namely dredging of the West Basin, would occur over a period of only 84 days and would be spread over the entire West Basin. All other dredging activities would occur much further from sensitive receptors.

Furthermore, construction activities in any single location would be transitory and short-term. Assessment of cancer risk is typically based on exposure periods of 30 years for residents and 25 years for off-site workers. Because DPM exhaust would be spread out over a large area, would be short-term at any given location, and would occur far from sensitive receptors, Alternative 2 construction activities are not anticipated to result in substantial elevated cancer risks to exposed persons.

To estimate potential maximum cancer risks and non-cancer chronic impacts, maximum results of the PM_{10} dispersion modeling, detailed in Appendix H2, and CARB's HARP were used. Analysis details are presented in Appendix H4. Past Port projects have consistently shown that the non-cancer acute hazard index and population cancer burden would not exceed the thresholds specified in Significance Criterion AQ-3. Most Alternative 2 construction activities would occur over water and further from population centers than other Port projects. Therefore, it is reasonable to conclude that non-cancer acute impacts and population cancer burden would be lower than other Port projects, which have consistently been below the thresholds. A detailed discussion is included in Appendix H4.

Table 5-4 presents the maximum estimated cancer risks and non-cancer chronic hazard index impacts due to Alternative 2 construction activities. The table shows that impacts would be below the thresholds of significance at all receptor types. Appendix H4 details assumptions and calculations made in evaluating Alternative 2 TAC impacts. Alternative 2 activities would not expose the public to significant levels of TACs. Mitigation measures are not required. **Impacts would be less than significant.**

Table 5-4 Maximum Cancer Risk and Non-Cancer Chronic Impacts Without Mitigation, Alternative 2

Health Impact	Receptor Type	Maximum Predicted Impact	Significance Threshold	Significant?
Cancer Risk	Residential/Sensitive[1]	5.8E-06	1.0E-05	No
Cancer Risk	Occupational	3.7E-07	1.0E-05	No
Non-Cancer Chronic	Residential/Sensitive	0.005	1	No
Non-Cancer Chronic	Occupational	0.02	1	No

Notes:
[1]. Sensitive receptor groups include children and infants, pregnant women, the elderly, and the acutely and chronically ill. Sensitive receptor locations typically include schools, hospitals, convalescent homes, child-care centers, and other locations where children, chronically ill individuals, or other sensitive persons could be regularly exposed. Sensitive individuals could also be present at any residence. Sensitive receptors were conservatively evaluated with residential exposure assumptions.

AQ-4: Construction of Alternative 2 would exceed General Conformity applicability rates.

Table 5-5 shows that annual construction emissions would exceed the General Conformity applicability rates for NO_2 and ozone (NOx precursor). **As a result, construction activities associated with Alternative 2 would result in significant impacts without mitigation.**

Table 5-5 General Conformity Emissions without Mitigation, Alternative 2 (ton/yr)

Source Category	PM_{10}	$PM_{2.5}$	Ozone (NOx precursor)	NO_2	CO	Ozone (VOC precursor)
2024						
Offroad Construction Equipment	0	0	0	0	0	0
Onroad Construction Vehicles	0	0	0	0	0	0
Fugitive Emissions	0	0	0	0	0	0
Marine Equipment	0	0	4	4	2	0
Total Construction Year 2024	0	0	4	4	2	0
Conformity Determination						
Applicability Rates	100	70	10	100	100	10
Significant?	**No**	**No**	**No**	**No**	**No**	**No**
2025						
Offroad Construction Equipment	0	0	0	0	0	0
Onroad Construction Vehicles	0	0	0	0	0	0
Fugitive Emissions	0	0	0	0	0	0
Marine Equipment	6	6	133	133	74	7
Total Construction Year 2025	6	6	133	133	74	7
Conformity Determination						
Applicability Rates	100	70	10	100	100	10
Significant?	**No**	**No**	**Yes**	**Yes**	**No**	**No**
2026						
Offroad Construction Equipment	0	0	0	0	0	0
Onroad Construction Vehicles	0	0	0	0	0	0
Fugitive Emissions	0	0	0	0	0	0
Marine Equipment	3	3	70	70	39	4
Total Construction Year 2026	3	3	70	70	39	4
Conformity Determination						
Applicability Rates	100	70	10	100	100	10
Significant?	**No**	**No**	**Yes**	**No**	**No**	**No**

Alternative 3 (Preferred Alternative)

All action alternatives include bend easing of the Main Channel to the authorized depth of -76’ MLLW, construction of structural improvements to the Pier J breakwater as described in Section 4.6.5, deepening Pier J Basin, and berth dredging at the Pier J South Slips in the Pier J Basin and along Pier T. Dredged material would be disposed at the Surfside Borrow Site Nearshore Placement Area, LA-2, and/or LA-3. In addition, Alternative 3 includes constructing an approach channel to Pier J South to -55 feet MLLW; constructing a turning basin outside of Pier J South to -55 feet MLLW; deepening the West Basin to -55 feet MLLW; and deepening of the Approach Channel to -80 feet MLLW, as well as disposal of dredge materials.

AQ-1: Construction of Alternative 3 would result in ambient air pollutant concentrations that exceed the NAAQS in **Table 5-6**, prior to mitigation.

Alternative 3 short-term (1-hour, 8-hour, and 24-hour) pollutant concentrations would be the same as Alternative 2 because peak activities and emissions for these averaging periods would be the same for both Alternatives. Annual activities and associated emissions would be only slightly different. **Table 5-6** presents the maximum offsite pollutant concentrations associated with construction of Alternative 3, prior to mitigation. The table shows that, without mitigation, only the total 1-hour NO_2 concentration would exceed the NAAQS. Figure H2.2 in Appendix H2 shows the location of the maximum 1-hour NO_2 concentration and the significant impact area. **The NO_2 exceedance would represent a significant air quality impact without mitigation.**

Table 5-6 Maximum Pollutant Concentrations Without Mitigation – Alternative 3

Pollutant	Averaging Time	Maximum Modeled Project Concentration (ug/m3)	Background Concentration (ug/m3)	Total Concentration (ug/m3)	NAAQS (ug/m3)	Concentration Exceeds NAAQS?
NO_2	1-Hour	133.0	141.4	274	188	Yes
	Annual	2.3	33.9	36	100	No
SO_2	1-Hour	0.4	23.6	24	196	No
CO	1-Hour	197.1	2,410.7	2,608	40,000	No
	8-Hour	57.9	1,951.5	2,009	10,000	No
PM_{10}	24-Hour	1.9	66.4	68	150	No
$PM_{2.5}$	24-Hour	1.7	27.2	29	35	No
	Annual	0.1	9.2	9.3	12.0	No

AQ-2: Construction of Alternative 3 would not create an objectionable odor at the nearest sensitive receptor.

Impacts would be similar to Alternative 2. Mitigation measures are not required. **Impacts would be less than significant.**

AQ-3: Construction of Alternative 3 would not expose the public to significant levels of TACs.

Impacts would be similar to Alternative 2. **Table 5-7** presents the maximum estimated cancer risks and non-cancer chronic hazard impacts due to Alternative 3 construction activities. The table shows that impacts would be below the thresholds of significance at all receptor types. Appendix H4 details assumptions and calculations made in evaluating Alternative 3 TAC impacts.

Alternative 3 activities would not expose the public to significant levels of TACs. Mitigation measures are not required. **Impacts would be less than significant.**

Table 5-7 Maximum Cancer Risk and Non-Cancer Chronic Impacts Without Mitigation, Alternative 3

Health Impact	Receptor Type	Maximum Predicted Impact	Significance Threshold	Significant?
Cancer Risk	Residential/Sensitive [1]	6.9E-06	1.00E-05	No
Cancer Risk	Occupational	4.4E-07	1.00E-05	No
Non-Cancer Chronic	Residential/Sensitive	0.006	1	No
Non-Cancer Chronic	Occupational	0.02	1	No

Notes:
[1]. Sensitive receptor groups include children and infants, pregnant women, the elderly, and the acutely and chronically ill. Sensitive receptor locations typically include schools, hospitals, convalescent homes, child-care centers, and other locations where children, chronically ill individuals, or other sensitive persons could be regularly exposed. Sensitive individuals could also be present at any residence. Sensitive receptors were conservatively evaluated with residential exposure assumptions.

AQ-4: Construction of Alternative 3 would exceed General Conformity applicability rates.

Table 5-8 shows that annual emissions would exceed the General Conformity applicability rates for NO_2, ozone (NOx and VOC precursors), and CO. **As a result, construction activities associated with Alternative 3 would result in significant impacts**.

Table 5-8 General Conformity Emissions Without Mitigation, Alternative 3 (ton/yr)

Source Category	PM_{10}	$PM_{2.5}$	Ozone (NOx precursor)	NO_2	CO	Ozone (VOC precursor)
2024						
Offroad Construction Equipment	0.0	0.0	0.2	0.2	0.1	0.0
Onroad Construction Vehicles	0.0	0.0	0.0	0.0	0.0	0.0
Fugitive Emissions	0.0	0.0	0.0	0.0	0.0	0.0
Marine Equipment	0.2	0.2	3.9	3.9	2.1	0.2
Total Construction Year 2024	0.2	0.2	4.1	4.1	2.3	0.2
Conformity Determination						
Applicability Rates	100	70	10	100	100	10
Significant?	**No**	**No**	**No**	**No**	**No**	**No**
2025						
Offroad Construction Equipment	0.0	0.0	0.0	0.0	0.0	0.0
Onroad Construction Vehicles	0.0	0.0	0.0	0.0	0.0	0.0
Fugitive Emissions	0.0	0.0	0.0	0.0	0.0	0.0
Marine Equipment	9.6	8.7	194.8	194.8	106.7	10.8
Total Construction Year 2025	9.6	8.7	194.8	194.8	106.7	10.8
Conformity Determination						
Applicability Rates	100	70	10	100	100	10
Significant?	**No**	**No**	**Yes**	**Yes**	**Yes**	**Yes**
2026						
Offroad Construction Equipment	0.0	0.0	0.0	0.0	0.0	0.0
Onroad Construction Vehicles	0.0	0.0	0.0	0.0	0.0	0.0
Fugitive Emissions	0.0	0.0	0.0	0.0	0.0	0.0
Marine Equipment	3.7	3.4	84.2	84.2	47.3	4.7
Total Construction Year 2026	3.7	3.4	84.2	84.2	47.3	4.7

Source Category	PM_{10}	$PM_{2.5}$	Ozone (NO_x precursor)	NO_2	CO	Ozone (VOC precursor)
Conformity Determination						
Applicability Rates	100	70	10	100	100	10
Significant?	**No**	**No**	**Yes**	**No**	**No**	**No**
2027						
Offroad Construction Equipment	0.0	0.0	0.0	0.0	0.0	0.0
Onroad Construction Vehicles	0.0	0.0	0.0	0.0	0.0	0.0
Fugitive Emissions	0.0	0.0	0.0	0.0	0.0	0.0
Marine Equipment	1.2	1.1	28.0	28.0	15.7	1.6
Total Construction Year 2027	1.2	1.1	28.0	28.0	15.7	1.6
Conformity Determination						
Applicability Rates	100	70	10	100	100	10
Significant?	**No**	**No**	**Yes**	**No**	**No**	**No**

Alternative 4

All action alternatives include bend easing of the Main Channel to the authorized depth of -76' MLLW, construction of structural improvements to the Pier J breakwater as described in Section 4.6.5, deepening Pier J Basin, and berth dredging at the Pier J South Slips in the Pier J Basin and along Pier T. Dredged material would be disposed at the Surfside Borrow Site Nearshore Placement Area, LA-2, and/or LA-3. In addition, Alternative 4 includes constructing an appro7 channel to Pier J South to -57 feet MLLW; constructing a turning basin outside of Pier J South to -57 feet MLLW; deepening the West Basin to -57 feet MLLW; deepening of the Approach Channel to -82' MLLW, Pier T wharf upgrades, and Pier J wharf upgrades.

AQ-1: Construction of Alternative 4 would result in ambient air pollutant concentrations that exceed the NAAQS in **Table 5-9**, prior to mitigation.

Alternative 4 short-term (1-hour, 8-hour, and 24-hour) pollutant concentrations would be the same as Alternatives 2 and 3 because peak activities and emissions for these averaging periods would be the same for these Alternatives. Annual activities and associated emissions would be only slightly different. **Table 5-9** presents the maximum offsite pollutant concentrations associated with construction of Alternative 4, prior to mitigation. The table shows that, without mitigation, only the 1-hour NO_2 total concentration would exceed the NAAQS. Figure H2.2 in Appendix H2 shows the location of the maximum 1-hour NO_2 concentration and the significant impact area. **The NO_2 exceedance would represent a significant air quality impact without mitigation.**

Table 5-9 Maximum Pollutant Concentrations Without Mitigation – Alternative 4

Pollutant	Averaging Time	Maximum Modeled Project Concentration (ug/m3)	Background Concentration (ug/m3)	Total Concentration (ug/m3)	NAAQS (ug/m3)	Concentration Exceeds NAAQS?
NO_2	1-Hour	133.0	141.4	274	188	Yes
	Annual	3.0	33.9	37	100	No
SO_2	1-Hour	0.4	23.6	24	196	No
CO	1-Hour	197.1	2,410.7	2,608	40,000	No
	8-Hour	57.9	1,951.5	2,009	10,000	No
PM_{10}	24-Hour	1.9	66.4	68	150	No
$PM_{2.5}$	24-Hour	1.7	27.2	29	35	No
	Annual	0.1	9.2	9.3	12.0	No

AQ-2: Construction of Alternative 4 would not create an objectionable odor at the nearest sensitive receptor.

Impacts would be similar to Alternatives 2 and 3. Mitigation measures are not required. **Impacts would be less than significant.**

AQ-3: Construction of Alternative 4 would expose the public to significant levels of TACs.

Impacts would be higher than Alternatives 2 and 3. **Table 5-10** presents the maximum estimated cancer risks and non-cancer chronic hazard impacts due to Alternative 4 construction activities. The table shows that the cancer risk of 1.3E-05 (13 in a million) at the maximally-impacted residential/sensitive receptor would exceed the threshold of significance. Appendix H4 details assumptions and calculations made in evaluating Alternative 4 TAC impacts.

Alternative 4 activities would expose the public to significant levels of TACs. Mitigation measures are required. **Impacts would be significant without mitigation.**

Table 5-10 Maximum Cancer Risk and Non-Cancer Chronic Impacts Without Mitigation, Alternative 4

Health Impact	Receptor Type	Maximum Predicted Impact	Significance Threshold	Significant?
Cancer Risk	Residential/Sensitive[1]	1.3E-05	1.00E-05	Yes
Cancer Risk	Occupational	8.4E-07	1.00E-05	No
Non-Cancer Chronic	Residential/Sensitive	0.01	1	No
Non-Cancer Chronic	Occupational	0.03	1	No

Notes:
[1]. Sensitive receptor groups include children and infants, pregnant women, the elderly, and the acutely and chronically ill. Sensitive receptor locations typically include schools, hospitals, convalescent homes, child-care centers, and other locations where children, chronically ill individuals, or other sensitive persons could be regularly exposed. Sensitive individuals could also be present at any residence. Sensitive receptors were conservatively evaluated with residential exposure assumptions.

AQ-4: Construction of Alternative 4 would exceed General Conformity applicability rates.

Table 5-11 shows that annual emissions would exceed the General Conformity applicability rates for NO_2, ozone (NOx and VOC precursors), and CO. **As a result, construction activities associated with Alternative 4 would result in significant impacts**.

Table 5-11 General Conformity Emissions Without Mitigation, Alternative 4 (ton/yr)

Source Category	PM_{10}	$PM_{2.5}$	Ozone (NOx precursor)	NO_2	CO	Ozone (VOC precursor)
2024						
Offroad Construction Equipment	0	0	3	3	3	0
Onroad Construction Vehicles	0	0	0	0	0	0
Fugitive Emissions	0	0	0	0	0	0
Marine Equipment	2	2	38	38	21	2
Total Construction Year 2024	2	2	41	41	24	2
Conformity Determination						
Applicability Rates	100	70	10	100	100	10
Significant?	**No**	**No**	**Yes**	**No**	**No**	**No**
2025						
Offroad Construction Equipment	0	0	0	0	0	0
Onroad Construction Vehicles	0	0	0	0	0	0
Fugitive Emissions	0	0	0	0	0	0
Marine Equipment	14	12	252	252	135	14
Total Construction Year 2025	14	12	252	252	135	14
Conformity Determination						
Applicability Rates	100	70	10	100	100	10
Significant?	**No**	**No**	**Yes**	**Yes**	**Yes**	**Yes**
2026						
Offroad Construction Equipment	0	0	0	0	0	0
Onroad Construction Vehicles	0	0	0	0	0	0
Fugitive Emissions	0	0	0	0	0	0
Marine Equipment	6	5	126	126	70	7
Total Construction Year 2026	6	5	126	126	70	7
Conformity Determination						
Applicability Rates	100	70	10	100	100	10
Significant?	**No**	**No**	**Yes**	**Yes**	**No**	**No**
2027						
Offroad Construction Equipment	0	0	0	0	0	0
Onroad Construction Vehicles	0	0	0	0	0	0
Fugitive Emissions	0	0	0	0	0	0
Marine Equipment	4	3	84	84	47	5
Total Construction Year 2027	4	3	84	84	47	5
Conformity Determination						
Applicability Rates	100	70	10	100	100	10
Significant?	**No**	**No**	**Yes**	**No**	**No**	**No**
2028						
Offroad Construction Equipment	0	0	0	0	0	0

Source Category	PM_{10}	$PM_{2.5}$	Ozone (NOx precursor)	NO_2	CO	Ozone (VOC precursor)
Onroad Construction Vehicles	0	0	0	0	0	0
Fugitive Emissions	0	0	0	0	0	0
Marine Equipment	4	3	84	84	47	5
Total Construction Year 2028	4	3	84	84	47	5
Conformity Determination						
Applicability Rates	100	70	10	100	100	10
Significant?	**No**	**No**	**Yes**	**No**	**No**	**No**
2029						
Offroad Construction Equipment	0	0	0	0	0	0
Onroad Construction Vehicles	0	0	0	0	0	0
Fugitive Emissions	0	0	0	0	0	0
Marine Equipment	1	1	12	12	7	1
Total Construction Year 2029	1	1	12	12	7	1
Conformity Determination						
Applicability Rates	100	70	10	100	100	10
Significant?	**No**	**No**	**Yes**	**No**	**No**	**No**

Alternative 5

All action alternatives include bend easing of the Main Channel to the authorized depth of -76' MLLW construction of structural improvements to the Pier J breakwater as described in Section 4.6.5, deepening Pier J Basin, and berth dredging at the Pier J South Slips in the Pier J Basin and along Pier T. Dredged material would be disposed at the Surfside Borrow Site Nearshore Placement Area, LA-2, and/or LA-3. In addition, Alternative 5 includes constructing an approach channel to Pier J South to -55 feet MLLW; constructing a turning basin outside of Pier J South to -55 feet MLLW; deepening the West Basin to -55 feet MLLW; the deepening of the Approach Channel to -80 feet MLLW (like Alternative 3), and the construction of a Standby Area adjacent to the Main Channel dredged to -67' MLLW, with a 300-foot diameter center anchor placement with a depth of -73'MLLW.

AQ-1: Construction of Alternative 5 would result in ambient air pollutant concentrations that exceed the NAAQS in **Table 5-12**, prior to mitigation.

Alternative 5 short-term (1-hour, 8-hour, and 24-hour) pollutant concentrations would be the same as Alternatives 2, 3 and 4 because peak activities and emissions for these averaging periods would be the same for these Alternatives. Annual activities and associated emissions would be only slightly different. **Table 5-12** presents the maximum offsite pollutant concentrations associated with construction of Alternative 5, prior to mitigation. The table shows that, without mitigation, only the 1-hour NO_2 total concentration would exceed the NAAQS. Figure H2.2 in Appendix H2 shows the location of the maximum 1-hour NO_2 concentration and the significant impact area. **The NO_2 exceedance would represent a significant air quality impact without mitigation.**

Table 5-12 Maximum Pollutant Concentrations Without Mitigation – Alternative 5

Pollutant	Averaging Time	Maximum Modeled Project Concentration (ug/m3)	Background Concentration (ug/m3)	Total Concentration (ug/m3)	NAAQS (ug/m3)	Concentration Exceeds NAAQS?
NO_2	1-Hour	133.0	141.4	274	188	Yes
	Annual	2.3	33.9	36	100	No
SO_2	1-Hour	0.4	23.6	24	196	No
CO	1-Hour	197.1	2,410.7	2,608	40,000	No
	8-Hour	57.9	1,951.5	2,009	10,000	No
PM_{10}	24-Hour	1.9	66.4	68	150	No
$PM_{2.5}$	24-Hour	1.7	27.2	29	35	No
	Annual	0.1	9.2	9.3	12.0	No

AQ-2: Construction of Alternative 5 would not create an objectionable odor at the nearest sensitive receptor.

Impacts would be similar to Alternatives 2, 3, and 4. Mitigation measures are not required. **Impacts would be less than significant.**

AQ-3: Construction of Alternative 5 would not expose the public to significant levels of TACs.

Impacts would be higher than Alternatives 2 and 3 but lower than Alternative 4. **Table 5-13** presents the maximum estimated cancer risks and non-cancer chronic hazard impacts due to Alternative 5 construction activities. The table shows that impacts would be below the thresholds of significance at all receptor types. Appendix H4 details assumptions and calculations made in evaluating Alternative 5 TAC impacts.

Alternative 5 activities would not expose the public to significant levels of TACs. Mitigation measures are not required. **Impacts would be less than significant.**

Table 5-13 Maximum Cancer Risk and Non-Cancer Chronic Impacts Without Mitigation, Alternative 5

Health Impact	Receptor Type	Maximum Predicted Impact	Significance Threshold	Significant?
Cancer Risk	Residential/Sensitive[1]	7.2E-06	1.00E-05	No
Cancer Risk	Occupational	5.3E-07	1.00E-05	No
Non-Cancer Chronic	Residential/Sensitive	0.006	1	No
Non-Cancer Chronic	Occupational	0.02	1	No

Notes:
[1] Sensitive receptor groups include children and infants, pregnant women, the elderly, and the acutely and chronically ill. Sensitive receptor locations typically include schools, hospitals, convalescent homes, child-care centers, and other locations where children, chronically ill individuals, or other sensitive persons could be regularly exposed. Sensitive individuals could also be present at any residence. Sensitive receptors were conservatively evaluated with residential exposure assumptions.

AQ-4: Construction of Alternative 5 would exceed General Conformity applicability rates.

Table 5-14 shows that annual emissions would exceed the General Conformity applicability rates for NO_2, ozone (NOx and VOC precursors), and CO. **As a result, construction activities associated with Alternative 5 would result in significant impacts.**

Table 5-14 General Conformity Emissions Without Mitigation, Alternative 5 (ton/yr)

Source Category	PM_{10}	$PM_{2.5}$	Ozone (NOx precursor)	NO_2	CO	Ozone (VOC precursor)
2024						
Offroad Construction Equipment	0	0	0	0	0	0
Onroad Construction Vehicles	0	0	0	0	0	0
Fugitive Emissions	0	0	0	0	0	0
Marine Equipment	0	0	4	4	2	0
Total Construction Year 2024	0	0	4	4	2	0
Conformity Determination						
Applicability Rate	100	70	10	100	100	10
Significant?	**No**	**No**	**No**	**No**	**No**	**No**
2025						
Offroad Construction Equipment	0	0	0	0	0	0
Onroad Construction Vehicles	0	0	0	0	0	0
Fugitive Emissions	0	0	0	0	0	0
Marine Equipment	10	9	195	195	107	11
Total Construction Year 2025	10	9	195	195	107	11
Conformity Determination						
Applicability Rate	100	70	10	100	100	10
Significant?	**No**	**No**	**Yes**	**Yes**	**Yes**	**Yes**
2026						
Offroad Construction Equipment	0	0	0	0	0	0
Onroad Construction Vehicles	0	0	0	0	0	0
Fugitive Emissions	0	0	0	0	0	0
Marine Equipment	4	3	84	84	47	5
Total Construction Year 2026	4	3	84	84	47	5
Conformity Determination						
Applicability Rate	100	70	10	100	100	10
Significant?	**No**	**No**	**Yes**	**No**	**No**	**No**
2027						
Offroad Construction Equipment	0	0	0	0	0	0
Onroad Construction Vehicles	0	0	0	0	0	0
Fugitive Emissions	0	0	0	0	0	0
Marine Equipment	4	3	84	84	47	5
Total Construction Year 2027	4	3	84	84	47	5
Conformity Determination						
Applicability Rate	100	70	10	100	100	10
Significant?	**No**	**No**	**Yes**	**No**	**No**	**No**
2028						
Offroad Construction Equipment	0	0	0	0	0	0

Source Category	PM_{10}	$PM_{2.5}$	Ozone (NOx precursor)	NO_2	CO	Ozone (VOC precursor)
Onroad Construction Vehicles	0	0	0	0	0	0
Fugitive Emissions	0	0	0	0	0	0
Marine Equipment	1	1	13	13	8	1
Total Construction Year 2028	1	1	13	13	8	1
Conformity Determination						
Applicability Rate	100	70	10	100	100	10
Significant?	**No**	**No**	**Yes**	**No**	**No**	**No**

5.5.4 Summary of Potential Impacts to Air Quality

Table 5-15 summarizes the impact determinations of the Alternatives without mitigation as they pertain to air quality.

Table 5-15 Summary of Potential Impacts to Air Quality without Mitigation

Air Quality Impact	Impact Determination without Mitigation
No Action Alternative	
The No Action Alternative would not result in off-site ambient air pollutant concentrations that exceed the NAAQS, expose the public to substantial toxic air contaminants, or create objectionable odors affecting sensitive receptors. Maintenance dredging is exempt from general conformity analysis.	Less than significant. No mitigation required.
Alternative 2	
AQ-1. Alternative 2 construction would result in ambient air pollutant concentrations that exceed the NAAQS in Table **5-1, prior to mitigation.**	Significant. Mitigation is required.
AQ-2. Alternative 2 would not create an objectionable odor at the nearest sensitive receptor.	Less than significant. No mitigation is required.
AQ-3. Alternative 2 would not expose the public to significant levels of TACs.	Less than significant. No mitigation is required.
AQ-4. Alternative 2 would exceed General Conformity applicability rates.	Significant.
Alternative 3	
AQ-1. Alternative 3 would result in ambient air pollutant concentrations that exceed the NAAQS in Table **5-1, prior to mitigation.**	Significant. Mitigation is required.
AQ-2. Alternative 3 would not create an objectionable odor at the nearest sensitive receptor.	Less than significant. No mitigation is required.
AQ-3. Alternative 3 would not expose the public to significant levels of TACs.	Less than significant. No mitigation is required.
AQ-4. Alternative 3 would exceed General Conformity applicability rates.	Significant.
Alternative 4	
AQ-1. Alternative 4 would result in ambient air pollutant concentrations that exceed the NAAQS in Table **5-1, prior to mitigation.**	Significant. Mitigation is required.
AQ-2. Alternative 4 would not create an objectionable odor at the nearest sensitive receptor.	Less than significant. No mitigation is required.
AQ-3. Alternative 4 would expose the public to significant levels of TACs.	Significant. Mitigation is required.
AQ-4. Alternative 4 would exceed General Conformity applicability rates.	Significant.
Alternative 5	
AQ-1. Alternative 5 would result in ambient air pollutant concentrations that exceed the NAAQS in Table **5-1, prior to mitigation.**	Significant. Mitigation is required.

Air Quality Impact	Impact Determination without Mitigation
AQ-2. Alternative 5 would not create an objectionable odor at the nearest sensitive receptor.	Less than significant. No mitigation is required.
AQ-3. Alternative 5 would not expose the public to significant levels of TACs.	Less than significant. No mitigation is required.
AQ-4. Alternative 5 would exceed General Conformity applicability rates.	Significant.

5.5.5 Air Quality Mitigation Measures and Impacts Following Mitigation

The following mitigation measures were considered and deemed not to be feasible:

- Hopper dredge with higher USEPA Tier engines. Hopper dredges are specialized equipment and, per consultation with a dredging contractor, higher Tier engines are uncommon and cannot be guaranteed as mitigation. The analysis conservatively assumed that the hopper dredge is equipped with Tier 2 engines.

The following mitigation measures would reduce Impacts AQ-1 and AQ-4 for all Alternatives and Impact AQ-3 for Alternative 4. Although Impacts AQ-2 and AQ-3 do not require mitigation (except for AQ-3 of Alternative 4), the mitigation measures would also reduce impacts associated with AQ-2 and AQ-3. The measures were adapted from the POLB's "Best Management Practices for Reducing Air Emissions from Construction Equipment" (POLB 2010) and were developed in conjunction with the 2010 Clean Air Action Plan (CAAP).

MM-AQ-1: Electric clamshell dredge. The use of an electric clamshell dredge shall be required for project clamshell dredging activities during the entire construction period of the project, and the construction of an electrical substation at Pier J is also required to provide electric power to the clamshell dredge. This mitigation measure would reduce significant Impacts AQ-1, AQ-3, and AQ-4.

MM-AQ-2: Construction-Related Harbor Craft. Construction-related harbor craft (tugboats, crew boats, and survey boats) with Category 1 or Category 2 marine engines shall meet USEPA Tier 3 emission standards for marine engines. In addition, the construction contractor shall require all construction-related tugboats that home fleet in the San Pedro Bay Ports: 1) to shut down their main engines and 2) to refrain from using auxiliary engines while at dock and instead use electrical shore power, if feasible. This mitigation measure would reduce significant Impacts AQ-1, AQ-3, and AQ-4.

MM-AQ-3: Off-Road Construction Equipment. Self-propelled, diesel-fueled off-road construction equipment 25 hp or greater shall meet USEPA/CARB Tier 4 Final emission standards for non-road equipment. This mitigation measure would reduce significant Impacts AQ-1, AQ-3, and AQ-4.

MM-AQ-4: Additional Mitigation for Off-Road Construction Equipment. Off-road diesel-powered construction equipment shall comply with the following:

- Construction equipment shall be maintained according to manufacturer's specifications.
- Construction equipment shall not idle for more than 5 minutes when not in use.

Although this measure would reduce combustion emissions, the emissions benefits achieved for Impacts AQ-1, AQ-3, and AQ-4 from its implementation were not quantified due to the wide range of variables involved.

Impacts Following Mitigation - Alternative 2

AQ-1: Table 5-16 presents the mitigated maximum offsite pollutant concentrations associated with construction of Alternative 2. The table shows that although the 1-hour federal NO_2 concentration would be reduced with mitigation, it would remain above the NAAQS. Figure H2.4 in Appendix H2 shows the location of the maximum 1-hour NO2 concentration and the significant impact area. All other pollutants would remain below the NAAQS. **Impacts would be significant and unavoidable under NEPA.**

Table 5-16 Maximum Pollutant Concentrations After Mitigation - Alternative 2

Pollutant	Averaging Time	Maximum Modeled Project Concentration (ug/m3)	Background Concentration (ug/m3)	Total Concentration (ug/m3)	NAAQS (ug/m3)	Concentration Exceeds NAAQS?
NO_2	1-Hour	114.9	141.4	256	188	Yes
	Annual	0.9	33.9	34.8	100	No
SO_2	1-Hour	0.1	23.6	24	196	No
CO	1-Hour	129.7	2,410.7	2,540	40,000	No
	8-Hour	44.0	1,951.5	1,995	10,000	No
PM_{10}	24-Hour	1.9	66.4	68	150	No
$PM_{2.5}$	24-Hour	1.7	27.2	29	35	No
	Annual	0.04	9.2	9.2	12.0	No

AQ-4: Table 5-17 presents the comparison of Alternative 2 mitigated annual construction emissions to General Conformity applicability rates. The table shows that NO_2 would be reduced to below its applicability rate, and only ozone (NOx precursor) emissions would remain above the applicability rate. All other pollutants would remain below the applicability rates.

Table 5-17 General Conformity Emissions After Mitigation - Alternative 2 (ton/yr)

Source Category	PM_{10}	$PM_{2.5}$	Ozone (NOx precursor)	NO_2	CO	Ozone (VOC precursor)
2024						
Offroad Construction Equipment	0	0	0	0	0	0
Onroad Construction Vehicles	0	0	0	0	0	0
Fugitive Emissions	0	0	0	0	0	0
Marine Equipment	0	0	3	3	2	0
Total Construction Year 2024	0	0	3	3	2	0
Conformity Determination						
Applicability Rate	100	70	10	100	100	10
Significant?	**No**	**No**	**No**	**No**	**No**	**No**
2025						
Offroad Construction Equipment	0	0	0	0	0	0
Onroad Construction Vehicles	0	0	0	0	0	0
Fugitive Emissions	0	0	0	0	0	0
Marine Equipment	4	4	84	84	54	5
Total Construction Year 2025	4	4	84	84	54	5
Conformity Determination						
Applicability Rate	100	70	10	100	100	10

Source Category	PM_{10}	$PM_{2.5}$	Ozone (NOx precursor)	NO_2	CO	Ozone (VOC precursor)
Significant?	**No**	**No**	**Yes**	**No**	**No**	**No**
2026						
Offroad Construction Equipment	0	0	0	0	0	0
Onroad Construction Vehicles	0	0	0	0	0	0
Fugitive Emissions	0	0	0	0	0	0
Marine Equipment	1	1	30	30	23	2
Total Construction Year 2026	1	1	30	30	23	2
Conformity Determination						
Applicability Rate	100	70	10	100	100	10
Significant?	**No**	**No**	**Yes**	**No**	**No**	**No**

Impacts Following Mitigation - Alternative 3

AQ-1: Table 5-18 presents the mitigated maximum offsite pollutant concentrations associated with construction of Alternative 3. The table shows that although the 1-hour federal NO_2 concentration would be reduced with mitigation, it would remain above the NAAQS. Figure H2.4 in Appendix H2 shows the location of the maximum 1-hour NO_2 concentration and the significant impact area. All other pollutants would remain below the NAAQS. **Impacts would be significant and unavoidable.**

Table 5-18 Maximum Pollutant Concentrations After Mitigation - Alternative 3

Pollutant	Averaging Time	Maximum Modeled Project Concentration (ug/m3)	Background Concentration (ug/m3)	Total Concentration (ug/m3)	NAAQS (ug/m3)	Concentration Exceeds NAAQS?
NO_2	1-Hour	114.9	141.4	256	188	Yes
	Annual	1.2	33.9	35	100	No
SO_2	1-Hour	0.1	23.6	24	196	No
CO	1-Hour	129.7	2,410.7	2,540	40,000	No
	8-Hour	44.0	1,951.5	1,995	10,000	No
PM_{10}	24-Hour	1.9	66.4	68	150	No
$PM_{2.5}$	24-Hour	1.7	27.2	29	35	No
	Annual	0.06	9.2	9.2	12.0	No

AQ-4: Table 5-19 presents the comparison of Alternative 3 mitigated annual construction emissions to General Conformity applicability rates. The table shows that NO_2 and ozone (NOx precursor) emissions would be reduced but would remain above the applicability rates. All other pollutants would remain below the applicability rates.

Table 5-19 General Conformity Emissions After Mitigation - Alternative 3 (ton/yr)

Source Category	PM_{10}	$PM_{2.5}$	Ozone (NOx precursor)	NO_2	CO	Ozone (VOC precursor)
2024						
Offroad Construction Equipment	0.0	0.0	0.1	0.1	0.2	0.0
Onroad Construction Vehicles	0.0	0.0	0.0	0.0	0.1	0.0
Fugitive Emissions	0.0	0.0	0.0	0.0	0.0	0.0
Marine Equipment	0.1	0.1	2.7	2.7	2.2	0.2
Total Construction Year 2024	0.2	0.1	2.8	2.8	2.4	0.2
Conformity Determination						
Applicability Rate	100	70	10	100	100	10
Significant?	**No**	**No**	**No**	**No**	**No**	**No**
2025						
Offroad Construction Equipment	0.0	0.0	0.0	0.0	0.0	0.0
Onroad Construction Vehicles	0.0	0.0	0.0	0.0	0.0	0.0
Fugitive Emissions	0.0	0.0	0.0	0.0	0.0	0.0
Marine Equipment	7.6	6.7	145.5	145.5	86.9	8.1
Total Construction Year 2025	7.6	6.7	145.5	145.5	86.9	8.1
Conformity Determination						
Applicability Rate	100	70	10	100	100	10
Significant?	**No**	**No**	**Yes**	**Yes**	**No**	**No**
2026						
Offroad Construction Equipment	0.0	0.0	0.0	0.0	0.0	0.0
Onroad Construction Vehicles	0.0	0.0	0.0	0.0	0.0	0.0
Fugitive Emissions	0.0	0.0	0.0	0.0	0.0	0.0
Marine Equipment	1.7	1.5	35.8	35.8	27.4	2.0
Total Construction Year 2026	1.7	1.5	35.8	35.8	27.4	2.0
Conformity Determination						
Applicability Rate	100	70	10	100	100	10
Significant?	**No**	**No**	**Yes**	**No**	**No**	**No**
2027						
Offroad Construction Equipment	0.0	0.0	0.0	0.0	0.0	0.0
Onroad Construction Vehicles	0.0	0.0	0.0	0.0	0.0	0.0
Fugitive Emissions	0.0	0.0	0.0	0.0	0.0	0.0
Marine Equipment	0.6	0.5	11.9	11.9	9.1	0.7
Total Construction Year 2027	0.6	0.5	11.9	11.9	9.1	0.7
Conformity Determination						
Applicability Rate	100	70	10	100	100	10
Significant?	**No**	**No**	**Yes**	**No**	**No**	**No**

Impacts Following Mitigation - Alternative 4

AQ-1: Table 5-20 presents the mitigated maximum offsite pollutant concentrations associated with construction of Alternative 4. The table shows that although the 1-hour federal NO_2 concentration would be reduced with mitigation, it would remain above the NAAQS. Figure H2.4 in Appendix H2 shows the location of the maximum 1-hour NO_2 concentration and the significant impact area. All other pollutants would remain below the NAAQS. **Impacts would be significant and unavoidable under NEPA.**

Table 5-20 Maximum Pollutant Concentrations After Mitigation - Alternative 4

Pollutant	Averaging Time	Maximum Modeled Project Concentration (ug/m3)	Background Concentration (ug/m3)	Total Concentration (ug/m3)	NAAQS (ug/m3)	Concentration Exceeds NAAQS?
NO_2	1-Hour	114.9	141.4	256	188	Yes
	Annual	1.9	33.9	36	100	No
SO_2	1-Hour	0.1	23.6	24	196	No
CO	1-Hour	129.7	2,410.7	2,540	40,000	No
	8-Hour	44.0	1,951.5	1,995	10,000	No
PM_{10}	24-Hour	1.9	66.4	68	150	No
$PM_{2.5}$	24-Hour	1.7	27.2	29	35	No
	Annual	0.1	9.2	9.3	12.0	No

AQ-3: **Table 5-21** presents the maximum estimated cancer risks and non-cancer chronic hazard impacts due to Alternative 4 construction activities, after mitigation. The table shows that although impacts would be reduced, the cancer risk of 1.1E-05 (11 in a million) at the maximally-impacted residential/sensitive receptor would remain above the threshold of significance. All other health impacts would remain below the thresholds. Therefore, Alternative 4 activities would expose the public to significant levels of TACs. **Impacts would be significant and unavoidable under NEPA.**

Table 5-21 Maximum Cancer Risk and Non-Cancer Chronic Impacts After Mitigation, Alternative 4

Health Impact	Receptor Type	Maximum Predicted Impact	Significance Threshold	Significant?
Cancer Risk	Residential/Sensitive[1]	1.1E-05	1.00E-05	Yes
Cancer Risk	Occupational	4.3E-07	1.00E-05	No
Non-Cancer Chronic	Residential/Sensitive	0.009	1	No
Non-Cancer Chronic	Occupational	0.02	1	No

Notes:
[1]. Sensitive receptor groups include children and infants, pregnant women, the elderly, and the acutely and chronically ill. Sensitive receptor locations typically include schools, hospitals, convalescent homes, child-care centers, and other locations where children, chronically ill individuals, or other sensitive persons could be regularly exposed. Sensitive individuals could also be present at any residence. Sensitive receptors were conservatively evaluated with residential exposure assumptions.

AQ-4: Table 5-22 presents the comparison of Alternative 4 mitigated annual construction emissions to General Conformity applicability rates. The table shows that NO_2, ozone (NOx and VOC precursors), and CO emissions would be reduced but would remain above the applicability rates. All other pollutants would remain below the applicability rates.

Table 5-22 General Conformity Emissions After Mitigation - Alternative 4 (ton/yr)

Source Category	PM_{10}	$PM_{2.5}$	Ozone (NOx precursor)	NO_2	CO	VOC
2024						
Offroad Construction Equipment	0	0	0	0	3	0
Onroad Construction Vehicles	0	0	0	0	0	0
Fugitive Emissions	0	0	0	0	0	0
Marine Equipment	1	1	27	27	21	2
Total Construction Year 2024	1	1	28	28	24	2
Conformity Determination						
Applicability Rate	100	70	10	100	100	10
Significant?	**No**	**No**	**Yes**	**No**	**No**	**No**
2025						
Offroad Construction Equipment	0	0	0	0	0	0
Onroad Construction Vehicles	0	0	0	0	0	0
Fugitive Emissions	0	0	0	0	0	0
Marine Equipment	13	12	250	250	135	14
Total Construction Year 2025	13	12	250	250	135	14
Conformity Determination						
Applicability Rate	100	70	10	100	100	10
Significant?	**No**	**No**	**Yes**	**Yes**	**Yes**	**Yes**
2026						
Offroad Construction Equipment	0	0	0	0	0	0
Onroad Construction Vehicles	0	0	0	0	0	0
Fugitive Emissions	0	0	0	0	0	0
Marine Equipment	4	3	78	78	50	4
Total Construction Year 2026	4	3	78	78	50	4
Conformity Determination						
Applicability Rate	100	70	10	100	100	10
Significant?	**No**	**No**	**Yes**	**No**	**No**	**No**
2027						
Offroad Construction Equipment	0	0	0	0	0	0
Onroad Construction Vehicles	0	0	0	0	0	0
Fugitive Emissions	0	0	0	0	0	0
Marine Equipment	2	1	36	36	27	2
Total Construction Year 2027	2	1	36	36	27	2
Conformity Determination						
Applicability Rate	100	70	10	100	100	10
Significant?	**No**	**No**	**Yes**	**No**	**No**	**No**
2028						
Offroad Construction Equipment	0	0	0	0	0	0
Onroad Construction Vehicles	0	0	0	0	0	0
Fugitive Emissions	0	0	0	0	0	0

Source Category	PM_{10}	$PM_{2.5}$	Ozone (NOx precursor)	NO_2	CO	VOC
Marine Equipment	2	2	36	36	27	2
Total Construction Year 2028	2	2	36	36	27	2
Conformity Determination						
Applicability Rate	100	70	10	100	100	10
Significant?	**No**	**No**	**Yes**	**No**	**No**	**No**
2029						
Offroad Construction Equipment	0	0	0	0	0	0
Onroad Construction Vehicles	0	0	0	0	0	0
Fugitive Emissions	0	0	0	0	0	0
Marine Equipment	0	0	5	5	4	0
Total Construction Year 2029	0	0	5	5	4	0
Conformity Determination						
Applicability Rate	100	70	10	100	100	10
Significant?	**No**	**No**	**No**	**No**	**No**	**No**

Impacts Following Mitigation - Alternative 5

AQ-1: Table 5-23 presents the mitigated maximum offsite pollutant concentrations associated with construction of Alternative 5. The table shows that although the 1-hour federal NO_2 concentration would be reduced with mitigation, it would remain above the NAAQS. Figure H2.4 in Appendix H2 shows the location of the maximum 1-hour NO_2 concentration and the significant impact area. All other pollutants would remain below the NAAQS. **Impacts would be significant and unavoidable under NEPA.**

Table 5-23 Maximum Pollutant Concentrations After Mitigation - Alternative 5

Pollutant	Averaging Time	Maximum Modeled Project Concentration (ug/m3)	Background Concentration (ug/m3)	Total Concentration (ug/m3)	NAAQS (ug/m3)	Concentration Exceeds NAAQS?
NO_2	1-Hour	114.9	141.4	256	188	Yes
	Annual	1.2	33.9	35	100	No
SO_2	1-Hour	0.1	23.6	24	196	No
CO	1-Hour	129.7	2,410.7	2,540	40,000	No
	8-Hour	44.0	1,951.5	1,995	10,000	No
PM_{10}	24-Hour	1.9	66.4	68	150	No
$PM_{2.5}$	24-Hour	1.7	27.2	29	35	No
	Annual	0.06	9.2	9.2	12.0	No

AQ-4: Table 5-24 presents the comparison of Alternative 5 mitigated annual construction emissions to General Conformity applicability rates. The table shows that NO_2 and ozone (NOx precursor) emissions would be reduced but would remain above the applicability rates. All other pollutants would remain below the applicability rates.

Table 5-24 General Conformity Emissions After Mitigation - Alternative 5 (ton/yr)

Source Category	PM_{10}	$PM_{2.5}$	Ozone (NOx precursor)	NO_2	CO	Ozone (VOC precursor)
2024						
Offroad Construction Equipment	0	0	0	0	0	0
Onroad Construction Vehicles	0	0	0	0	0	0
Fugitive Emissions	0	0	0	0	0	0
Marine Equipment	0	0	3	3	2	0
Total Construction Year 2024	0	0	3	3	2	0
Conformity Determination						
Applicability Rates	100	70	10	100	100	10
Significant?	**No**	**No**	**No**	**No**	**No**	**No**
2025						
Offroad Construction Equipment	0	0	0	0	0	0
Onroad Construction Vehicles	0	0	0	0	0	0
Fugitive Emissions	0	0	0	0	0	0
Marine Equipment	8	7	146	146	87	8
Total Construction Year 2025	8	7	146	146	87	8
Conformity Determination						
Applicability Rates	100	70	10	100	100	10
Significant?	**No**	**No**	**Yes**	**Yes**	**No**	**No**
2026						
Offroad Construction Equipment	0	0	0	0	0	0
Onroad Construction Vehicles	0	0	0	0	0	0
Fugitive Emissions	0	0	0	0	0	0
Marine Equipment	2	2	36	36	27	2
Total Construction Year 2026	2	2	36	36	27	2
Conformity Determination						
Applicability Rates	100	70	10	100	100	10
Significant?	**No**	**No**	**Yes**	**No**	**No**	**No**
2027						
Offroad Construction Equipment	0	0	0	0	0	0
Onroad Construction Vehicles	0	0	0	0	0	0
Fugitive Emissions	0	0	0	0	0	0
Marine Equipment	2	2	36	36	27	2
Total Construction Year 2027	2	2	36	36	27	2
Conformity Determination						
Applicability Rates	100	70	10	100	100	10
Significant?	**No**	**No**	**Yes**	**No**	**No**	**No**
2028						
Offroad Construction Equipment	0	0	0	0	0	0
Onroad Construction Vehicles	0	0	0	0	0	0
Fugitive Emissions	0	0	0	0	0	0
Marine Equipment	0	0	6	6	4	0
Total Construction Year 2028	0	0	6	6	4	0
Conformity Determination						
Applicability Rates	100	70	10	100	100	10
Significant?	**No**	**No**	**No**	**No**	**No**	**No**

5.6 Greenhouse Gas Environmental Consequences

This section assesses GHG emissions associated with the No Action and Action Alternatives. Regulatory initiatives are described in Section 10 and existing conditions are described in Section 3.6 (Affected Environment).

There are currently no Federal GHG emission thresholds. Therefore, the USACE will not utilize the SCAQMD quantitative CEQA significance threshold for industrial projects, propose a new GHG threshold, or make a NEPA significance impact determination for GHG emissions anticipated to result from any of the alternatives. Rather, in compliance with NEPA implementing regulations, the anticipated emissions are disclosed for each alternative without expressing a judgment as to their significance.

5.6.1 GHG Assessment Methodology

Construction of the action alternatives would generate GHG emissions within the Harbor District and surrounding region. The following section describes the methods used to evaluate GHG emissions from the action alternatives. Appendix H1 includes data and assumptions used to estimate GHG emissions under each alternative.

Construction activities associated with the action alternatives would include dredging and minor on-land activities, and would utilize dredging equipment, off-road construction equipment, a minimal number of on-road construction vehicles, and construction worker vehicles. The following methodologies and key assumptions were used to quantify GHG emissions for each action alternative:

- Dredging Equipment: Hopper dredges would be used to dredge sediment in the Approach Channel and transport and place the dredged sediment at off-shore placement sites. Electric clamshell dredges would be used to dredge the Main Channel, West Basin, Pier J Basin, Pier J Approach Channel, and Pier T Berths. Assumptions regarding dredge utilization, schedule, activity, and engine size were based on project-specific dredging requirements and dredging rates and are detailed in Appendix H1. Hopper dredge engines are large marine engines used for propulsion and operation of the dredging equipment. GHG emission factors for hopper dredges therefore reflect USEPA marine engine standards (USEPA 2016a). Hopper dredge propulsion and auxiliary engines were assumed to be Tier 2 marine diesel engines, per USACE. Clamshell dredges are not self-propelled, and emission factors for these engines reflect existing USEPA non-road engine standards and California engine fleet requirements per the CARB OFFROAD2017 Inventory (CARB 2017a). Clamshell dredge engines were assumed to be Tier 3 off-road diesel engines, per USACE and the Port.
- Harbor Craft: Tugboats would be used to position clamshell dredges and transport sediment-laden barges to off-shore and near-shore sediment placement sites. Crew boats and survey boats would also be used to support dredging activities. Assumptions regarding harbor craft utilization and engine size were based on project-specific dredging requirements and dredging rates and are presented in Appendix H1. GHG emission factors for harbor craft were obtained from the POLB 2013 Emissions Inventory, Appendix C (POLB 2013). GHG emission factors are dependent on fuel consumption and do not vary appreciably with engine Tier or model year.
- Off-road Construction Equipment: Off-road construction equipment would be used during non-dredging activities such as construction of the electrical substation15, structural improvements

[15] The electrical substation would supply electricity to the clamshell dredge, which would be electric after implementation of Mitigation Measure AQ-1. Therefore, the unmitigated construction emission calculations assume

to the Pier J breakwater, and wharf upgrades. Assumptions regarding equipment type, utilization and engine size were based on project-specific engineering requirements and are presented in Appendix H1. GHG emission factors for off-road construction equipment reflect emission factors per the CARB OFFROAD2017 Inventory (CARB 2017a).

- On-Road Construction Vehicles and Worker Vehicles: A few construction vehicles would be used during non-dredging activities to deliver construction materials, such as piles and concrete, and haul away waste. Assumptions regarding vehicle activity for construction vehicles and worker vehicles were based on engineering requirements and are presented in Appendix H1. GHG emission factors reflect the SCAQMD-wide fleet mix per CARB's On-Road EMFAC Database (CARB 2017b).
- All GHG emissions were initially calculated as CO2, CH4 and N2O. CO2e was then calculated by multiplying each GHG emission by its global warming potential (GWP) and adding the results to produce a single, combined emission rate representing all GHG emissions. This analysis uses GWPs from the IPCC Fourth Assessment Report (AR4) (IPCC 2007), which is consistent with those used in the POLB 2017 Air Emissions Inventory (POLB 2017) and USEPA's Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990–2017 (USEPA 2019). CO2e emissions are commonly presented in units of metric tons (MT). One MT equals 1,000 kilograms or 1.1 short tons.

5.6.2 GHG Environmental Consequences

No Action Alternative

Under the No Action Alternative, the USACE and Port would not construct an Approach Channel to Pier J South, deepen the West Basin Channel, deepen the Approach Channel, widen portions of the Main Channel, or construct the LSF. However, maintenance dredging of existing channel depths would continue, when and where needed. This alternative would not increase ship calls or throughput and would not incrementally increase GHG emissions within the study area. Maintenance dredging of the federal channels would be subject to separate detailed evaluation under NEPA and maintenance dredging of the berths would be subject to separate detailed evaluation under both NEPA and CEQA.

Alternative 2

All action alternatives include bend easing of the Main Channel to the authorized depth of -76 feet MLLW, construction of structural improvements to the Pier J breakwater as described in Section 4.6.5, deepening Pier J Basin, berth dredging at the Pier J South Slips in the Pier J Basin and along Pier T, and, with implementation of MM-AQ-1, use of electric clamshell dredges and construction of an electrical substation at Pier J. Dredged material would be disposed at the Surfside Borrow Site Nearshore Placement Area, LA-2, and/or LA-3. In addition, Alternative 2 includes constructing an approach channel to Pier J South to -53 feet MLLW; constructing a turning basin outside of Pier J South to -53 feet MLLW; deepening the West Basin to -53 feet MLLW; and the deepening of the Approach Channel to -78 feet MLLW.

Table 5-25 summarizes the construction GHG emissions associated with Alternative 2, both with and without implementation of MM-AQ-1. The effects of the remaining air quality mitigation measures on construction GHG emissions were not quantified, as they are expected to have relatively minor GHG benefits.

a diesel clamshell dredge and no electrical substation construction. The mitigated construction emission calculations assume an electric clamshell dredge and electrical substation construction.

Table 5-25 Construction GHG Emissions – Alternative 2

Source Category	CO2e Emissions without MM-AQ-1	CO2e Emissions with MM-AQ-1
	(MT)	(MT)
2024		
Off-road Construction Equipment	55	62
On-road Construction Vehicles	14	25
Fugitive Emissions	0	0
Marine Equipment	257	257
Total Construction Year 2024	**326**	**344**
2025		
Off-road Construction Equipment	0	0
On-road Construction Vehicles	0	0
Fugitive Emissions	0	0
Marine Equipment	9,185	6,428
Electricity Generation	0	1,412
Total Construction Year 2025	**9,185**	**7,840**
2026		
Off-road Construction Equipment	0.0	0.0
On-road Construction Vehicles	0.0	0.0
Fugitive Emissions	0.0	0.0
Marine Equipment	5,019	2,732
Electricity Generation	0	1,172
Total Construction Year 2026	**5,019**	**3,903**
Total Construction Emissions	**14,531**	**12,087**
Notes: MT = metric tons.		

Alternative 3 (Preferred Alternative)

All action alternatives include bend easing of the Main Channel to the authorized depth of -76 feet MLLW, construction of structural improvements to the Pier J breakwater as described in Section 4.6.5, deepening Pier J Basin, berth dredging at the Pier J South Slips in the Pier J Basin and along Pier T, and, with implementation of MM-AQ-1, use of electric clamshell dredges and construction of an electrical substation at Pier J. Dredged material would be disposed at the Surfside Borrow Site Nearshore Placement Area, LA-2, and/or LA-3. In addition, Alternative 3 includes constructing an approach channel to Pier J South to -55 feet MLLW; constructing a turning basin outside of Pier J South to -55 feet MLLW; deepening the West Basin to -55 feet MLLW; and deepening of the Approach Channel to -80 feet MLLW, as well as disposal of dredge materials.

Table 5-26 summarizes the construction GHG emissions associated with Alternative 3, both with and without implementation of MM-AQ-1.

Table 5-26 Construction GHG Emissions – Alternative 3

Source Category	CO_2e Emissions without MM-AQ-1	CO_2e Emissions with MM-AQ-1
	(MT)	(MT)
2024		
Off-road Construction Equipment	55	62
On-road Construction Vehicles	14	25
Fugitive Emissions	0	0
Marine Equipment	257	257
Total Construction Year 2024	**326**	**344**
2025		
Off-road Construction Equipment	0	0
On-road Construction Vehicles	0	0
Fugitive Emissions	0	0
Marine Equipment	13,160	10,411
Electricity Generation	0	1,408
Total Construction Year 2025	**13,160**	**11,819**
2026		
Off-road Construction Equipment	0.0	0.0
On-road Construction Vehicles	0.0	0.0
Fugitive Emissions	0.0	0.0
Marine Equipment	6,030	3,282
Electricity Generation	0	1,408
Total Construction Year 2026	**6,030**	**4,689**
2027		
Off-road Construction Equipment	0.0	0.0
On-road Construction Vehicles	0.0	0.0
Fugitive Emissions	0.0	0.0
Marine Equipment	2,004	1,091
Electricity Generation	0	468
Total Construction Year 2027	**2,004**	**1,559**
Total Construction Emissions	**21,521**	**18,411**
Notes: MT = metric tons.		

Alternative 4

All action alternatives include bend easing of the Main Channel to the authorized depth of -76 feet MLLW, construction of structural improvements to the Pier J breakwater as described in Section 4.6.5, deepening Pier J Basin, berth dredging at the Pier J South Slips in the Pier J Basin and along Pier T, and, with implementation of MM-AQ-1, use of electric clamshell dredges and construction of an electrical substation at Pier J. Dredged material would be disposed at the Surfside Borrow Site Nearshore Placement Area, LA-2, and/or LA-3. In addition, Alternative 4 includes constructing an approach channel to Pier J South to -57 feet MLLW; constructing a turning basin outside of Pier J South to -57 feet MLLW; deepening the West Basin to -57 feet MLLW; deepening of the Approach Channel to -82 feet MLLW, Pier T wharf upgrades, and Pier J wharf upgrades.

Table 5-27 summarizes the construction GHG emissions associated with Alternative 4, both with and without implementation of MM-AQ-1.

Table 5-27 Construction GHG Emissions - Alternative 4

Source Category	CO_2e Emissions without MM-AQ-1	CO_2e Emissions with MM-AQ-1
	(MT)	(MT)
2024		
Off-road Construction Equipment	715	732
On-road Construction Vehicles	90	101
Fugitive Emissions	0	0
Marine Equipment	2,506	2,505
Total Construction Year 2024	**3,311**	**3,339**
2025		
Off-road Construction Equipment	0	0
On-road Construction Vehicles	0	0
Fugitive Emissions	0	0
Marine Equipment	16,255	16,255
Total Construction Year 2025	**16,255**	**16,255**
2026		
Off-road Construction Equipment	0.0	0.0
On-road Construction Vehicles	0.0	0.0
Fugitive Emissions	0.0	0.0
Marine Equipment	8,755	5,998
Electricity Generation	0	1,412
Total Construction Year 2026	**8,755**	**7,410**
2027		
Off-road Construction Equipment	0.0	0.0
On-road Construction Vehicles	0.0	0.0
Fugitive Emissions	0.0	0.0
Marine Equipment	6,010	3,270
Electricity Generation	0	1,404
Total Construction Year 2027	**6,010**	**4,673**
2028		
Off-road Construction Equipment	0.0	0.0
On-road Construction Vehicles	0.0	0.0
Fugitive Emissions	0.0	0.0
Marine Equipment	6,028	3,279
Electricity Generation	0	1,408
Total Construction Year 2028	**6,028**	**4,687**
2029		
Off-road Construction Equipment	0.0	0.0
On-road Construction Vehicles	0.0	0.0
Fugitive Emissions	0.0	0.0
Marine Equipment	886	482
Electricity Generation	0	207
Total Construction Year 2029	**886**	**689**
Total Construction Emissions	**41,247**	**37,054**
Notes: MT = metric tons.		

Alternative 5

All action alternatives include bend easing of the Main Channel to the authorized depth of -76 feet MLLW construction of structural improvements to the Pier J breakwater as described in Section 4.6.5, deepening Pier J Basin, berth dredging at the Pier J South Slips in the Pier J Basin and along Pier T, and, with implementation of MM-AQ-1, use of electric clamshell dredges and construction of an electrical substation at Pier J. Dredged material would be disposed at the Surfside Borrow Site Nearshore Placement Area, LA-2, and/or LA-3. In addition, Alternative 5 includes constructing an approach channel to Pier J South to -55 feet MLLW; constructing a turning basin outside of Pier J South to -55 feet MLLW; deepening the West Basin to -55 feet MLLW; the deepening of the Approach Channel to -80 feet MLLW (like Alternative 3), and the construction of a Standby Area adjacent to the Main Channel dredged to -67 feet MLLW, with a 300-foot diameter center anchor placement with a depth of -73 feet MLLW.

Table 5-28 summarizes the construction GHG emissions associated with Alternative 5, both with and without implementation of MM-AQ-1.

Table 5-28 Construction GHG Emissions – Alternative 5

Source Category	CO_2e Emissions without MM-AQ-1	CO_2e Emissions with MM-AQ-1
	(MT)	(MT)
2024		
Off-road Construction Equipment	55	62
On-road Construction Vehicles	14	25
Fugitive Emissions	0	0
Marine Equipment	257	257
Total Construction Year 2024	**326**	**344**
2025		
Off-road Construction Equipment	0	0
On-road Construction Vehicles	0	0
Fugitive Emissions	0	0
Marine Equipment	13,160	10,411
Electricity Generation	0	1,441
Total Construction Year 2025	**13,160**	**11,852**
2026		
Off-road Construction Equipment	0.0	0.0
On-road Construction Vehicles	0.0	0.0
Fugitive Emissions	0.0	0.0
Marine Equipment	6,030	3,282
Electricity Generation	0	1,375
Total Construction Year 2026	**6,030**	**4,656**
2027		
Off-road Construction Equipment	0.0	0.0
On-road Construction Vehicles	0.0	0.0
Fugitive Emissions	0.0	0.0
Marine Equipment	6,030	3,282
Electricity Generation	0	1,408
Total Construction Year 2027	**6,030**	**4,689**
2028		

Source Category	CO_2e Emissions without MM-AQ-1	CO_2e Emissions with MM-AQ-1
Off-road Construction Equipment	0.0	0.0
On-road Construction Vehicles	0.0	0.0
Fugitive Emissions	0.0	0.0
Marine Equipment	958	521
Electricity Generation	0	224
Total Construction Year 2028	**958**	**745**
Total Construction Emissions	**26,505**	**22,286**
Notes: MT = metric tons.		

5.7 Aesthetics

The purpose of this section is to determine the degree of visual and aesthetic impacts that would be attributable to the Project. The POLB is an industrial, predominantly disturbed area. The character of the existing visual environment, as described in Section 3.7, was documented through field reconnaissance, photographic records, and aerial photograph interpretation. The Regulatory setting is described in Section 10.

5.7.1 Impact Significance Criteria

An impact to visual aesthetics would be considered significant if:

- a landscape is changed in a manner that permanently and substantially degrades an existing view shed or alters the character of a view shed by adding incompatible structures.

5.7.2 Alternative 1 (No Action)

Under the No Action Alternative, the USACE and Port would not construct an Approach Channel to Pier J South, deepen the West Basin Channel, deepen the Approach Channel, widen portions of the Main Channel, or construct the LSF. However, maintenance dredging of existing channel depths would continue, when and where needed. Although this alternative would not increase ship calls, visual obstructions in the form of lightering vessels offshore would continue to occur at their present rate. The No Action Alternative is not expected to result in a significant impact to aesthetics as described above. Maintenance dredging of the federal channels would be subject to separate detailed evaluation under NEPA and maintenance dredging of the berths would be subject to separate detailed evaluation under both NEPA and CEQA.

5.7.3 Alternative 2

Dredging

Dredging in the federal channels would involve two separate dredges (a clamshell and a hopper dredge) along with their support vessels that would be visible in the harbor. They would be present for approximately 21.6 months.

Electrical Substation

Construction of the electrical substation would have negligible impacts as it is a low-lying structure encompassed by the structures and facilities of the adjacent container terminal. Therefore, no landscape would be changed in a manner that permanently and substantially degrades an existing view shed or alters the character of a view shed by adding incompatible structures.

Staging Area

Use of potential areas within Port boundaries would have negligible impacts because the staging area would be located within the industrial/commercial area of the POLB and would not stand out from its surroundings. Therefore, no landscape would be changed in a manner that permanently and substantially degrades an existing view shed or alters the character of a view shed by adding incompatible structures.

Placement/Disposal

Placement at the Surfside Borrow Site Nearshore Placement Area would involve the hopper dredge transiting from the Approach Channel to the Surfside Borrow Site Nearshore Placement Area, lingering for a moment during placement, and then returning to continue dredging. This would take place over a period of approximately 2.2 months. At the same time sediments would be placed by scow at the same site over a period of approximately 8 months. Ocean Disposal operations would not be visible from shore. Therefore, no landscape would be changed in a manner that permanently and substantially degrades an existing view shed or alters the character of a view shed by adding incompatible structures.

Local Service Facilities

Dredging of 202,000 cy of sediments associated with Alternative 2 from the Pier J Basin would result in impacts over a period of approximately 34 days. Wharf improvements are not required for this alternative. Visual obstructions would be in the form of a single clamshell dredge with support vessels adjacent to the berths. Pier J breakwater improvements would all be under water and would not be visible. Construction equipment would be visible during construction but would be similar to impacts from dredging equipment over a much shorter time period. Therefore, no landscape would be changed in a manner that permanently and substantially degrades an existing view shed or alters the character of a view shed by adding incompatible structures.

Significance Determination

The addition of the dredges and their support equipment could be seen as adding visual interest to the ship traffic present in the harbor but in any case, would be a negligible change in terms of overall vessel transits. The addition of the construction and their support equipment for the Pier J breakwater improvements could be seen as adding visual interest to the ship traffic present in the harbor but in any case, would be a negligible change in terms of overall vessel transits. Project impacts would be temporary and would not permanently and substantially degrade any existing view shed or alter the character of a view shed by adding incompatible structures. Impacts to Aesthetics would be less than significant.

5.7.4 Alternative 3 (Preferred Alternative)

Dredging

Dredging in the federal channels would involve two separate dredges (a clamshell and a hopper dredge) along with their support vessels that would be visible in the harbor. They would be present for approximately 28.1 months.

Electrical Substation

Construction of the electrical substation would have negligible impacts as it is a low-lying structure encompassed by the structures and facilities of the adjacent container terminal. Therefore, no landscape would be changed in a manner that permanently and substantially degrades an existing view shed or alters the character of a view shed by adding incompatible structures.

Staging Area

Use of potential areas within Port boundaries would have negligible impacts because the staging area would be located within the industrial/commercial area of the POLB and would not stand out from its surroundings. Therefore, no landscape would be changed in a manner that permanently and substantially degrades an existing view shed or alters the character of a view shed by adding incompatible structures.

Placement/Disposal

Placement at the Surfside Borrow Site Nearshore Placement Area would involve the hopper dredge transiting from the Approach Channel to the Surfside Borrow Site Nearshore Placement Area, lingering for a moment during placement, and then returning to continue dredging. This would take place over a period of approximately 4.8 months. Ocean Disposal operations would not be visible from shore. Therefore, no landscape would be changed in a manner that permanently and substantially degrades an existing view shed or alters the character of a view shed by adding incompatible structures.

Local Service Facilities

Dredging of 337,000 cy of sediments associated with Alternative 3 from the Pier J Basin would result in impacts over a period of approximately 51 days. Wharf improvements are not required for this alternative. Visual obstructions would be in the form of a single clamshell dredge with support vessels adjacent to the berths. Pier J breakwater improvements would all be under water and would not be visible. Construction equipment would be visible during construction but would be similar to impacts from dredging equipment over a much shorter time period. Therefore, no landscape would be changed in a manner that permanently and substantially degrades an existing view shed or alters the character of a view shed by adding incompatible structures.

Significance Determination

The addition of the dredges and their support equipment could be seen as adding visual interest to the ship traffic present in the harbor but in any case, would be a negligible change in terms of overall vessel transits. The addition of the construction and their support equipment for the Pier J breakwater improvements could be seen as adding visual interest to the ship traffic present in the harbor but in any case, would be a negligible change in terms of overall vessel transits. Project impacts would be temporary and would not permanently and substantially degrade any existing view shed or alter the character of a view shed by adding incompatible structures. Impacts to Aesthetics would be less than significant.

5.7.5 Alternative 4

Dredging

Dredging in the federal channels would involve two separate dredges (a clamshell and a hopper dredge) along with their support vessels that would be visible in the harbor. They would be present for approximately 50.4 months.

Electrical Substation

Construction of the electrical substation would have negligible impacts as it is a low-lying structure encompassed by the structures and facilities of the adjacent container terminal. Therefore, no landscape would be changed in a manner that permanently and substantially degrades an existing view shed or alters the character of a view shed by adding incompatible structures.

Staging Area

Use of potential areas within Port boundaries would have negligible impacts because the staging area would be located within the industrial/commercial area of the POLB and would not stand out from its surroundings. Therefore, no landscape would be changed in a manner that permanently and substantially degrades an existing view shed or alters the character of a view shed by adding incompatible structures.

Placement/Disposal

Placement at the Surfside Borrow Site Nearshore Placement Area would involve the hopper dredge transiting from the Approach Channel to the Surfside Borrow Site Nearshore Placement Area, lingering for a moment during placement, and then returning to continue dredging. This would take place over a period of approximately 4.8 months. Ocean Disposal operations would not be visible from shore.

Local Service Facilities

Dredging of 452,000 cy of sediments associated with Alternative 3 from the Pier J Basin and Pier T (West Basin) berth would result in impacts over a period of approximately 64 days. Wharf improvements are required for this alternative. Visual obstructions would be in the form of a single clamshell dredge with support vessels adjacent to the berths and construction equipment at the berths for wharf modifications. Pier J breakwater improvements would all be under water and would not be visible. Construction equipment would be visible during construction but would be similar to impacts from dredging equipment over a much shorter time period. Therefore, no landscape would be changed in a manner that permanently and substantially degrades an existing view shed or alters the character of a view shed by adding incompatible structures.

Significance Determination

The addition of the dredges and their support equipment could be seen as adding visual interest to the ship traffic present in the harbor but in any case, would be a negligible change in terms of overall vessel transits. The addition of the construction and their support equipment for the Pier J breakwater improvements could be seen as adding visual interest to the ship traffic present in the harbor but in any case, would be a negligible change in terms of overall vessel transits. The presence of a land-based crane for wharf improvements would not be noticeable in a container terminal with numerous container cranes immediately nearby. Project impacts would be temporary and would not permanently and substantially degrade any existing view shed or alter the character of a view shed by adding incompatible structures. Impacts to Aesthetics would be less than significant.

5.7.6 Alternative 5

Dredging

Dredging in the federal channels would involve two separate dredges (a clamshell and a hopper dredge) along with their support vessels that would be visible in the harbor. They would be present for approximately 38.3 months.

Electrical Substation

Construction of the electrical substation would have negligible impacts as it is a low-lying structure encompassed by the structures and facilities of the adjacent container terminal. Therefore, no landscape would be changed in a manner that permanently and substantially degrades an existing view shed or alters the character of a view shed by adding incompatible structures.

Staging Area

Use of potential areas within Port boundaries would have negligible impacts because the staging area would be located within the industrial/commercial area of the POLB and would not stand out from its surroundings. Therefore, no landscape would be changed in a manner that permanently and substantially degrades an existing view shed or alters the character of a view shed by adding incompatible structures.

Placement/Disposal

Placement at the Surfside Borrow Area would involve the hopper dredge transiting from the Approach Channel to the Surfside Borrow Site Nearshore Placement Area, lingering for a moment during placement, and then returning to continue dredging. This would take place over a period of approximately 4.8 months. Ocean Disposal operations would not be visible from shore. Therefore, no landscape would be changed in a manner that permanently and substantially degrades an existing view shed or alters the character of a view shed by adding incompatible structures.

Local Service Facilities

Dredging of 304,000 cy of sediments associated with Alternative 3 from the Pier J Basin would result in impacts over a period of approximately 51 days. Wharf improvements are not required for this alternative. Visual obstructions would be in the form of a single clamshell dredge with support vessels adjacent to the berths. Pier J breakwater improvements would all be under water and would not be visible. Construction equipment would be visible during construction but would be similar to impacts from dredging equipment over a much shorter time period. Therefore, no landscape would be changed in a manner that permanently and substantially degrades an existing view shed or alters the character of a view shed by adding incompatible structures.

Significance Determination

The addition of the dredges and their support equipment could be seen as adding visual interest to the ship traffic present in the harbor but in any case, would be a negligible change in terms of overall vessel transits. The addition of the construction and their support equipment for the Pier J breakwater improvements could be seen as adding visual interest to the ship traffic present in the harbor but in any case, would be a negligible change in terms of overall vessel transits. Project impacts would be temporary and would not permanently and substantially degrade any existing view shed or alter the character of a view shed by adding incompatible structures. Impacts to Aesthetics would be less than significant.

5.7.7 Summary of Potential Impacts to Aesthetics

No significant unavoidable impacts were identified.

5.7.8 Mitigation Measures

No mitigation would be required as no significant impacts have been identified.

5.8 Cultural Resources

The environmental consequences of the various action alternatives, as well as the No Action Alternative, are evaluated in this section. Regulatory setting is described in Section 10 and existing environmental conditions are described in Section 3.8.

5.8.1 Impact Significance Criteria

Under NEPA, significance is determined based on 'context' and 'intensity.' For cultural resources context is often viewed in terms of how important the resource may or may not be, while intensity is viewed in terms of the severity of the impacts to the resource. While cultural resources that are not eligible for the NRHP are still considered as part of the NEPA review once that resource fails to meet the criteria for eligibility for inclusion on the NRHP its 'context' is found to be lacking. The phrase "adverse effect" (used in the NHPA) and "significant impact" (used in the NEPA) are not equivalent terms but are similar in concept. Under the NHPA, impacts to cultural resources are typically examined in terms of how the project would affect the characteristics that make the property eligible for the NRHP. Such impacts are referred to as adverse effects in the NHPA implementing regulations (36 CFR 800.5). For the purposes of this analysis, an adverse effect to an eligible cultural resource would be considered a significant impact under NEPA if, after minimization and mitigation, the remaining impacts to the property from implementation of the alternative would be substantial enough to result in the loss of a property's eligibility.

Environmental Commitments

- If previously unknown cultural resources are discovered during the project, all ground-disturbing activities shall immediately cease within the area of the discovery until USACE has met the requirement of 36 C.F.R. 800.13 regarding post-review discoveries. USACE shall evaluate the eligibility of such resources for listing on the National Register of Historic Places and propose actions to resolve any anticipated adverse effects. Work shall not resume in the area surrounding the potential historic property until USACE re-authorizes project construction.

- In the event human remains are discovered, all ground-disturbing activities shall be halted immediately within the area of the discovery, and a USACE archaeologist and the Los Angeles County Coroner must be notified. The coroner will determine whether the remains are of forensic interest. If human remains, funerary objects, sacred objects, or items of cultural patrimony are encountered during the proposed project, the USACE will follow the steps outlined in 36 C.F.R. 800.13 regarding post-review discoveries and shall notify the POLB who shall ensure that the process outlined in California Public Resources Code Section 5097.98 are carried out.

5.8.2 No Action Alternative

Under the No Action Alternative, the USACE and Port would not construct an Approach Channel to Pier J South, deepen the West Basin Channel, deepen the Approach Channel, widen portions of the Main Channel, or construct the LSF. However, maintenance dredging of existing channel depths would continue, when and where needed. This alternative would not increase ship calls or throughput and would not cause any physical changes from the current condition within the study area. The No Action Alternative is not expected to result in a significant impact to cultural resources as described above. Maintenance dredging of the federal channels would be subject to separate detailed evaluation under NEPA and maintenance dredging of the berths would be subject to separate detailed evaluation under both NEPA and CEQA.

Summary of Potential Impacts to Cultural Resources

Impacts would be less than significant

5.8.3 Alternative 2

Dredging

As discussed previously, there are no known submerged cultural resources within the areas to be dredged in this alternative. The current Federal Channel, the West Basin, and a portion of the Pier J Turning Basin have been previously dredged. The wreckage of the ferryboat Sierra Nevada has been previously mitigated and removed by USACE as part of a past dredging project. The wreck depicted by some sources as being in the Federal Channel in the Middle Harbor is not indicated on recent NOAA navigation charts and was presumably removed during past dredging events. No other wrecks are indicated within the APE on the navigation charts, and it is unlikely that any intact submerged cultural resources exist within the APE. Thus, the proposed dredging would not have any effect on historic properties.

Any staging area that would be necessary to support dredging operations would be temporary in nature and would not cause ground disturbance. The staging area would be located within the industrial/commercial Port complex. Thus, establishing a temporary staging area would not have any effect on historic properties.

Placement/Disposal

There are no known submerged historic resources within LA-2 or LA-3, and both have been used as disposal sites for decades. Any cultural resources that may have been present are presumably now deeply buried under deposited sediment. Disposal of additional dredged sediments in these two areas would not have any effect on historic properties.

The Surfside Borrow Site Nearshore Placement Area would be located within an existing borrow site that has been used repeatedly as a sand source over decades, so no intact cultural resources could exist within the placement area. Furthermore, the nearshore area is a highly energetic environment, and the ocean bottom tends to be mobile. It is unlikely that any cultural resources would have persisted in this area, even if it had not been excavated for beach nourishment material. Thus, placement of dredged sediment in the nearshore area would not have any effect on historic properties.

Electric Substation

The new substation required on Pier J would occupy an area measuring 50 feet by 70 feet. Construction of this facility may require that a trench up to 4,250 feet long be excavated from the existing substation at the north end of Pier J to the proposed substation location in the southern portion of the pier. The existing asphalt would be removed from the area where the substation would be located. The trench and substation would be backfilled and repaved with asphalt at the conclusion of construction. The northern portion of Pier J was created from dredged fill in 1965, so there is no possibility of intact subsurface cultural deposits. The area that would be trenched for installation of the conduit was an unimproved open space until it was developed in the 1970s. The southern portion of the pier where the substation would be located was created from dredged fill in the 1980s. Pier J, like the rest of the port, has been substantially reconfigured and reconstructed over its life to meet changes in shipping technology. The existing substation was constructed in 2011/2012. Thus, the proposed trenching and construction of a new substation would be in keeping with the continued use of Pier J as an active shipping pier. Construction of the new electric substation would not have any effect on historic properties.

Local Service Facilities

The POLB would deepen the Pier J Basin, berths J266-J270 along the Pier J South Slip to -55 feet MLLW. These areas have been previously dredged, and no submerged cultural resources are known with them. No effect to historic properties is anticipated from this activity.

Improvements to the breakwaters at the entrance to Pier J may also be required to stabilize them after deepening. The ends of the Pier J breakwaters would be stabilized with 680 linear feet of underwater bulkhead wall (steel sheet or king pile) with anti-scour rock placed in front of the wall. The rock would extend up to 30 feet in front of the wall, and construction would disturb an area up to 10 feet behind the wall. The breakwaters were completed in 2000, so stabilizing them would have no effect on historic properties.

Significance Determination

USACE consulted with the SHPO regarding the potential for historic properties to exist within the APE. On December 9, 2020, the USACE received comment from the SHPO agreeing there would be no historic properties affected. Documentation of consultation is included in Appendix N. Because no effects are anticipated as a result of Alternative 2, impacts would be less than significant.

5.8.4 Alternative 3 (Preferred Alternative)

Dredging

Dredging activities would be similar to those in Alternative 2 except that dredged depths would be increased. The most likely submerged cultural resources would be shipwrecks that are typically located on or within surface sediments, so deepening dredging depths on the order of two or even four feet would be unlikely to have increased effects. The only material difference in terms of potential effects to cultural resources (increases/changes in the APE) from Alternative 2 is that the Approach Channel would be lengthened to “daylight” the target depth of -80’ MLLW. No submerged cultural resources are known within the APE, including the Approach Channel extension. Thus, there would be no effect to historic properties.

Any staging area that would be necessary to support dredging operations would be temporary in nature and would not cause ground disturbance. The staging area would be located within the industrial/commercial Port complex. Thus, establishing a temporary staging area would not have any effect on historic properties

Associated Impacts

All the activities associated with the placement/disposal of dredged sediment, electric substation, and LSF would be similar to Alternative 2. No effect to historic properties is anticipated.

Significance Determination

USACE consulted with the SHPO regarding the potential for historic properties to exist within the APE. On December 9, 2020, the USACE received comment from the SHPO agreeing there would be no historic properties affected. Documentation of consultation is included in Appendix N. Because no effects are anticipated as a result of Alternative 3, impacts would be less than significant.

5.8.5 Alternative 4

Potential effects to cultural resources would be the same as those discussed for Alternative 3 except that dredged depths would be further increased with the addition of wharf improvements discussed below. The Approach Channel would be extended even farther to maintain the target depth of -83’ MLLW. No submerged cultural resources are known within the APE. Thus, there would be no effect to historic properties.

Local Service Facilities

Wharf improvements could also be necessary to provide additional support to the existing wharf infrastructure to accommodate dredging along the berths. Wharf modifications would include the temporary removal and reinstallation of fenders, bollards, and other marine fixings to the wharf structure. An excavator would be used to remove existing debris and existing slope protection at the toe of the slope. A new sheet pile wall would then be installed to support the wharf. Cement grout may need to be injected into the soil behind the wall to relieve pressure on the bulkhead. All ground disturbance would occur in areas where imported soils were used to create the wharfs in what was originally offshore areas of San Pedro Bay, so no intact cultural deposits are present. The basic shape of the northern portion of Pier J was constructed from fill in 1965, but the area within the APE was not developed until the 1970s.

Pier J South and berths J266-J270 were completed in 1991 and are also less than 50 years in age. Berths T132-T140 were originally constructed sometime between 1940 and 1944, but they were entirely reconstructed between 1998 and 2002 to allow the handling of shipping containers, including the construction of railroad tracks along the edge of the wharf to support large mobile cranes. All of the original timber wharfs and supporting timber piling within the POLB had been replaced with concrete by the 1970s to deter fire. Stabilizing Berth 140 would have no effect on historic properties.

Associated Impacts

All the activities associated with the placement/disposal of dredged sediment, electric substation, and other LSF would be similar to Alternative 2. No effect to historic properties is anticipated.

Significance Determination

USACE consulted with the SHPO regarding the potential for historic properties to exist within the APE. On December 9, 2020, the USACE received comment from the SHPO agreeing there would be no historic properties affected. Documentation of consultation is included in Appendix N. Because no effects are anticipated as a result of Alternative 4, impacts would be less than significant.

5.8.6 Alternative 5

Dredging

The effects of dredging would be the same as those discussed for Alternative 3, except dredging would also occur to create the Standby Area. This area has been previously dredged by the POLB. Although the wreckage of the Pierpoint Queen is described by some sources to be located within the potential Standby Area, no wreck is shown on the NOAA charts at this location, and it was likely removed by past dredging. Further, remote sensing study performed by the Underwater Archaeological Consortium in 1989 for a previous dredging project did not record any anomalies at this location. Because dredging occurred in the 1960s, any sunken project in this area would have been deposited recently and would have obtained significance to constitute a historic property. No submerged cultural resources are known within the APE. Thus, there would be no effect to historic properties.

Associated Impacts

All other activities associated with placement/disposal, the electric substation, and LSF would be similar to Alternative 2. No effect to historic properties is anticipated.

Significance Determination

USACE consulted with the SHPO regarding the potential for historic properties to exist within the APE. On December 9, 2020, the USACE received comment from the SHPO agreeing there would be no historic properties affected. Documentation of consultation is included in Appendix N. Because no effects are anticipated as a result of Alternative 5, impacts would be less than significant.

Summary of Potential Impacts to Cultural Resources

No significant unavoidable impacts were identified.

Mitigation Measures

No mitigation would be required as no significant impacts have been identified.

5.9 Noise

The environmental consequences of the various action alternatives, as well as the No Action Alternative, are evaluated in this section. Regulatory setting is described in Section 10 and existing environmental conditions are described in Section 3.9.

5.9.1 Impact Significance Criteria

Project noise impacts would be considered significant if:

- noise resulting from the project results in an increase of 10 dBA above background during the day or a night-time increase of 5 dBA above background.

This is a short-term project and a perceived daytime doubling of noise levels is considered to be significant. A lower threshold is used for nighttime noise to reflect the increased sensitivity of people to nighttime sources of noise.

Environmental Commitments

- Equip all internal combustion engines with properly operating mufflers.

5.9.2 Alternative 1 (No Action)

Under the No Action Alternative, the USACE and Port would not construct an Approach Channel to Pier J South, deepen the West Basin Channel, deepen the Approach Channel, widen portions of the Main Channel, or construct the LSF. However, maintenance dredging of existing channel depths would continue, when and where needed. This alternative would not increase ship calls or throughput and would not incrementally increase noise. The No Action Alternative is not expected to result in a significant impact as described above. Maintenance dredging of the federal channels would be subject to separate detailed evaluation under NEPA and maintenance dredging of the berths would be subject to separate detailed evaluation under both NEPA and CEQA.

5.9.3 Alternative 2

Dredging

The type of dredge that would most likely be used generates a Leq of 71.5 dBA at 50 feet (Parsons Engineering Science, Inc. 1996). This would be a clamshell dredge. The hopper dredge is similar in noise levels to a large vessel and noise from it would not be distinguishable from other vessels operating in the harbor. Ambient noise levels in harbors have been measured at between Leq 64.1 and 71.8 dBA depending on the time of day and day of the week. During daylight hours, particularly on the weekend, dredge noise would be indistinguishable from background noise levels.

The noise levels at various distances from a 71.5 dBA noise source are estimated as follows:

Table 5-29 Noise Levels at Various Distances

100 feet – 65.5 dBA
200 feet – 59.5 dBA
400 feet – 53.5 dBA
500 feet – 47.5 dBA
1000 feet – 41.5 dBA
2000 feet – 35.5 dBA
3000 feet – 29.5 dBA
(Calculated using a point source spherical radiator equation, Caltrans Noise Manual, 1980.)

The data suggests that a typical dredging noise source will fade into the noise background by around 100 feet from the dredge. There are no sensitive receptors within1-1/4 mile of the proposed dredging activity. Noise levels would return to ambient conditions upon project completion; therefore, impacts would not be significant.

Electrical Substation

Construction of the electrical substation would have negligible impacts to noise levels because construction would be occurring in a highly developed part of the Port.

Staging Area

Use of potential areas within Port boundaries would have negligible impacts to noise levels because the staging area would be located in a highly developed part of the POLB, and no construction activities would take place in the staging area. Activities in the staging area would be limited to office space and personnel parking as well as storage of equipment related to the construction efforts.

Placement/Disposal

Placement at the Surfside Borrow Site Nearshore Placement Area will be far enough offshore that noise levels will be indistinguishable at the beach from ambient noises. Ocean Disposal operations would not be heard from shore due to the distance offshore of the two ODMDS (six miles for LA-2 and five miles for LA-3).

Local Service Facilities

Berth dredging would be similar to channel dredging and noise levels would be indistinguishable from background noise levels at the nearest sensitive receptors. Wharf improvements are not required for this alternative. Placement of a submerged sheet pile structure with associated rock protection to stabilize the Pier J breakwaters would have potential effects on noise levels. Sheet pile installation would be by either a hammer or vibratory method, to be determined during design based on sediment characteristics. The nearest sensitive receptor, the cruise ship terminal, is approximately ¾ mile from the site. The nearest residences are approximately 2 miles from the site. Average maximum noise levels from a hammer are 110 dBA at 50 feet; from a vibratory driver it is 101 dBA at 50 feet (NRC undated manual on Procedures for Preparing a Biological Assessment). Noise from a hammer is expected to be approximately 68 dBA or barely audible at the cruise ship terminal, but exposures are short term for individuals and is not expected to result in significant noise impacts during day-time operations. Noise from a vibratory driver is expected to be approximately 59 dBA or inaudible at the cruise ship terminal. Noise from a hammer is expected to be approximately 62 dBA or barely audible at the nearest residence, but exposures are short term for individuals and is not expected to result in significant noise impacts during day-time operations. Noise from a vibratory driver is expected to be approximately 53 dBA or inaudible at the nearest residences. Nighttime exposures at the nearest residences are expected to be long term and more audible than during daylight. Operations should be restricted to daylight hours only to avoid impacts to residences. Rock placement would be by crane from a barge and would not be discernible at the nearest sensitive receptors.

Significance Determination

The data suggests that a typical dredging noise source will fade into the noise background by around 100 feet from the dredge. There are no sensitive receptors within1-1/4 mile of the proposed dredging activity. There would be no measurable noise level increases as a result of the project. Construction of local service facilities, including Pier J breakwater improvements, electrical substation construction, and the construction and operation of the staging area would not be discernible at the nearest sensitive receptors as they would be masked by noise from ongoing activities at the Port. Noise levels would return to ambient conditions upon project completion; therefore, impacts would not be significant.

5.9.4 Alternative 3 (Preferred Alternative)

Dredging

Impacts would be the same as for Alternative 2 but would extend over a slightly longer period.

Electrical Substation

Construction of the electrical substation would have negligible impacts on noise levels because construction would be occurring in a highly developed part of the Port.

Staging Area

Use of potential areas within Port boundaries would have negligible impacts on noise levels because the staging area would be located in a highly developed part of the POLB, and no construction activities would take place in the staging area. Activities in the staging area would be limited to office space and personnel parking as well as storage of equipment related to the construction efforts.

Placement/Disposal

Impacts would be the same as for Alternative 2.

Local Service Facilities

Berth dredging would be similar to channel dredging and noise levels would be indistinguishable from background noise levels at the nearest sensitive receptors. Wharf improvements are not required for this alternative. Placement of a submerged sheet pile structure with associated rock protection to stabilize the Pier J breakwaters would be the same as for Alternative 2.

Significance Determination

The data suggests that a typical dredging noise source will fade into the noise background by around 100 feet from the dredge. There are no sensitive receptors within1-1/4 mile of the proposed dredging activity. There would be no measurable noise level increases because of the project. Construction of local service facilities, including Pier J breakwater improvements, electrical substation construction, and the construction and operation of the staging area, would not be discernible at the nearest sensitive receptors as they would be masked by noise from ongoing activities at the Port. Noise levels would return to ambient conditions upon project completion; therefore, impacts would not be significant.

5.9.5 Alternative 4

Dredging

Impacts would be the same as for Alternative 2 but would extend over a slightly longer period.

Electrical Substation

Construction of the electrical substation would have negligible impacts on noise levels because construction would be occurring in a highly developed part of the Port.

Staging Area

Use of potential areas within Port boundaries would have negligible impacts on noise levels because the staging area would be located in a highly developed part of the POLB, and no construction activities would take place in the staging area. Activities in the staging area would be limited to office space and personnel parking as well as storage of equipment related to the construction efforts.

Placement/Disposal

Impacts would be the same as for Alternative 2.

Local Service Facilities

Berth dredging would be similar to channel dredging and noise levels would be indistinguishable from background noise levels at the nearest sensitive receptors. Wharf improvements are required for this alternative. While there would be noise from construction equipment related to wharf improvements, the distance to the nearest sensitive receptor (1-1/4 to 1-1/2 mile) and relatively high noise levels in the POLB would make any noise from construction indistinguishable. Placement of a submerged sheet pile structure with associated rock protection to stabilize the Pier J breakwaters would be the same as for Alternative 2. Pile driving impacts associated with wharf modification in this alternative would be similar to sheet pile driving. However, the nearest sensitive receptor is approximately 1-1/2 miles away in the community of Wilmington from the Pier T site, the Pier J site is a similar distance for the Pier J breakwater. Noise from a hammer is expected to be less than 62 dBA or barely audible at the nearest residence and is not expected to result in significant noise impacts during day-time operations. Noise from a vibratory driver is expected to be less than 53 dBA or inaudible at the nearest residences. Nighttime exposures at the nearest residences are expected to be long term and more audible than during daylight. Operations should be restricted to daylight hours only to avoid impacts to residences.

Significance Determination

The data suggests that a typical dredging noise source will fade into the noise background by around 100 feet from the dredge. There are no sensitive receptors within1-1/4 mile of the proposed dredging activity. There would be no measurable noise level increases as a result of the project. Construction of local service facilities, including Pier J breakwater improvements and wharf improvements, electrical substation construction, and the construction and operation of the staging area, would not be discernible at the nearest sensitive receptors as they would be masked by noise from ongoing activities at the Port. Noise levels would return to ambient conditions upon project completion; therefore, impacts would not be significant.

5.9.6 Alternative 5

Dredging

Impacts would be the same as for Alternative 2 but would extend over a slightly longer period.

Electrical Substation

Construction of the electrical substation would have negligible impacts on noise levels because construction would be occurring in a highly developed part of the Port.

Staging Area

Use of potential areas within Port boundaries would have negligible impacts on noise levels because the staging area would be located in a highly developed part of the POLB, and no construction activities would take place in the staging area. Activities in the staging area would be limited to office space and personnel parking as well as storage of equipment related to the construction efforts.

Placement/Disposal

Impacts would be the same as for Alternative 2.

Local Service Facilities

Berth dredging would be similar to channel dredging and noise levels would be indistinguishable from background noise levels at the nearest sensitive receptors. Wharf improvements are not required for this alternative. Placement of a submerged sheet pile structure with associated rock protection to stabilize the Pier J breakwaters would be the same as for Alternative 2.

Significance Determination

The data suggests that a typical dredging noise source will fade into the noise background by around 100 feet from the dredge. There are no sensitive receptors within1-1/4 mile of the proposed dredging activity. There would be no measurable noise level increases as a result of the project. Construction of local service facilities, including Pier J breakwater improvements, electrical substation construction, and the construction and operation of the staging area, would not be discernible at the nearest sensitive receptors as they would be masked by noise from ongoing activities at the Port. Noise levels would return to ambient conditions upon project completion; therefore, impacts would not be significant.

5.9.7 Summary of Potential Impacts to noise

No significant unavoidable impacts were identified.

5.9.8 Mitigation and Monitoring Measures

No mitigation would be required as no significant impacts have been identified.

5.10 Socioeconomics

As stated in Section 3.10, NEPA requires consideration of "economic" and "social" effects (40 CFR § 1508.8) but CEQA only requires evaluation of population and housing such that increased population or housing results in physical impacts. Regulatory setting and determination that the project area includes an environmental justice community (minority population) is described in Section 10.

5.10.1 Impact Significance Criteria

In accordance with generally accepted CEQA criteria and Executive Order 12898 for federal projects, significant socioeconomic/environmental justice impacts would occur if:

- The project would adversely induce substantial growth either directly or indirectly;
- The project would displace existing housing or cause a substantial increased demand for housing through population growth; and/or
- The project results in disproportionately high and adverse impacts on minority populations.

5.10.2 Alternative 1 (No Action)

Under the No Action Alternative, the USACE and Port would not construct an Approach Channel to Pier J South, deepen the West Basin Channel, deepen the Approach Channel, widen portions of the Main Channel, or construct the LSF. However, maintenance dredging of existing channel depths would continue, when and where needed. This alternative would not increase ship calls or throughput. The No Action Alternative is not expected to result in any significant impacts to socioeconomic/environmental justice as described above. Maintenance dredging of the federal channels would be subject to separate detailed evaluation under NEPA and maintenance dredging of the berths would be subject to separate detailed evaluation under both NEPA and CEQA.

5.10.3 Alternative 2

Construction crews would be required for two dredges and associated support vessels. Crews would either come from local sources and/or specialized employees brought in temporarily by the construction contractor. Construction crews would most likely be employed by the contractor and there would be few, if any, new hires over the duration of construction. The construction jobs created by this alternative would be a negligible increase for the region and would not induce a substantial decrease in area employment. Therefore, the project would not adversely induce substantial growth either directly or indirectly. Since it is likely that the Project would mainly draw from construction workers who already reside in the larger region, there would not be a large influx of construction workers to the area. Therefore, impacts on population because of Project construction would be less than significant. The project would not displace existing housing nor would it create a demand for housing through population growth.

The project area includes an environmental justice community. However, project impacts are restricted to construction impacts. Construction impacts are in the Outer Harbor and two terminals both of which are located remotely from any potential project impacts. The minority population would, therefore, not be directly affected by the project. A health risk assessment, for example, was prepared by the POLB. It shows that there would be no increase in health risks to the minority population because of the project. Therefore, there would not be disproportionately high and adverse human health or environmental impacts on minority populations.

Significance Determination

This alternative would not adversely induce substantial growth either directly or indirectly, would not displace existing housing or cause a substantial increased demand for housing through population growth, nor result in disproportionately high and adverse impacts on minority/low-income populations. Therefore, impacts on Socioeconomics would be less than significant.

5.10.4 Alternative 3 (Preferred Alternative)

Impacts would be the same as for Alternative 2 but would extend over a slightly longer period.

Significance Determination

Impacts to Socioeconomics would not be significant for reasons discussed above for Alternative 2.

5.10.5 Alternative 4

Impacts would be the same as for Alternative 2 but would extend over a slightly longer period. Additional workers would be required to construct wharf improvements for this alternative but would not adversely induce substantial growth either directly or indirectly, would not displace existing housing or cause a substantial increased demand for housing through population growth, nor result in disproportionately high and adverse impacts on minority/low-income populations.

Significance Determination

This alternative would not adversely induce substantial growth either directly or indirectly, would not displace existing housing or cause a substantial increased demand for housing through population growth, nor result in disproportionately high and adverse impacts on minority/low-income populations. Therefore, impacts on Socioeconomics would be less than significant.

5.10.6 Alternative 5

Impacts to Socioeconomics would be the same as for Alternative 2 but would extend over a slightly longer period.

Significance Determination

Impacts would not be significant for reasons discussed above for Alternative 2.

5.10.7 Mitigation Measures

No mitigation would be required as no significant impacts have been identified.

5.11 Transportation

This section addresses the potential for the various alternatives to impact existing vehicular traffic and vessel movements in the project vicinity. Regulatory setting is described in Section 10 and existing environmental conditions are described in Section 3.11.

5.11.1 Impact Significance Criteria

A significant impact to traffic would occur if the project would result in any of the following:

- The addition of project related traffic would substantially add vehicle trips to cause an increase in Level of Service (LOS) on local roadways;
- The project would substantially interfere with or restrict traffic flow; and/or
- The project would cause a change in vessel traffic patterns, including an increase in traffic volumes or a change in location that result in substantial incremental changes to vessel safety.

The City/POLB define traffic level of service thresholds as follows:

LOS without the Project	LOS or Change in Volume to Capacity (V/C) with the Project
A, B, C, or D	To E or F
E, F	0.02 or greater

5.11.2 Alternative 1 (No Action)

Under the No Action Alternative, the USACE and Port would not construct an Approach Channel to Pier J South, deepen the West Basin Channel, deepen the Approach Channel, widen portions of the Main Channel, or construct the LSF. However, maintenance dredging of existing channel depths would continue, when and where needed. This alternative would not impact existing vehicular traffic and vessel movements in the project vicinity. Maintenance dredging of the federal channels would be subject to separate detailed evaluation under NEPA and maintenance dredging of the berths would be subject to separate detailed evaluation under both NEPA and CEQA.

5.11.3 Alternative 2

Dredging

Dredging of 4.88 mcy of sediments associated with Alternative 2 would result in vehicle trips from construction crews that would operate the clamshell dredge and hopper dredge. As shown in Appendix M, the traffic activity associated with the construction is estimated between 54 and 240 daily trips, with the peak of 240 expected to occur for only two months in early in 2026 (associated with the simultaneous dredging at the approach channel with the hopper dredge and the main channel widening with the clam shell dredge). During all other months, the project is estimated to generate fewer than 150 daily trips. For analysis purposes, the peak of 240 daily trips is used to be conservative and to account for unexpected overlap in phases. This addition of daily trips does not result in substantial interference or restriction of traffic flow.

The morning, midday, and afternoon peak hours, for traffic impact analysis purposes, are defined as occurring between 7:00 and 8:00 AM, 2:00 PM and 3:00 PM, and 4:00 and 5:00 PM, respectively. Because it is not known when shift changes would occur, these estimates assume that they would coincide with the peak hours of traffic within the Port. Of the 240 peak daily trips, 80 trips would occur in the AM peak hour, 80 trips would occur in the midday peak hour, and 80 trips would occur in the PM peak hour. The 80 trips during each peak hour includes 40 inbound trips and 40 outbound trips.

For dredging activity, workers would be launched by water taxi from one of three potential launch sites: Pier T, Pier S, or a location near Pier D Street & Pico Avenue. Primary access routes connecting the regional freeway system with each land-side work site and each launch site under consideration were identified and are shown in Appendix M. The three main access routes are via Long Beach Freeway (I-710), the Harbor Freeway (I-110), and the Terminal Island Freeway (SR-47/SR-103). These access routes would be for both truck access and for workers commuting to the project area.

The City of Long Beach considers LOS D as the upper limit of satisfactory operations for intersections. A significant impact is identified where project traffic causes the intersection to deteriorate from LOS D to LOS E or F and increases the V/C ratio by 0.02 or more, or if the project traffic causes an increase in V/C ratio of 0.02 or greater when the intersection is operating at LOS E or F in the baseline condition. As shown in Appendix M, good levels of service (LOS D or better) are shown under existing baseline and future conditions for the three analyzed weekday peak hours. Construction of the proposed Project would occur between 2024 and 2029. Given the relatively modest peak hour trip generation (up to 80 trips in any one hour), the broad distribution of those trips across the study area, and the relatively uncongested setting in which they would occur, it can be concluded that the additional Project traffic would result in less than significant impacts under significance criterion 1 according to the City's criteria.

The estimation of project-related daily vehicles miles of travel (VMT) is based on the trip generation estimates presented above. POLB estimates that the trip lengths to the construction site could be up to 50 miles. This analysis assumes that vehicle one-way trips to and from the construction site for both workers and material delivery trucks would average 25 miles. Based on the estimated 240 daily one-way trips, the Project-related average daily VMT is estimated to be approximately 6,000 miles. Of the five full years of construction, Year 2 (2025) has the highest annual average VMT with an estimated 1,204,500 miles.

The proposed dredging activities for Alternative 2 involve barges and tugs that would occur over an approximately two-year period. These activities would be scheduled by the POLB and the construction contractors to minimize potential conflicts with vessel traffic in the Approach Channel, Main Channel, West Basin, Pier J Basin, and Pier J Approach areas. Construction operators contracted by the Port are required to have completed training in protocols specific to Long Beach Harbor and POLB marine navigation. This alternative would be subject to the USACE restrictions and requirements specified in the conditions of a USACE-issued Department of the Army permit. Those conditions require the contractor to undertake several coordination and monitoring activities. For example, the contractor would have to publish a Notice to Mariners describing project activities and schedule, coordinate vessel activities with the Marine Exchange, USCG, and Port Pilots, monitor VHF Channel 16 (the marine safety channel), and provide regular reports of activities. The presence of two separate dredges (a clamshell and a hopper dredge) along with their support vessels would not change in vessel traffic patterns, including an increase in traffic volumes or a change in location that results in substantial incremental changes to vessel safety owing to the large number of vessels currently transiting the area on a daily basis.

With the Project completion, the operations at all the facilities would continue as usual and is not anticipated to result in additional vehicular or vessel traffic. The electric substation is expected to be in place following dredging and may generate two employees twice per year to perform routine maintenance. The addition of this operational traffic is negligible and would not result in any significant traffic impacts at the study intersections under any of the impact significance criteria.

Placement/Disposal

The construction vehicular and vessel traffic associated with placement of 2.5 mcy at the Surfside Borrow Site Nearshore Placement Area is included in the analysis above. Placement at this site would not result in any increase in ground transportation or a change in vessel traffic patterns, including an increase in traffic volumes or a change in location that results in substantial incremental changes to vessel safety. Impacts of disposal at the LA-2 and LA-3 ODMDS would not result in any increase in ground transportation or a change in vessel traffic patterns, including an increase in traffic volumes or a change in location that result in substantial incremental changes to vessel safety.

Local Service Facilities

Dredging of 202,000 cy of sediments associated with Alternative 2 from the Pier J and Basin would result in 108 daily vehicle trips and would not overlap with other features. Similar vessel traffic impacts and restrictions as described above would occur. Wharf improvements are not required for this alternative. Placement of a submerged sheet pile structure with associated rock protection to stabilize the Pier J breakwaters would not overlap with other features. Therefore, the project, including local service facilities, would not result in any increase in ground transportation or a change in vessel traffic patterns, including an increase in traffic volumes or a change in location that results in substantial incremental changes to vessel safety.

Significance Determination

Project dredging, the placement of dredged materials, and operational maintenance would not result in the addition of project related traffic that would substantially add vehicle trips to cause an increase in LOS on local roadways, or substantially interfere with or restrict traffic flow. Additionally, the project would not cause a change in vessel traffic patterns, including an increase in traffic volumes or a change in location that result in substantial incremental changes to vessel safety. Therefore, impacts to Transportation would be less than significant.

5.11.4 Alternative 3 (Preferred Alternative)

Dredging

Impacts would be similar to Alternative 2, except that dredging of approximately 7.1 mcy of sediments associated with Alternative 3 would result in the peak daily traffic conditions and vessels from in-water construction occurring for a longer period of time (approximately an additional six months). The simultaneous operations of the hopper dredge and the clamshell dredge would result in a maximum of 240 peak daily vehicle trips. Thus, the ground and vessel transportation impacts would be the same as described above for Alternative 2. Operational impacts for routine maintenance of the electric substation would also be the same as described under Alternative 2.

Placement/Disposal

Impacts from vehicle and vessel traffic would be similar to Alternative 2. Placement impacts at the Surfside Borrow Site Nearshore Placement Area would be identical to Alternative 2 as the volumes are the same. Impacts from ocean disposal at LA-2 and/or LA-3 would be the similar to Alternative 2.

Local Service Facilities

Impacts from vehicle and vessel traffic would be similar to Alternative 2. Dredging of 304,000 cy of sediments associated with Alternative 3 from the Pier J Basin would result in the same 108 daily vehicle trips as described above for Alternative 2. Similar vessel traffic impacts and restrictions as described above would occur. Wharf improvements are not required for this alternative. Placement of a submerged sheet pile structure with associated rock protection to stabilize the Pier J breakwaters would not overlap with other features. Therefore, the project, including local service facilities, would not result in any increase in ground transportation or a change in vessel traffic patterns, including an increase in traffic volumes or a change in location that results in substantial incremental changes to vessel safety.

Significance Determination

Project dredging, the placement of dredged materials, and operational maintenance would not result in the addition of project related traffic that would substantially add vehicle trips to cause an increase in LOS on local roadways, or substantially interfere with or restrict traffic flow. Additionally, the project would not cause a change in vessel traffic patterns, including an increase in traffic volumes or a change in location that result in substantial incremental changes to vessel safety. Therefore, impacts to transportation would be less than significant.

5.11.5 Alternative 4

Dredging

Impacts would be similar to Alternative 2, except that dredging of approximately 11.86 mcy of sediments associated with Alternative 4 would result in the peak daily traffic conditions and vessels from in-water construction occurring for a longer period of time (approximately an additional twenty-six months). The simultaneous operations of the hopper dredge and the clamshell dredge would result in a maximum of 240 peak daily trips. Thus, the ground and vessel transportation impacts would be the same as described above for Alternative 2. Operational impacts for routine maintenance of the electric substation would also be the same as described under Alternative 2.

Placement/Disposal

Impacts from vehicle and vessel traffic would be similar to Alternative 2. Placement impacts at the Surfside Borrow Site Nearshore Placement Area would be identical to Alternative 2 as the volumes are the same. Impacts from ocean disposal at LA-2 and/or LA-3 would be similar to Alternative 2.

Local Service Facilities

Impacts from vehicle and vessel traffic would be similar to Alternative 2. Dredging of 456,000 cy of sediments associated with Alternative 4 from the Pier J Basin and Pier T (West Basin) would require use of the clam shell dredge in subsequent phases with a maximum of 54 total workers. Therefore, Alternative 4 would result in the same 108 daily vehicle trips as described above for Alternative 2, and the impacts would be the same. Wharf upgrades for both Pier J and Pier T would each require approximately 25 workers, resulting in approximately 125 daily trips. These features would be constructed prior to dredging activity and would not overlap subsequent phases. Similar vessel traffic impacts and restrictions as described above would occur. Placement of a submerged sheet pile structure with associated rock protection to stabilize the Pier J breakwaters would not overlap with other features. Therefore, the project, including local service facilities, would not result in any increase in ground transportation or a change in vessel traffic patterns, including an increase in traffic volumes or a change in location that results in substantial incremental changes to vessel safety.

Significance Determination

Project dredging, the placement of dredged materials, and operational maintenance would not result in the addition of project related traffic that would substantially add vehicle trips to cause an increase in LOS on local roadways, or substantially interfere with or restrict traffic flow. Additionally, the project would not cause a change in vessel traffic patterns, including an increase in traffic volumes or a change in location that result in substantial incremental changes to vessel safety. Therefore, impacts to transportation would be less than significant.

5.11.6 Alternative 5

Dredging

Impacts would be similar to Alternative 2, except that dredging of approximately 8.4 mcy of sediments associated with Alternative 5 would result in the peak daily traffic conditions and vessels from in-water construction occurring for a longer period of time (approximately an additional fifteen months). The simultaneous operations of the hopper dredge and the clam shell dredge would result in a maximum of 240 peak daily trips. Thus, the ground and vessel transportation impacts would be the same as described above for Alternative 2. Operational impacts for routine maintenance of the electric substation would also be the same as described under Alternative 2.

Placement/Disposal

Impacts from vehicle and vessel traffic would be similar to Alternative 2. Placement impacts at the Surfside Borrow Site Nearshore Placement Area would be identical to Alternative 2 as the volumes are the same. Impacts from ocean disposal at LA-2 and/or LA-3 would be similar to Alternative 2.

Local Service Facilities

Impacts from vehicle and vessel traffic would be similar to Alternative 2. Dredging of 304,000 cy of sediments associated with Alternative 3 from the Pier J Basin would result in the same 108 daily vehicle trips as described above for Alternative 2. Wharf improvements are not required for this alternative. Similar vessel traffic impacts and restrictions as described above would occur. Placement of a submerged sheet pile structure with associated rock protection to stabilize the Pier J breakwaters would not overlap with other features. Therefore, the project, including local service facilities, would not result in any increase in ground transportation or a change in vessel traffic patterns, including an increase in traffic volumes or a change in location that results in substantial incremental changes to vessel safety.

Significance Determination

Project dredging, the placement of dredged materials, and operational maintenance would not result in the addition of project related traffic that would substantially add vehicle trips to cause an increase in LOS on local roadways, or substantially interfere with or restrict traffic flow. Additionally, the project would not cause a change in vessel traffic patterns, including an increase in traffic volumes or a change in location that result in substantial incremental changes to vessel safety. Therefore, impacts to transportation would be less than significant.

5.11.7 Summary of Potential Impacts to Transportation

No significant unavoidable impacts were identified.

5.11.8 Mitigation Measures

No mitigation would be required as no significant impacts have been identified.

5.12 Land Use

This analysis of land use impacts addresses the alternatives' compatibility with existing and planned land use, and conformance with local land use plans. Compatibility with existing land use is assessed to determine whether various components of the proposed Project would conflict with existing, planned, and adjacent uses. Conformance with land use plans is based on consistency between the proposed use and adopted plans such as the general plans.

5.12.1 Impact Significance Criteria

A significant impact to land use would occur if:

- The project would result in long-term or permanent conversion of land to other uses;
- The project would result in long-term or permanent conflicts with adjacent land or water uses; and/or
- The project would conflict with existing or known future land use plans (LUPs) or policies.

5.12.2 Impacts

The project would not result in any changes to Land Use for any of the alternatives, including Alternative 1 (No Action). There would be no conversion of land to other uses, no permanent conflicts would be established, and the project would be in conformance with the Port's Master Plan.

5.12.3 Summary of Potential Impacts to land use

No significant unavoidable impacts were identified.

5.12.4 Mitigation Measures

No mitigation would be required as no significant impacts have been identified.

5.13 Recreation

This section addresses the potential impacts of the project alternatives to recreational experiences within the vicinity of the project.

5.13.1 Impact Significance Criteria

Impacts will be considered significant if the project results in a permanent loss of existing recreational uses.

5.13.2 Alternative 1 (No Action)

Under the No Action Alternative, the USACE and Port would not construct an Approach Channel to Pier J South, deepen the West Basin Channel, deepen the Approach Channel, widen portions of the Main Channel, or construct the LSF. However, maintenance dredging of existing channel depths would continue, when and where needed. This alternative would not increase ship calls or throughput. The No Action Alternative is not expected to result in results in a permanent loss of existing recreational uses. Maintenance dredging of the federal channels would be subject to separate detailed evaluation under NEPA and maintenance dredging of the berths would be subject to separate detailed evaluation under both NEPA and CEQA.

5.13.3 Alternative 2

Dredging

Impacts would be restricted to recreational boating and fishing in the main channel areas. Dredges and support vessels would be provided with appropriate USCG lights and day shapes and would be required to not block channels that would be used by commercial or recreational vessels. Impacts to recreational boaters will be negligible. The project would not impact shoreline recreational uses in the area.

Electrical Substation

Construction of the electrical substation would have negligible impacts to recreation because the substation would be located within the confines of the POLB and is not accessible for recreational purposes. Therefore, construction of the electrical substation would not result in a permanent loss of existing recreational uses.

Staging Area

Use of potential areas within Port boundaries would have negligible impacts to recreation because the staging area would be located within the confines of the POLB and is not accessible for recreational purposes. Therefore, the staging area would not result in a permanent loss of existing recreational uses.

Placement/Disposal

Recreational vessel usage of the Surfside Borrow Site Nearshore Placement Area and disposal at the ODMDS would be negligible as placement operations are very short duration (15-30 minutes, 2-3 times per day) and the placement vessel could easily be avoided. Therefore, placement/disposal activities would not result in a permanent loss of existing recreational uses.

Local Service Facilities

Berth dredging would be in confined to wharf areas where little to no recreational boating or fishing takes place. Wharf improvements are not required for this alternative. Placement of a submerged sheet pile structure with associated rock protection to stabilize the Pier J breakwaters would have negligible impacts to recreation because this is in an area where little to no creational boating or fishing takes place. Therefore, the local service facilities would not result in a permanent loss of existing recreational uses.

Significance Determination

There would be no permanent loss of recreational uses because of the proposed Project. Therefore, impacts would be less than significant.

5.13.4 Alternative 3 (Preferred Alternative)

Dredging

Impacts would be the same as for Alternative 2 but would extend over a slightly longer period.

Electrical Substation

Impacts would be the same as Alternative 2.

Staging Area

Impacts would be the same as Alternative 2.

Placement/Disposal

Impacts would be the same as for Alternative 2.

Local Service Facilities

Berth dredging would be in confined wharf areas where little to no recreational boating or fishing takes place. Wharf improvements are not required for this alternative. Placement of a submerged sheet pile structure with associated rock protection to stabilize the Pier J breakwaters would have negligible impacts because this is in an area where little to no creational boating or fishing takes place. Therefore, the local service facilities would not result in a permanent loss of existing recreational uses.

Significance Determination

There would be no permanent loss of recreational uses because of the proposed Project. Therefore, impacts would be less than significant.

5.13.5 Alternative 4

Dredging

Impacts would be the same as for Alternative 2 but would extend over a slightly longer period.

Electrical Substation

Impacts would be the same as Alternative 2.

Staging Area

Impacts would be the same as Alternative 2.

Placement/Disposal

Impacts would be the same as for Alternative 2.

Local Service Facilities

Berth dredging would be in confined wharf areas where little to no recreational boating or fishing takes place. Wharf improvements are required for this alternative but would not interfere with any recreational uses as they would be located inside container terminals with no public access. Placement of a submerged sheet pile structure with associated rock protection to stabilize the Pier J breakwaters would have negligible impacts to recreation because this is in an area where little to no creational boating or fishing takes place. Therefore, the local service facilities would not result in a permanent loss of existing recreational uses.

Significance Determination

There would be no permanent loss of recreational uses because of the proposed Project. Therefore, impacts would be less than significant.

5.13.6 Alternative 5

Dredging

Impacts would be the same as for Alternative 2 but would extend over a slightly longer period.

Electrical Substation

Impacts would be the same as for Alternative 2.

Staging Area

Impacts would be the same as for Alternative 2.

Placement/Disposal

Impacts would be the same as for Alternative 2.

Local Service Facilities

Berth dredging would be in confined wharf areas where little to no recreational boating or fishing takes place. Wharf improvements are not required for this alternative. Placement of a submerged sheet pile structure with associated rock protection to stabilize the Pier J breakwaters would have negligible impacts to recreation because this is in an area where little to no creational boating or fishing takes place. Therefore, the local service facilities would not result in a permanent loss of existing recreational uses.

Significance Determination

There would be no permanent loss of recreational uses because of the proposed Project. Therefore, impacts would be less than significant.

5.13.7 Summary of Potential Impacts to recreation

No significant unavoidable impacts were identified.

5.13.8 Mitigation Measures

No mitigation would be required as no significant impacts have been identified.

5.14 Public Safety

This section evaluates the potential public health and safety effects of the proposed Project and alternatives. Potential affects addressed in this section include public access and safety during project construction, marine safety and lifeguard services, recreational safety, vessel traffic and safety, and potential public health and safety impacts.

5.14.1 Impact Significance Criteria

An impact to public health and safety would be considered potentially significant if it would:

- Create a health hazard or potential health hazard;
- Expose people to potential health hazards; and/or
- Create navigation hazards or result in unsafe conditions for vessel traffic.

5.14.2 Alternative 1 (No Action)

Construction impacts would not occur. Improvements to the efficiency of the operation of the POLB would not occur.

5.14.3 Alternative 2

Dredging

Dredging is expected to be confined to clean sediments suitable for open ocean placement/disposal. Health hazards from dredging contaminated sediments would not occur. Most of the dredging would be accomplished by electric clamshell dredges reducing the emission of toxic air contaminants to non-hazardous levels. Air emissions would not create a public health hazard or expose people to potential health hazards because of the levels of emissions expected and the distance between the source of the emissions and the nearest public receptors. Dredges and support vessels would display lights and day shapes required by USCG regulations and would not create a navigation hazard.

Additionally, updates would be made to ATONs as required by the USCG. Updates would be required in the Approach Channel expansion and in the Main Channel bend easing. New ATONs would be required in the Pier J Approach. Preliminary information from the USCG indicate that the proposed Federal channel configuration would require four to six buoys. Final array of ATON updates would be determined during PED through consultation with the USCG.

Electrical Substation

Construction of the electrical substation would have negligible impacts to public safety because the substation would be located within the confines of the POLB and is not accessible the public. Therefore, construction of the electrical substation would not create a health hazard, expose people to a health hazard, or result in a navigation hazard.

Staging Area

Use of potential areas within Port boundaries would have negligible impacts to public safety because the staging area would be located within the confines of the POLB and is not accessible the public. Therefore, the staging area would not create a health hazard, expose people to a health hazard, or result in a navigation hazard.

Placement/Disposal

Placement at the Surfside Borrow Site Nearshore Placement Area and disposal at the ODMDS would not create either a health or navigation hazard as placement operations are very short duration (15-30 minutes, 2-3 times per day) and the placement vessel could easily be avoided. Therefore, placement/disposal activities would not create a health hazard, expose people to a health hazard, or result in a navigation hazard.

Local Service Facilities

Berth dredging would be in confined wharf areas that would not create either a health or navigation hazard. Impacts are the same as for federal channel dredging addressed above. Wharf improvements are not required for this alternative. Placement of a submerged sheet pile structure with associated rock protection to stabilize the Pier J breakwaters would have negligible impacts to public safety. Impacts are the same as for federal channel dredging addressed above. Therefore, local service facilities would not create a health hazard, expose people to a health hazard, or result in a navigation hazard.

Significance Determination

The project would not create a health hazard, expose people to a health hazard, or result in a navigation hazard. Therefore, impacts would be less than significant.

5.14.4 Alternative 3 (Preferred Alternative)

Dredging

Impacts would be the same as for Alternative 2 but would extend over a slightly longer period.

Electrical Substation

Impacts would be the same as for Alternative 2.

Staging Area

Impacts would be the same as for Alternative 2.

Placement/Disposal

Impacts would be the same as for Alternative 2.

Local Service Facilities

Impacts would be the same as for Alternative 2.

Significance Determination

The project would not create a health hazard, expose people to a health hazard, or result in a navigation hazard. Therefore, impacts would be less than significant.

5.14.5 Alternative 4

Dredging

Impacts would be the same as for Alternative 2 but would extend over a slightly longer period.

Electrical Substation

Impacts would be the same as for Alternative 2.

Staging Area

Impacts would be the same as for Alternative 2.

Placement/Disposal

Impacts would be the same as for Alternative 2.

Local Service Facilities

Impacts would be the same as for Alternative 2. Impacts associated with wharf improvements would occur within container terminals with no public access. No direct safety impacts would occur due to isolation. Air emissions would not create a public health hazard or expose people to potential health hazards because of the low levels of emissions expected and the distance between the source of the emissions and the nearest public receptors. Therefore, local service facilities would not create a health hazard, expose people to a health hazard, or result in a navigation hazard.

Significance Determination

The project would not create a health hazard, expose people to a health hazard, or result in a navigation hazard. Therefore, impacts would be less than significant.

5.14.6 Alternative 5

Dredging

Impacts would be the same as for Alternative 2 but would extend over a slightly longer period.

Electrical Substation

Impacts would be the same as for Alternative 2.

Staging Area

Impacts would be the same as for Alternative 2.

Placement/Disposal

Impacts would be the same as for Alternative 2.

Local Service Facilities

Impacts would be the same as for Alternative 2.

Significance Determination

The project would not create a health hazard, expose people to a health hazard, or result in a navigation hazard. Therefore, impacts would be less than significant.

5.14.7 Summary of Potential Impacts to public safety

No significant unavoidable impacts were identified.

5.14.8 Mitigation Measures

No mitigation would be required as no significant impacts have been identified.

5.15 Public Utilities

This section addresses public utilities that could be affected by implementation of the proposed action. The season of construction has no bearing on the impact analysis.

5.15.1 Impact Significance Criteria

Significant impacts to public utilities would occur if any of the alternatives result in:

- Substantial and long-term interruption of utility service;
- Substantial alteration to existing public utilities; and/or
- An increased need for additional capacity of existing facilities, including water, sewer, stormwater drainage, solid waste, natural gas, electric power, and telephone service

Because an increase in service demand would not occur with the proposed action, this analysis focuses on displacement or disruption of services and utilities.

5.15.2 Impacts

The project would not result in any interruptions of utility services, alteration to public utilities, or increased need for public utilities for any of the alternatives, including Alternative 1 (No Action). There are no public utilities located in any of the proposed dredge areas (including the berths) or any of the placement/disposal sites. Wharf improvements required for Alternative 4 would not result in any interruptions of utility services, alteration to public utilities, or increased need for public utilities as existing utilities would be protected in place.

5.15.3 Summary of Potential Impacts to public utilities

No significant unavoidable impacts were identified.

5.15.4 Mitigation Measures

No mitigation would be required as no significant impacts have been identified.

6 CUMULATIVE PROJECT IMPACTS

CEQA Guidelines require a discussion of significant environmental impacts that would result from project related actions in combination with "closely related past, present, and probable future projects" located in the immediate vicinity (CEQA Guidelines, § 15130 [b][1][A]). These cumulative impacts are defined as "two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts" (CEQA Guidelines, § 15355).

The discussion of cumulative impacts is further guided by the CEQA Guidelines in §§ 15130(a) and (b), which state:

- An EIR shall not discuss impacts which do not result in part from the project evaluated in the EIR.
- When the cumulative effect of the project's incremental contribution and the effect of other projects is not significant, the EIR shall briefly indicate why and not discuss it further.
- An EIR may identify a significant cumulative effect but determine that a project's contribution is less than cumulatively considerable and less than significant. That conclusion could result if the project is required to implement or fund its fair share of a mitigation measure designed to alleviate the cumulative impact.
- The discussion of cumulative impacts shall reflect the possibility of occurrence and severity of the impacts and focus on cumulative impact to which the identified other projects could contribute.

Federal regulations implementing NEPA (40 C.F.R. §§ 1500-1508) require that the cumulative impacts of a proposed action be assessed. NEPA defines a cumulative impact as an "impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions" (40 C.F.R. § 1508.7).

In general, effects of a particular action or group of actions would be considered cumulative impacts under the following conditions:

- Effects of several actions occur in a common location;
- Effects are not localized (i.e., can contribute to effects of an action in a different location);
- Effects on a particular resource are similar in nature (i.e., affects the same specific element of a resource); and
- Effects are long-term (short-term impacts tend to dissipate over time and cease to contribute to cumulative impacts).

6.1 Description of Cumulative Projects

The cumulative projects considered in the following analyses generally considered those projects in San Pedro Bay as the Region of Influence (ROI). Specifically, the ROI is defined as from the Inner Harbor Channels of the Ports of Los Angeles and Long Beach in the north to the outer breakwater in the south. The only predicted impacts from the proposed project are construction impacts. Cumulative projects, therefore, are limited to those that could overlap with the construction period of 2025-2027. **Table 6-1** includes a listing of those projects considered to be reasonably foreseeable during the construction period.

Table 6-1 Cumulative Projects

Project Title	Project Description	Status	Relevant Potential Cumulative Environmental Factors
Queen Mary Island	The project would redevelop a 45-acre site located at 1126 Queens Highway to include 500,000 square feet of new development to support the existing Queen Mary and Carnival Cruise Line. The new development could include renovating the Queen Mary, retail, restaurants, entertainment activities (e.g., theater, bowling alley, and golf venue), hotel, education and aquatic centers, event spaces, and marina and transportation improvements.	Environmental Review under development. Expected construction date: Unknown, may occur concurrently.	Air Quality/GHG Emissions, Biological Resources, Cultural Resources, Hydrology and Water Quality, Noise, Transportation
Pier B On-Dock Rail Support Facility	The project would reconfigure, expand, and enhance the existing Pier B rail facility to support efficient use of on-dock rail.	Approved project. Expected construction date: February 2023-June 2032.	Air Quality/GHG Emissions
Port of Los Angeles Maintenance Dredging	Maintenance dredging is the routine removal of accumulated sediment from channel beds to maintain the design depths of navigation channels, harbors, marinas, boat launches, and port facilities. This is conducted regularly for navigational purposes (at least once every 5 years).	Continuous but intermittent; on average every 3 to 5 years. Expected construction date: Unknown, may occur concurrently.	Air Quality/GHG Emissions, Marine Biology, Marine Water Quality
Port of Long Beach Maintenance Dredging	Maintenance dredging is the routine removal of accumulated sediment from channel beds to maintain the design depths of navigation channels, harbors, marinas, boat launches, and port facilities.	Continuous but intermittent. Expected construction date: Unknown, may occur concurrently.	Air Quality/GHG Emissions, Marine Biology, Marine Water Quality
San Pedro Bay Federal Channel Maintenance Dredging	Maintenance dredging is the routine removal of accumulated sediment from channel beds to maintain the design depths of navigation channels in both the Port of Los Angeles and the Port of Long Beach	Continuous but intermittent. Expected construction date: Unknown, may occur concurrently.	Air Quality/GHG Emissions, Marine Biology, Marine Water Quality
East San Pedro Bay Ecosystem Restoration Feasibility Study	The proposed feasibility study will investigate alternatives to restore and improve aquatic ecosystem structure and function for increased habitat biodiversity within ESPB.	Environmental Review under development. Expected construction date: Unknown, may occur concurrently.	Recreation

Source: POLB 2019

6.2 Analysis of Cumulative Impacts

6.2.1 Geology and Topography

There are no expected substantial adverse impacts to geology or topography associated with the proposed Project, which is also not expected to contribute to cumulatively significant adverse impacts under any alternative.

6.2.2 Oceanographic and Coastal Processes

The proposed Project is not expected to cause a significant adverse impact to oceanography or coastal processes under any alternative and is also not expected to contribute to cumulatively significant adverse impacts to oceanographic and coastal processes under any alternative.

6.2.3 Water and Sediment Quality

The Project impacts to water and sediment quality would incrementally add to the cumulative impacts of other dredging projects should they occur at the same time. Cumulatively considered, these projects could potentially increase turbidity in the study area and contribute to a decrease in water quality. Potential cumulative impacts may occur if more than one project involving dredging occurs simultaneously or immediately before or after the proposed action in the same vicinity. The only reasonably foreseeable project would be maintenance dredging in the Port of Los Angeles. Chances of overlap are considered to be slight due to the short-term nature of dredging projects and the relatively long interval between maintenance dredging projects in the Port of Los Angeles in the vicinity of the Proposed Project. Because the project would result in short-term localized turbidity that has a low potential for overlapping with turbidity resulting from other projects, and any overlap that would occur would also be short term, no significant long-term cumulative impacts to water resources are anticipated.

6.2.4 Biological Resources

The proposed Project is not expected to cause a significant adverse impact to biological resources under any alternative and is also not expected to contribute to cumulatively significant adverse impacts to biological resources under any alternative.

6.2.5 Air Quality

The greatest cumulative impact on the quality of regional air basin would be the incremental addition of pollutants mainly from the use of heavy equipment and trucks associated with the construction of these projects. The proposed Project has identified significant air quality impacts. Air quality impacts from the cumulative projects are expected to result in adverse impacts. However, the impact of the proposed Project has already been identified as being significant, so that the addition of impacts from the cumulative projects does not result in the identification of new significant impacts solely resulting from the addition of emissions from any of the cumulative projects.

The Greenhouse Gas (GHG) emissions projected from implementation of the proposed Project are considered small and are well below the adopted levels that are considered substantial at both the federal and state levels. Therefore, implementation of the proposed Project would not result in, or considerably contribute to, a cumulatively significant adverse impact to GHG.

6.2.6 Aesthetics

Due to the short-term nature of the more visible construction activities, any overlap between other ongoing or proposed projects in the study area would be minimal and temporary. Therefore, the proposed Project is not expected to contribute to cumulatively significant adverse impacts to aesthetics under any alternative.

6.2.7 Cultural Resources

Cultural resources such as prehistoric sites, historic properties, and cultural landscapes are non-renewable resources, so adverse effects can be permanent. The creation and repetitive expansion of the Ports of Long Beach and Los Angeles within the San Pedro Bay and associated dredging have resulted in the loss of submerged historic and possibly prehistoric archaeological resources in the area. The proposed Project is not expected to cause a significant adverse impact to cultural resources under any alternative and is also not expected to contribute to cumulatively significant adverse impacts to cultural resources under any alternative.

6.2.8 Noise

The proposed Project is not expected to cause a significant adverse impact to noise under any alternative and is also not expected to contribute to cumulatively significant adverse impacts to noise levels under any alternative.

6.2.9 Socioeconomics

The proposed Project and other similar projects would result in long-term beneficial impacts to socioeconomics in the local area and region under all alternatives. There would not be disproportionately high and adverse human health or environmental impacts on minority/low-income populations from the Project singly, or in combination with other similar projects. Other projects in the cumulative assessment are also generally short-term. Implementation of the proposed Project would not result in, or considerably contribute to, a cumulatively significant adverse impact to socioeconomics under any alternative.

6.2.10 Transportation

As discussed in Appendix M (Fehr & Peers 2019), the traffic analysis accounted for future (2040) traffic operations at the 15 study intersections in the vicinity of the proposed project that could be affected by project-related traffic. This data was taken from a recent study published by the Port (Port Master Plan Update Draft Program Environmental Impact Report [PMP EIR], August 2019), which accounts for specific related past, present, and reasonably foreseeable future projects and ambient growth within and surrounding the Port. The analysis also accounts for the completion of the Gerald Desmond Bridge Replacement and Middle Harbor Terminal Redevelopment projects. As described in Section 5.10, good levels of service (LOS D or better) are expected under future conditions for the three analyzed weekday peak hours. Therefore, the proposed project would not result in a significant contribution to cumulative traffic impacts, and impacts would be considered less than cumulatively considerable.

6.2.11 Land Use

Under all alternatives, the project would not cause significant adverse impacts to land use. The cumulatively considered future projects would also be compatible with existing and future land use plans. Combined with the beneficial impacts to land use that would occur with implementation of the proposed action, no cumulatively significant adverse impacts to land use would occur under any alternative.

6.2.12 Recreation

The Proposed Project is not expected to cause a significant adverse impact to recreation under any alternative and is also not expected to contribute to cumulatively significant adverse impacts to recreation under any alternative.

6.2.13 Public Safety

Appropriate public safety measures such as appropriate lighting and marking of dredge and support vessels along with the location and schedule of the dredge and the offshore restricted zone would be published in the USCG Local Notice to Mariners. Air emissions would not create a public health hazard or expose people to potential health hazards because of the levels of emissions expected and the distance between the source of the emissions and the nearest public receptors. Considering the implementation of these and other reasonable public safety measures at the Project site and would be required for all other projects listed in **Table 6-1**, no significant impacts to public safety would occur.

Additionally, updates will be made to ATONS as required by the USCG. Updates will be required in the Approach Channel expansion and in the Main Channel bend easing. New ATONS will be required in the Pier J Approach. Preliminary information from the USCG indicate that the proposed Federal channel configuration would require four to six buoys. Final array of ATON updates will be determined during PED through consultation with the USCG.

6.2.14 Public Utilities

Regional demand for existing utility services such as water, sewer, gas and electric, solid waste, and wastewater would not be incrementally increased by implementation of the proposed project. Short-term cumulative interruption of services would be avoided by project design and monitoring efforts. It is not anticipated that any long-term disruption impacts would occur. Generally, the proposed project and listed cumulative projects would not result in new construction with substantial increase in demand for utilities. Therefore, implementation of the Proposed Project would not result in, or considerably contribute to, a cumulatively significant adverse impact to public utilities under any alternative.

6.2.15 Determination

The USACE has concluded that the cumulative impacts of projects, including maintenance, reconstruction, and upgrades, from current project and reasonably foreseeable future actions in the proximity of Port of Long Beach would be highly localized and would not significantly affect the quality of the existing human environments.

7 EFFECTS FOUND NOT TO BE SIGNIFICANT

Issues that were found to be less than significant without the need for mitigation measures included in this IFR included geology and topography, oceanographic and coastal processes, water and sediment quality, greenhouse gases, aesthetics, cultural resources, noise, socioeconomics, transportation, land use, recreation, public safety, and public utilities. The analysis determined that the proposed Project would not have a long-term significant effect on these elements and the analyses of these issues are detailed in this document in Section 5.

8 UNAVOIDABLE SIGNIFICANT IMPACTS

This IFR considered the potential impacts of the proposed alternatives, in addition to the No Action Alternative, according to several resource categories: geology and topography, oceanographic and coastal processes, water and sediment quality, air quality, greenhouse gases, aesthetics, cultural resources, noise, socioeconomics, transportation, land use, recreation, public safety, and public utilities. Significant unavoidable impacts to air quality may occur from the emissions of toxic air contaminants from construction equipment. Mitigation measures would be implemented but would not reduce impacts to below significance. A description of mitigation and monitoring for the proposed project including potential mitigation measures are included in Section 5.

9 RECOMMENDED PLAN

This section provides a detailed description of the Recommended Plan that was developed and selected through the plan formulation process. The details discussed in this section include plan components, design and construction considerations, operations and maintenance, dredged material placement, costs, benefits, risk and uncertainty, the non-Federal Sponsor's (NFS) view, Environmental Operating Principles (EOPs), and the USACE Campaign Plan.

The USACE process for selecting an alternative begins at the district and NFS level and expands, as products are developed, to incorporate the division and headquarters levels through a series of reviews and approvals, and at the same time allows for feedback and suggestions from resource agencies and stakeholders. For congressionally authorized projects, such as this, the final agency decision maker is the Secretary of the Army through the Assistant Secretary of the Army for Civil Works (ASA [CW]).

The navigation improvements included in the Recommended Plan respond to local needs and desires as well as the economic and environmental criteria used to screen, evaluate, select, and refine measures and alternatives. If implemented, the Recommended Plan would more efficiently handle the current and forecasted vessel fleets and cargo volumes with improved safety, fewer delays, and less congestion than under the No Action Alternative while avoiding all unacceptable adverse environmental impacts, except for significant air quality impacts from construction emissions.

9.1 Description of the Recommended Plan

This section provides details of the Recommended Plan.

9.1.1 General Navigation Features

GNF of the Recommended Plan for liquid bulk vessels includes:

- Deepening the Approach Channel from -76 feet MLLW to -80 feet MLLW
- Bend easing within portions of the Main Channel to -76 feet MLLW

GNF of the Recommended Plan for container ships includes:

- Constructing an Approach Channel to Pier J South from -50 feet MLLW to -55 feet MLLW
- Constructing a turning basin outside of Pier J from -50 feet MLLW to -55 feet MLLW
- Deepening the West Basin from -50 feet MLLW to -55 feet MLLW
- Constructing a new dredge electric substation at Pier J South

Approximately 7.1 mcy of dredged material for the GNF would be placed in a combination of a nearshore site and an EPA-designated offshore disposal site. **Figure 9-1** shows the location of the GNF. To support dredging by an electric clamshell dredge at the Pier J berth, the approach channel and turning basin, a new dredge electric substation is required as a mitigation measure for air quality impacts.

LSF includes channel and berth dredging within the Pier J South Slip to -55 feet MLLW. Approximately 337,000 cy of dredged material would be placed in an EPA-designated offshore disposal site for the LSF. In addition, structural improvement on the Pier J breakwaters at the entrance of the Pier J Slip would be necessary to accommodate deepening of the Pier J Slip and Approach Channel to -55 feet MLLW.

Figure 9-1 The Recommended Plan

9.2 Dredging and Dredged Material Management

9.2.1 Dredging Volumes

Total dredging is approximately 7.4 mcy. **Table 9-1** displays the approximate dredging volumes by location.

Table 9-1 Dredging Volume by Location

Dredge Location	Dredge Depth (ft MLLW)	Dredge Quantity (CY)
Approach Channel	-80	2,600,000
Main Channel Widening	-76	1,065,000
West Basin	-55	717,000
Pier J Approach	-55	2,673,000
Pier J Basin/Berth (LSF)	-55	337,000
Total Dredge Volume		**7,392,000**

9.2.2 Dredged Material Placement Locations

Dredged material will be disposed of in a nearshore placement site (i.e., Surfside Borrow Site Nearshore Placement Area) and ocean-dredged material disposal sites (ODMDS) (LA-2 and LA-3) [see **Figure 9-2**]. The nearshore placement site, approximately 5 miles from the project, can accommodate about 2.5 mcy of dredged material. LA-2 and LA-3, approximately 9 miles and 22 miles, respectively, from the project site, have an annual disposal volume limit of 1.0 and 2.5 mcy, respectively, from all sources. It is assumed that 0.9 mcy for LA-2 and 2.2 mcy for LA-3 is available for use by this project each year.

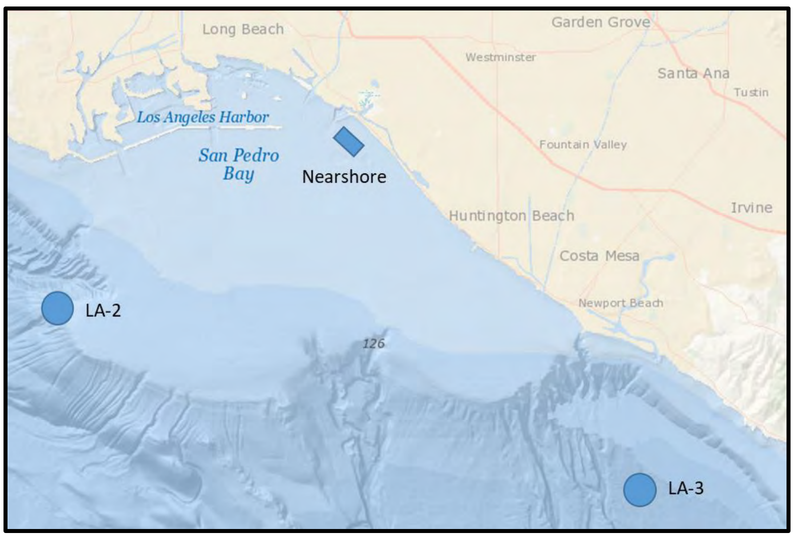


Figure 9-2 Dredged Material Placement Locations

In keeping with the USACE commitment to maximize beneficial reuse of dredged sediments, the project will maximize beneficial reuse if future sites are identified during PED; these could include Port fill projects and use of sediments by the USACE's East San Pedro Bay Ecosystem Restoration Project (should that project be congressionally authorized, funded, and implemented concurrently with the Recommended Plan). In addition, options are available if unsuitable sediments are identified during sediment testing, including Port fill and the use of a borrow pit (North Energy Island) in San Pedro Bay, which has been used in the past for in-water disposal (with capping) of contaminated sediments. Should future beneficial reuse sites be identified, USACE will consider use of such sites in a supplemental documentation. Based on historical sediment quality data, none of the sediments are considered to be suitable for direct placement on the beach based on grain size compatibility issues. However, should sediments suitable for direct beach placement be identified during the sediment test program to be conducted in PED, USACE will identify suitable beach locations in the vicinity needing nourishment and evaluate in a supplemental documentation.

9.2.3 Construction Methodology

The exact construction methodology will be determined by the contractor selected through the contracting process. However, assumptions regarding various construction techniques that could be used were made for planning and estimating purposes.

9.2.4 Type of Dredging Equipment

It is assumed that dredging will be performed using a hopper dredge as well as an electric clamshell dredge. To minimize transit time, disposal of material from the hopper dredge will maximize use of the nearshore site, while a clamshell dredge will be evaluated for disposal at an ODMDS and the nearshore site. To reduce air quality emissions, the construction of an electrical substation, on Pier J, will also be required for this project. Construction would take approximately 2.5 years beginning in 2025.

9.2.5 Dredging Schedule

Project construction is expected to last two and a half years, and the expected construction sequence is shown in **Figure 9-3**. The Approach Channel will be completed in year one, utilizing the Nearshore placement site and LA-2. The rest of the project areas, completed by the clamshell dredge, will take the full 2.5 years. One limiting factor on production is the yearly disposal capacity at the disposal sites LA-2 and LA-3. Another is the production rate (i.e., 6,000 cy/day) that the clamshell dredge can achieve.

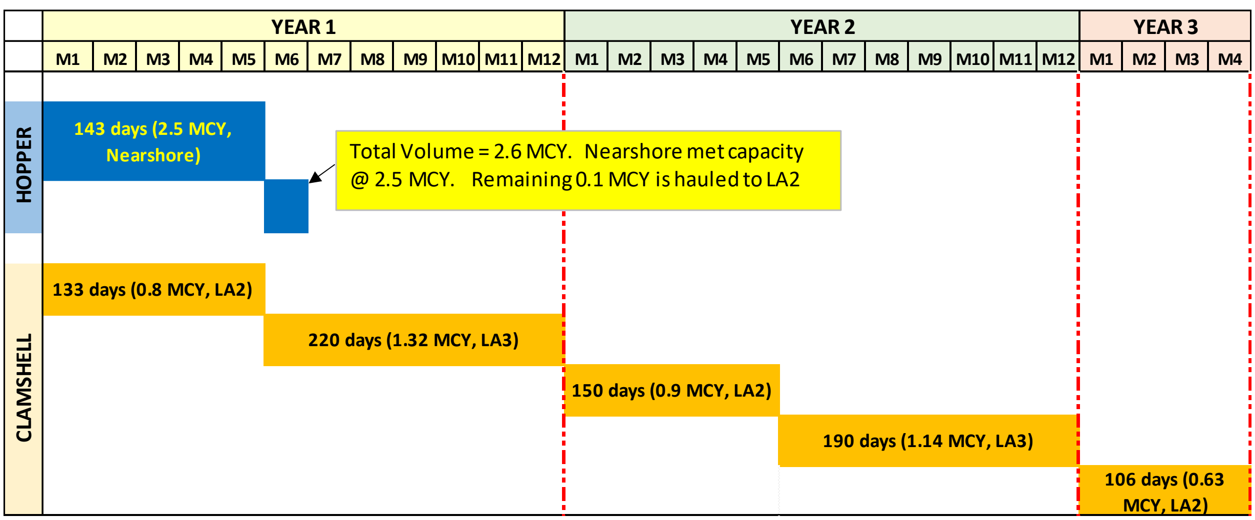


Figure 9-3 Construction Sequence

9.3 Lands, Easements, Rights-of-Way, and Relocation Considerations

The requirements for lands, easements, rights-of-way, and relocations (LERRs) are necessary to support construction, operation, and maintenance for the proposed Project. It is the responsibility of the NFS to acquire real estate interest required for the project. No real estate acquisition is required for the deepening/widening for any of the proposed alternatives, which will entail 100 percent in-water construction. All dredging for the proposed project will be below Mean High Water (MHW) and are within the navigable waters of the United States and are available to the Federal government by navigation servitude.

Two existing ODMDS will be used for the project as well as a nearshore site that has been used as a borrow site for a beach nourishment project. Both ODMDS are designated USEPA sites that are approximately 9 and 22 miles from the project area, in the ocean. Appendix E (Real Estate) provides detailed information pertaining to LERRs required for the project.

There are three proposed staging areas: Pier T Echo (4.4 acres), Pier S (3.3 acres) and Pier D (1 acre) (shown in **Figure 9-4** in blue**)**. The NFS has fee ownership of the proposed staging areas shown in the figure. If access to the proposed project and staging area will be by public roads and the NFS-owned lands are within the proposed project area, a Temporary Work Area Easement will not be required. Pier T was part of the former Long Beach Naval Shipyard, which was BRACed in 1997. The NFS would not be eligible for lands that were previously transferred via BRAC if the acquisition was accomplished at no cost. In addition, Pier T was used as a staging area during part of the Long Beach Channel Deepening Project in 2013.

Figure 9-4 Proposed Staging Areas

9.4 Detailed Cost Estimates and Benefits

This section presents the Federal and non-Federal responsibilities for implementing the Recommended Plan. This includes Federal and non-Federal project cost sharing requirements and the division of responsibilities between the Federal government and the NFS, the POLB. It also lists the steps toward project approval, and a schedule of the major milestones for the design and construction of the Recommended Plan.

The Cost Engineering Appendix (Appendix F) contains detailed information on project costs, cost assumptions, and the associated risks that factored in the contingency. The Economic Appendix (Appendix E) includes detailed discussions of the benefits analysis.

9.4.1 Project Costs and Cost Apportionment for the Recommended Plan

Table 9-2 shows the project cost sharing guidelines for channel depths greater than -50 feet MLLW. The estimates used for the cost apportionment shown in **Table 9-3** are based on the Project First Cost (Constant Dollar Basis) on the Total Project Cost Summary (TPCS) spreadsheet shown in Appendix F, Cost Engineering. USACE guidance requires use of the Constant Dollar Cost estimate at current price levels for feasibility reports and the Chief of Engineers Report. The Constant Dollar Costs at current price levels serve as the basis for the cost of the project for authorization and represents the Project First Cost. Project First Cost include planning, engineering, and design costs, construction management costs, construction costs of the GNF with both federal and NFS in-kind contributions as applicable, LERR values, and contingencies determined through the Cost and Schedule Risk Analysis.

Table 9-2 Cost Sharing for Project Depths > -50 Feet

	Federal	Non-Federal
Construction		
General Navigation Features (GNF)	50%	50 +10%[1]
Aids to Navigation	100%	0%
Local Service Facilities	0%	100%
LERR	0%	100%
Operations and Maintenance		
GNF	50%	50%

[1] The Non-Federal Sponsor shall pay an additional 10% of the costs of GNF in cash over a period of 30 years, at an interest rate determined pursuant to Section 106 of the Water Resources Development Act of 1986. The value of LERR shall be credited toward the additional 10% payment.

As detailed in **Table 9-3**, the Recommended Plan has an estimated project first cost of $136,780,000 for the GNF. The value of lands, easements, rights-of-way, and relocations (LERR), estimated to be $1,462,000, is 100 percent non-Federal expense. The estimated Federal and non-Federal shares for GNF is $67,659,000 and $69,121,000, respectively (FY 2021 Price Level). In addition to the non-Federal Sponsor's (POLB) estimated share of the project first cost for GNF, the non-Federal Sponsor must pay an additional 10 percent of the cost of the GNF of the project less credit for LERR, in cash over a period not to exceed 30 years with interest. The additional 10 percent payment is estimated to be $12,069,800.

ATONS, which have an estimated cost of $653,000, would be provided at 100 percent Federal cost (USCG). Associated LSF costs, estimated to be $18,316,000, will also be the responsibility of the non-Federal Sponsor. Project cost apportionment after the 10 percent payment of GNF and associated ATONS and LSF costs brings the estimated cost share to $56,242,000 Federal and $99,507,000 non-Federal (FY 2021 Price Level).

O&M dredging expenses have been estimated to occur every 25 years at $3,434,500 per dredge cycle, totaling to about $6.9 million (equivalent annual costs estimated at $101,000) over the 50-year period of analysis (2027-2076).

Table 9-3 Detailed Project Costs (Oct 2020 Price Level; 2.5% Discount Rate)

	Total Project	Federal Share	Non-Federal Share
GENERAL NAVIGATION FEATURES (GNF)	> -50 feet	50%	50%
Construction Costs			
Year 1 (Dredging)	$57,225,000	$28,612,500	$28,612,500
Year 1 (Electric Substation)	$13,167,000	$6,583,500	$6,583,500
Year 2 (Dredging)	$30,471,000	$15,235,500	$15,235,500
Year 3 (Dredging)	$10,327,000	$5,163,500	$5,163,500
Preconstruction Engineering and Design (PED)	$16,678,000	$8,339,000	$8,339,000
Construction Management (CM)	$7,450,000	$3,725,000	$3,725,000
TOTAL CONSTRUCTION OF GNF	**$135,318,000**	**$67,659,000**	**$67,659,000**
Lands and Damages	$1,462,000	-	$1,462,000
TOTAL PROJECT FIRST COST GNF	**$136,780,000**	**$67,659,000**	**$69,121,000**
Additional 10% of GNF[1]	**-**	**($12,069,800)**	**$12,069,800**
ASSOCIATED COSTS			
Aids to Navigation (100% Federal—USCG)	**$653,000**	**$653,000**	**-**
Local Service Facilities[2] (100% Non-Federal)	**$18,316,000**	**-**	**$18,316,000**
PROJECT FIRST COST plus ASSOCIATED COSTS	**$155,749,000**	**$56,242,000**	**$99,507,000**
		36%	*64%*
OMRR&R Over 50 Years	$6,869,000	$3,434,500	$3,434,500

1. The non-Federal Sponsor shall pay an additional 10% of the costs of GNF in cash, pursuant to Section 101 of the Water Resources Development Act of 1986. The value of LERR shall be credited toward the additional 10% payment.
2. Includes PED and CM

Based on a FY 2022 discount rate of 2.5 percent and a 50-year period of analysis, the equivalent annual benefits and costs are estimated at $20,960,000 and $5,868,000, respectively **(Table 9-4)**. The project is estimated to provide annual net benefits of $15,092,000 and a benefit-to-cost ratio of 3.6.

Table 9-4 Costs and Benefits Summary (Oct 2020 Price Level)

Equivalent Annual Benefits and Costs	
FY 2021 Price Levels, 50-year Period of Analysis, 2.5% Discount Rate	
	Total
Investment Costs	
Total Project Construction Costs	$155,749,000
Interest During Construction	$7,827,000
Total Investment Cost	$163,576,000
Average Annual Costs	
Interest and Amortization of Initial Investment	$5,767,000
OMRR&R	$101,000
Total Average Annual Costs (A)	$5,868,000
Total Average Annual Benefits (B)	$20,960,000
Net Average Annual Benefits (B-A)	$15,092,000
Benefit-to-Cost Ratio (B/A)	**3.6**

9.4.2 Project Schedule and Interest During Preconstruction Engineering and Design (PED)/Construction

Table 9-5 presents the approximate project milestone schedule durations. The overall schedule and durations depend on the time required to obtain congressional authorization and timely funding. Other areas of schedule uncertainty include the availability of dredging equipment to complete the work and delays due to unexpected severe weather conditions. For interest during construction (IDC) calculations, an 18-month duration was assumed for PED and a 28-month duration was assumed for construction.

IDC accounts for the opportunity cost of expended funds before the benefits of the project are available and is included among the economic costs that comprise the project costs. The amount of the pre-base year cost equivalent adjustments depends on the interest rate; the construction schedule, which determines the point in time at which costs occur; and the magnitude of the costs to be adjusted. The PED durations are included in the IDC, as well as the construction durations. The current construction schedule assumes authorization of the project in a future Water Resources Development Act (WRDA). Assuming Congress provides funding subsequently to authorization of the project, the proposed schedule of activities would follow resulting in benefits starting in the base year of the proposed project (which is assumed to be 2027). The IDC was computed with the 2021 fiscal year Federal discount rate of 2.5 percent. Total PED and construction duration includes 46 months with the PED activity taking about 18 months and the construction taking about 28 months (2 years and 4 months). **Table 9-5** summarizes the PED and construction activities.

Table 9-5 Approximate PED and Construction Duration used to Compute IDC

Description	Duration in Months	Cumulative Months
PED Start	0	S
Design Agreement	5	S+5
Plans and Specifications	18	S+23
Project Partnership Agreement initiated	4	S+27
Advertise Contract (contingent upon funding)	2	S+29
Award Contract	3	S+32
Construction Start (C=Construction Start)	0	C
Construction Complete	28	C+28

9.4.3 Operation, Maintenance, Repair, Rehabilitation, and Replacement (OMRR&R)

Historically, channel deepening projects result in a net increase in O&M dredging requirements. This has been well documented over multiple historic deepening and widening projects (Rosati 2005; Vincente and Uva 1984). Sedimentation will result in the need for O&M dredging at the recommended depth over the project life. The main sources of sedimentation within the inner port and berths is prop wash from the large propellers of commercial vessels along with the small amounts of sediment inflow from the channel through Queen's Gate.

O&M within the harbor and berth areas of the port are maintained by the Port of Long Beach Authority under a Waste Discharge Requirements Authorization from the State of California Regional Water Quality Control Board for maintenance dredging, which is renewed every five years (most recently in 2018). From 2014-2018 POLB Authority maintenance dredging amounted to only 170,000 cy, the majority of which was placed in LA-2 ODMDS. O&M for the Approach Channel is performed by the USACE, while the Main Channel has been maintained through collaboration of POLB and USACE. The USACE maintains a Dredged Material Management Plan for the Los Angeles region, which outlines strategies for management of dredged sediments, which includes offshore disposal (LA-2). Since navigation improvement dredging of the Main Channel in 2014, there has been no sedimentation within the channel requiring maintenance. For the Approach Channel, since navigation improvements completed in 2001,there is presently a 40,000-cubic-yard shoal within authorized channel limits, which does not impact navigability. O&M dredging of the federal channels included in the Recommended Plan is anticipated to occur every 25 years. With the addition of new channels (Pier J Approach Channel and the West Basin) as well as deepening of existing channels, the maintenance footprint increases over current O&M, which will most likely lead to a higher volume of material to be dredged. An increase in the frequency of O&M dredging is not anticipated within the harbor and berths, current federal channels, or the new Pier J Approach due to the implementation of the Recommended Plan. The increase in average annual O&M costs is estimated at $101,000.

9.4.4 Financial Analysis of Non-Federal Sponsor's Capabilities

A financial analysis is required for any plan being considered for USACE implementation that involves non-federal cost sharing. The purpose of the financial analysis is to ensure that the non-federal sponsor understands the financial commitment involved and has reasonable plans for meeting that commitment. By memorandum dated April 24, 2007, the Assistant Secretary of the Army (Civil Works), granted approval of the self-certification of NFSs for their ability to pay the non-federal share of projects. The self-certification is required prior to submission of the Project Partnership Agreement, typically during the PED phase of the project. Included with the self-certification, the financial analysis shall include the NFS's statement of financial capability, the NFS financing plan, and an assessment of the NFS's financial capability.

9.4.5 View of Non-Federal Sponsor

The POLB, the NFS, supports this project.

9.4.6 Summary of Accounts

The federal process incorporates four accounts to facilitate evaluation and display of effects of alternative plans. The four accounts are NED, EQ, RED, and OSE. They are established to facilitate evaluation and display of effects of alternative plans. The NED account is required. Other information that is required by law or that would have a material bearing on the decision-making process should be included in the other accounts, or in some other appropriate format used to organize information on effects. The federal objective is to determine the project alternative that reasonably maximizes net benefits while protecting the Nation's environment. The environmental effects of the Recommended Plan were evaluated under the EQ account and are detailed in Section 5. The economic analysis evaluated the NED benefits and costs of the Recommended Plan. The economic analysis also evaluated the RED impacts of the Recommended Plan. OSE considerations are discussed in Section 4.7.

The NED account displays changes in the economic value of the national output of goods and services. Under this account, the Recommended Plan generates average annual equivalent (AAEQ) net benefits of about $21 million with a benefit-cost ratio (BCR) of 3.6.

9.4.7 Risk and Uncertainty

Risk and uncertainty exist in the project benefits projected and in the cost estimates. There are also technical risks and uncertainties which were addressed during the study using a Risk Register. The purpose of the register is to apply a risk-based decision-making approach throughout the study. The register was used to highlight areas of study risks and identify ways to address those risks, such as reducing the schedule, optimizing the study area, and identifying the optimum amount of modeling to make a risk-based decision.

The benefits are a function of projected cargo and fleet forecasts, vessel operating costs, vessel itineraries, and changes in the overall economy, including the balance of trade between nations – in particular, with Asia. There are also uncertainties regarding changes in port operations and infrastructure.

A potential area of risk is sediment testing of the dredge material and the determination of suitability for ocean disposal and nearshore placement. Sediment testing will take place during PED. Options are available if unsuitable sediments are identified during sediment testing, including port fill projects and use of a borrow pit in San Pedro Bay, which has been previously used for in-water disposal (with capping) of contaminated sediments.

Another potential area of risk are the annual disposal volume limits on the proposed ocean disposal sites. As previously discussed, LA-2 has an annual disposal volume limits of 1.0 mcy from all sources, and 0.9 mcy were assumed to be available for use by this project annually. Use of LA-2 by other projects for implementation at the same time as this project would allow for less than the optimal 0.9 mcy material placed at this site. However, this risk is minimized by having the contingency of using the second ocean disposal site, LA-3, for excess material. According to USEPA, if implementation timing of various projects cannot be adjusted to avoid exceeding the annual maximum capacity at either site, one alternative would involve additional funds that could be allocated for site monitoring (e.g., multi-beam echosounder survey or sediment profile imaging) to assess the physical impacts of the additional dredged material disposed at either site.

A potential area of risk is the timely construction of the electric substation near Pier J. Dredging of Pier J slip, berth, and approach with an electric clamshell dredge is contingent on the completion of the substation, which would serve as a power supply. The Port already constructed an existing electric substation near Pier T that would serve as a power supply to the electric clamshell dredge when working on the West Basin and Main Channel widening. The Port has technical knowledge and understanding of the design, lead time, and necessary coordination (i.e., Southern California Edison) for the new substation to tie-in to existing grid.

Portions of the proposed channel dredging at Pier J are within the vicinity of existing port structures (i.e., bulkhead walls, breakwaters, and rock dikes). To minimize any potential damages or undermining of these structures, stand-off distances, where no dredging will be performed, from the toe of the structures are recommended. In addition, dredging the Pier J transition area could be subject to slope failures as the bottom toe of the east breakwater is less than 100 feet from the Federal Channel. To minimize slope failure risks within this area, a clamshell dredge would be used; the footprint for the transition area could also be moved farther away from the breakwater, if needed.

The presence of rock and debris during dredging operation is a potential risk. During the 1998-1999 deepening of the Approach Channel, rock and debris were unexpectedly encountered during dredging operations. Larger size stones would cause the suction heads to be raised and lose suction power, affecting the hopper dredge's performance. All stones encountered were located seaward of Queen's Gate; no record of any stone encountered landward of Queen's Gate. Detailed subsurface explorations during PED would be conducted to better characterize the materials in the project area.

The above factors, as well as analysis of each project element, were incorporated into the Cost and Schedule Risk Assessment (CSRA) process to develop a more statistically based project contingency. Areas of specific risk to cost and schedule were translated into higher contingencies, which were then applied to the total project cost. As additional information is developed during the PED phase, the risk and uncertainty of these factors are expected to decrease.

The project is largely comprised of dredging operations, which USACE and the Port have significant experience with at the POLB. This gives USACE a level of confidence that the cost estimates are reasonable. Cost contingencies and incremental costs are discussed in Appendix F (Cost Engineering).

There is no risk to LSF for the planning (2027-2077) and adaptation (2077-2127) horizons due to SLR for either the Low or Intermediate USACE SLC curves. However, for the High SLC curve beyond the year 2100 there is uncertainty in possible impacts to LSF. The POLB maintains an extensive Climate Adaptation and Coastal Resiliency Plan that guides design and management of port facilities in response to these uncertainties of direct and indirect risks associated with climate change and SLR. Further discussion of this is in Appendix B (Coastal Engineering) Section 2.6.2.

9.4.8 With-Project Sea Level Change

The Recommended Plan is not expected to cause a change in wave energy transmission from the exterior to Inner Harbor regions, as there is expected to be no decrease in wave attenuation or protection provided by the Middle and Long Beach Breakwaters. Following recent repairs by USACE in 2019 the breakwaters are currently fully performing as designed, with crest elevation of 14 feet MLLW. If the most aggressive sea level change of 2.3 feet at 50 years occurs, the structures would maintain their designed performance in wave attenuation and protection for the life of the project, with no impact to project area function.

9.5 Environmental Operating Principles

The USACE Environmental Operating Principles (EOPs) have been taken into consideration throughout the study process and will continue to be part of construction and operation of the Recommended Plan. Below are the USACE EOPs:

- Foster sustainability as a way of life throughout the organization.
- Proactively consider environmental consequences of all USACE activities and act accordingly.
- Create mutually supporting economic and environmentally sustainable solutions.
- Continue to meet our corporate responsibility and accountability under the law for activities undertaken by the USACE, which may impact human and natural environments.
- Consider the environment in employing a risk management and systems approach throughout the life cycles of projects and programs.
- Leverage scientific, economic, and social knowledge to understand the environmental context and effects of USACE actions in a collaborative manner.
- Employ an open, transparent process that respects views of individuals and groups interested in USACE activities.

In coordination with the agencies and other stakeholders, the USACE will proactively consider the environmental consequences of the proposed project. Avoidance and minimization measures were evaluated, and mitigation will be provided, where necessary. In accordance with the mandate of this designation and the EOPs, the USACE has proposed a plan that supports economic and environmentally sustainable solutions.

9.6 USACE Campaign Plan

USACE Vision: A great engineering force of highly disciplined people working with our partners through disciplined thought and action to deliver innovative and sustainable solutions to the Nation's engineering challenges.

USACE Mission: Provide public engineering services in peace and war to strengthen our Nation's security, energize the economy, and reduce risks from disasters.

Commander's Intent: The USACE will be one disciplined team, in thought, word, and action. We will meet our commitments, with and through our partners, by saying what we will do and doing what we will say. Through execution of the Campaign Plan, the USACE will become a GREAT organization as evidenced by the following in all mission areas: delivering superior performance; setting the standard for the profession; making a positive impact on the Nation and other nations; and being built to last by having a strong "bench" of educated, trained, competent, experienced, and certified professionals.

This IFR is consistent with these themes. The vertical USACE project team has jointly applied, and will continue to apply, the latest policy and planning guidance and worked closely with federal, State and local stakeholders and professionals familiar with the problems, opportunities and resources of the Port of Long Beach to evaluate the feasibility of providing navigation improvements in an expeditious fashion to achieve the common goals of providing safe, effective, and efficient navigation while protecting the environment.

10 ENVIRONMENTAL COMPLIANCE AND COMMITMENTS

10.1 Compliance with Applicable Regulatory Statutes and Permit Requirements

Federal and state environmental requirements considered in the preparation of this IFR are briefly reviewed in the following subsections. Applicable local regulations are presented in this Section 10, as appropriate.

10.1.1 Federal Environmental Regulations

National Environmental Policy Act of 1969 (42 U.S.C. 4321, et seq.)

This EIS has been prepared in accordance with the requirements of NEPA and the CEQ Regulations for Implementing the Procedural Provisions of NEPA (40 Code of Federal Regulations [CFR] 1500-1508), as well as USACE's NEPA regulations at 33 C.F.R. part 230 (also ER 200-2-2). USACE did not identify any agencies capable of or willing to participate as cooperating agencies in accordance with NEPA guidelines. Estimated dredge volumes have increased slightly in the Final IFR due to the availability and use of recent bathymetric surveys. The increased sediment volume does not change the analysis or result in different effects conclusions. Therefore, the analysis in this Final IFR is adequate.

Coastal Zone Management Act of 1972 (16 U.S.C. 1451, et seq.)

The Coastal Zone Management Act (CZMA) preserves, protects, develops, and, where possible, restores or enhances the Nation's coastal zone resources for this and succeeding generations. Section 307(c) of the CZMA, called the "federal consistency" provision, requires that federal actions, within and outside the coastal zone, which have reasonably foreseeable effects on any coastal use (land or water) or natural resource of the coastal zone be consistent with the enforceable policies of a state's federally approved coastal management program. Federal agency activities must be consistent to the maximum extent practicable with the enforceable policies of a state coastal management program. The term "consistent to the maximum extent practicable" means fully consistent with the enforceable policies of management programs unless full consistency is prohibited by existing law applicable to the Federal agency. 15 C.F.R. 930.32(a)(1). The federal government certified the California Coastal Management Program (CCMP) in 1977. The enforceable policies of that document are Chapter 3 of the California Coastal Act of 1976. All consistency documents are reviewed for consistency with these policies.

The USACE has determined, based on the evaluation of potential impacts in this IFR, that the project is consistent to the maximum extent practicable with the enforceable polices of the CCMP. The USACE, by means of an exception to Planning Bulletin 2018-01(S) [PB], issued 20 June 2019, proposes to complete CZMA consultation through concurrence from the California Coastal Commission (CCC) during the PED phase. The Assistant Secretary of the Army (Civil Works) granted the exception on June 4, 2021, a copy of which can be found in Appendix A. CCC staff has indicated support for the project, including a written declaration that there are no foreseeable issues that would delay or prevent future concurrence with the USACE Consistency Determination. A copy of the CCC's letter can be found in Appendix A.

Clean Water Act (33 U.S.C. 1251, et seq.)

Sections 404 and 401 of the Clean Water Act (CWA) pertain directly to the proposed project.

Section 404 of the CWA governs the discharge of dredged or fill material into waters of the U.S. Although the USACE does not process and issue itself a permit for its own activities, the USACE authorizes its own discharges of dredged or fill material by applying all applicable substantive legal requirements. A Section 404(b)(1) evaluation is prepared and included in this IFR as Appendix D. The 404(b)(1) evaluation demonstrates the Recommended Plan complies with the 404(b)(1) guidelines. The Recommended Plan is the least environmentally damaging practicable alternative (LEDPA).

The USACE will ensure that this project, as proposed, is consistent, or otherwise in compliance with, the USEPA's Section 404(b)(1) guidelines (40 CFR Part 230). Unless exempted under Section 404(r) of the CWA, the 404(b)(1) guidelines prohibit the USACE from undertaking a project unless it is the LEDPA. If exempted under 404(r) specifically during project authorization, the USACE can implement a plan that is not the LEDPA and would also be exempt from Section 401 CWA compliance. In the absence of a Section 404(r) exemption, during PED the USACE will request water quality certification, along with information and data demonstrating compliance with state water quality standards, from the Los Angeles RWQCB, pursuant to 33 CFR 336.1(a)(1) and (b)(8). Information to be developed during PED includes the testing of sediments and making suitability determinations for disposal of sediment at the Surfside Borrow Site Nearshore Placement Area. The RWQCB has provided a letter of support for the project, a copy of which can be found in Appendix A. The IFR contains sufficient information regarding water quality effects, including consideration of Section 404(b)(1) guidelines, to meet EIS content requirements of Section 404(r), should that exemption be invoked.

River and Harbor Act of 1899, as amended (33 U.S.C. 403)

Section 10 of the River and Harbor Act prohibits the unauthorized obstruction or alteration of any navigable waters of the United States, and authorizes the USACE to regulate all activities that affect the course, capacity, or coordination of navigable waters of the U.S. Navigable waters of the U.S. are defined in 33 CFR Part 329 as those waters that are subject to the ebb and flow of the tide and/or are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce. USACE has complied with River and Harbor Act in the development of this Integrated Report.

Fish and Wildlife Coordination Act (16 U.S.C. 661, et seq)

This Act requires Federal agencies to coordinate with the USFWS and local State agencies when any stream or body of water is proposed to be impounded, diverted, or otherwise modified. The intent is to give fish and wildlife conservation equal consideration with other purposes of water resources development projects. Coordination under the Act is ongoing. In response to the requirements of this Act, USACE is coordinating with the USFWS and the California Department of Fish and Wildlife (CDFW) during the initial and current stages of planning. The USACE has coordinated with the USFWS, including preparation of a Planning Aid Report (PAR), and also participated in discussions of the project during meetings of the Southern California Dredged Material Management Team and CDFW in the development of the proposed alternatives, environmental commitments, and potential mitigation measures. The USFWS prepared and submitted a PAR in accordance with the Act. A copy of the PAR is attached to this document in Appendix I. A Final Coordination Act Report (CAR) was submitted to the USACE on April 14, 2021. A copy of the Final CAR can be found in Appendix I.

Endangered Species Act (16 U.S.C. 1531, et seq)

The Endangered Species Act of 1973 (ESA) protects endangered and threatened species by prohibiting Federal actions that would jeopardize the continued existence of such species or result in the destruction or adverse modification of habitat of such species. USACE requested a species list of Federal endangered and threatened species from the USFWS on July 31, 2017. USFWS responded, on September 3, 2014, that they “generally don’t provide species lists except through our ECOS portal.” A species list was requested from the portal on February 18, 2015, with an updated list requested on March 10, 2015. USACE requested a species list of Federal endangered and threatened species from the NMFS on July 31, 2014. A species list was provided on August 29, 2014. Additional and more recent ongoing coordination with respect to Federal endangered and threatened species has occurred with both USFWS and NMFS in the development of this IFR. Federally endangered or threatened species that inhabit the project area are listed and discussed in Section 3.4 and Section 5.4.

Telephone discussions were held with the NMFS on February 23, 2021, and July 28, 2021 to discuss effects to green sea turtle. On July 29, 2021, the USACE submitted a written request for informal consultation to the NMFS. This was followed up with a conference call held on August 4, 2021, during which the USACE verified with NMFS the current accuracy of their species list. Following the August 4, 2021, conference call, the USACE prepared a revised informal consultation request letter dated August 9, 2021. The August 9, 2021, request letter also serves as the biological assessment, which can be found in Appendix A, Attachment 4.1. With the implementation of certain measures to avoid and minimize impacts to green sea turtle (listed in Section 5.4), USACE has determined that the project may affect, but is not likely to adversely affect, green sea turtle. The NMFS concurred with the USACE’s may affect not likely to adversely affect green sea turtles by letter dated August 31, 2021, thus concluding informal consultation. A copy of this letter can be found in Appendix A.

Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. 1801, et seq.)

Federal agencies must consult with the NMFS on actions that may adversely affect Essential Fish Habitat (EFH). EFH is defined as those “waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity.” NMFS encourages streamlining the consultation process using review procedures under NEPA, Fish and Wildlife Coordination Act, CWA, and/or Endangered Species Act provided that documents meet requirements for EFH assessments under Section 600.920(g). EFH assessments must include (1) a description of the proposed action, (2) an analysis of effects, including cumulative effects, (3) the Federal agency’s views regarding the effects of the action on EFH, and (4) proposed mitigation, if applicable. An EFH assessment has been prepared in conjunction with this IFR. NMFS provided their conservation recommendation letter on December 23, 2019. USACE response to recommendations provided to NMFS on July 22, 2020 (see Appendix A).

Marine Mammal Protection Act (16 U.S.C. 1361, et seq)

The Marine Mammal Protection Act (MMPA) protects marine mammals and establishes a marine mammal commission to regulate such protection. The requirements of this Act were considered in the evaluation of environmental consequences of the alternatives The MMPA was considered and evaluated in the development of this IFR in Section 5.4.

Migratory Bird Treaty Act (MBTA) (16 U.S.C. 703-711)

The Migratory Bird Treaty Act (1916) agreed upon between the United States and Canada; the Convention for the Protection of Migratory Birds and Animals (1936), agreed upon between the United States and Mexico; and subsequent amendments to these Acts, collectively referred to as the MBTA, provide legal protection for almost all breeding bird species occurring in the United States. These Acts restrict the killing, taking, collecting, and selling or purchasing of native bird species or their parts, nests, or eggs. Certain game bird species are allowed to be hunted for specific periods determined by federal and state governments. The intent of the Act is to eliminate any commercial market for migratory birds, feathers, or bird parts, especially for eagles and other birds of prey. The proposed action complies with this Act in that no occupied nests will be destroyed, and the action will not disrupt migratory patterns. The MBTA was considered and evaluated in the development of this IFR in Section 5.4.

National Historic Preservation Act (54 U.S.C. 306101, et seq.)

Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended, established the National Register of Historic Places (NRHP), which is a master list of historic properties of national, state, and local significance. Under Section 106, agencies are required to consider the effects of their actions on properties that may be eligible for or are listed in the NRHP. The NRHP established the Advisory Council on Historic Preservation (ACHP) to comment on federally licensed, funded, or executed undertakings affecting National Register properties. Regulations of the ACHP (36 C.F.R. part § 800) provide guidance for Federal agencies to meet Section 106 requirements. This process involves consultation with the State Historic Preservation Officer (SHPO), the ACHP, and other interested parties, including Native American Tribes, as warranted. Pursuant to Section 106 of the NHPA, the USACE consulted with the SHPO and obtained a concurring comment of no historic properties affected, as evidenced in a letter received December 9, 2020 (Appendix N). The USACE, therefore, has no further obligations under the NHPA.

Archaeological Resources Protection Act of 1979

Not applicable as Federal or Tribal lands are not involved in this project.

Native American Graves Protection & Repatriation Act (25 U.S.C. 3000-3013, 18 U.S.C. 1170)

Not applicable as Federal or Tribal lands are not involved in this project. If Native American remains and associated funerary objects are disturbed, USACE would follow the procedures for unanticipated discoveries in 36 C.F.R. 800.13.

American Indian Religious Freedom Act of 1978 (42 USC 1996)

Not applicable as Federal lands are not part of this project. USACE consulted with the Indian tribes as required under Section 106 of the National Historic Preservation Act.

Clean Air Act (42 U.S.C. 7401, et seq)

The CAA regulates emissions of air pollutants to protect the nation's air quality. The CAA is applicable to permits and planning procedures related to the disposal of dredged materials onshore and in open waters within 3 miles (mi) of the nearest shoreline. Section 118 of the CAA (42 U.S.C. § 7418) requires all Federal agencies engaged in activities that may result in the discharge of air pollutants to comply with Federal and State laws, and interstate and local requirements regarding control and abatement of air pollution.

Section 176(c) requires all Federal projects to conform to USEPA approved or promulgated SIPs. This Act was considered in the evaluation of consequences of the alternatives. CAA Applicability Analysis is addressed for this action (Section 5.5). The CAA final General Conformity Determination for the Recommended Plan is included in Appendix H5. The Recommended Plan conforms to the latest EPA-approved AQMP as the emissions from the project are accommodated within the AQMP's emissions budgets, and the proposed project is not expected to result in any new or additional violations of the NAAQS or impede the projected attainment of the NAAQS.

Federal Water Project Recreation Act (16 U.S.C. 460l-12 – 460l-22, 662)

This Act requires that any Federal water project must give full consideration to opportunities afforded by the project for outdoor recreation and fish and wildlife enhancement. The proposed action would not impact any recreational uses in the study area.

Section 103 of the Marine Protection, Research and Sanctuaries Act, 33 U.S.C. 1413

Section 103 of the MPRSA of 1972, or Ocean Dumping Act, regulates the transportation of dredged material for the purpose of dumping it into ocean waters, where the USACE determines that the dumping will not unreasonably degrade or endanger human health, welfare, or amenities, or the marine environment, ecological systems, or economic potentialities. Ocean disposal of dredged material associated with the Recommended Plan would be at the LA-2 and LA-3 ODMDS. Testing of sediments proposed for ocean disposal would be conducted during PED in consultation with the Southern California Dredged Material Management Team (SC-DMMT) in accordance with the Green Book (USEPA & USACE 1991). The USACE will evaluate test results, make a suitability determination, and seek formal concurrence from the USEPA, all which will be documented in an appropriate supplement to the IFR.

Executive Order 11990, Protection of Wetlands

This Executive Order requires that governmental agencies, in carrying out their responsibilities, provide leadership and "take action to minimize the destruction, loss, or degradation of wetlands, and to preserve and enhance the natural and beneficial values of wetlands." This Executive Order was considered in the development of alternatives. The action will have no permanent adverse effect on wetlands.

Executive Order 11991

This Executive Order is related to protection and enhancement of environmental quality. Section 1 of this Executive Order directs the CEQ to issue guidelines to Federal agencies for implementing procedural provisions of NEPA (1969). The guidelines recommend early EIS preparation and preparation of impact statements that are concise, clear, and supported by evidence that agencies have made the necessary analyses. These guidelines (ER 200-2-2, 33 CFR 230 March 1988) were followed in the preparation of this IFR.

Executive Order 13045

On April 21, 1997, President Clinton signed Executive Order 13045, Protection of Children from Environmental Health Risks and Safety Risks (62 Fed. Reg. 19885 (1997)). The policy of the Executive Order states that:

> A growing body of scientific knowledge demonstrates that children may suffer disproportionately from environmental health risks and safety risks. These risks arise because: children's neurological, immunological, digestive, and other bodily systems are still developing; children eat more food, drink more fluids, and breath more air in proportion to their body weights than adults; children's size and weight may diminish their protection from standard safety features; and children's behavior patterns may make them more susceptible to accidents because they are less able to protect themselves. Therefore, to the extent permitted by law and appropriate, and consistent with the agency's mission, each Federal agency;
>
> (a) shall make it a high priority to identify and assess environmental health risks and safety risks that may disproportionately affect children; and
>
> (b) ensure that its policies, programs, activities, and standards address disproportionate risks to children that result from environmental health risks or safety risks.

To assess the potential for impacts to disproportionately accrue to children, it is important to document those land uses surrounding the proposed project sites (i.e., receiver sites) that are likely to contain a higher proportion of children throughout the course of a day. For the purposes of this analysis, children are considered those individuals who are under 18 years of age and the sensitive land uses identified include schools, parks, and daycare centers within 0.25 mile and 0.5 mile from the proposed action sites. It is considered that health and safety risks to children, if they were to occur as part of the proposed action, would occur within these buffer zones. Existing land use maps were used to identify child focused these land uses. Schools and parks are relatively well documented on such maps. Daycare centers vary in size and can include in-home daycare providers, stand-alone institutional centers, or larger centers associated with another facility such as a church or larger school. Larger facilities or those associated with other facilities are typically more commonly documented on land use maps. Smaller facilities may not be included in mapping, but these are not necessarily dedicated child-focused land uses and are more similar in nature to residences than schools with respect to the number of children present on-site.

Child-focused land uses do not occur within the project area. Therefore, children would not suffer disproportionately from environmental health risks and safety risks.

Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations

This Executive Order focuses Federal attention on the environment and human health conditions of minority and low-income communities and calls on agencies to achieve environmental justice as part of its mission.

The Executive Order requires the USEPA and all other Federal agencies (as well as state agencies receiving Federal funds) to develop strategies to address this issue as part of the NEPA process. The agencies are required to identify and address, as appropriate, any disproportionately high and adverse human health or environmental impacts of their programs, policies, and activities on minority and low-income populations. The Executive Order makes clear that its provisions apply fully to programs involving Native Americans. The CEQ has oversight responsibility for the Federal government's compliance with E.O. 12898 and NEPA. The CEQ, in consultation with the USEPA and other agencies, has developed guidance to assist Federal agencies with their NEPA procedures so that environmental justice concerns are effectively identified and addressed. According to the CEQ's Environmental Justice Guidance under the National Environmental Policy Act, agencies should consider the composition of the affected area to determine whether minority populations or low-income populations are present in the area affected by the proposed action, and if so whether there may be disproportionately high and adverse human health or environmental impacts (CEQ 1997).

An analysis of demographic data was conducted to derive information on the approximate locations of low-income and minority populations in the community of concern. Since the analysis considers disproportionate impacts, two areas must be defined to facilitate comparison between the area actually affected and a larger regional area that serves as a basis for comparison and includes the area actually affected. The larger regional area is defined as the smallest political unit that includes the affected area and is called the community of comparison. For purposes of this analysis, the affected area is a one-mile radius around the project area, and the city of Long Beach is the community of comparison.

Minority populations: EO 12898 defines a minority as an individual belonging to one of the following population groups: American Indian or Alaskan Native; Asian or Pacific Islander; Black, not of Hispanic origin; or Hispanic. A minority population, for the purposes of this environmental justice analysis, is identified when the minority population of the potentially affected area is greater than 50 percent or the minority population is meaningfully greater than the general population or other appropriate unit of geographic analysis. USEPA's EJScreen tool was used to obtain the study area demographics. **Table 10-1** provides a summary of the study area demographics, complete EJScreen Reports can be found in Appendix K.

Table 10-1 Study Area Demographics

Demographic Affected	Area	State	City
Minority Population	63%	62%	72%
Low-income Population	0%	35%	42%

Poverty Rates: The EO does not provide criteria to determine if an affected area consists of a low-income population. For purposes of this assessment, the CEQ criterion for defining low-income population has been adapted to identify whether the population in an affected area constitutes a low-income population. An affected geographic area is considered to consist of a low-income population (i.e., below the poverty level, for purposes of this analysis) where the percentage of low-income persons: 1) is greater than 50 percent, or 2) is meaningfully greater than the low-income population percentage in the general population or other appropriate unit of geographic analysis. The United States Census Bureau poverty assessment weighs income before taxes and excludes capital gains and non-cash benefits (such as public housing, Medicaid, and food stamps). **Table 10-1** provides a summary of the income and poverty status for the study area.

As shown in the table above, the aggregate minority population is 72 percent of the total population in the city, and 63 percent of the total population in the affected area. The aggregate population percentage in the affected area does exceed 50 percent. The affected area minority population percentage is greater than the minority population percentage in the state of California as a whole, which is approximately 62 percent, but is not greater than the city of Long Beach, which is 72 percent. The minority population in the project area exceeds 50 percent, therefore we have a minority population in the project area.

As shown in the table above, 0 percent of the individuals in the affected area are considered below the poverty level. This percentage in the affected area does not exceed 50 percent. In addition, the affected area low-income population percentage is not greater than the low-income population in the city, which is 42 percent, or the state of California, which is 35 percent. Therefore, the affected area does not contain a high concentration of low-income population.

The project area includes an EJ community. However, project impacts are restricted to construction impacts. Construction impacts are in the Outer Harbor and two terminals both of which are located remotely from any potential project impacts. The minority population would, therefore, not be directly affected by the project. A health risk assessment, for example, was prepared by the POLB. It shows that there would be no increase in health risks to the minority population because of the project. Therefore, there would not be disproportionately high and adverse human health or environmental impacts on minority populations.

Executive Order 13045, Environmental Health and Safety Risks to Children

This Executive Order is designed to focus Federal attention on actions that affect human health and safety conditions that may disproportionately affect children. Consistent with Executive Order 13045, the project would not disproportionately impact children in the region of influence.

Executive Order 11593, Protection and Enhancement of the Cultural Environment, 13 May 1971

Coordination with the State Historic Preservation Officer signifies compliance

Executive Order 11988, Floodplain Management, 24 May 1977 amended by Executive Order 12148, 20 July 1979.

Not applicable; project is not located within a floodplain.

Executive Order 13175, Consultation and Coordination with Indian Tribal Governments, 6 November 2000

Consultation with Indian Tribal Governments, where applicable, and consistent with executive memoranda, DoD Indian policy, and USACE Tribal Policy Principals signifies compliance.

Executive Order 13112, Invasive Species Control, 3 February 1999

The project will not introduce invasive species to the project area and is therefore compliant with the EO.

Executive Order 13186, Protection of Migratory Birds, 10 January 2001

Consultation with USFWS, which was completed in April 2021, signifies compliance.

Executive Order 13007, Accommodation of Sacred Sites, 24 May 1996

Not applicable as Federal lands are not involved.

Executive Order 13807, Establishing Discipline and Accountability in the Environmental Review and Permitting Process for Infrastructure Projects

Full Compliance will be met upon issuance of a Record of Decision.

10.1.2 State Environmental Regulations

California Environmental Quality Act (Public Resources Code, Sections 21000-21177)

This Act requires that state and local agencies consider environmental consequences and project alternatives before a decision is made to implement a project requiring state or local government approval, financing, or participation by the State of California. In addition, CEQA requires the identification of ways to avoid or reduce environmental degradation or prevent environmental damage by requiring implementation of feasible alternatives or mitigation measures. This Integrated Report was prepared in accordance with this regulation.

California Coastal Act of 1976, as amended

The Act specifies basic goals for coastal conservation and development related to protection, enhancement and restoration of coastal resources, giving priority to "coastal-dependent" uses and maximizing public access to California residents and visitors. The Act defines the "coastal zone" of California, which generally extends 3.0 mi out to sea and inland generally 1,000 yards (yd). It may be extended further inland in certain circumstances. It is also less than 1,000 yd wide in some urban areas. Each city and county in California, which, is on the coast must prepare a Local Coastal Program (LCP) for all areas within the coastal zone. The LCP includes Land Use Plans (LUPs), zoning ordinance amendments and map changes to reflect the Coastal Act and LCP goals and policies at the local level. See discussion of required federal coordination of the CZMA with the California Coastal Act above.

Porter-Cologne Water Quality Control Act of 1969 (California Water Code §§ 13000-13999.10)

This Act mandates that activities that may affect waters of the State shall be regulated to attain the highest quality. The RWQCB provides regulations for a "nondegradation policy" that are especially protective of waters with high quality. This Act was considered in the evaluation of consequences of the alternatives.

California State Lands Commission

The California State Lands Commission (CSLC) has regulatory authority to administer, sell, lease or dispose of the public lands owned by the state or under its control, including not only school lands but tidelands, submerged lands, swamp and overflowed lands, and beds of navigable rivers and lakes (California Public Resources Code Section 6216). The CSLC created the California Coastal Sanctuary, which includes all state waters subject to tidal influence such as the study area. California Public Resources Code Section 6303 requires that a Lease Agreement for Utilization of Sovereign Lands be issued prior to initiation of any project that occurs on state-owned lands.

The federal government has the right to improve and protect navigation. The "federal navigational servitude," deriving from the Commerce Clause of the U.S. Constitution, gives the United States a dominant servitude which reflects the superior interest of the United States in navigation and the nation's navigable waters in the interests of commerce. U.S.C.A. Const. Art. 1, § 8, cl. 3; U.S.C.A. Const. Amend. 5; see Mildenberger v. United States, 91 Fed.Cl. 217, 247-55 (2010), affirmed on other grounds, 643 F.3d 938 (Fed .Cir. 2011). Navigational servitude is an exercise of Federal Constitutional power rather than the acquisition of a real property interest. Navigational servitude allows the United States to construct upon or otherwise improve submerged lands without compensation, and without requirement to obtain an easement or leasehold interest in such submerged lands. Under the Submerged Lands Act, the United

States retains its navigational servitude and its rights in and powers to regulate and control lands and navigable waters for the purposes of commerce, navigation, national defense, and international affairs. According to the Act, these purposes shall be paramount to the proprietary rights of ownership, management, administration, leasing, use, and development of lands and natural resources recognized and vested in the states under the Act. Nothing in the Submerged Lands Act affects the use, development, improvement, or control of lands and waters, under the constitutional authority of the U.S., for navigation. Nothing shall relinquish the rights of the United States arising under its authority to regulate or improve navigation. Exceptions from the establishment of states' title, power and rights include all structures and improvements constructed by the United States in the exercise of its navigational servitude. See 43 U.S.C. §§ 1313 - 1314. The dredging and disposal activities of a deepening project serves a traditional navigation purpose, and are therefore, within the limits of the navigation servitude power available to our agency. Therefore, in addition to dredging, placement of dredged material in the nearshore below the mean high tide line at Surfside Borrow Site Nearshore Placement Area would not require acquisition of an interest from the State Lands Commission. Use of the designated placement sites LA-2 and LA-3 does not require the exercise of the servitude or the acquisition of any interest in land, for the reasons described in the Real Estate Plan for the project.

California Endangered Species Act (Cal. Fish and Game Code §§ 2050-2116)

California was the first state in the nation to protect fish, flora and fauna with the enactment of the California Endangered Species Act (CESA) in 1970. Congress followed suit in 1973 by passing the federal ESA. The two acts complement each other and work in parallel. As the responsible agency for the CESA, the California Department of Fish and Wildlife (CDFW, formerly California Department of Fish and Game, CDFG) has regulatory authority over state-listed endangered and threatened species. Because the proposed project may affect species that are listed as threatened or endangered under both the state and federal Endangered Species Acts and because the project is subject to CEQA review and federal review pursuant to NEPA, the CDFW shall participate to the greatest extent practicable in the federal endangered species consultation. The state legislature encourages cooperative and simultaneous findings between state and federal agencies. Further, the General Counsel for the CDFW has issued a memorandum to CDFW regional managers and division chiefs clarifying the CESA consultation process wherein, if a federal Biological Opinion (BO) has been prepared for a species, the CDFW must use this BO in lieu of its own findings unless it is inconsistent with CESA. CDFW Code Section 2095 authorizes participation in federal consultation and adoption of a federal BO. By adopting the federal BO, the CDFW need not issue a taking permit per Section 2081 of the state Code. If the BO is consistent with CESA, the CDFW will complete a 2095 form in finalizing the adoption of the BO. If the federal BO is found to be inconsistent with CESA, the CDFW will issue its own BO per Section 2090 of the state Code and may issue a 2081 take permit with conditions of approval. The proposed project would comply with this Act.

10.1.3 Air Quality Regulatory Setting

Sources of air emissions in the SCAB are regulated by USEPA, CARB, and SCAQMD. In addition, regional and local jurisdictions play a role in air quality management. The existing rules, regulations, and policies that potentially apply to the Proposed Action and alternatives are discussed below.

Federal Regulations

The Clean Air Act

The federal Clean Air Act (CAA) of 1963 and its subsequent amendments form the basis for the nation's air pollution control effort. USEPA is responsible for implementing most aspects of the CAA. Basic elements of the act include the NAAQS for major air pollutants, hazardous air pollutant standards, attainment plans, motor vehicle emission standards, stationary source emission standards and permits, acid rain control measures, stratospheric O_3 protection, and enforcement provisions.

The CAA delegates enforcement of the federal standards to the states. In California, CARB is responsible for enforcing air pollution regulations. CARB, in turn, delegates the responsibility of regulating stationary emission sources to local air agencies. In the SCAB, SCAQMD has this responsibility.

State Implementation Plan and Air Quality Management Plan

For areas that do not attain the NAAQS, the CAA requires the preparation of a SIP, detailing how the State will attain the NAAQS within mandated timeframes. In response to this requirement, SCAQMD develops the AQMP, which is incorporated into the SIP. The AQMP is updated every several years in response to NAAQS revisions, USEPA SIP disapprovals, attainment demonstration changes, etc.; each AQMP builds on the prior AQMP. The AQMP is usually a collaborative effort between the SCAQMD, CARB and the Southern California Association of Governments (SCAG).

The most recent 2016 AQMP was adopted and submitted to the EPA in March 2017. The 2016 AQMP focuses on attainment of the ozone and $PM_{2.5}$ NAAQS through the reduction of ozone and $PM_{2.5}$ precursor NOx, as well as through direct control of $PM_{2.5}$. The 2016 AQMP also identifies control measures and strategies to demonstrate the region's attainment of the revoked 1997 8-hour ozone NAAQS (80 ppb) by 2024; the 2008 8-hour ozone standard (75 ppb) by 2032; the 2012 annual PM2.5 standard (12 ug/m3) by 2025; the 2006 24-hour PM2.5 standard (35 ug/m3) by 2019; and the revoked 1979 1-hour ozone standard (120 ppb) by 2023.

The 2016 AQMP reported that although population in the SCAG region has increased by more than 20 percent since 1990, air quality has improved due to air quality control projects at the local, state and federal levels. In particular, 8-hour ozone levels have been reduced by more than 40 percent, 1-hour ozone levels by close to 60 percent, and annual PM2.5 levels by close to 55 percent since 1990 (SCAQMD 2017).

General Conformity

Established under the CAA (section 176(c)(4)), the General Conformity rule plays an important role in helping states and tribes improve air quality in those areas that do not meet the NAAQS. Under the General Conformity rule, federal agencies must work with state, tribal and local governments in a nonattainment or maintenance area to ensure that federal actions conform to the air quality plans established in the applicable state or tribal implementation plan.

EPA initially promulgated the General Conformity rule in 1993. Subsequently, EPA collected information from other federal agencies on how to maintain the same environmental protections while streamlining the General Conformity implementation process. This information was used to revise the General Conformity rule. After soliciting public comments, EPA issued final rule revisions on April 5, 2010.

The purpose of the general conformity rule is to ensure that actions taken by the Federal agencies do not interfere with a state's plan to attain and maintain national standards for air quality.

The General Conformity Rule (40 Code of Federal Regulations [CFR] Sections 93.150–93.165) ensures that federal actions comply with national ambient air quality standards. In order to meet this CAA requirement, a federal agency must demonstrate that every action that it undertakes, approves, permits or supports will conform to the appropriate SIP. To do so, the Federal agency must either determine that the action is exempt from General Conformity regulations or make a conformity determination consistent with the General Conformity requirements.

A Federal action is exempt from General Conformity regulations if an applicability analysis shows that total direct and indirect emissions of the criteria pollutant or precursor in a nonattainment or maintenance area caused by a Federal action would be less than any of the rates specified in 40 CFR 93.153(b)(1). The applicability rates are based on the maintenance and nonattainment designations and classifications for the project area. "Total of direct and indirect emission" means the sum of direct and indirect emissions increases and decreases caused by the Federal action, i.e., the "net" emissions considering all direct and indirect emissions. The portion of emissions which are exempt or presumed to conform under § 93.153 (c), (d), (e), or (f) are not included in the "total of direct and indirect emissions." The "total of direct and indirect emissions" includes emissions of criteria pollutants and emissions of precursors of criteria pollutants. Direct emissions include construction emissions. Indirect emissions means those emissions of a criteria pollutant or its precursors:

1. That are caused or initiated by the Federal action and originate in the same nonattainment or maintenance area but occur at a different time or place as the action;
2. That are reasonably foreseeable;
3. That the agency can practically control; and
4. For which the agency has continuing program responsibility.

"Reasonably foreseeable emissions" are projected future direct and indirect emissions that are identified at the time the conformity determination is made; the location of such emissions is known and the emissions are quantifiable as described and documented by the Federal agency based on its own information and after reviewing any information presented to the Federal agency.

If the action is determined not to be exempt and the emissions would equal or exceed the applicability rates, a conformity determination is required.

Emission Standards for Marine Engines

Emissions from marine diesel engines (compression ignition engines) have been regulated starting in 1999 through several EPA rules that apply to different engine categories. The scope of application of the marine engine rules covers all new marine diesel engines at or above 37 kW. Regulated engines include both propulsion and auxiliary marine diesel engines. A propulsion engine is one that moves a vessel through the water or assists in guiding the direction of the vessel, whereas auxiliary engines are all other marine engines. Certain overlap exists between the marine diesel engine regulations and regulations for mobile, land-based nonroad engines, which may be applicable to some types of engines used on marine vessels.

Emission Standards for Nonroad Diesel Engines

EPA established a series of emission standards for new off-road diesel engines. Tier 1 standards were phased in from 1996 to 2000; Tier 2 standards were phased in from 2001 to 2006; Tier 3 standards were phased in from 2006 to 2008; and Tier 4 standards, which require add-on emission control equipment, were phased in from 2008 to 2015. For each Tier category, the phase-in schedule is driven by engine size.

The Tier 4 standards complement the 2007 and later on-road heavy-duty engine standards by requiring an additional 90 percent reduction in PM and NO_X compared to Tier 3 standards. To enable sulfur-sensitive control technologies in Tier 4 engines, USEPA mandated reductions in the sulfur content of non-road diesel fuels to 15 parts per million (ppm) (also known as the Ultra-Low Sulfur Diesel [ULSD]) in 2010; the federal fuel standard is preempted by the California standard, which took effect in 2006. These standards apply to clamshell dredging and land-based construction equipment but not to marine vessels or hopper dredgers, which use marine engines.

Emission Standards for On-Road Trucks

To reduce PM, NO_X, and VOC from on-road heavy-duty diesel trucks, USEPA established a series of progressively cleaner emission standards for new engines starting in 1988. These emission standards have been revised over time, with the last major revision in 2007. The PM standard took full effect in 2007 and the NOx and VOC standards were phased in from 2007 through 2010. To enable sulfur-sensitive control technologies in newer engines, USEPA limited the sulfur content of on-road diesel fuels to 15 ppm (ultra-low sulfur diesel) effective June 2006.

State Regulations

California Clean Air Act

In California, CARB is designated as the state agency responsible for all air quality regulations. CARB, which became part of the California Environmental Protection Agency (Cal/EPA) in 1991, is responsible for implementing the requirements of the federal CAA, regulating emissions from motor vehicles and consumer products, and implementing the California Clean Air Act of 1988 (CCAA). The CCAA outlines a program to attain the CAAQS for criteria pollutants. Since the CAAQS are generally more stringent than the NAAQS, attainment of the CAAQS requires greater emission reductions than what is required to show attainment of the NAAQS. Similar to the federal system, State requirements and compliance dates are based on the severity of the ambient air quality standard violation within a region.

CARB In-Use Off-Road Diesel-Fleets Regulation

This regulation requires owners of off-road mobile equipment powered by diesel engines 25 hp or larger to meet fleet average or best available control technology (BACT) requirements for NOx and PM emissions by March 1 of each year. The regulation is structured by fleet size: large, medium, and small. The main tactic to reduce fleet emissions under the regulation is to replace older equipment with newer equipment meeting more stringent emission standards. The target emission rates for these fleets are reduced annually over time. Enforcement of fleet average requirements for large fleets (greater than 5,000 total fleet horsepower) began in July 2014. The regulation also limits equipment idling. The regulation would mainly apply to off-road vehicles needed for construction activities.

CARB Portable Diesel-Fueled Engines Air Toxic Control Measure (ATCM)

CARB adopted the ATCM in 2004 with revisions in 2007 to reduce DPM emissions from portable diesel-fueled engines. The rule requires fleets to reduce their emissions by retiring, replacing, or repowering older engines or installing exhaust retrofits. The rule also requires that owners meet DPM emission fleet averages that become more stringent in 2013, 2017, and 2020. The regulation would mainly apply to off-road construction equipment including equipment on some dredging barges.

CARB Commercial Harbor Craft (CHC) Regulation

This regulation requires reduction of TAC and criteria pollutant emissions from diesel-fueled engines used in new and in-use CHC. Under the regulation, CHC include tugboats, tow boats, ferries, excursion vessels, work boats, crew/supply vessels, fishing vessels, barges, and dredges. The regulation requires that, beginning in year 2009, all in-use, newly purchased, or replacement engines meet USEPA’s Tier 2 or greater emission standards per a compliance schedule set forth by CARB. For CHC with home ports in the SCAB, the compliance schedule is accelerated by 2 years, as compared to statewide requirements. The regulation would mainly apply to tugboat engines and engines on hopper dredgers.

Statewide Portable Equipment Registration Program

The Statewide Portable Equipment Registration Program (PERP) establishes a uniform program to regulate portable engines and portable engine-driven equipment units. Once registered in the PERP, engines and equipment units may operate throughout California without the need to obtain individual permits from local air districts as long as the equipment is located at a single location for no more than 12 months. The PERP generally would apply to construction-related equipment (e.g., dredging and barge equipment).

Local Plans and Policies

SCAQMD is primarily responsible for planning, implementing, and enforcing federal and State ambient standards within the SCAB. As part of its planning responsibilities, SCAQMD prepares the AQMP based on the attainment status of the air basins within its jurisdiction. SCAQMD is also responsible for permitting and controlling stationary sources of criteria pollutant and TAC emissions as delegated by USEPA.

Through the attainment planning process, SCAQMD develops the SCAQMD Rules and Regulations to regulate sources of air pollution in the SCAB. The SCAQMD rules applicable to the No Action and Project action alternatives are listed below.

SCAQMD Rule 403 – Fugitive Dust

The purpose of this rule is to control the amount of PM entrained in the atmosphere from man-made sources of fugitive dust. The rule prohibits visible emissions of fugitive dust from any active operation, open storage pile, or disturbed surface beyond the property line of an emissions source. Construction and operational sources of fugitive dust are subject to this rule.

For construction activities that would occur under the Proposed Plan, best available control measures identified in the rule would be required to minimize fugitive dust emissions from earth-moving and grading activities. These measures would include site watering as necessary to maintain sufficient soil moisture content. Additional requirements apply to operations on a property with 1) 50 or more acres of disturbed surface area or 2) a daily earth-moving throughput volume of 5,000 cubic yards or more that occurs at least three times during the most recent 365-day period.

Port of Long Beach Green Port Policy

POLB developed the Port of Long Beach Green Port Policy in 2004. The policy serves as a guide for decision making and establishes a framework for environmentally friendly Port operations. The goal of the air quality program element of the POLB Green Port Policy is to reduce harmful air emissions from Port activities (POLB 2005).

San Pedro Bay Ports Clean Air Action Plan

As a means to implement the Green Port Policy, the Port of Long Beach, in conjunction with the Port of Los Angeles, and with the cooperation of SCAQMD, CARB, and USEPA, adopted the San Pedro Bay Ports CAAP on November 20, 2006, and adopted an updated CAAP in November 2010. The CAAP is a sweeping plan designed to reduce the health risks posed by air pollution from all port-related emissions sources, including ships, trains, trucks, terminal equipment, and harbor craft. In addition, a major goal of the CAAP is to ensure that port-related sources provide a “fair share” of regional emission reductions to enable the SCAB to attain state and national ambient air quality standards.

The CAAP proposed to implement emission control measures largely through new lease agreements and the CEQA approval process for new projects. To encourage implementation of these measures for terminals that do not undergo lease negotiations, Port of Los Angeles and Port of Long Beach proposed strategies such as incentive funding and tariff changes. The CAAP identified source-specific emission control measures and also included a Project Specific Standard, whereby new projects had to meet a 10 in one million cancer risk threshold.

The 2010 CAAP Update identified three categories of major enhancements: 1) updates to emission control measures; 2) adoption of the San Pedro Bay Standards (SPBS); and 3) CAAP progress tracking. The SPBS include a health risk reduction standard with the goal of reducing the population-weighted cancer risk of port-related DPM emissions by 85 percent in highly impacted communities located proximate to Port sources and throughout residential areas in the POLB region. The SPBS also includes an emission reduction standard for Port-related sources relative to 2005 emission levels: 1) by 2014, reduce emissions of NOx , SOx, and DPM by 22, 93, and 72 percent, respectively and 2) by 2023, reduce emissions of NOx , SOx, and DPM by 59, 93, and 77 percent, respectively.

The progress and effectiveness of the CAAP are measured against attaining the SPBS health risk and emission reduction standards, as compared to operations associated with the 2005 annual San Pedro Bay Ports emissions inventories. These efforts allow the Port, the community, and regulators to determine the best use of resources for addressing air quality problems.

In November 2017 the Port of Los Angeles and Port of Long Beach adopted the 2017 CAAP Update. This plan includes new strategies that will reduce emissions from sources in and around the San Pedro Bay Ports while maintaining the San Pedro Bay Ports’ competitive position in the global economy. These strategies have been guided by ongoing regional air quality compliance efforts, and notably, the goals of the California Sustainable Freight Action Plan (CSFAP). As articulated in the CSFAP, to support the ultimate goal of zero-emissions goods movement, the San Pedro Bay Ports must develop strategies that include the introduction of clean vehicles and equipment, infrastructure, freight efficiency, and energy planning. As a result, the initiatives in the 2017 CAAP Update are broader in scope than in the previous CAAPs.

The 2017 CAAP Update continues the health risk and emission reduction targets set in the 2010 CAAP Update and it promotes two new GHG emission reduction targets. The 2017 CAAP Update also incorporates the recent commitment by the mayors of Los Angeles and Long Beach to move towards zero emissions at the Ports, including setting goals of zero-emissions CHE by 2030 and zero-emissions drayage trucks by 2035.

The new emission reduction strategies span both near-term and long-term implementation periods: 1) near-term actions will produce air quality improvements within the next 5 years and will rely on accelerating the adoption of commercially available cleaner engine technologies and operational changes and 2) long-term actions will be implemented over the next two decades as a series of interim steps to achieve the goals of zero emissions and the reduction of the San Pedro Bay Ports' carbon footprint. These strategies are both source-specific and programmatic in nature and include flexibilities on how operators can best achieve these goals.

Port of Long Beach Community Grants Program

In 2009, the Port launched its Community Grant Programs (CGP) to address cumulative air and health impacts arising from new development projects. Since establishing the CGP, the Port has provided $17.4 million in funding for nearly 120 community-based mitigation projects.

In 2016, the Port developed a new updated program, the CGP, which allocates $46.4 million over the next 12 to 15 years in three categories: Community Health, Facility Improvements, and Community Infrastructure. An Investment Plan developed as part of a Community Impact Study identifies a framework for measuring and monetizing the results of the CGP (POLB 2019).

10.1.4 Greenhouse Gas Regulatory Setting

Although all levels of government have some responsibility to protect air quality through adoption and enforcement of regulations, the regulation of GHG emissions is a relatively new component of air quality. This section describes the federal GHG regulatory framework that would apply to the No Action and Project action alternatives.

Federal GHG Plans, Policies, Regulations, and Laws

The U.S. government administers a wide array of programs designed to reduce GHG emissions nationwide. These programs focus on energy efficiency, renewable energy, non- CO_2 gases, and implementation of technologies designed to achieve GHG reductions.

USEPA has promulgated several GHG regulations for stationary sources, such as the Prevention of Significant Deterioration (PSD) Permit Program and the Rule for Mandatory Reporting of Greenhouse Gases. However, because emissions associated with Port operations are primarily mobile in nature, USEPA's regulations directed at mobile sources are of primary interest for the No Action and Project action alternatives.

Proposed Endangerment and Cause or Contribute Findings for GHG under the CAA

On December 7, 2009, USEPA signed two distinct findings regarding GHGs under section 202(a) of the CAA:

- **Endangerment Finding:** The Administrator finds that the current and projected concentrations of the six key well-mixed greenhouse gases—CO_2, CH_4, N_2O, HFCs, PFCs, and SF_6—in the atmosphere threaten the public health and welfare of current and future generations.
- **Cause or Contribute Finding:** The Administrator finds that the combined emissions of these well-mixed greenhouse gases from new motor vehicles and new motor vehicle engines contribute to the greenhouse gas pollution which threatens public health and welfare.

These findings do not themselves impose any requirements on industry or other entities. However, this action is a prerequisite to promulgating USEPA's GHG regulations and emission standards, such as GHG emission standards for light- and heavy-duty vehicles.

Light-Duty Vehicle Greenhouse Gas Emissions and Corporate Average Fuel Economy Standards

On May 7, 2010, USEPA and U.S. Department of Transportation National Highway Traffic Safety Administration (NHTSA) finalized the Light-Duty Vehicle Rule, which established a national program consisting of GHG emission and corporate average fuel economy standards for light-duty vehicles. Light-Duty Vehicle Rule standards apply to new cars and trucks starting with model year 2012.

Heavy Duty Vehicle National Program

In September 2011, USEPA and NHTSA developed the Heavy-Duty Vehicle National Program, designed to reduce fuel consumption (and GHG emissions by association) from medium- and heavy-duty vehicles. The program was directed at vehicle model years 2014–2018 and was projected to reduce GHG emissions by approximately 270 million MT. In August 2016, USEPA and NHTSA adopted Phase 2 of the program, which sets performance-based standards that would be met through wider deployment of existing and advanced technologies. For diesel engines, the proposed standards would begin for model year 2018 engines and phase in vehicle model years through 2027.

Mandatory Greenhouse Gas Reporting Rule

On September 22, 2009, USEPA published the Final Mandatory Greenhouse Gas Reporting Rule (Reporting Rule) in the Federal Register. The Reporting Rule requires reporting of GHG data and other relevant information from fossil fuel and industrial GHG suppliers, vehicle and engine manufacturers, and all facilities that would emit 25,000 MT or more of CO_2e per year. Facility owners are required to submit an annual report with detailed calculations of facility GHG emissions due on March 31 for emissions in the previous calendar year. The Reporting Rule would also mandate recordkeeping and administrative requirements to enable USEPA to verify the annual GHG emissions reports. Owners of existing facilities that commenced operation prior to January 1, 2011, are required to submit an annual report for calendar year 2011. Although this rule does not bear directly on the No Action and Project action alternatives, it serves to illustrate the developing GHG regulatory climate.

State GHG Plans, Policies, Regulations, and Laws

To date, California is one of 23 states that have set GHG emission targets. EO S-3-05 and AB 32, the California Global Warming Solutions Act of 2006, promulgated targets to achieve reductions in GHGs to 1990 levels by the year 2020. This target-setting approach allows progress to be made in addressing climate change and is a forerunner to setting emission limits. CARB is responsible for regulating GHGs in California.

EO S-3-05 (2005) and AB 32 (2006)

Executive Order (EO) S-3-05 set statewide GHG emission-reduction targets as follows: by 2010, reduce GHG emissions to 2000 levels; by 2020, reduce GHG emissions to 1990 levels; and by 2050, reduce GHG emissions to 80 percent below 1990 levels.

Assembly Bill (AB) 32, California Global Warming Solutions Act of 2006 codified EO S-3-05 into law. AB 32 also required CARB to establish a program to track and report GHG emissions, to approve a scoping plan for achieving technologically feasible and cost-effective measures that reduce GHG emissions, and to adopt, implement, and enforce regulations to ensure the achievement of the required GHG emission reductions.

EO B-30-15 (2015) and SB 32 (2016)

EO B-30-15 extended AB 32 goals and set a GHG reduction goal of 40 percent below 1990 levels by 2030. The EO also addressed the need for climate adaptation and directed state governments to take a number of actions, including factoring climate change in state agencies' planning and investment decisions. SB 32 codified EO B-30-15.

AB 32 Scoping Plans

AB 32 required the CARB to develop a Scoping Plan, setting a framework for California's GHG reduction efforts. The first Scoping Plan was approved by CARB in 2008. The First Update to the Climate Change Scoping Plan was approved by the board in 2014 and identified regulatory actions for vehicles and fuels and several measures that target movement of goods and port operations. The Scoping Plan also identified challenges to meeting future electrical demand, including building transmission lines for sources of renewable energy and modernizing electricity infrastructure. In 2016, statewide GHG emissions were 429 MMT of CO2e, which for the first time achieved the AB32 2020 target of 431 MMT (1990 levels) (CARB 2018).

In December 2017, CARB approved the 2017 Climate Change Scoping Plan, which proposed new GHG reduction measures from all sectors of the economy to enable the state to meet the 2030 GHG target codified in SB 32 (CARB 2017a).

EO S-01-07 (2007)

EO S-01-07 mandates that: 1) a statewide goal be established to reduce the carbon intensity of California's transportation fuels by at least 10 percent by 2020 and 2) a low carbon fuel standard for transportation fuels be established for California. CARB adopted the final standard in November 2009, and the standard became effective in 2011.

AB 1493 – Vehicular Emissions of Greenhouse Gases (2002)

AB 1493, enacted in July 2002, required CARB to develop and adopt regulations that reduce GHGs emitted by passenger vehicles and light-duty trucks. Regulations adopted by CARB apply to 2009 model year and later vehicles. CARB estimated that the regulation will reduce GHGs emissions from light-duty passenger vehicle fleet by 18 percent in 2020 and 27 percent in 2030. USEPA granted California the authority to implement GHG emission-reduction standards for new passenger cars, pickup trucks, and sport utility vehicles on June 30, 2009.

Seal Level Rise Programs

EO S-13-08 enhanced California's management of potential effects of climate change. The EO directed the California Natural Resources Agency (CNRA) to do the following:

- Initiate California's first statewide climate change adaptation strategy to assess the state's expected climate change impacts, identify where California is most vulnerable, and recommend climate adaptation policies by early 2009;
- Request the National Academy of Sciences (NAS) to establish an expert panel to report on SLR impacts in California to inform state planning and development efforts;
- Issue guidance to state agencies for how to plan for SLR in designated coastal and floodplain areas for new projects; and
- Initiate a report on critical existing and planned infrastructure projects vulnerable to SLR.

The CNRA issued guidance on SLR in the 2009 California Climate Adaptation Strategy and in the 2018 Update called Safeguarding California Plan (CNRA 2018b). The guidance document provides the agency's summary of the latest science on how climate change could impact the state and recommendations on how to manage against those threats in seven sector areas, including public health, biodiversity and habitat, ocean and coastal resources, water management, agriculture, forestry, and transportation and energy infrastructure.

The Coastal and Ocean Working Group of the California Climate Action Team (CO-CAT), with science support provided by the OPC's Science Advisory Team and the California Ocean Science Trust, released SLR guidance that recommended a range of SLR estimates for years 2030 to 2100 for state agencies to consider for planning development projects. The National Research Council (NRC) of the NAS released their final report on SLR for California in June 2012 (NRC 2012) and CO-CAT updated their SLR Interim Guidance Document the following year based on these findings (CO-CAT 2013).

In 2018, the California Coastal Commission (CCC) adopted the Update to the Sea Level Rise Policy Guidance. The updated guidance includes a range of SLR projections for a given emission scenario (and an extreme SLR scenario), based on the likelihood of occurrence or probability of a sea level height. The guidance also recommends an approach for low, medium-high, and extreme risk aversion decisions, which equate to 66, 95, and 99.5 percentile SLR values for a given scenario (CCC 2018).

Renewables Portfolio Standard

California's Renewable Portfolio Standard (RPS) is a key program for advancing renewable energy in California. The RPS, amended several times, sets escalating renewable energy procurement requirements for the state's electric utilities. As of 2018, the RPS requires that 33 percent, 60 percent, and 100 percent of total retail sales of electricity be procured from eligible renewable sources by the end of 2020, 2030 and 2045, respectively.

The Short-Lived Climate Pollutant Reduction Strategy

Short-lived climate pollutants (SLCPs) are powerful climate forcers that, although remain in the atmosphere for a shorter period of time than longer-lived climate pollutants, such as CO2, have greater warming potencies. SLCPs include methane, fluorinated gases, and black carbon. The SLCP Reduction Strategy, initiated by SB 605 in 2014 and SB 1383 in 2016, approved by CARB in 2017 , lays out a framework for 40 percent reduction in methane and hydrofluorocarbon emissions below 2013 levels by 2030 and a 50 percent reduction in anthropogenic black carbon emissions below 2013 levels by 2030 (CARB 2017b). The SLCP Reduction Strategy has been integrated into the 2017 Climate Change Scoping Plan Update.

Local GHG Plans and Policies

Port of Long Beach Green Port Policy (2005)

The POLB Green Port Policy includes initiatives that reduce emissions of criteria pollutants and TACs from operations at the Port. Many of these measures also would result in GHG emission reductions.

San Pedro Bay Ports Clean Air Action Plan (2007, 2010, and 2017)

As a means to implement the Green Port Policy, the POLB implements the San Pedro Bay Ports CAAP process. Many CAAP measures designed to reduce criteria pollutants would also result in GHG reductions. The 2017 CAAP Update includes new strategies that have been guided by ongoing regional air quality compliance efforts and, notably, the goals of the CSFAP. As articulated in the CSFAP, to support the ultimate goal of zero-emissions goods movement, the ports must develop strategies that include the introduction of clean vehicles and equipment, infrastructure, freight efficiency, and energy planning.
The 2017 CAAP Update continues the health risk and emission-reduction targets set in the 2010 CAAP Update and it promotes two new emission-reduction targets:

- Reduce GHGs from port-related sources to 40 percent below 1990 levels by 2030.
- Reduce GHGs from port-related sources to 80 percent below 1990 levels by 2050.

The 2017 CAAP Update also incorporates the recent commitment by the mayors of Los Angeles and Long Beach to move toward zero emissions at the ports, including setting goals of zero-emissions CHE by 2030 and zero-emissions drayage trucks by 2035.

Port of Long Beach Framework to Reduce Greenhouse Gas Emissions (2008)

The Port's commitment to protecting the environment from the harmful effects of Port operations, as stated in the Green Port Policy, addresses the development of programs and projects to reduce GHG emissions. In September 2008, the Port's BHC adopted a formal resolution establishing a framework for reducing GHG emissions. The framework outlined efforts that are well underway at the Port toward addressing climate change:

- The Port collaborated with other City departments to produce the City's first voluntary GHG emissions inventory (calendar year 2007), which was submitted to the California Climate Action Registry (CCAR); the Port continues to develop an annual inventory of GHG emissions for Harbor District activities. The reporting portion of CCAR has since transitioned to The Climate Registry.
- The Port joined other City departments in preparing a plan to increase energy efficiency in City-owned facilities, thereby reducing indirect GHG emissions from energy generation. This initiative is known as the SCE 2009-2011 Local Government Partnership.
- In February 2010, the City adopted the Long Beach Sustainable City Action Plan that includes initiatives, goals, and actions that will move Long Beach toward becoming a sustainable city. The Sustainable City Action Plan includes initiatives to reduce the City's carbon footprint and sets a

goal to reduce GHG emissions from City facilities and operations 15 percent by 2020, relative to 2007 levels.

- The Port participates in tree planting and urban forest renewal efforts through its support of the City's Urban Forest Master Plan. Tree planting reduces GHG emissions by sequestering CO_2.
- Port staff consulted with the Long Beach Gas and Oil Department and Tidelands Oil Production Company to evaluate potential opportunities for capturing CO_2 produced by oil operations in the Harbor District and reinjecting it back into subsurface formations through wells at the Port (a form of sequestration).
- Beginning in 2006, the POLB annual air pollutant emissions inventory quantifies GHG emissions from oceangoing vessels (OGVs), heavy-duty trucks, CHE, harbor craft, and locomotives.
- The Port's Renewable Energy Working Group has developed strategies to expand the use and production of renewable energy at the Port. Criteria will be established to evaluate emerging technologies in a manner similar to the CAAP Technology Advancement Program.
- The Port's Renewable Energy Working Group finalized a Solar Energy Technology and Siting Study (Solar Siting Study) that reviewed available solar technologies and estimated the solar energy generation potential for the entire Harbor District. The study determined that there are many sites where solar energy technologies could be developed on building rooftops and at ground level.
- Based on the Solar Siting Study, Port staff is developing a program to provide incentive funding to Port tenants for the installation of solar panels on tenant-controlled facilities.

In May 2013, the Port BHC adopted the POLB Energy Policy to guide efforts to secure a more sustainable and resilient supply of power as demand grows. Under the policy, the Port of Long Beach will implement measures to increase efficiency, conservation, resiliency, and renewable energy in collaboration with various groups, including port tenants, utilities, other City departments, industry stakeholders, labor unions, universities, and the Port of Los Angeles.

The Port is developing a Greenhouse Gas Strategic Plan (GHG Plan). This plan will examine GHG impacts for all activities within the Harbor District and will identify strategies for reducing the overall carbon footprint of those activities. Similar to the CAAP, the Port's GHG Plan will identify strategies for activities under direct Port control and those that are controlled by third parties, such as tenants. The GHG Plan also will be used to mitigate potential project-specific and cumulative GHG impacts from future projects through modernization and/or upgrading of marine terminals and other facilities in the Harbor District.

Long Beach Sustainable City Action Plan (2010)

The Long Beach Sustainable City Action Plan is intended to guide operational, policy, and financial decisions to create a more sustainable Long Beach. Although the plan is mostly focused on City property, buildings, and public transportation, some elements refer to Port activities. This includes Action 1 of Transportation Initiative 4, which seeks to reduce emissions from Port mobile sources through implementing mitigation incentive measures to modernize fleets, retrofit older engines, and use cleaner fuels.

City of Long Beach General Plan – Mobility Element, The Mobility of Goods (2013)

The City of Long Beach General Plan, Mobility Element was developed to improve the way people, goods, and resources are moved in Long Beach. The Mobility of Goods section does not identify specific strategies to reduce GHG emissions, but it does call for the improvement of Citywide infrastructure, especially increase of on-dock rail facilities. The Mobility of Goods section notes that, without rail infrastructure improvements, more containers will be shipped by truck to near-dock and off-dock rail yards; the result would be more truck trips on freeways and roadways near the Port.

City of Long Beach Construction and Demolition Recycling Program

The City of Long Beach Construction and Demolition Recycling Program, set forth in Municipal Code Section 18.67.090, encourages the use of green building techniques in new construction and promotes reuse or salvaging of recyclable materials in demolition, deconstruction, and construction projects. Much of construction and demolition debris, which represents an estimated 22 percent of the total disposed waste stream in local landfills, can be reused or recycled, conserving natural resources and saving valuable landfill space. In response to state-mandated waste reduction goals and as part of the City's commitment to sustainable development, the City adopted an ordinance that requires certain demolition and/or construction projects to divert at least 60 percent of waste either through recycling, salvage, or deconstruction (City of Long Beach 2011).

Climate Adaptation and Coastal Resiliency Plan (2016)

The POLB developed the 2016 Climate Adaptation and Coastal Resiliency Plan (CRP) in accordance with California Assembly Bill 691 (2014) to manage the direct and indirect risks associated with climate change and coastal hazards and to endure continuity of Port operations within the Harbor District (POLB 2016b). The following steps were taken to develop and implement the CRP:

- Reviewed the best available climate science to determine primary stressors and impacts;
- Review the best available and most current climate science to determine primary stressors and potential impacts;
- Complete an inventory of Port assets (terminals, infrastructure, ecological resources, and public access/recreational facilities) and a vulnerability assessment;
- Complete inundation mapping for six sea level rise scenarios based on the most appropriate sea level rise model(s) for Port assets;
- Develop vulnerability profiles for Port assets by system;
- Identify near- and long-term adaptation strategies; and
- Develop five detailed adaptation strategies that will make the Port more resilient to climate change, including integration of strategies into Port guidelines and policies and adding sea level rise analyses to the Harbor Development Permit process.

CRP development included a comprehensive inventory to identify and organize all Port assets and operations. The inventory identifies piers, wharves, utilities, roadways, rail, and critical buildings and backland areas essential to Port operations. This type of inventory assisted in prioritizing and developing actions necessary to avoid or minimize impacts on Port assets. Assets were organized by system (e.g., transportation network, piers, utilities, breakwater, etc.), which became the basis for vulnerability profiles devised for each system. The primary climate change hazards identified in the CRP include flooding events from anticipated sea level rise, increased precipitation, riverine flooding, and storm surge. Impacts from a flood event can vary; for example, assets such as paved roads may be temporarily closed when flooded but regain normal function once floodwaters recede. Some assets may remain fully functional if the inundation is limited to a few inches or less, while other assets such as railway systems may be completely shut down if significant inundation occurs. If flooding events become more frequent, severe, or even permanent, the Port will need to assess structural enhancements to its facilities.

Southern California Association of Governments (SCAG) 2016–2040 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS) (2016)

The SCAG developed the 2016–2040 RTP/SCS with the primary goal of increasing mobility for the region's residents and visitors but also with an emphasis on sustainability, pursuant to SB 375 (Sustainable Communities and Climate Protection Act of 2008). This law set regional targets for GHG emission reductions from passenger vehicle use for 2020 and 2035 and it requires that SCAG include an SCS in the RTP that would reduce GHG emissions from passenger vehicles. The RTP/SCS also includes strategies for goods movement.

The RTP/SCS Goods Movement Appendix identifies strategies for regional highway improvements, regional rail improvements (i.e., on-dock and near-dock rail), and San Pedro Bay Ports access projects. The RTP/SCS Goods Movement Appendix also identifies goods movement environmental strategies such as the short-term deployment of commercially available lower-emission trucks and locomotives and the longer-term development of a zero- and near-zero emission freight system. The Proposed Plan promotes these goods movement strategies through development goals, as it proposes to increase on-dock rail capacity, to re-design terminals to improve the efficiency of goods movement, and to support implementation of the Green Port Policy initiatives, such as the 2017 CAAP Update and its objective to achieve zero- and near-zero emission CHE and drayage trucks.

10.1.5 Transportation Regulatory Setting

The traffic analysis was prepared in conformance with City of Long Beach procedures and Port Protocols that were incorporated into the traffic analysis.

Many laws and regulations are in place to regulate marine terminals, vessels calling at marine terminals, and emergency response/contingency planning. Responsibilities for enforcing or executing these laws and regulations fall to various international, federal, state, and local agencies, as summarized below.

<u>Federal Laws</u>

A number of federal laws regulate marine terminals and vessels. These laws address, among other matters, design and construction standards, operational standards, and spill prevention and cleanup. Regulations to implement these laws are contained primarily in Titles 33 (Navigation and Navigable Waters), 40 (Protection of Environment), and 46 (Shipping) of the CFR.

<u>United States Coast Guard</u>

The USCG, through Title 33 (Navigation and Navigable Waters) and Title 46 (Shipping) of the CFR, is the federal agency responsible for vessel inspection, marine terminal operations safety, coordination of federal responses to marine emergencies, enforcement of marine pollution statutes, marine safety (navigation aids, etc.), and operation of the NRC for spill response. It is also the lead agency for offshore spill response.

<u>U.S. Army Corps of Engineers (USACE)</u>

The USACE is responsible for reviewing all aspects of a project that could affect navigation and waters of the United States. The USACE's authority to regulate navigation lies in Section 10 of the Rivers and Harbors Act of 1899. USACE has specialized equipment and personnel for maintaining navigation channels, removing navigation obstructions, and accomplishing structural repairs. Since 1789, the Federal government has authorized navigation channel improvement projects; the General Survey Act of 1824 established USACE's role as the agency responsible for the navigation system. Since then, ports have worked in partnership with USACE to maintain the waterside elements of port facilities.

Other Organizations and Programs

Marine Exchange of Southern California

As discussed previously, the Marine Exchange is a non-profit service organization charged with enhancing navigation safety in the vicinity of the ports. The Marine Exchange also operates PORTS, which monitors oceanographic and meteorological conditions in the vicinity of the ports.

Harbor Safety Committee

The LA-LB Harbor Safety Committee (Committee) is responsible for planning the safe navigation and operation of within San Pedro Bay and its approaches. This Committee was created under the authority of Government Code Section 8670.23(a), which requires the Administrator of the Office of Oil Spill Prevention and Response to create harbor safety committees. The Committee issues the Harbor Safety Plan (HSP) l updates annually.

Harbor Safety Plan

The LA-LB HSP contains operating procedures for vessels operating in the port vicinity. The vessel operating procedures stipulated in the HSP are considered Good Marine Practice; some procedures are federal, state, or local regulations, while other guidelines are non-regulatory “Standards of Care.” The HSP provides specific rules for navigation of vessels in reduced visibility conditions and establishes vessel speed limits (12 knots within the Precautionary Area or six knots within the harbor). These speed restrictions do not preclude the master or pilot from adjusting speeds to avoid or mitigate unsafe conditions.

Vessel Transportation Service

As described previously, VTS is a service that monitors vessel traffic in approach and departure lanes, as well as internal movements within the harbor. This system provides information on vessel traffic and ship locations so that vessels can avoid ACGs in the approaches to the Long Beach/Los Angeles Harbor. The system uses radar, radio, and visual inputs to gather real time vessel traffic information and broadcast traffic advisories and summaries to assist mariners.

10.1.6 Aesthetics Regulatory Setting

Local Regulations

Adopted local and regional plans and policies within the City of Long Beach General Plan provide the primary regulatory guidance for maintaining aesthetic resources in the Harbor District. Areas considered to have the greatest visual sensitivity are typically located along scenic highways or in other natural areas. The primary areas of concern generally result from changes in prominent topographic features, changes in the character of an area with high visual sensitivity, removal of important vegetation, or obstructing public views of a visually sensitive landscape.

Port of Long Beach Port Master Plan

The 1990 Port Master Plan (PMP) as amended includes goals that address preserving and enhancing visual quality within the Harbor District. An underlying PMP planning principle is to maintain Queensway Bay as a buffer between the highly industrialized inner San Pedro Bay Port Complex and downtown waterfront recreational areas. The 1990 PMP as amended focuses on minimizing disruptions of significant view corridors, which includes creating and maintaining scenic views of the Queen Mary and promoting visual connectivity to downtown and the greater Long Beach area.

City of Long Beach General 1 Plan Scenic Routes Element

The City of Long Beach General Plan Scenic Routes Element contains goals and objectives relevant to visual resources that guide private development, government actions, and programs within the City. Additionally, the Scenic Routes Element contains policies to protect the City's scenic resources. These goals, objectives, and policies are intended to serve as long-term principles and policy statements.

10.1.7 Cultural Regulatory Setting

The National Historic Preservation Act (NHPA) and its implementing regulations 36 CFR Part 800 provide a regulatory framework for the identification, documentation, and evaluation of cultural resources that may be affected by Federal undertakings. Under the Act, Federal agencies must take into account the effects of their undertakings on historic properties (cultural resources that have been found to be eligible for listing or which are listed in the National Register of Historic Places) and afford the Advisory Council on Historic Properties a reasonable opportunity to comment on such undertaking.

Identification of Historic Properties

A records search was performed on July 25, 2018 at the South Central Coastal Information Center (SCCIC) to identify historic properties. In addition, the NAHC Sacred Lands File, USACE records, and NOAA navigation charts and reports were reviewed. Project initiation letters were mailed to the Native American contacts identified by the NAHC requesting information about any known tribal resources in the project area on August 1, 2019. The Gabrieleno Band of Mission Indians - Kizh Nation indicated on a call on September 25, 2019 that there were cultural resources located on particular landforms in the vicinity, but the APE does not extend to that area. The USACE conducted formal consultation with the SHPO and tribes, and on December 9, 2020 received agreement from SHPO that no historic properties would be affected within the APE. No comments were received from tribes.

Assessment and Resolution of Adverse Effects

In accordance with the criteria of adverse effect described in 36 CFR Part 800.5(1), impacts on cultural resources are considered adverse if an undertaking may alter characteristics of the historic property that qualify it for inclusion in the NRHP in a manner that would diminish its integrity of location, setting, materials, feeling, or association. Examples of adverse effects on historic properties include:

- Physical destruction, damage, or alteration of all or part of the property.
- Removal of the property from its historic location.
- Change of the character of the property's use or physical features within the property's setting that contribute to its historic significance.

- Introduction of visual, audible, or atmospheric elements that are out of character with the property or alter its setting.
- Neglect of a property resulting in its deterioration or destruction.

Regulation 36 CFR Part 800.6 details the resolution of adverse effects, including provisions relating to the development of an agreement document. Because the USACE found no historic properties in the APE that would be affected by the undertaking, and received agreement from SHPO, application of the criteria of adverse effect was not relevant.

10.1.8 Noise Regulatory Settings

Applicable noise standards include Federal regulations, State regulations (Health and Safety Code Section 46000 et seq.), and municipal ordinances with specific noise criteria established by the city of Long Beach.

Federal Government

The Federal Government regulates occupational noise exposure common in the workplace through the Occupational Safety and Health Administration (OSHA) under the USEPA. Noise exposure of this type is dependent on work conditions, is addressed through a facility's or contractor's Health and Safety Plan and is therefore not applicable to this project and is not addressed further in this document.

State of California Standards

The California Office of Noise Control has set acceptable noise limits for sensitive uses. Sensitive-type land uses, such as schools and homes, are "normally acceptable" in exterior noise environments up to 65 dBA CNEL and "conditionally acceptable" in areas up to 70 dBA CNEL. A "conditionally acceptable" designation implies that new construction or development should be undertaken only after a detailed analysis of the noise reduction requirements for each land use type is made and needed noise insulation features are incorporated in the design. By comparison, a "normally acceptable" designation indicates that standard construction can occur with no special noise reduction requirements.

City of Long Beach

Section 8 of the LBMC prescribes exterior noise level limits. These limits apply to noise sources that persist for a cumulative total of more than 30 minutes in any hour or:

- The noise standard plus 5 dB for a cumulative period of more than 15 minutes in any hour;
- The noise standard plus 10 dB for a cumulative period of more than 5 minutes in any hour;
- The noise standard plus 15 dB for a cumulative period of more than 1 minute in any hour; or
- The noise standard plus 20 dB or the maximum measured ambient noise level, for any period of time.

10.2 Environmental Commitments

The following lists the actions committed to be undertaken by the USACE for the Recommended Plan to ensure environmental impacts are reduced to the extent possible. These actions may be part of design of the project as may be best management practices or specific features to reduce environmental impacts; they may be monitoring activities to alert the USACE and the contractor to potential environmental impacts; and they may be mitigation measures to compensate for actual impacts to the environment.

1. It is the Contractor's responsibility to obtain all applicable air permits and comply with federal, state, and local air and noise regulations.

2. If previously unknown cultural resources are discovered during the project, all ground-disturbing activities shall immediately cease within the area of the discovery until USACE has met the requirement of 36 CFR 800.13 regarding post-review discoveries. USACE shall evaluate the eligibility of such resources for listing on the National Register of Historic Places and propose actions to resolve any anticipated adverse effects. Work shall not resume in the area surrounding the potential historic property until USACE re-authorizes project construction.

3. In the event human remains are discovered, all ground-disturbing activities shall be halted immediately within the area of the discovery, and a USACE archaeologist and the Los Angeles County Coroner must be notified. The coroner will determine whether the remains are of forensic interest. If human remains, funerary objects, sacred objects, or items of cultural patrimony are encountered during the proposed project, the USACE will follow the steps outlined in 36 C.F.R. 800.13 regarding post-review discoveries and shall notify the POLB who shall ensure that the process outlined in California Public Resources Code 5097.98 are carried out.

4. The Contractor shall keep construction activities under surveillance, management, and control to avoid pollution of surface and ground waters.

5. The Contractor shall implement a Water Quality Monitoring Plan at the dredge and nearshore placement sites. The plan shall include weekly monitoring of water quality parameters (salinity, pH, dissolved oxygen, temperature, and percent light transmissivity) with an instrument package at four stations. The four stations are sited relative to the dredge and will be 100 feet upcurrent of the dredge, 100 feet downcurrent of the dredge, 300 feet downcurrent of the dredge, and a control station located outside of any dredge plume. Monthly water samples will be taken from the station 300 feet downcurrent of the dredge for analysis of total suspended solids, total reportable petroleum hydrocarbons (TRPH), and for any contaminants of concern identified during sediment sampling and analysis to be conducted during the PED phase of the project. Similar monitoring would be conducted at the Surfside Borrow Site Nearshore Placement Area during sediment placement activities at that location relative to the placement site release point. Dredging will be controlled to keep water quality impacts to acceptable levels, controls will include modifying the dredging operation and the use of silt curtains (if feasible). Turbidity (NTUs), light transmittance will be limited to a 20 percent maximum change between the control station and 300 feet downstream station. Dissolved oxygen will not at any time be depressed more than 10 percent from that which occurs naturally, and will be maintained at a minimum of 5mg/l. The pH will be limited to a 0.2-unit change from that which occurs naturally.

6. All dredging and fill activities will remain within the boundaries specified in the plans. There will be no dumping of fill or material outside of the project area or within any adjacent aquatic community.

7. The Contractor shall keep construction activities under surveillance, management, and control to minimize interference with, disturbance to, and damage of fish and wildlife.

8. The Contractor shall mark the dredge and all associated equipment in accordance with USCG regulations. The Contractor must contact the USCG two weeks prior to the commencement of dredging. The following information shall be provided: the size and type of equipment to be used; names and radio call signs for all working vessels; telephone number for on-site contact with the project engineer; the schedule for completing the project; and any hazards to navigation.

9. The Contractor shall move equipment upon request by the USCG and Harbor patrol law enforcement and rescue vessels.

10. Construction equipment shall be properly maintained to minimize emissions of air pollutants.

11. Retarding injection timing of diesel-powered equipment to reduce NOx emissions will be implemented where practicable.

12. Equip all internal combustion engines with properly operating mufflers.

13. Pre-construction surveys for *Caulerpa taxifolia* will be conducted in the Main Channel and the proposed Pier J Channel and Turning Basin. The USACE would conduct Surveillance Level surveys for *Caulerpa taxifolia*. Surveys shall be completed not earlier than 90 days prior to the commencement of dredging and not later than 30 days prior to the onset of work. Surveys would systematically sample at least 20 percent of the bottom of the entire area to be dredged to assure that widespread of occurrences of *Caulerpa taxifolia* would be identified if present. Surveys would be accomplished using diver transects, remote cameras, or acoustic surveys with visual ground truthing. The USACE would submit survey results in standard format to the National Marine Fisheries Service (NMFS)/California Department of Fish and Wildlife (CDFW) within 24 hours of first noting the occurrence. In the event that Caulerpa taxifolia is detected, dredging would be delayed until such time as the infestation has been isolated, treated, and the risk of spread from the proposed action eliminated. In the event that NMFS/CDFW determines that the risk of *Caulerpa taxifolia* infestation has been eliminated or substantially reduced, the requirement for *Caulerpa taxifolia* surveys may be rescinded, or the frequency or level of detail of surveys may be decreased

14. The Contractor shall implement a Spill Prevention Plan including employee training and the staging of material on site to clean up accidental spills.

15. Adhere to site use conditions for material disposal at the LA-2 and LA-3 ODMDS.

16. A sediment Sampling and Analysis Plan (SAP) will be conducted for all sediments to be dredged as part of the proposed project. The SAP will be prepared in consultation with the SC-DMMT and will comply with appropriate testing manuals (the Inland Testing Manual (USEPA & USACE 1998) for sediments to be placed at the Surfside nearshore placement area and the Green Book (USEAP & USACE 1991) for sediments disposed of at the two ocean dredged material disposal sites, LA-2 and LA-3). The USACE will evaluate test results, make a suitability determination, and seek formal concurrence from the USEPA.

17. USACE will apply to the Los Angeles Regional Water Quality Control Board for a Section 401 Water Quality Certification during PED and will comply with all conditions of the final Water Quality Certification.

18. USACE will seek concurrence from the California Coastal Commission with its determination that the project is consistent to the maximum extent practicable with the enforceable polices of the CCMP during PED and will comply with all conditions of the concurrence.

19. USACE will implement the following measures to avoid and minimize impacts to green sea turtle for hopper dredge operations.

    a. During dredging, transit to and from and as placement of dredged material at the Surfside Borrow Site Nearshore Placement Area occurs, a qualified biologist with experience monitoring green sea turtles will be onboard the hopper dredge to monitor for the presence of green sea turtles. The green sea turtle monitor will have the authority to cease or alter operations to avoid impacts to green sea turtles.
    b. During dredging, the biological monitor will periodically check in the hopper for the presence of green sea turtles.
    c. Adequate lighting will be provided during nighttime operations (i.e., dredging, dredge material transport and placement) to allow the monitor to observe the surrounding area effectively.
    d. All vessels associated with the project will not exceed eight (8) knots inside the breakwater (most vessels will be transiting outside the breakwater).
    e. If a green sea turtle is observed within the vicinity of the project site during project operations, all appropriate precautions shall be implemented to avoid or minimize unintended impacts. These precautions include, but are not limited to:
        i. Cessation of placement operations that is observed within 100 feet of a green sea turtle;
        ii. Operations may not resume until the green sea turtle has departed the monitoring zone by its own accord or has not been observed for a 15-minute period of time;
        iii. Maneuver the hopper dredge to avoid any free-swimming green sea turtles observed during transit.
    f. Biological monitors will maintain a written log of all green sea turtle observations during project operations. This observation log will be provided by the biological monitors to the USACE and NMFS within a reasonable period of time after the completion of construction. Each observation log will contain the following information:
        i. Observer name and title;
        ii. Type of construction activity (dredging, etc.);
        iii. Date and time animal first observed (for each observation);
        iv. Date and time observation ended (for each observation). A green sea turtle observation will terminate if (1) an animal is observed exiting the monitoring zone or (2) after a 15-minute period of no observation (assumption is that animal has exited, but was not observed to do so);
        v. Location of monitor (latitude/longitude), direction of green sea turtle in relation to the monitor, and estimated distance (in meters) of green sea turtle to the monitor; and
        vi. Nature and duration of equipment shutdown.
    g. Any observations involving the potential "take" of green sea turtles will be reported by the biological monitor(s) to the USACE within 10 minutes of the incident and to the NMFS stranding coordinator immediately thereafter.
    h. The Contractor will implement an Environmental Protection Plan that will include a green sea turtle Monitoring and Avoidance Plan and an employee training program on green sea turtle

observation protocols, avoidance, and minimization measures. The program will be conducted by the Biological Monitor and a record kept of dates of training, names and positions of attending employees, and an outline of the training presentation.

20. USACE will implement the following measures to avoid and minimize impacts to green sea turtle for clamshell dredge operations.

    a. During construction, a 100-foot (visually estimated) monitoring zone around all in-water equipment, vessels, and/or debris shall be implemented. Green sea turtle monitoring is not required for the transportation of material between dredging and disposal sites.
    b. Visual monitoring of the monitoring zone (visually estimated) shall commence at least 15 minutes prior to the beginning of in-water construction activities each day and after each break of more than 30 minutes. If a green sea turtle is observed within the monitoring zone, all in-water project activities shall cease as soon as possible, in consideration of worker safety. Project activities shall not commence or continue until the green sea turtle has either been observed having left the monitoring zone, or at least 15 minutes have passed since the last sighting whereby it is assumed the green sea turtle has voluntarily left the monitoring zone.
    c. The visual monitor shall maintain a written log containing all observations of green sea turtles including:
        i. Observer name and title;
        ii. Type of activity (dredging, etc.);
        iii. Date and time animal first observed (for each observation);
        iv. Date and time observation ended (for each observation), including if the green sea turtle was observed exiting the monitoring zone or was assumed to have exited following a 15-minute period of no observation;
        Location of observer (latitude/longitude), direction, and estimated distance to green sea turtle;
        v. Nature and duration of equipment shutdown.
    d. The green sea turtle observation log shall be provided by the visual monitor to the USACE for transmittal to NMFS within a reasonable time after completion of construction. Any observations involving potential take of green sea turtle shall be reported to the USACE and NMFS within 24 hours.
    e. Adequate lighting will be provided during nighttime operations to allow the monitor to observe the surrounding area effectively.
    f. The visual monitor will be trained in how to conduct visual monitoring and in the identification of green sea turtles by the Biological Monitor proposed for monitoring hopper dredge operations.
    g. The Contractor will implement an Environmental Protection Plan that will include a green sea turtle Monitoring and Avoidance Plan and an employee training program on green sea turtle observation protocols, avoidance, and minimization measures. The training program will be conducted by the Biological Monitor and a record kept of dates of training, names and positions of attending employees, and an outline of the training presentation.

21. If other, unrelated projects occur that result in an exceedance of annual disposal limits at either LA-2 or LA-3, USACE will coordinate with USEPA to identify and implement additional monitoring at the disposal site[s].

22. Construction crews would be tasked in accordance with standard specification requirements to look for and avoid any marine mammals, including whales during dredging, transportation, and placement/disposal activities. A member of the bridge crew will be identified as a marine mammal

monitor. The monitor will be trained in how to conduct visual monitoring and in the identification of marine mammals by the biological monitor proposed for monitoring hopper dredge operations.

a. The visual monitor shall maintain a written log containing all observations of marine mammals including:
   i. Observer name and title;
   ii. Type of marine mammal observed;
   iii. Date and time animal first observed (for each observation);
   iv. Date and time observation ended (for each observation);
   v. Location of observer (latitude/longitude), direction, and estimated distance to marine mammal; and
   vi. Behavior of marine mammal.

Mitigation measures include the following:

MM-AQ-1: Electric clamshell dredge. The use of an electric clamshell dredge shall be required for all clamshell dredging activities during the entire construction period of the project, and the construction of an electrical substation at Pier J is also required to provide electric power to the clamshell dredge.

MM-AQ-2: Construction-Related Harbor Craft. Construction-related harbor craft (tugboats, crew boats, and survey boats) with Category 1 or Category 2 marine engines shall meet USEPA Tier 3 emission standards for marine engines. In addition, the Contractor shall require all construction-related tugboats that home fleet in the San Pedro Bay Ports: 1) to shut down their main engines and 2) to refrain from using auxiliary engines while at dock and instead use electrical shore power, if feasible.

MM-AQ-3: Off-Road Construction Equipment. Self-propelled, diesel-fueled off-road construction equipment 25 hp or greater shall meet USEPA/CARB Tier 4 Final emission standards for non-road equipment.

MM-AQ-4: Additional Mitigation for Off-Road Construction Equipment. Off-road diesel-powered construction equipment shall comply with the following:

- Construction equipment shall be maintained according to manufacturer’s specifications.
- Construction equipment shall not idle for more than 5 minutes when not in use.

11 OTHER NEPA REQUIRED ANALYSES

This section addresses other topics required by NEPA. These include the relationship between local short-term uses of the environmental and long-term productivity and the identification of any irreversible and irretrievable commitments of resources.

11.1 Relationship Between Short-Term Uses of the Environmental and Maintenance and Enhancement of Long-Term Productivity

The CEQ under NEPA Regulations (40 CFR Part 1500 et seq.) require that an EIS discuss issues related to environmental sustainability. The discussion relates to environmental consequences, including consideration of "the relationship between local short-term uses of man's environment and the maintenance and enhancement of long-term productivity" (42 USC Section 4332[C][iv]).

Implementation of the proposed action or any alternative would not result in any environmental impacts that would significantly narrow the range of beneficial uses of the environment or pose long-term risks to health, safety, or the general welfare of the public communities surrounding the receiver sites. Rather, the project would provide for future, more efficient, Port operations.

11.2 Irreversible or Irretrievable Commitments of Resources

CEQ regulations (40 C.F.R. §1502.16) require analysis of significant irreversible and irretrievable effects. Irreversible commitments include permanent damage to the environment that cannot be reversed. Irretrievable commitments include those that are temporarily lost but can be replaced either on site or off site after the Recommended Plan has been undertaken. This section describes any resources that would be lost either temporarily or permanently because of the constructing the Recommended Plan.

The Recommended Plan would require the use of non-renewable resources, such as fuels for the construction components of the Recommended Plan. However, the Recommended Plan does not represent an uncommon construction project that uses an extraordinary amount of raw materials in comparison to other urban or industrial development projects of similar scope and magnitude.

Fossil fuels and energy would be consumed in the form of diesel, oil, and gasoline used for equipment and vehicles during construction and operation activities. During operations, diesel, oil, and gasoline would be used by ships, terminal (e.g., cargo handling) equipment, and vehicles. Electrical energy and natural gas would be consumed during construction and operations. These energy resources would be irretrievable and irreversible.

Non-recoverable materials and energy would be used during construction and operations, but the amounts needed would be easily accommodated by existing supplies. Although the increase in the amount of materials and energy used would be insignificant, they would nevertheless be unavailable for other uses.

12 ENVIRONMENTAL IMPACT REPORT (CEQA)

12.1 Introduction

This chapter of the Integrated Feasibility Report (IFR) serves as the functional equivalent of an Environmental Impact Report (EIR) pursuant to the California Environmental Quality Act (CEQA). The intent of this chapter is to ensure full compliance with CEQA, and to analyze and disclose each of the potentially significant environmental effects that could result from implementation of the proposed Project and alternatives at the level of analysis required by CEQA for an EIR and in accordance with all other requirements of CEQA (Public Resources Code [PRC], Section 21000 et seq.), CEQA Guidelines (14 California Code of Regulations [CCR], Section 15000 et seq.), and POLB Procedures for Implementation of the CEQA (Resolution No. HD-1973).

For the purposes of the CEQA analysis, Alternative 3 (National Economic Development [NED] Plan) as presented in Chapter 4, along with certain actions to be undertaken by POLB, is the proposed Project. According to CEQA Guidelines Section 15121(a) (CCR, Title 14, Division 6, Chapter 3), the purpose of an EIR) is to serve as an informational document that will inform public agency decision-makers and the public generally of the significant environmental effects of a project, identify possible ways to minimize the significant effects, and describe reasonable alternatives to the project. Alternatives to the proposed Project are addressed in Section 12.5 in accordance with Section 15126.6 of the CEQA Guidelines.

12.1.1 Proposed Project Summary

The Plan Formulation and Array of Alternatives presented in detail in Chapter 4 identify Alternative 3 as the Port's proposed Project for the purposes of CEQA. In summary, the proposed Project involves constructing an approach channel to Pier J South and deepening the West Basin Channel to a new depth of -55 feet MLLW (with a 2-foot overdredge allowance) for cargo vessels, constructing a turning basin outside the Pier J slip, deepening the Approach Channel to -80 feet MLLW, bend easing portions of the Main Channel to match the currently authorized depth in the Main Channel of -76 feet MLLW, to accommodate liquid bulk vessels, deepening berths at Pier J and Pier T to -55 feet MLLW, and constructing structural improvements to the Pier J breakwaters.

The proposed Project would involve dredging approximately 7.4 mcy of sediments, of which 2.5 mcy would be disposed of at the nearshore Surfside-Sunset Borrow Site off Huntington Beach and the remainder would be disposed of at the LA2 and LA3 offshore disposal areas. Dredging would involve a hopper dredge and a clamshell dredge as well as tugboats and barges for disposal operations and utility boats for support. The breakwaters at the entrance to the Pier J Slip would be reinforced against the increased depth by driving sheet piling and placing rock riprap over the sheet piling; pile driving would occur only during daylight hours and would use a "soft-start" approach to minimize noise impacts. Construction would last for 28 months.

12.1.2 Project Objectives

The purpose of the Port of Long Beach Deep Draft Navigation Feasibility Study is to identify and evaluate alternatives to increase transportation efficiencies for container and liquid bulk vessels operating in the Port, for both the current and future fleet, and to improve conditions for vessel operations and safety. The basic objectives of the Project are to do the following:

- Reduce transportation costs by allowing a more efficient future fleet mix (e.g., displace Panamax and smaller-scale Post-Panamax vessels with larger-scale Post-Panamax vessels, which have increased cargo capacity).
- Reduce vessel congestion in the Port.
- Increase channel depth to encourage shippers to replace smaller, less efficient vessels with larger, more efficient vessels on Long Beach route services.
- Remove channel restrictions to increase vessels' maximum loading capacity, thereby resulting in fewer vessel trips to transport the forecasted cargo.
- Reduce wait times within the harbor to reduce loading and unloading delays for deeper drafting liquid bulk vessels and to provide a safe area to anchor adjacent to the Main Channel during equipment failures.

12.1.3 CEQA Baseline

CEQA Guidelines Section 15125(a) states that the existing physical environmental conditions at the time of the Notice of Preparation (NOP) will normally constitute the baseline for determining whether impacts are significant. The NOP was initially published in November 2016, and an Amended NOP was published in January 2019. For the purposes of this CEQA analysis, 2016 will be used as the CEQA baseline, which is the point of comparison of the potential environmental effects. In contrast, the NEPA baseline, used in Chapter 5, is the future without project or No Action Alternative.

12.1.4 Determining Significance Under CEQA

The Port of Long Beach (POLB) is the lead agency under CEQA for preparation of the EIR. CEQA requires the lead agency to identify each significant effect on the environment resulting from the proposed project (CEQA Guidelines Sections 15064 and 15126), and ways to mitigate each significant effect (CEQA Guidelines Section 15126.4). Each significant effect on the environment must be disclosed in an EIR and mitigated, if feasible. In addition, the CEQA Guidelines lists many mandatory findings of significance, which are required in an EIR. This chapter discusses the effects of this project and feasible mitigation, where required, in terms of CEQA significance. Finally, unlike NEPA, CEQA does not require a co-equal analysis of alternatives. Instead, the EIR describes the environmental impacts of the proposed Project in detail and includes “sufficient information about each alternative to allow meaningful evaluation, analysis, and comparison with the proposed project” (CEQA Section 15126.6(d)). In this CEQA analysis, the alternatives are described in summary and compared with one another and with the proposed Project in Section 12.4. The comparison of impacts of the alternatives is based on the detailed descriptions and co-equal analysis of the alternatives contained in Chapter 4, Plan Formulation, and Chapter 5, Environmental Consequences.

12.2 Impacts of the Proposed Project

Impacts of the proposed Project and alternatives are largely discussed in detail in Chapter 5. However, some topical areas require additional CEQA-specific discussion and impact determination. Supplemental CEQA discussion is provided within the sections below to support the CEQA significance determinations where required. For each of the environmental resource areas, the determination of the significance of impacts is based on the CEQA Guidelines, Appendix G Checklist (Environmental Checklist), as modified by POLB to reflect port operations within a highly urbanized industrial complex.

12.2.1 Aesthetics/Visual Resources

Environmental Setting

The environmental setting for aesthetics and visual resources is described in Section 3.6; the following information supplements that description.

The proposed Project site includes the Approach Channel through Queen's Gate, portions of the Main Channel, a portion of the West Basin, and the Pier J Slip, Turning Basin, and Approach. The main existing visual elements of the project viewshed include 40- to 48-foot-tall-stacks of cargo containers, the 205-foot-tall cranes that line the waterways, the new Gerald Desmond Bridge across the Back Channel, and large container transport equipment, including vessels, mobile gantry cranes, semi-trucks, and trains. Access to the project area is restricted; therefore, no public views are possible from Pier J or the Pier T/West Basin area.

Impacts and Mitigation

Significance Criteria

Impacts on aesthetics/visual resources would be considered significant if the Proposed Project would:

- **AES-1: Have a substantial adverse effect on a scenic vista;**
- **AES-2: Substantially damage scenic resources, including but not limited to trees, rock, outcroppings, and historic building within a state scenic highway;**
- **AES-3: Create a new source of substantial light or glare with would adversely affect day or nighttime views in the area; and/or**
- **AES-4: Conflict with applicable zoning and other regulations governing scenic quality.**

Impacts

Impact AES-1: The proposed Project would not have a substantial adverse effect on a scenic vista.

Impact Determination

The proposed Project is not located within an officially designated scenic vista. The Port area is characterized by heavy industrial land uses, including marine container terminals, which dominate the landscape and viewshed. The visual elements associated with the proposed Project would include barges within the harbor for dredging equipment and transport of disposal sediments, and temporary construction activities. Accordingly, the dredging of the navigation channels and berths within the Port complex would be consistent with the existing viewshed and landscape, and the proposed Project would not adversely affect a scenic vista. No impact on a scenic vista would occur and mitigation is not required.

Impact AES-2: The proposed Project would not substantially damage scenic resources, including but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway.

Impact Determination

There are no state-designated scenic highways within the Port; the closest one is located approximately 23 miles north of the Port in the city of Anaheim where State Route 91 meets State Route 55. Highway 1

(Ocean Boulevard), located to the east of the project area, is classified as "eligible" for state scenic designation. As noted in the City of Long Beach Scenic Routes Element, no city- or county-designated scenic roadway provides scenic views of the project area. The proposed Project is not within a high-quality foreground view from any officially designated state scenic highways. Additionally, the project area does not include any scenic resources that would be affected by the proposed Project. As such, the proposed Project would not adversely affect a scenic resource within a state scenic highway, result in impacts on the existing visual character or quality of the surrounding uses, or not alter the qualities of the area that contribute to the scenic highway designation. No impact would occur, and mitigation is not required.

Impact AES-3: The proposed Project would not create a new source of substantial light or glare which would adversely affect day or nighttime views in the area.

Impact Determination

The proposed Project site is located within and adjacent to the highly industrialized Port complex and is characterized by substantial night-time lighting within marine terminals and along roadways. Port activities take place 24 hours per day, and the lighting is visible from a distance. The proposed Project would create new sources of light from nighttime activities, but this source would be limited to the staging areas, dredges, disposal barges, and tugboats. The new lighting would be nominal in the context of the existing nighttime operations at the Port and would be temporary, lasting only as long as construction. Accordingly, impacts would be less than significant, and mitigation is not required.

Impact AES-4: The proposed Project would not conflict with applicable zoning and other regulations governing scenic quality.

Impact Determination

The Port is entirely located within the Port-Related Industrial (IP) zoning district, which is characterized predominately by maritime industry. Uses in this district are primarily port-related or water dependent but may also include water-oriented commercial and recreational facilities primarily serving the general public, and utility installations and rights-of-way. All new uses in the IP district must be consistent with the Port Master Plan (PMP), which establishes permitted uses within Planning Districts throughout the Port.

According to the 1990 PMP, the project is located within several Planning Districts: District 4 – Terminal Island, District 5 – Middle Harbor, District 7 – Navigation, District 8 – Southeast Harbor Planning District, and District 10 – Outer Harbor. The permitted uses within these districts include primary port facilities, port-related industries and facilities, ancillary Port facilities, hazardous cargo facilities, oil and gas production, navigation and maneuvering. The Port is currently preparing the 2020 PMP Update, which modified the Planning Districts throughout the Port. According to the 2020 PMP Update, the project is located within District 4 – West Basin, and District 5 – Southeast Basin. The permitted uses in these Districts includes primary Port facilities and Port-related facilities, hazardous cargo facilities, maritime support facilities, institutional facilities, oil and gas production, renewable energy resources, environmental protection, utilities, navigable corridor, maneuvering and berthing, environmental protection, navigable corridor, maneuvering and berthing, and sediment management areas. There are no regulations that govern scenic resources or quality in the IP zone or the Port Master Plan. Therefore, the proposed Project would not conflict with applicable zoning and other regulations governing scenic quality. As construction would not conflict with applicable zoning and other regulations governing scenic quality, no mitigation is required.

12.2.2 Agriculture and Forestry Resources

Environmental Setting

There are no agricultural or forestry resources that exist within the project area or the Port complex.

Impacts and Mitigation

Significance Criteria

Impacts on agriculture and forestry resources would be considered significant if the Proposed Project would:

- **AFR-1: Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use;**
- **AFR-2: Conflict with existing zoning for agricultural use, or a Williamson Act contract;**
- **AFR-3: Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g));**
- **AFR-4: Result in the loss of forest land or conversion of forest land to non-forest use; and/or**
- **AFR-5: Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?**

Impacts

Impact AFR-1: The proposed Project would not convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use.

Impact Determination

The Port complex does not have any agricultural farmland. Therefore, no impacts would occur, and mitigation is not required.

Impact AFR-2: The proposed Project would not conflict with existing zoning for agricultural use, or a Williamson Act contract use.

Impact Determination

The Port complex does not have any agricultural farmland or existing zoning for agricultural use. The Port is entirely located within the Port-Related Industrial (IP) zoning district, which is characterized predominately by maritime industry and marine resources. Uses in this district are primarily port-related or water dependent but may also include water-oriented commercial and recreational facilities primarily serving the general public, and utility installations and rights-of-way. Therefore, no impacts would occur, and mitigation is not required.

Impact AFR-3: The proposed Project would not conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g)).

Impact Determination

The Port complex does not have any forest land or existing zoning for forest or timberland resources. The Port is entirely located within the Port-Related Industrial (IP) zoning district, which is characterized predominately by maritime industry and marine resources. Therefore, no impacts would occur, and mitigation is not required.

Impact AFR-4: The proposed Project would not result in the loss of forest land or conversion of forest land to non-forest use.

Impact Determination

The Port complex does not have any forest land. Therefore, no impacts would occur, and mitigation is not required.

Impact AFR-5: The proposed Project would not involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use.

Impact Determination

The Port complex does not have any farmland or forest land. Therefore, no impacts would occur, and mitigation is not required.

12.2.3 Air Quality and Health Risk Assessment

The environmental setting for air quality and health risk assessment is described in Section 3.5; the following information supplements that description for the purposes of the CEQA analysis.

Environmental Setting

Air pollutants are defined as two general types: (1) criteria pollutants, representing six common air pollutants for which the USEPA and California Air Resources Board (CARB) have set health- and welfare-protective national and state ambient air quality standards; and (2) toxic air contaminants (TACs), which may lead to serious illness or increased mortality even when present at relatively low concentrations. Generally, TACs do not have ambient air quality standards. The three TACs that do have ambient air quality standards (i.e., lead, vinyl chloride, and hydrogen sulfide) are not pollutants of concern for the proposed Project.

Criteria Pollutants

Air quality at a given location can be described by the concentrations of criteria air pollutants in the atmosphere near ground level. The significance of a pollutant concentration is determined by comparing it to an appropriate national or state ambient air quality standard. These standards represent the allowable atmospheric concentrations at which the public health and welfare are protected and include a reasonable margin of safety to protect the more sensitive individuals in the population.

Regional Air Pollutant Levels

The USEPA, CARB, and local air districts classify an area as attainment, unclassified, or non-attainment depending on whether the monitored ambient air quality data show compliance, lack of data, or non-compliance with the ambient air quality standards, respectively. The national ambient air quality standards (NAAQS) and California ambient air quality standards (CAAQS) relevant to the proposed Project are provided in **Table 12-1. Table 12-2** summarizes the federal and state attainment status of criteria pollutants in the South Coast Air Basin (SCAB) based on the NAAQS and CAAQS.

Table 12-1 National and California Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards	National Standards	Potential Health Effects
O_3	1-hour	0.09 ppm	—	Breathing difficulties, lung tissue damage
	8-hour [2]	0.070 ppm	0.070 ppm	
PM_{10}	24-hour	50 µg/m³	150 µg/m³	Increased respiratory disease, lung damage, cancer, premature death
	Annual	20 µg/m³	—	
$PM_{2.5}$	24-hour [3]	—	35 µg/m³	Increased respiratory disease, lung damage, cancer, premature death
	Annual	12 µg/m³	12 µg/m³	
CO	1-hour	20 ppm	35 pm	Chest pain in heart patients, headaches, reduced mental alertness
	8-hour	9.0 ppm	9 ppm	
NO_2	1-hour	0.18 ppm	0.100 ppm [1]	Lung irritation and damage
	Annual	0.030 ppm	0.053 ppm	
SO_2	1-hour	0.25 ppm	0.075 ppm [1]	Increases lung disease and breathing problems for asthmatics
	3-hour	—	0.5 ppm	
	24-hour	0.04 ppm	—	

Notes:
ppm = parts per million; µg/m³ = micrograms per cubic meter; "—" = no standards
[1] The federal 1-hour NO_2 and SO_2 standards are based on the 3-year average of the 98th and 99th percentiles, respectively, of the annual distribution of daily maximum values.
[2] The federal 8-hour O_3 standard is based on the annual fourth-highest daily maximum 8-hour concentration, averaged over 3 years.
[3] The federal 24-hour $PM_{2.5}$ standard is based on the 3-year average of the 98th percentile of the daily values.

Table 12-2 SCAB Attainment Status

Pollutant	Attainment Status	
	Federal	State
O_3	Extreme Nonattainment	Nonattainment
PM_{10}	Maintenance	Nonattainment
$PM_{2.5}$	Moderate Nonattainment	Nonattainment
CO	Maintenance	Attainment
NO_2	Maintenance	Attainment
SO_2	Attainment	Attainment

Source: USEPA 2019; CARB 2019.

Local Air Pollutant Levels

The POLB operates two air monitoring sites, one located in the Inner Harbor area near the intersection of Canal Avenue and 12th Street (Superblock site) and the other in the Outer Harbor area at the end of Navy Mole Road (Gull Park site). The stations collect ambient air pollutant and meteorological conditions within the Port region. The Gull Park air monitoring station is the site most representative of the Project vicinity because it is located in the Port's outer harbor, at the eastern end of the Navy Mole, a peninsula that terminates at the Long Beach Main Channel, and as such is proximal to the proposed dredging areas. Air quality impacts at the Gull Park site would be due primarily to ships and terminal operations, rather than on road trucks and distribution centers as is the case at the Superblock station (POLB 2017).

Table 12-3 presents the maximum pollutant concentrations measured at the POLB Gull Park monitoring station from 2016 to 2018, which is the most recent 3-year period available (POLB 2016a, 2017, 2018). These data show that the monitoring station exceeded the state 24-hour and annual PM10 standards in all 3 years. The Gull Park station does not have a filter-based PM2.5 monitor. In 2016 to 2018, none of the surrounding monitoring stations (Superblock, North Long Beach or South Long Beach) exceeded the PM2.5 NAAQS or CAAQS.

Table 12-3 Maximum Pollutant Concentrations Measured at the POLB Gull Park Monitoring Station

Pollutant	Averaging Period	National Standard	State Standard	Concentration [a]		
				2016	2017	2018
O_3 (ppm)	1-hour	--	0.09	0.071	0.081	0.075
	8-hour National [b]	0.070	--	0.056	0.054	0.051
	8-hour State	--	0.07	0.062	0.058	0.054
CO (ppm)	1-hour	35	20	2.0	2.1	1.9
	8-hour	9	9	1.7	1.7	1.5
NO_2 (ppm)	1-hour National [c]	0.100	--	0.078	0.077	0.075
	1-hour State	--	0.18	0.086	0.096	0.083
	Annual	0.053	0.030	0.018	0.018	0.017
SO_2 (ppm)	1-hour National [d]	0.075	--	0.013	0.011	0.009
	1-hour State	--	0.25	0.012	0.012	0.011
	24-hour	--	0.04	0.003	0.005	0.004
PM_{10} (µg/m^3)	24-hour National [e]	150	--	51.2	66.4	56.1
	24-hour State	--	50	52.7	84	56.1
	Annual	--	20	25.3	27	24.4
$PM_{2.5}$ (µg/m^3)[f]	24-hour	35	--	--	--	--
	Annual	12	12	--	--	--

Notes:

[a] Exceedances of the standards are shown in bold. All reported values represent the highest recorded concentration during the year unless otherwise noted.

[b] The monitored concentrations reported for the national 8-hour O_3 standard represent the 3-year average (including the reported year and the prior 2 years) of the 4th highest 8-hour concentration each year.

[c] The monitored concentrations reported for the national 1-hour NO_2 standard represent the 3-year average (including the reported year and the prior 2 years) of the 98th percentile of the annual distribution of daily maximum 1-hour average concentrations.

[d] The monitored concentrations reported for the national 1-hour SO_2 standard represent the 3-year average (including the reported year and the prior 2 years) of the 99th percentile of the annual distribution of daily maximum 1-hour average concentrations.

[e] The monitored concentrations reported for the national 24-hour PM_{10} standard represent the 2nd highest concentration recorded during each calendar year. The standard is attained when the number of days per calendar year exceeding 150 µg/m^3 is equal to or less than one.

[f] The Gull Park station does not have a filter-based PM2.5 Monitor. In 2016 to 2018, none of the surrounding monitoring stations (Superblock, North Long Beach or South Long Beach) exceeded the PM2.5 NAAQS or CAAQS.

Air Quality Regulatory Setting

Sources of air emissions in the SCAB are regulated by USEPA, CARB, and SCAQMD. In addition, regional and local jurisdictions play a role in air quality management. The existing rules, regulations, and policies pertaining to CEQA and that potentially apply to the proposed Project are discussed below.

Federal Regulations

The Clean Air Act

The federal CAA of 1963 and its subsequent amendments form the basis for the nation's air pollution control effort. USEPA is responsible for implementing most aspects of the CAA. Basic elements of the act include the NAAQS for major air pollutants, hazardous air pollutant standards, attainment plans, motor vehicle emission standards, stationary source emission standards and permits, acid rain control measures, stratospheric O3 protection, and enforcement provisions.

The CAA delegates enforcement of the federal standards to the states. In California, CARB is responsible for enforcing air pollution regulations. CARB, in turn, delegates the responsibility of regulating stationary emission sources to local air agencies. In the SCAB, SCAQMD has this responsibility.

State Implementation Plan and Air Quality Management Plan

For areas that do not attain the NAAQS, the CAA requires the preparation of a SIP, detailing how the State will attain the NAAQS within mandated timeframes. In response to this requirement, SCAQMD develops the AQMP, which is incorporated into the SIP. The AQMP is updated every several years in response to NAAQS revisions, USEPA SIP disapprovals, attainment demonstration changes, etc.; each AQMP builds on the prior AQMP. The AQMP is usually a collaborative effort between the SCAQMD, CARB and the Southern California Association of Governments (SCAG).

The most recent 2016 AQMP was adopted and submitted to the EPA in March 2017. The 2016 AQMP focuses on attainment of the ozone and PM2.5 NAAQS through the reduction of ozone and PM2.5 precursor NOx, as well as through direct control of PM2.5. The 2016 AQMP also identifies control measures and strategies to demonstrate the region's attainment of the revoked 1997 8-hour ozone NAAQS (80 ppb) by 2024; the 2008 8-hour ozone standard (75 ppb) by 2032; the 2012 annual PM2.5 standard (12 ug/m3) by 2025; the 2006 24-hour PM2.5 standard (35 ug/m3) by 2019; and the revoked 1979 1-hour ozone standard (120 ppb) by 2023.

The 2016 AQMP reported that although population in the SCAG region has increased by more than 20 percent since 1990, air quality has improved due to air quality control projects at the local, state and federal levels. In particular, 8-hour ozone levels have been reduced by more than 40 percent, 1-hour ozone levels by close to 60 percent, and annual PM2.5 levels by close to 55 percent since 1990 (SCAQMD 2017).

Emission Standards for Marine Engines

Emissions from marine diesel engines (compression ignition engines) have been regulated starting in 1999 through several EPA rules that apply to different engine categories. The scope of application of the marine engine rules covers all new marine diesel engines at or above 37 kW. Regulated engines include both propulsion and auxiliary marine diesel engines. A propulsion engine is one that moves a vessel through the water or assists in guiding the direction of the vessel, whereas auxiliary engines are all other marine engines. Certain overlap exists between the marine diesel engine regulations and regulations for mobile, land-based nonroad engines, which may be applicable to some types of engines used on marine vessels.

Emission Standards for Nonroad Diesel Engines

EPA established a series of emission standards for new off-road diesel engines. Tier 1 standards were phased in from 1996 to 2000; Tier 2 standards were phased in from 2001 to 2006; Tier 3 standards were phased in from 2006 to 2008; and Tier 4 standards, which require add-on emission control equipment, were phased in from 2008 to 2015. For each Tier category, the phase-in schedule is driven by engine size.

The Tier 4 standards complement the 2007 and later on-road heavy-duty engine standards by requiring an additional 90 percent reduction in PM and NOX compared to Tier 3 standards. To enable sulfur-sensitive control technologies in Tier 4 engines, USEPA mandated reductions in the sulfur content of non-road diesel fuels to 15 parts per million (ppm) (also known as the Ultra-Low Sulfur Diesel [ULSD]) in 2010; the federal fuel standard is preempted by the California standard, which took effect in 2006. These standards apply to clamshell dredging and land-based construction equipment but not to marine vessels or hopper dredgers, which use marine engines.

Emission Standards for On-Road Trucks

To reduce PM, NOX, and VOC from on-road heavy-duty diesel trucks, USEPA established a series of progressively cleaner emission standards for new engines starting in 1988. These emission standards have been revised over time, with the last major revision in 2007. The PM standard took full effect in 2007 and the NOx and VOC standards were phased in from 2007 through 2010. To enable sulfur-sensitive control technologies in newer engines, USEPA limited the sulfur content of on-road diesel fuels to 15 ppm (ultra-low sulfur diesel) effective June 2006.

State Regulations

California Clean Air Act

In California, CARB is designated as the state agency responsible for all air quality regulations. CARB, which became part of the Cal/EPA in 1991, is responsible for implementing the requirements of the federal CAA, regulating emissions from motor vehicles and consumer products, and implementing the CCAA. The CCAA outlines a program to attain the CAAQS for criteria pollutants. Since the CAAQS are generally more stringent than the NAAQS, attainment of the CAAQS requires greater emission reductions than what is required to show attainment of the NAAQS. Similar to the federal system, State requirements and compliance dates are based on the severity of the ambient air quality standard violation within a region.

State Implementation Plan

For areas that do not attain a NAAQS, the CAA requires preparation of a SIP, detailing how the State will attain the NAAQS within mandated timeframes. In response to this requirement, the SCAQMD and Southern California Association of Governments (SCAG) periodically prepare an AQMP. Once approved by CARB, the AQMP is incorporated into the SIP and then submitted by CARB to the USEPA for final approval.

The SCAQMD developed AQMPs in 2003, 2007, and 2012 (SCAQMD 2003; 2007; 2012b). The focus of these AQMPs was to demonstrate attainment of the national PM_{10}, $PM_{2.5}$, and O_3 standards, while making progress toward attainment of the State ambient standards. The most recent AQMP was approved by the SCAQMD Governing Board in March 2017 and CARB approved and submitted it to USEPA for approval as the SIP for the SCAB in April 2017. This 2016 AQMP focuses on attainment of the O_3 and $PM_{2.5}$ NAAQS through reductions of the O_3 and $PM_{2.5}$ precursor NO_x, as well as through direct control of $PM_{2.5}$. The 2016

AQMP identifies control measures and strategies to demonstrate that the SCAB will attain the revoked 1997 8-hour O_3 NAAQS (80 parts per billion [ppb]) by 2024; the 2008 8-hour O_3 standard (75 ppb) by 2032; the 2012 annual $PM_{2.5}$ standard (12 ug/m^3) by 2025; the 2006 24-hour $PM_{2.5}$ standard (35 ug/m^3) by 2019; and the revoked 1979 1-hour O_3 standard (120 ppb) by 2023.

The 2016 AQMP reported that although population in the SCAG region has increased by more than 20 percent since 1990, air quality has improved due to air quality control projects at the local, State, and federal levels. In particular, 8-hour O_3 levels have been reduced by more than 40 percent, 1-hour O_3 levels by close to 60 percent, and annual $PM_{2.5}$ levels by about 55 percent since 1990.

CARB In-Use Off-Road Diesel-Fleets Regulation

This regulation requires owners of off-road mobile equipment powered by diesel engines 25 hp or larger to meet fleet average or best available control technology (BACT) requirements for NOx and PM emissions by March 1 of each year. The regulation is structured by fleet size: large, medium, and small. The primary means by which to reduce fleet emissions under the regulation is to replace older equipment with newer equipment meeting more stringent emission standards. The target emission rates for these fleets are reduced annually over time. Enforcement of fleet average requirements for large fleets (greater than 5,000 total fleet horsepower) began in July 2014. The regulation also limits equipment idling. The regulation would mainly apply to off-road vehicles needed for construction activities.

CARB Portable Diesel-Fueled Engines Air Toxic Control Measure (ATCM)

CARB adopted the ATCM in 2004 with revisions in 2007 to reduce DPM emissions from portable diesel-fueled engines. The rule requires fleets to reduce their emissions by retiring, replacing, or repowering older engines or installing exhaust retrofits. The rule also requires that owners meet DPM emission fleet averages that become more stringent in 2013, 2017, and 2020. The regulation would mainly apply to off-road construction equipment, including equipment on some dredging barges.

CARB Commercial Harbor Craft (CHC) Regulation

This regulation requires reduction of TAC and criteria pollutant emissions from diesel-fueled engines used in new and in-use CHC. Under the regulation, CHC include tugboats, tow boats, ferries, excursion vessels, work boats, crew/supply vessels, fishing vessels, barges, and dredges. The regulation requires that, beginning in year 2009, all in-use, newly purchased, or replacement engines meet USEPA’s Tier 2 or greater emission standards per a compliance schedule set forth by CARB. For CHC with home ports in the SCAB, the compliance schedule is accelerated by 2 years, as compared to statewide requirements. The regulation would mainly apply to tugboat engines and engines on hopper dredges.

Statewide Portable Equipment Registration Program

The Statewide Portable Equipment Registration Program (PERP) establishes a uniform program to regulate portable engines and portable engine-driven equipment units. Once registered in the PERP, engines and equipment units may operate throughout California without the need to obtain individual permits from local air districts as long as the equipment is located at a single location for no more than 12 months. The PERP generally would apply to construction-related equipment (e.g., dredging and barge equipment).

Local Plans and Policies

SCAQMD is primarily responsible for planning, implementing, and enforcing federal and State ambient standards within the SCAB. As part of its planning responsibilities, SCAQMD prepares the AQMP based on the attainment status of the air basins within its jurisdiction. SCAQMD is also responsible for permitting and controlling stationary sources of criteria pollutant and TAC emissions as delegated by USEPA.

Through the attainment planning process, SCAQMD develops the SCAQMD Rules and Regulations to regulate sources of air pollution in the SCAB. The SCAQMD rules applicable to the No Action and Project Action Alternatives are listed below.

SCAQMD Rule 402 – Nuisance

This rule prohibits discharge of air contaminants or other materials that cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public; or that endanger the comfort, repose, health, or safety of any such persons or the public; or that cause, or have a natural tendency to cause, injury or damage to business or property.

SCAQMD Rule 403 – Fugitive Dust

The purpose of this rule is to control the amount of PM entrained in the atmosphere from man-made sources of fugitive dust. The rule prohibits visible emissions of fugitive dust from any active operation, open storage pile, or disturbed surface beyond the property line of an emissions source. Construction and operational sources of fugitive dust are subject to this rule.

For construction activities that would occur under the Proposed Plan, best available control measures identified in the rule would be required to minimize fugitive dust emissions from earth-moving and grading activities. These measures would include site watering as necessary to maintain sufficient soil moisture content. Additional requirements apply to operations on a property with: (1) 50 or more acres of disturbed surface area or (2) a daily earth-moving throughput volume of 5,000 cubic yards or more that occurs at least three times during the most recent 365-day period.

Port of Long Beach Green Port Policy

POLB developed the Port of Long Beach Green Port Policy in 2004. The policy serves as a guide for decision making and establishes a framework for environmentally friendly Port operations. The goal of the air quality program element of the POLB Green Port Policy is to reduce harmful air emissions from Port activities (POLB 2005).

San Pedro Bay Ports Clean Air Action Plan

As a means to implement the Green Port Policy, the Port of Long Beach, in conjunction with the Port of Los Angeles, and with the cooperation of SCAQMD, CARB, and USEPA, adopted the San Pedro Bay Ports CAAP on November 20, 2006, and adopted an updated CAAP in November 2010. The CAAP is a sweeping plan designed to reduce the health risks posed by air pollution from all port-related emissions sources, including ships, trains, trucks, terminal equipment, and harbor craft. In addition, a major goal of the CAAP is to ensure that port-related sources provide a “fair share” of regional emission reductions to enable the SCAB to attain state and national ambient air quality standards.

The CAAP proposed to implement emission control measures largely through new lease agreements and the CEQA approval process for new projects. To encourage implementation of these measures for terminals that do not undergo lease negotiations, Port of Los Angeles and Port of Long Beach proposed strategies such as incentive funding and tariff changes. The CAAP identified source-specific emission control measures and also included a Project Specific Standard, whereby new projects had to meet a 10-in-one-million cancer risk threshold.

The 2010 CAAP Update identified three categories of major enhancements: 1) updates to emission control measures; 2) adoption of the San Pedro Bay Standards (SPBS); and 3) CAAP progress tracking. The SPBS include a health risk reduction standard with the goal of reducing the population-weighted cancer risk of Port related DPM emissions by 85 percent in highly impacted communities located proximate to Port sources and throughout residential areas in the POLB region. The SPBS also includes an emission reduction standard for Port related sources relative to 2005 emission levels: 1) by 2014, reduce emissions of NOx , SOx, and DPM by 22, 93, and 72 percent, respectively and 2) by 2023, reduce emissions of NOx , SOx, and DPM by 59, 93, and 77 percent, respectively.

The progress and effectiveness of the CAAP are measured against attaining the SPBS health risk and emission reduction standards, as compared to operations associated with the 2005 annual San Pedro Bay Ports emissions inventories. These efforts allow the Port, the community, and regulators to determine the best use of resources for addressing air quality problems.

In November 2017 the Port of Los Angeles and Port of Long Beach adopted the 2017 CAAP Update. This plan includes new strategies that will reduce emissions from sources in and around the San Pedro Bay Ports while maintaining the San Pedro Bay Ports' competitive position in the global economy. These strategies have been guided by ongoing regional air quality compliance efforts, and notably, the goals of the California Sustainable Freight Action Plan (CSFAP). As articulated in the CSFAP, to support the ultimate goal of zero-emissions goods movement, the San Pedro Bay Ports must develop strategies that include the introduction of clean vehicles and equipment, infrastructure, freight efficiency, and energy planning. As a result, the initiatives in the 2017 CAAP Update are broader in scope than in the previous CAAPs.

The 2017 CAAP Update continues the health risk and emission reduction targets set in the 2010 CAAP Update and it promotes two new GHG emission reduction targets. The 2017 CAAP Update also incorporates the recent commitment by the mayors of Los Angeles and Long Beach to move towards zero emissions at the Ports, including setting goals of zero-emissions CHE by 2030 and zero-emissions drayage trucks by 2035.

The new emission reduction strategies span both near-term and long-term implementation periods: 1) near-term actions will produce air quality improvements within the next 5 years and will rely on accelerating the adoption of commercially available cleaner engine technologies and operational changes and 2) long-term actions will be implemented over the next two decades as a series of interim steps to achieve the goals of zero emissions and the reduction of the San Pedro Bay Ports' carbon footprint. These strategies are both source-specific and programmatic in nature and include flexibilities on how operators can best achieve these goals.

Port of Long Beach Community Grants Program

In 2009, the Port launched its Community Grant Programs (CGP) to address cumulative air and health impacts arising from new development projects. Since establishing the CGP, the Port has provided $17.4 million in funding for nearly 120 community-based mitigation projects.

In 2016, the Port developed a new updated program, the CGP, which allocates $46.4 million over the next 12 to 15 years in three categories: Community Health, Facility Improvements, and Community Infrastructure. An Investment Plan developed as part of a Community Impact Study identifies a framework for measuring and monetizing the results of the CGP (POLB 2019).

Additional details regarding the existing conditions and environmental setting are provided in Section 3.5. Details regarding the data and assessment methodologies are provided in Appendix H1.

Impacts and Mitigation

Significance Criteria

Impacts on air quality and health risk would be considered significant if the proposed Project would:

- **AQ-1: Produce emissions that would exceed any of the SCAQMD daily thresholds of significance in Table 12-4.**

Table 12-4 SCAQMD Daily Emission Thresholds for Construction

Air Pollutant	Construction Emission Threshold (Pounds/Day)
VOC	75
CO	550
NO_x	100
SO_x	150
PM_{10}	150
$PM_{2.5}$	55

Source: SCAQMD 2019.
Key: CO = carbon monoxide; NO_x = nitrogen oxides; PM_{10} = particulate matter 10 micrometers or less in diameter; $PM_{2.5}$ = particulate matter 2.5 micrometers or less in diameter; SCAQMD = South Coast Air Quality Management District; SO_x = sulfur oxides; VOC = volatile organic compound

- **AQ-2: Result in off-site ambient air pollutant concentrations that exceed any of the SCAQMD thresholds of significance shown in Table 12-5.**

Table 12-5 SCAQMD Thresholds for Ambient Air Pollutant Concentrations

Air Pollutant	Ambient Concentration Threshold
NO_2	
1-hour average (state)	0.18 ppm (339 µg/m^3)
1-hour average (federal)	0.100 ppm (188 µg/m^3)
Annual average (state)	0.030 (57 µg/m^3)
Annual average (federal)	0.0534 (100 µg/m^3)
PM_{10}	
24-hour average (construction)	10.4 µg/m^3
Annual average	1.0 µg/m^3
$PM_{2.5}$	
24-hour average (construction)	10.4 µg/m^3
SO2	
1-hour average (state)	0.25 ppm
1-hour average (federal)	0.075 ppm
24-hour average (state)	0.04 ppm
CO	
1-hour average (state)	20 ppm
1-hour average (federal)	35 ppm
8-hour average (state and federal)	9.0 ppm

Source: SCAQMD 2019.
Key: CO = carbon monoxide; µg/m^3 = microgram per cubic meter; NO_2 = nitrogen dioxide; PM_{10} = particulate matter less than 10 microns in diameter; $PM_{2.5}$ = particulate matter less than 2.5 microns in diameter; ppm = parts per million; SCAQMD = South Coast Air Quality Management District; SO_2 = sulfur dioxide
Notes:
a. The SCAQMD has determined that ambient air pollutant concentrations less than those identified above would not cause or substantially contribute to an exceedance of the NAAQS or CAAQS.
b. The SCAQMD also has established concentration thresholds for sulfates and lead but proposed Project emissions of these pollutants would be very low, such that thresholds would not be exceeded.
c. The NO_2, SO_2, and CO thresholds are absolute concentration thresholds, meaning that the maximum predicted project concentration is added to the background concentration in the project vicinity, and the total concentration is compared to the threshold.
d. The federal 1-hour NO_2 standard of 0.100 ppm (188 µg/m^3) is used as a significance threshold in this document even though SCAQMD does not list it as one of its Air Quality Significance Thresholds. This standard applies to the 3-year average of the annual 98th percentile of the daily maximum 1-hour concentrations.
e. The PM_{10} and $PM_{2.5}$ thresholds are incremental concentration thresholds developed by the SCAQMD to comply with the NAAQS and CAAQS. The PM_{10} and $PM_{2.5}$ maximum predicted project incremental concentrations are directly compared to the thresholds without adding background concentrations.

- **AQ-3: Create an objectionable odor at the nearest sensitive receptor pursuant to SCAQMD Rule 402.**
- **AQ-4: Produce emissions that would expose the public to significant levels of TACs. The determination of significance is based on the following:**
  - **Maximum incremental cancer risk greater than or equal to 10 in one million (10×10^{-6});**
  - **Non-cancer (chronic or acute) hazard index greater than or equal to 1.0 (Project increment); or**
  - **Population cancer burden greater than 0.5 excess cancer cases in areas equal to or exceeding 1 in one million (1×10^{-6}) cancer risk.**
- **AQ-5: Conflict with or obstruct implementation of an applicable AQMP or would not conform to the most recently adopted SIP.**

Impacts

Impact AQ-1: The proposed Project would produce emissions that would exceed some of the SCAQMD daily thresholds of significance.

Impact Determination

The proposed Project would contribute to an increase in criteria pollutant emissions during construction. Short-term emissions would result from the use of construction equipment, including equipment used for dredging (clamshell, hydraulic, or hopper dredge barges) and disposal (tugs and barges), and trips generated by construction workers and haul/material delivery trucks.

Construction of the proposed Project would produce emissions that exceed the SCAQMD daily thresholds of significance. The following table summarizes the unmitigated peak daily emissions associated with construction activities. The table shows that, without mitigation, emissions would exceed SCAQMD thresholds for NO_X in years 2024, 2025, 2026, and 2027; and for $PM_{2.5}$, CO, and VOC in 2025. These exceedances would represent significant regional air quality impacts.

Table 12-6 Peak Daily Construction Emissions

	PM_{10}	$PM_{2.5}$	NOX	SOX	CO	VOC
Source Category	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)
2024						
Off-road construction equipment	0.3	0.3	7.2	0.0	5.4	0.8
On-road construction vehicles	0.8	0.3	3.4	0.0	1.2	0.0
Fugitive emissions	0.0	0.0	0.0	0.0	0.0	0.0
Marine equipment	7.7	6.8	142.8	0.1	79.4	7.9
Total Construction Year 2024	8.7	7.4	153.4	0.1	86.0	8.7
Impacts						
Significance threshold	150	55	100	150	550	75
Significant?	**No**	**No**	**Yes**	**No**	**No**	**No**
2025						
Off-road construction equipment	0.0	0.0	0.0	0.0	0.0	0.0
On-road construction vehicles	0.0	0.0	0.0	0.0	0.0	0.0
Fugitive emissions	0.0	0.0	0.0	0.0	0.0	0.0
Marine equipment	100.8	90.6	1,970.0	1.3	1,070.5	109.2
Total Construction Year 2025	100.8	90.6	1,970.0	1.3	1,070.5	109.2
Impacts						
Significance threshold	150	55	100	150	550	75
Significant?	**No**	**Yes**	**Yes**	**No**	**Yes**	**Yes**
2026						
Off-road construction equipment	0.0	0.0	0.0	0.0	0.0	0.0
On-road construction vehicles	0.0	0.0	0.0	0.0	0.0	0.0
Fugitive emissions	0.0	0.0	0.0	0.0	0.0	0.0
Marine equipment	21.8	20.2	495.1	0.4	278.5	27.4
Total Construction Year 2026	21.8	20.2	495.1	0.4	278.5	27.4
Impacts						
Significance threshold	150	55	100	150	550	75
Significant?	**No**	**No**	**Yes**	**No**	**No**	**No**
2027						
Off-road construction equipment	0.0	0.0	0.0	0.0	0.0	0.0
On-road construction vehicles	0.0	0.0	0.0	0.0	0.0	0.0
Fugitive emissions	0.0	0.0	0.0	0.0	0.0	0.0
Marine equipment	21.8	20.2	495.1	0.4	278.5	27.4
Total Construction Year 2027	21.8	20.2	495.1	0.4	278.5	27.4
Impacts						
Significance threshold	150	55	100	150	550	75
Significant?	**No**	**No**	**Yes**	**No**	**No**	**No**
Notes:						
On-road construction vehicle emissions include construction vehicles and worker vehicles and reflect exhaust, road dust, tire wear, and brake wear emissions. Only dredging and disposal activities would occur in years 2025, 2026, and 2027. Marine equipment emissions include emissions from dredges and construction-related harbor craft. Fugitive emissions include construction dust. Emissions might not add precisely due to rounding.						

Mitigation Measures

The following mitigation measures would be implemented to reduce impacts.

MM-AQ-1: Electric Clamshell Dredge. The use of an electric clamshell dredge shall be required for project clamshell dredging activities during the entire construction period of the project, and the construction of an electrical substation at Pier J is also required to provide electric power to the clamshell dredge.

MM-AQ-2: Construction-Related Harbor Craft. Construction-related harbor craft (tugboats, crew boats, and survey boats) with Category 1 or Category 2 marine engines will meet at least EPA Tier 3 emission standards for marine engines. In addition, the construction contractor will require all construction-related tugboats that home fleet in the San Pedro Bay Ports: 1) to shut down their main engines and 2) to refrain from using auxiliary engines while at dock and instead use electrical shore power, if feasible.

MM-AQ-3: Fleet Modernization of Off-Road Construction Equipment. Self-propelled, diesel-fueled off-road construction equipment 25 horsepower or greater will meet EPA/CARB Tier 4 Final emission standards for non-road equipment.

MM-AQ-4: Additional Mitigation for Off-Road Construction Equipment. Off-road diesel-powered construction equipment will comply with the following:

- Construction equipment will be maintained according to manufacturer's specifications.
- Construction equipment will not idle for more than five minutes when not in use.

Although this measure would reduce combustion emissions, the benefits achieved from its implementation were not quantified due to the wide range of variables involved.

Impacts Following Mitigation

Implementation of Mitigation Measures MM-AQ-1 through MM-AQ-4 would reduce construction emissions associated with the proposed Project. **Table 12-7** summarizes the mitigated peak daily emissions associated with the proposed Project following mitigation. The emissions include construction of the electrical substation at Pier J, as required by MM-AQ-1. The table shows that although emissions would be reduced with mitigation, NO_x would remain above significance thresholds in years 2024, 2025, 2026, and 2027; and $PM_{2.5}$, CO, and VOC would remain above significance thresholds in 2025. Impacts would be significant and unavoidable.

Table 12-7 Peak Daily Construction Emissions with Mitigation

Source Category	PM10	PM2.5	NOX	SOX	CO	VOC
	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)
2024						
Off-road construction equipment	0.1	0.1	3.5	0.0	12.7	1.3
On-road construction vehicles	1.3	0.4	4.1	0.0	2.1	0.1
Fugitive emissions	2.0	0.3	0.0	0.0	0.0	0.0
Marine equipment	4.9	4.3	101.5	0.1	80.8	5.6
Total Construction Year 2024	8.3	5.2	109.1	0.2	95.7	7.0
Impacts						
Significance threshold	150	55	100	150	550	75
Significant?	**No**	**No**	**Yes**	**No**	**No**	**No**
2025						
Off-road construction equipment	0.0	0.0	0.0	0.0	0.0	0.0
On-road construction vehicles	0.0	0.0	0.0	0.0	0.0	0.0
Fugitive emissions	0.0	0.0	0.0	0.0	0.0	0.0
Marine equipment	88.3	78.6	1,673.5	1.1	953.5	92.7
Total Construction Year 2025	88.3	78.6	1,673.5	1.1	953.5	92.7
Impacts						
Significance threshold	150	55	100	150	550	75
Significant?	**No**	**Yes**	**Yes**	**No**	**Yes**	**Yes**
2026						
Off-road construction equipment	0.0	0.0	0.0	0.0	0.0	0.0
On-road construction vehicles	0.0	0.0	0.0	0.0	0.0	0.0
Fugitive emissions	0.0	0.0	0.0	0.0	0.0	0.0
Marine equipment	9.8	8.8	210.8	0.2	161.4	11.7
Total Construction Year 2026	9.8	8.8	210.8	0.2	161.4	11.7
Impacts						
Significance threshold	150	55	100	150	550	75
Significant?	**No**	**No**	**Yes**	**No**	**No**	**No**
2027						
Off-road construction equipment	0.0	0.0	0.0	0.0	0.0	0.0
On-road construction vehicles	0.0	0.0	0.0	0.0	0.0	0.0
Fugitive emissions	0.0	0.0	0.0	0.0	0.0	0.0
Marine equipment	9.8	8.8	210.8	0.2	161.4	11.7
Total Construction Year 2027	9.8	8.8	210.8	0.2	161.4	11.7
Impacts						
Significance threshold	150	55	100	150	550	75
Significant?	**No**	**No**	**Yes**	**No**	**No**	**No**

Notes:

On-road construction vehicle emissions and fugitive dust emissions increase with mitigation because mitigation includes the construction of the land-based electrical substation.
CO emissions would increase slightly with higher tier engines per EPA marine emission factors.
On-road construction vehicle emissions include construction vehicles and worker vehicles and reflect exhaust, road dust, tire wear, and brake wear emissions.
Only dredging and disposal activities would occur in years 2025, 2026, and 2027.
Marine equipment emissions include emissions from dredges and harbor craft.
Fugitive emissions include construction dust. Emissions might not add precisely due to rounding.

Health Effects of Pollutant Emissions

In *Sierra Club v. County of Fresno (2018)*, the California Supreme Court ruled that an EIR for a proposed master-planned, mixed-use development in Fresno County known as Friant Ranch did not adequately relate the expected adverse air quality impacts to likely health consequences or explain in meaningful detail why it is not feasible at the time of drafting to provide such an analysis. In response to the Court's decision, Section H3.1 of Appendix H3 provides a detailed discussion of the potential health effects associated with the proposed Project's significant regional emissions impacts identified above. In summary, construction emissions associated with the proposed Project would potentially contribute to regional adverse health effects associated with exposure to $PM_{2.5}$ and ozone (which is formed photochemically from emissions of NO_X and VOC) in the SCAB. The proposed Project would not contribute to regional adverse health effects associated with exposure to CO or NO_2. Impacts would be temporary, occurring only during the construction period.

Impact AQ-2: The proposed project would result in off-site ambient air pollutant concentrations that exceed the SCAQMD thresholds of significance.

Impact Determination

Construction of the proposed Project would result in ambient air pollutant concentrations that exceed the NAAQS and CAAQS. **Table 12-8** and **Table 12-9** present the maximum offsite pollutant concentrations associated with construction, which demonstrate that the total 1-hour NO_2 concentration would exceed the NAAQS and CAAQS; the annual NO_2 concentration and the SO_2 and CO concentrations would not exceed the NAAQS or CAAQS; neither PM_{10} nor $PM_{2.5}$ concentrations would exceed NAAQS or CAAQS. The NO_2 exceedances would represent significant local air quality impacts. Appendix H2 provides figures showing the locations of the maximum 1-hour NO2 concentrations and the geographical areas where the NAAQS and CAAQS would be exceeded. The maximum concentrations and significant impact areas would occur on Port property.

Table 12-8 Maximum Pollutant Concentrations of NO_2, SO_2, and CO

Pollutant	Averaging Time	Maximum Modeled Project Concentration (ug/m^3)	Background Concentration (ug/m^3)	Total Concentration (ug/m^3)	Significance Threshold (AAQS) (ug/m^3)	Significant?
NO_2	1-hour state	173.2	181.0	354	339	**Yes**
	1-hour federal	133.0	141.4	274	188	**Yes**
	Annual	2.3	33.9	36	57	No
SO_2	1-hour state	0.4	31.5	32	655	No
	1-hour federal	0.4	23.6	24	196	No
	24-hour state	0.05	13.1	13	105	No
CO	1-hour	197.1	2,410.7	2,608	23,000	No
	8-hour	57.9	1,951.5	2,009	10,000	No

Table 12-9 Maximum Pollutant Concentrations of PM_{10} and $PM_{2.5}$

Pollutant	Averaging Time	Maximum Modeled Project Concentration (ug/m^3)	Significance Threshold (SCAQMD) (ug/m^3)	Significant?
PM_{10}	24-hour	1.9	10.4	No
	Annual	0.1	1.0	No
$PM_{2.5}$	24-hour	1.7	10.4	No

Mitigation Measures

Implementation of Mitigation Measures **MM-AQ-1** through **MM-AQ-4** would reduce impacts from off-site pollutant concentrations.

Impacts Following Mitigation

Table 12-10 and **Table 12-11** present the maximum local offsite pollutant concentrations associated with construction of the proposed Project with mitigation. These tables show that the 1-hour state NO_2 concentration would be reduced to below the CAAQS. Although the 1-hour federal NO_2 concentration would be reduced with mitigation, it would remain above the NAAQS. All other pollutants would be reduced and would remain below the level of significance. Because the 1-hour federal NO_2 would remain above the NAAQS, local impacts would be significant and unavoidable. Figure H2.4 in Appendix H2 shows the location of the maximum federal 1-hour NO2 concentration and the significant impact area. They are both located on Port property.

Table 12-10 Maximum Pollutant Concentrations of NO_2, SO_2, and CO During Construction, after Mitigation

Pollutant	Averaging Time	Maximum Modeled Project Concentration (ug/m^3)	Background Concentration (ug/m^3)	Total Concentration (ug/m^3)	Significance Threshold (AAQS) (ug/m^3)	Significant?
NO_2	1-hour state	138.8	181.0	320	339	No
	1-hour federal	114.9	141.4	256	188	**Yes**
	Annual	1.2	33.9	35	57	No
SO_2	1-hour state	0.1	31.5	32	655	No
	1-hour federal	0.1	23.6	24	196	No
	24-hour state	0.02	13.1	13	105	No
CO	1-hour	129.7	2,410.7	2,540	23,000	No
	8-hour	44.0	1,951.5	1,995	10,000	No

Table 12-11 Maximum Pollutant Concentrations of PM_{10} and $PM_{2.5}$ During Construction, after Mitigation

Pollutant	Averaging Time	Maximum Modeled Project Concentration (ug/m^3)	Significance Threshold (SCAQMD) (ug/m^3)	Significant?
PM_{10}	24-hour	1.9	10.4	No
	Annual	0.06	1.0	No
$PM_{2.5}$	24-hour	1.7	10.4	No

Health Effects of Local Pollutant Concentrations

In response to the Court's decision on *Sierra Club v. County of Fresno (2018)*, Section H3.2 of Appendix H3 provides a detailed discussion of the potential health effects associated with the proposed Project's significant local pollutant concentration impacts identified above. In summary, construction of the proposed Project would potentially contribute to local adverse health effects associated with exposure to NO_2. The area of impact would occur on POLB property. The proposed Project would not contribute to local adverse health effects associated with exposure to SO_2, CO, PM_{10}, or $PM_{2.5}$. Impacts would be temporary, occurring only during the construction period.

Morbidity and Mortality

Numerous studies have been published over the years that have established a strong correlation between the inhalation of ambient PM and mortality (premature death) and morbidity (illness). These respirable particles (PM_{10} and $PM_{2.5}$) can accumulate in the human respiratory system or penetrate the vascular system, causing or aggravating diseases such as asthma, bronchitis, lung disease, and cardiovascular disease. Children, the elderly, and the ill are believed to be especially vulnerable to adverse health effects of PM10 and $PM_{2.5}$.

The Port considers the assessment of potential mortality and morbidity effects to be an expansion of the PM2.5 ambient impact discussion for project operations and therefore quantifies morbidity and mortality when operation of a project would result in offsite 24-hour $PM_{2.5}$ incremental concentrations that exceed the SCAQMD significance criterion of 2.5 μg/m^3 (SCAQMD 2019). Since the proposed Project would not generate PM emissions during operation, a quantification of PM mortality and morbidity was not warranted. Furthermore, the local $PM_{2.5}$ concentration impacts during construction would be less than significant; therefore, the proposed Project would not substantially increase mortality and morbidity effects in the region.

Impact AQ-3: The proposed Project would not create an objectionable odor at the nearest sensitive receptor pursuant to SCAQMD Rule 402.

Impact Determination

The proposed project is not expected to generate objectionable odors that would adversely affect sensitive receptors. Construction activities would generate air pollutants due to the combustion of diesel fuel. The mobile nature of most emission sources would help to decentralize, disperse, and dilute emissions over the relatively large project site. Furthermore, the distance between the construction activities and the nearest sensitive receptor is nearly one mile and therefore is expected to be far enough to allow for adequate dispersion of these emissions to below objectionable odor levels. In addition, dredged sediment would be transported to off-shore disposal sites several miles away from receptors. Finally, the existing industrial setting represents is an already complex odor environment. For example, existing nearby container terminals include freight and goods movement activities that use ships, diesel trucks, and diesel cargo-handling equipment that generate similar odors as would the proposed Project. Within this context, the proposed Project would not likely result in changes to the overall odor environment in the vicinity. Therefore, the proposed Project would not be likely to produce objectionable odors that would affect a sensitive receptor. Impacts would be less than significant, and mitigation is not required.

Impact AQ-4: The proposed Project would not produce emissions that would expose the public to significant levels of TACs.

Impact Determination

Construction of the proposed Project would result in temporary emissions of diesel particulate matter (DPM), a toxic air contaminant, from the combustion of diesel fuel in marine engines, off-road construction equipment engines, harbor craft, and a minimal number of on-road construction vehicles. More than 99 percent of the DPM emissions would occur over water. The nearest sensitive receptors would be residences located approximately one mile north of the West Basin. The closest offsite workers would be located at nearby Port terminals, approximately 50 meters from the nearest construction activity.

Construction activities would occur over a period of approximately 39 months and would be spread out over a total area of over 1,700 acres. Activities in a given dredging area are unlikely to affect the same receptors affected by activities in a different dredging area (e.g., dredging activities in the West Basin, the area closest to sensitive receptors, are unlikely to affect the same receptors affected by dredging of the 4.2-mile-long Approach Channel, which is separated from the West Basin by 2.5 miles or more). In addition, the activity closest to sensitive receptors, dredging of the West Basin, would occur over a period of only 120 days and would be spread over the entire West Basin. All other dredging activities would occur much farther from sensitive receptors.

Furthermore, construction activities in any single location would be transitory and short-term. Assessment of cancer risk is typically based on exposure periods of 30 years for residents and 25 years for off-site workers. Because DPM exhaust would be spread out over a large area, short-term at any given location, and occur far from sensitive receptors, construction activities are not anticipated to result in substantial elevated cancer risks to exposed persons.

To estimate potential maximum cancer risks and non-cancer chronic impacts, maximum results of the PM_{10} dispersion modeling, detailed in Appendix H2, and CARB's Hotspots Analysis and Reporting Program (HARP) were used. Analysis details are presented in Appendix H4. Past Port projects have consistently shown that the non-cancer acute hazard index and population cancer burden would not exceed SCAQMD thresholds. Most construction activities would occur over water and farther from population centers than other Port projects. Therefore, it is reasonable to conclude that non-cancer acute impacts and population cancer burden would be lower than other Port projects, which have consistently been below SCAQMD thresholds. A detailed discussion is included in Appendix H4.

Table 12-12 presents the maximum estimated cancer risks and non-cancer chronic hazard index impacts due to construction activities. The table shows that impacts would be below the thresholds of significance at all receptor types. Appendix H4 details assumptions and calculations made in evaluating TAC impacts.

Table 12-12 Maximum Cancer Risk and Non-Cancer Chronic Impacts

Health Impact	Receptor Type	Maximum Predicted Impact	Significance Threshold	Significant?
Cancer Risk	Residential/Sensitive	6.9×10^{-6}	1×10^{-5}	No
Cancer Risk	Occupational	4.4×10^{-7}	1×10^{-5}	No
Non-Cancer Chronic	Residential/Sensitive	0.006	1	No
Non-Cancer Chronic	Occupational	0.02	1	No

Therefore, project activities would not expose the public to significant levels of toxic air contaminants. Impacts would be less than significant, and mitigation is not required.

Impact AQ-5: The proposed Project would not conflict with or obstruct implementation of an applicable AQMP or would not conform to the most recently adopted SIP.

Impact Determination

The proposed Project is located in the SCAB, which is under the jurisdiction of the SCAQMD. The San Pedro Bay ports of Los Angeles and Long Beach, in cooperation with the USEPA, California Air Resources Board (CARB), and SCAQMD, have developed an aggressive strategy to significantly reduce health risks posed by air pollution from port-related sources as a means of complying with the SCAQMD's air quality management plan for the region.

The proposed Project would produce emissions of nonattainment pollutants primarily from diesel-powered sources. The AQMP proposes emission-reduction measures that are designed to bring the SCAB into attainment of the CAAQS and NAAQS. The attainment strategies in the AQMP include source control measures and clean fuel programs that are enforced at the state and federal levels on engine manufacturers and petroleum refiners and retailers. SCAQMD also adopts AQMP control measures into the SCAQMD rules and regulations, which are then used to regulate sources of air pollution in the SCAB. Compliance with these requirements would further ensure that project activities would not obstruct implementation of the AQMP.

The POLB provides SCAG with Port-wide cargo forecasts that are used to simulate growth and emissions scenarios in the AQMP. The Port operates well within the cargo forecasts provided for the AQMP. One objective of the AQMP is to improve the flow of goods at the San Pedro Bay Ports. The proposed Project would assist in implementing this AQMP objective, as described in Section 4.2. Therefore, the proposed Project would not conflict with or obstruct implementation of the applicable AQMP or SIP. Impacts would be less than significant, and mitigation is not required.

12.2.4 Biota and Habitats

Environmental Setting

Habitats

The environmental setting for biota and habitats is described in detail in Section 3.4. Briefly, the project site consists almost entirely of marine habitats that include soft-bottom and hard-bottom open-water areas, mostly in deep (>20 feet) water but including some shallow areas along the rocky shoreline and breakwaters. Biological communities in those areas include plankton, benthic infauna (species living within the sediments), benthic epifauna (species living on or just above the sediment surface), hard-substrate organisms living on rock dikes and pilings, demersal (bottom-dwelling) and pelagic (open-water) fish, marine mammals, and marine-associated birds.

No eelgrass (*Zostera marina* or *Z. pacifica*) has been reported within the project area; eelgrass grows in shallow (less than 20 feet deep), soft-bottom areas, which do not occur in the project area. No naturally-occurring terrestrial habitats are located within the project area. The entire project area consists of engineered fill on which the Port was constructed. The Surfside Borrow Pit nearshore dredged material placement site is characterized by soft sediments, is in an area characterized by high-energy hydrodynamics, and is used periodically for sediment placement and removal; accordingly, it would not contain sensitive habitats. Further, the placement area does not contain any known eelgrass beds.

No Significant Ecological Areas (SEA) as designated by Los Angeles County are located in the Port of Long Beach; the only SEA in the Port Complex is the California Least Tern nesting site on Pier 400 in the Port of Los Angeles.

Biological Communities

Plankton consists of tiny plants (diatoms and flagellates), animals (copepods, other small crustaceans, fish and invertebrate larvae), Protista (dinoflagellates), and bacteria that drift in the water column. They comprise the bottom trophic levels of the marine food chain and are an important food source for many larger animals.

Biological surveys over the past three decades, as summarized in MBC and Merkel & Associates (2016), have identified nearly three hundred species of benthic infauna in the San Pedro Bay Port Complex. The infaunal community is dominated by polychaete worms, with smaller densities of mollusks, arthropods, nemerteans, and echinoderms. Outer Harbor and shallow areas generally have a greater abundance of benthic species compared to the Inner Harbor and deep areas. Although the benthic epifauna is dominated by shrimp and crabs, large mollusks (e.g., snails) and echinoderms (e.g., sea cucumbers and brittle stars) are also present.

Hard substrates within the intertidal zones offer habitat for a wide variety of sessile organisms such as sponges, bryozoans, corals, anemones, worms, mussels, barnacles, tunicates, and algae (including several kelp species), as well as for mobile invertebrates such as nudibranchs, snails, crabs, lobsters, sea urchins, and sea stars. It also provides a foraging resource for other species including a variety of fish and marine-associated birds. Within the intertidal zone (the area between the high and low tide line), a key physical factor that affects the distribution and abundance of organisms is the tide, because organisms are subject to varying degrees of submergence and exposure. The rock dikes and breakwaters provide excellent habitat for giant kelp (*Macrocystis pyrifera*) and other large seaweeds, which are abundant in the project area.

Nearly 100 fish species have been documented from the Port Complex, although most are infrequent or rare. The most common pelagic species in recent biological surveys are northern anchovy (*Engraulis mordax*), California grunion (*Leuresthes tenuis*), Pacific mackerel (*Scomber japonicus*), topsmelt (*Atherinops affinis*), and jacksmelt (*Atherinopsis californiensis*), all of them important forage fish for other fish, birds, and marine mammals. The most abundant demersal species are white croaker (*Genyonemus lineatus*), queenfish (*Seriphus politus*), and California lizardfish (*Synodus lucioceps*); other abundant species include speckled sanddab (*Citharichthys stigmaeus*), California tonguefish (*Symphurus atricaudus*), and staghorn sculpin (*Leptocottus armatus*).

All marine mammals are protected under the federal Marine Mammal Protection Act. Marine mammals that frequent or have been observed within the Port complex include cetaceans (whales and dolphins) and pinnipeds (sea lions and seals). The most abundant cetaceans observed within and adjacent to the project area are bottlenose dolphins and short-beaked common dolphins; grey whales (*Eschrichtius robustus*) pass by the Port in nearshore waters during their migrations, and individuals occasionally enter the Outer Harbor. Blue, fin, and humpback whales occur farther offshore but are not known to enter the harbor. The only pinnipeds known to frequent the harbor are California sea lion (*Zalophus californianus*), which are widespread within the Port Complex, and harbor seals (*Phoca vitulina*), which are mostly observed in the Outer Harbor.

Several dozen marine-associated bird species have been observed within the Port Complex. The most abundant species are gulls, terns, and pelicans but during the fall migration the port area is visited by large numbers of ducks, geese, and shorebirds (e.g., sandpipers, stilts, and dowitchers). Gulls, terns, pelicans, and cormorants use the Outer Harbor to forage for food and to rest on the water surface and on breakwaters and rock dikes.

Special-Status Species

A number of sensitive species and their habitats are protected by federal and state laws, as described in more detail in Sections 3.4.3 and 3.4.4 and in POLB (2019). No algae or invertebrate species are protected but eelgrass, which is widespread along the coast of Southern California, is considered a sensitive habitat because of its nursery function for fish. Eelgrass beds occur within the Port Complex but not in or near the project area.

California Least Tern (*Sternula antillarum brownii*) is protected under the federal and California Endangered Species Acts, and a number of other bird species are protected under federal and state laws and regulatory policies; Section 3.4.4 and POLB (2019, Table 3.1.1) describe the special-status bird species in more detail.

A number of commercially important fish species are federally managed by NOAA Fisheries under the Coastal Pelagics and Pacific Groundfish fisheries management plans (FMPs) authorized by the Magnuson-Stevens Fisheries Management Act; all of the Coastal Pelagic species and about a third of the Pacific Groundfish species have been observed in the Port. The entire project area is designated as EFH under those FMPs.

Four species of sea turtles are federally listed as threatened or endangered, but three are considered absent from the project area with the East Pacific DPS of green sea turtle having a low probability of occurring in the Study Area. USACE has made a may affect, not likely to adversely affect, determination for the Recommended Plan. The POLB agrees to apply the listed avoidance and minimization measures to LSF.

Invasive/Non-Native Species

A number of non-native plants, invertebrate, fish, and bird species have been documented in the project area. Of these, the invasive marine green alga *Caulerpa taxifolia* is of particular concern because of its tenacity and lack of natural biological control agents. *Caulerpa* tends to smother native marine communities, and its control in Southern California is the focus of a concerted, multi-agency effort.

Impacts and Mitigation

Significance Criteria

Impacts on biota and habitats would be considered significant if the Proposed Project would:

- **BIO-1: Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the CDFW or USFWS;**
- **BIO-2: Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations or by the CDFW or USFWS;**
- **BIO-3: Have a substantial adverse effect on state or federally protected wetlands (including but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means;**
- **BIO-4: Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites;**
- **BIO-5: Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance; and/or**
- **BIO-6: Conflict with the provisions of an adopted Habitat Conservation plan, National Conservation Plan, or other approved local, regional, or state habitat conservation plan.**

Impacts

Impact BIO-1: The proposed Project would not have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the CDFW or USFWS.

Impact Determination

As described in greater detail in Section 5.4, a number of special-status species and their habitats known to exist in the harbor area are protected under numerous laws and regulations, including the federal ESA, the CESA, the Migratory Bird Treaty Act, and the Marine Mammal Protection Act, administered by the USFWS, NOAA Fisheries, and CDFW. Dredging and sediment disposal and placement activities could have direct and indirect impacts to these species. Direct impacts would result from temporary water quality degradation (including decreased dissolved oxygen [DO] and increased turbidity, as described in greater detail in Section 2.10). Such activities could affect foraging and/or nesting habitat or behaviors for a number of federally- and state-listed sensitive bird and marine mammal species. Indirect impacts could occur as a result of physical modification of habitats from dredging or sediment placement.

Dredging, ocean disposal, placement of material at nearshore placement sites, and breakwater construction activities would be unlikely to affect any listed, candidate, sensitive, or special-status species due to the temporary nature of increases in noise, vibration, or turbidity and the “soft start” used for pile driving at the Pier J breakwaters (“soft start” means that pile driving would be initiated at reduced energy to give marine wildlife the opportunity to vacate the vicinity of the pile-driving activity). All of the special-status species, being highly mobile, would be readily able to avoid the construction areas. Accordingly, dredging, disposal, and other in-water activities would not adversely affect these species.

A USACE study at several previously dredged sites in Southern California concluded that most dredging and nearshore placement activities do not affect the foraging of the endangered California least tern, *Sternula antillarum brownii* (USACE 2016) that construction of the proposed Project would not adversely affect nesting least terns and that the limited project footprint, temporary nature of construction, and availability of alternate foraging areas closer to the nesting site justify a no-adverse-effect determination. For the same reasons, project construction would be unlikely to have substantial adverse effects on other federally- or state-listed sensitive marine bird species (Section 3.4).

As described in Section 5.4.4, the primary threat to listed whale species in the study area is strikes by fast moving, large vessels. Within the harbor, operating dredges are either stationary (clamshell dredges) or moving at speed of 1-3 knots (hopper dredges). Neither poses a threat to any of the listed whale species, both because whales rarely occur inside the harbor and because whales can readily avoid such slow-moving objects. Outside the harbor, dredges and tugboat/barge combinations transporting dredged material to disposal sites could encounter whales, particularly during migrations. Those vessels would move relatively slowly (5-10 knots, depending on sea conditions), meaning that they would represent little or no threat to any of the listed whale species. The ODMDS site designation EIS (USACE and USEPA, 2005) concluded that, “Marine mammals in the vicinity of the LA-3 and LA-2 ODMDSs during disposal operations will potentially be disturbed by the noise and activity of the disposal tug and barge, and by the turbid plume from the disposed sediments. The migratory path of gray whales may be temporarily deflected ... gray whales are fairly tolerant of noise from ships and are likely to deviate their migratory course just enough to avoid ships ...”. Accordingly, the USACE has determined that the proposed Project would not affect any of the listed whale species.

Four species of sea turtles are federally listed as threatened or endangered, but three are considered absent from the project area with the East Pacific DPS of green sea turtle having a low probability of occurring in the Study Area. USACE has made a may affect, not likely to adversely affect, determination for the Recommended Plan. The POLB agrees to apply the listed avoidance and minimization measures to LSF. There would not be any substantial loss in the population or habitat of any native fish, wildlife, or vegetation. Benthic populations removed during dredging or buried at the placement/disposal sites are expected to recover within 1–2 years following disturbance. The project would not have substantial adverse effects on any listed species or their critical habitats. Therefore, impacts would be less than significant, and mitigation is not required.

Impact BIO-2: The proposed Project would not have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations or by the CDFW or USFWS.

Impact Determination

The proposed Project would not result in a substantial adverse effect on any riparian habitat or other sensitive natural communities within the harbor and in areas nearby. No riparian habitat and very limited eelgrass habitat currently exist within the Harbor District. Construction of the proposed Project would not directly affect eelgrass. Eelgrass does not occur in the proposed dredge footprint (MBC and Merkel & Associates 2016) and the likelihood of eelgrass existing within the disposal or placement areas is remote because 1) those locations are too deep to sustain eelgrass habitat, and 2) those locations are in open waters, whereas eelgrass occurs in sheltered areas. However, eelgrass surveys would be performed prior to dredging in accordance with the permit-specified requirements under Clean Water Act (CWA) Section 404 for local sponsor (i.e., Port only) activities and in accordance with the California Eelgrass Mitigation Policy (CEMP) administered by National Marine Fisheries Services (NMFS).

Impacts on existing sensitive natural communities could occur through the introduction of invasive species (e.g., *Caulerpa taxifolia*) in marine habitats. *Caulerpa taxifolia* has not been detected in the harbor and has been eradicated from known localized areas of occurrence in Southern California. The Approach Channel is considered to be too deep and too rough for *Caulerpa taxifolia*, however, the Main Channel and the proposed Pier J Channel and Turning Basin are considered to be suitable habitat. Accordingly, pre-construction surveys would be performed prior to dredge and disposal activities, consistent with the *Caulerpa* Control Protocol (NMFS and CDFW 2008) and in accordance with permit-specified requirements under Clean Water Act (CWA) Section 404. This would minimize the potential for the introduction and spread of invasive species and would not conflict with any local policies or ordinances protecting biological resources.

Because the proposed Project would not have a substantial adverse effect on a sensitive natural community, impacts would be less than significant, and mitigation is not required.

Impact BIO-3: The proposed Project would not have a substantial adverse effect on state or federally protected wetlands (including but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means.

Impact Determination

No state or federally protected wetlands exist in or near the project area. Therefore, proposed Project activities would not have a substantial adverse effect on state or federally protected wetlands, and no impact would occur, and mitigation is not required.

Impact BIO-4: The proposed Project would not interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors or impede the use of native wildlife nursery sites.

Impact Determination

Construction activities could temporarily increase turbidity, thereby degrading water quality in a manner that could affect fish and other marine life movement within the area. Mobile species are expected to relocate out of the immediate area until dredging activities are completed. Some benthic populations would be removed by dredging but they would recolonize the area following completion of dredging.

Construction activities could affect EFH by removing or decreasing the functions and values of that habitat. Construction activities could result in direct and indirect impacts, such as 1) direct removal/burial of organisms; 2) turbidity/siltation effects, including light attenuation from turbidity; 3) contaminant release and uptake, including nutrients, metals, and organics; 4) release of oxygen-consuming substances; 5) entrainment; and 6) noise disturbances. However, any such effects would be temporary and limited in extent to the immediate dredge or disposal area; noise impacts from pile driving would be reduced by the use of the "soft start" approach. Fish would be readily able to avoid the construction area during construction, physical disturbances would rapidly dissipate, and disturbed sediment and rock dike areas would return to their pre-construction states.

The movement or migration of fish or wildlife would not be substantially impeded; therefore, impacts would be less than significant, and mitigation is not required.

Impact BIO-5: The proposed Project would not conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.

Impact Determination

Applicable regulations protecting biological resources in the Harbor District are administered by federal and state agencies under the various laws and policies described above and in Section 3.4. Construction of the proposed Project would be conducted in accordance with all applicable regulations protecting biological resources. The proposed Project would not conflict with any local policies or ordinances protecting biological resources. Therefore, no impacts would occur, and mitigation is not required.

Impact BIO-6: The proposed Project would not conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.

Impact Determination

The project area is not located within an adopted Natural Communities Conservation Plan or Habitat Conservation Plan area. As such, implementation of the proposed Project would not conflict with an applicable Natural Communities Conservation Plan or Habitat Conservation Plan. Therefore, no impacts would occur, and mitigation is not required.

12.2.5 Historic and Tribal Cultural Resources

Environmental Setting

The environmental setting for historic and tribal cultural resources is described in detail in Section 3.8. Briefly, the Port of Long Beach is located roughly along the coastline of San Pedro Bay, an area that was formerly inhabited by several Native American cultures and, more recently, by European settlers. Archeological, historical, and other cultural resources have been documented throughout the San Pedro Bay area. However, the project area consists almost entirely of open water: navigation channels in the Outer Harbor and adjacent ocean, a portion of the West Basin of Long Beach Harbor, and disposal sites both nearshore and offshore. In addition, a small area on Pier E would be used for construction staging.

The water areas that would be dredged for the proposed Project were formerly coastal ocean and have only been adjacent to land in the 100 years since development of the Port Complex began. Most of the project area waters have been previously dredged, and the three disposal sites have been used for several decades for a variety of projects. The only in-water cultural resources could possibly occur in the water areas are recent-era shipwrecks, but none is known from the project site.

The landside area on Pier E consists of land in the industrialized Port created in the late 20^{th} Century by placement of dredged material. There are no documented historic structures or other cultural resources on either site. There were historic structures on Pier T, adjacent to the West Basin, but they are no longer extant, having been removed or destroyed during development of port facilities.

Impacts and Mitigation

Significance Criteria

Impacts on historic and tribal cultural resources would be considered significant if the proposed Project would:

- **CR-1: Cause a substantial adverse change in the significance of a historical resource pursuant to §15064.5;**
- **CR-2: Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5;**
- **CR-3: Disturb any human remains, including those interred outside of formal cemeteries; and/or**
- **CR-4: Cause a substantial adverse change in the significance of a tribal cultural resource as defined in PRC Section 21074.**

Impacts

Impact CR-1: The proposed Project would not cause a substantial adverse change in the significance of a historical resource pursuant to §15064.5.

Impact Determination

Because there are no structures present on the land areas that could be affected by the project that are considered significant historic resources and because no shipwrecks or other submerged cultural resources are known to be present in the dredge footprint, the proposed Project would not adversely change the significance of any historical resources. Therefore, impacts would be less than significant, and mitigation is not required.

Impact CR-2: The proposed Project would not cause a substantial adverse change in the significance of an archaeological resource pursuant to § 15064.5.

Impact Determination

As described in Section 5.7.4, construction activities associated with the proposed Project would not have the potential to uncover archaeological resources because all Project-related activities would occur within sediments of the bay, most of them in previously dredged areas, and on recently-placed fill material. However, in the event of an unanticipated discovery, standard conditions in the permits and contracts issued by the USACE and POLB would, as described in Section 10.2, require construction activities to be halted, archeological experts to be notified, and the USACE to complete an evaluation of the significance of those resources and determine the appropriate resolution of any potential adverse effects. With these precautions in place, impacts on archeological resources would be less than significant and mitigation is not required.

Impact CR-3: The proposed Project would not disturb any human remains, including those interred outside of formal cemeteries.

Impact Determination

Because the proposed Project site is located on a previously disturbed area, the proposed Project would not affect remains interred outside of formal cemetery. No human remains are known to exist on the proposed Project site, and the proposed Project site is not designated, nor has it been designated, for use as a cemetery. However, if human remains or items of cultural patrimony are discovered, standard conditions in the permits and contracts issued by the USACE and POLB would, as described in Section 10.2, require construction activities to be halted, appropriate experts to be notified, and the remains or other objects to be treated in accordance with applicable laws. With these precautions in place, impacts would be less than significant, and mitigation is not required.

Impact CR-4: The proposed Project would not cause a substantial adverse change in the significance of a tribal cultural resource as defined in PRC Section 21074.

Impact Determination

The proposed Project would occur within the water areas, and minimal landside areas, which are on documented fill. Therefore, the proposed Project is not anticipated to result in changes to listed or eligible tribal cultural resources. The Port has undertaken appropriate outreach to invite consultation by Native American tribes in accordance with AB 52. A review of the Sacred Land File through the Native American Heritage Commission identified the following tribes within the project area: Gabrieleno Band of Mission Indians—Kizh Nation, Gabrieleno/Tongva San Gabriel Band of Mission Indians, Gabrielino/Tongva Nation, Gabrielino Tongva Indians of California Tribal Council, and the Gabrielino-Tongva Tribe. However, none of the tribes requested consultation. There is no evidence of tribal resources occurring in the area that could be affected. Accordingly, no impacts would occur, and mitigation is not required.

12.2.6 Geology, Soils, and Seismic Conditions

Environmental Setting

The environmental setting for geology, soils, and seismic conditions is described in Section 3.1. Briefly, the Port is located in the seismically active southwestern portion of the Los Angeles Basin. The nearest faults are the Wilmington blind-thrust, Palos Verdes Hills, Newport-Inglewood, Whittier, and San Andreas faults, which all have the potential to affect the Port area.

Most of the project area consists of Holocene-age soft marine sediments, primarily silt with clay and sand fractions, deposited by the Los Angeles River. These sediments overlay rock formations occurring at depths below the scope of the proposed Project. The sediments within the dredge footprint of the proposed Project have been repeatedly disturbed by previous dredging and by vessel activity. The land formations within the proposed Project area consist of fill material (i.e., dredged material and imported soils) placed in the late twentieth century to create new land for marine terminals.

Impacts and Mitigation

Significance Criteria

Impacts on geology/soils would be considered significant if the proposed Project would:

- **GEO-1: Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:**
  - **Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map;**
  - **Strong seismic ground shaking;**
  - **Landslides, lateral spreading, subsidence, or collapse; and/or**
  - **Tsunamis or seiches.**
- **GEO-2: Result in substantial soil erosion or the loss of topsoil.**
- **GEO-3: Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property.**
- **GEO-4: Directly or indirectly destroy a unique geologic feature or result in the permanent loss of, or loss of access to, a paleontological resource of regional or statewide significance.**
- **GEO-5: Known mineral (petroleum or natural gas) resources would be rendered inaccessible.**

Impacts

Impact GEO-1: The proposed Project would not directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:

- ***Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map;***
- ***Strong seismic ground shaking;***
- ***Landslides, lateral spreading, subsidence, or collapse; and/or***
- ***Tsunamis or seiches.***

Impact Determination

The project does not involve the development of habitable structures that would be affected by seismic activity, nor does it involve the alteration of existing landforms such that risks of ground rupture, landslides, or tsunamis or seiches would be increased. Accordingly, no impact would occur, and mitigation is not required.

Impact GEO-2: The proposed Project would not result in substantial soil erosion or the loss of topsoil.

Impact Determination

Construction would occur primarily in the harbor waters and would not result in erosion. The landside construction would be minimal and would occur on existing developed and disturbed areas; compliance with the NPDES Construction General Permit (CGP) and project-specific Stormwater Pollution Prevention Plan (SWPPP) would be mandatory and would ensure that any runoff from landside construction would not cause substantial soil erosion or loss of topsoil. Standard, permit-specified best management practices (BMPs) for soil stabilization can include use of vegetation, soil binders, mulches, geotextiles, plastic covers, and erosion control blankets. These measures are typically utilized during and immediately following construction until paving the completed and vegetation is established, thereby reducing erosion. Construction contractors would be required to implement BMPs to prevent/contain releases of soils. Monitoring of the BMPs to ensure compliance is included in the SWPPP as controls. Construction activities would comply with POLB guidance and applicable permits and applicable sections of the Long Beach Municipal Code and California Building Code. Therefore, the proposed Project would not result in substantial soil erosion or the loss of topsoil. No impact would occur, and mitigation is not required.

Impact GEO-3: The proposed Project would not be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property.

Impact Determination

Because construction of the project would not affect the expansiveness of soils and does not involve the development of habitable structures that would be affected by geologic constraints, no impact would occur, and mitigation s not required.

Impact GEO-4: The proposed Project would not directly or indirectly destroy a unique geologic feature or result in the permanent loss of, or loss of access to, a paleontological resource of regional or statewide significance.

Impact Determination

The potential to encounter sensitive paleontological resources during dredging in the San Pedro Bay is also extremely low since sediments in the Bay are silts and sands deposited by. A records search conducted by the Natural History Museum of Los Angeles County on August 29, 2019 for vertebrate paleontology records confirmed that there are no vertebrate fossil localities that lie directly within the proposed Project area boundaries (McLeod pers. comm.). However, there are localities nearby from the same sedimentary deposits that probably occur at depth in the proposed Project area. It was noted that shallow excavations in the artificial fill and younger Quaternary deposits that may occur at the uppermost layers in the proposed Project area probably will not uncover significant vertebrate fossil remains. Deeper excavations that extend down into older Quaternary deposits, however, may well encounter significant fossil vertebrate specimens. However, the channels that will be dredged have been dredged in the past to form the fill that makes up the various piers and terminals at the Port. To minimize potential impacts from unanticipated excavation of paleontological resources during dredging, a Worker Environmental Awareness Program (WEAP) would be implemented, and all construction crews and contractors would be required to participate in WEAP training prior to starting work on the project. The WEAP training would include a review of sediment samples and measures to be implemented for avoidance of these paleontological resources or geologic features. It would also include training workers to stop work if suspicious fossils are discovered to allow for appropriate identification, characterization, and disposition of such resources. Therefore, the proposed Project would not directly or indirectly destroy unique paleontological resources or geologic features. Impacts would be less than significant, and mitigation is not required.

Impact GEO-5: The proposed Project would not render known mineral (petroleum or natural gas) resources inaccessible.

Impact Determination

According to the Division of Oil, Gas, and Geothermal Resources' Online Mapping System, the project site is within the Wilmington Oil Field, and several oil wells exist in the vicinity of the project (Division of Oil, Gas, and Geothermal Resources 2019).However, dredging and disposal would take place in open-water areas where no oil extraction activities occur, and landside facilities would not be located at or near any oil wells or other production facilities. Accordingly, the proposed Project would not increase the rates of existing oil extraction or affect production and abandonment plans for any project area oil wells around the project site. Therefore, the proposed Project would not result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan. No impact on the availability of a mineral resource would occur and mitigation is not required.

12.2.7 Hazards and Hazardous Materials

Environmental Setting

The environmental setting for hazards and hazardous materials is described in Section 3.13. Briefly, hazards associated with the proposed Project would consist largely of the small amounts of hazardous materials (fuels, lubricants, solvents, etc.) used on construction equipment. Contaminated sediments could be encountered and will necessitate sampling, characterization, and special handling. Given the levels of contamination typical of sediments, they would not constitute hazardous materials or wastes.

Impacts and Mitigation

Significance Criteria

Impacts during construction would be considered significant if the proposed Project would:

- **HAZ-1: Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials;**
- **HAZ-2: Create a significant adverse effect on the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment;**

- **HAZ-3: Produce an adverse effect on the public or environment as a result of being located on a site that is known to contain hazardous materials or create a significant hazard to people or the environment because of the presence of soil or groundwater contamination;**
- **HAZ-4: Impair implementation, physically interfere with, or result in an inconsistency with an adopted emergency response plan or emergency evacuation plan;**
- **HAZ-5: Not comply with state guidelines associated with abandoned oil wells;**
- **HAZ-6: Handle hazardous materials, substances, or wastes within 0.25 mile of an existing or planned school;**
- **HAZ-7: Expose people or structures, either directly or indirectly, to a significant risk of loss, injury, or death involving wildland fires;**
- **HAZ-8: Result in a safety hazard or excessive noise for people residing or working in a project area located within an airport land use plan or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport; and**
- **HAZ-9: Result in an inconsistency with the Port of Long Beach Risk Management Plan.**

Impacts

Impact HAZ-1: The proposed Project would not create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials.

Impact Determination

The proposed Project is not expected to result in routine transport, use, or disposal of significant quantities of hazardous materials. However, during construction, activities could involve the limited transport, storage, use, or disposal of hazardous materials such as fueling and servicing construction equipment on site, and the transport of fuels, lubricating fluids, and solvents. Such storage, handling, and disposal would be regulated by the California Department of Toxic Substances Control (DTSC), EPA, Occupational Safety and Health Administration, Los Angeles County Fire Department, and Los Angeles County Health Department.

Accidents resulting in spills of hazardous materials—including fuel, lubricants, or hydraulic fluid from the equipment used during dredging and disposal—could occur during the proposed Project and adversely affect water quality. Impacts would depend on the amount and type of material spilled as well as specific conditions (i.e., currents, wind, temperature, waves, tidal stage, and vessel activity). As such, impacts related to routine transport, use, or disposal of significant quantities of hazardous materials would be less than significant and mitigation is not required.

Impact HAZ-2: The proposed Project would not create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment.

Impact Determination

The proposed Project activities could result in contaminated sediments being encountered during dredging, excavation, and associated activities throughout the proposed Project area. Past dredging in the Approach Channel to maintain authorized depths was accompanied by sediment testing programs, which identified phthalate compounds and low tributyltin levels (USACE 2018). All detected metal concentrations were below National Oceanic and Atmospheric Administration effects range low values. A second sediment testing program was conducted in 2018 in support of upcoming maintenance dredging in the Approach Channel to remove high spots. The POLB Approach Channel sediments showed moderate chemical contamination. Chemical data for some constituents were above effects range low levels and human health objectives. Because it has been identified that sediments in the proposed Project site have historically been contaminated, it is possible that dredging activities required for the proposed Project would encounter these or other contaminated sediments. However, dredging and placement operations are not expected to result in the release of toxic substances as the dredged materials are expected to be clean enough to be placed in the nearshore or disposed of at one of two nearby ocean-dredged material disposal sites. As such, impacts related to the release of hazardous materials into the environment would be less than significant and mitigation is not required.

Impact HAZ-3: The proposed Project would not produce an adverse effect on the public or environment as a result of being located on a site that is known to contain hazardous materials or create a significant hazard to people or the environment because of the presence of soil or groundwater contamination.

Impact Determination

The construction activities associated with the proposed Project would primarily involve dredging of sediment materials. As discussed above, dredging and placement operations are not expected to result in the release of toxic substances as the dredged materials are expected to be clean enough to be placed in the nearshore or disposed of at one of two nearby ocean-dredged material disposal sites. As such, impacts related to the release of hazardous materials into the environment would be less than significant. Impacts would be less than significant, and mitigation is not required.

Impact HAZ-4: The Project would not impair implementation, physically interfere with, or result in an inconsistency with an adopted emergency response plan or emergency evacuation plan.

Impact Determination

The proposed Project would not interfere with any current emergency response plans or emergency evacuation plans for local, state, or federal agencies. Access to all local roads would be maintained during construction and project operation. Any emergency procedures or design features required by city, state, and federal guidelines would be implemented during construction and operation of the proposed Project. Therefore, the proposed Project would not impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan. No impacts would occur, and mitigation is not required.

Impact HAZ-5: The proposed Project would comply with state guidelines associated with abandoned oil wells.

Impact Determination

The proposed project is located within the harbor waters and would not affect existing or abandoned oil wells. No impact would occur, and mitigation is not required.

Impact HAZ-6: The proposed Project would not handle hazardous materials, substances, or waste within 0.25 mile of an existing or planned school.

Impact Determination

Because there are no schools located or proposed within one-quarter mile of the project site, no impact would occur, and mitigation is not required.

Impact HAZ-7: The proposed Project would not expose people or structures, either directly or indirectly, to a significant risk of loss, injury, or death involving wildland fires.

Impact Determination

Because there are no wildlands adjacent to or in the general project vicinity, no impacts associated with exposing people or structures to increased wildland fire hazards would occur, and mitigation is not required.

Impact HAZ-8: The proposed Project would not result in a safety hazard or excessive noise for people residing or working in a project area located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport.

Impact Determination

The project site is not located within a 2-mile radius of any public airport. As such, the proposed Project would not result in an airplane safety hazard for people residing or working in the project area. No impact would occur, and mitigation is not required.

Impact HAZ-9: The proposed Project would not result in an inconsistency with the Port of Long Beach Risk Management Plan.

Impact Determination

Generally, the Port RMP is associated with the operational use and storage of hazardous materials and not construction-related impacts, unless construction activities would involve large quantities of hazardous materials that could cause off-site impacts. Hazardous materials used during construction would be limited to construction equipment fuels and other construction materials, such as hydraulic oils, solvents, welding gases, or cleaning supplies, with limited potential to affect areas off of the construction site. Therefore, construction activities would not be inconsistent with the Port RMP. No impact would occur, and mitigation is not required

12.2.8 Hydrology/Water Quality

Environmental Setting

The environmental setting for hydrology and water quality is described in Section 3.3. Briefly, waters of the project site are oceanic in character, with salinity typically approximately 33.5 parts per thousand. Tidally-driven circulation maintains generally good water quality, with dissolved oxygen concentrations ranging between 6 and 10 mg/liter. Water clarity can decrease as a result of turbidity caused by vessel action, storms, construction, and algal blooms, but is generally typical of coastal waters. Dissolved chemical contaminants such as metals, chlorinated pesticides, PCBs, and petroleum hydrocarbons are present at low concentrations, mostly as a result of inputs from landside activities and storm drainage from inland areas.

Water circulation in the project area is driven primarily by the mixed semi-diurnal tidal cycle (two high and two low tides, each of different magnitudes, per lunar day). The mean tidal range is 3.81 feet (mean low to mean high water; Table 3-2), but the asymmetrical nature of the tide results means that the range between mean lower low water and mean higher high water is 5.49 feet.

Currents in the project area result from tidal flows through the Queens Gate and around the eastern end of the Long Beach Breakwater. Maximum flood and ebb tidal velocities occur at Queens Gate, with surface velocities reaching up to 1.1 feet per second. Tidal circulation is generally clockwise within the Port of Long Beach, with flows of 0.2 to 0.3 feet per second (fps) in inner channels and 0.3 to 1.1 fps at the entrance channel near Queens Gate. The current pattern is affected by the Port's topography: land masses and breakwaters divert current flows, and deep channels facilitate current flow.

The Port is protected from wave action from the west and north by the Palos Verdes Peninsula and the mainland; ocean waves reaching 10 to 12 feet in height typically approach from the south and southeast, generated by tropical and extratropical storms. The Middle and Long Beach breakwaters provide protection from those waves such that waves inside the breakwaters typically take the form of a short-period swell.

Impacts and Mitigation

Significance Criteria

Impacts during construction would be considered significant if the proposed Project would:

- **WQ-1: Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality;**
- **WQ-2: Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin;**
- **WQ-3: Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:**
  - **Result in substantial erosion or siltation on- or off-site.**
  - **Substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite.**
  - **Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or**
  - **Impede or redirect flood flows.**
- **WQ-4: In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation;**
- **WQ-5: Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan; and/or**
- **WQ-6: Substantially alter water circulation or currents or result in the long-term detrimental alteration of harbor circulation that would cause reduced water quality.**

Impacts

Impact WQ-1: The proposed Project would not violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality.

Impact Determination

Construction of the proposed Project, including dredging activities, would potentially affect water quality. Construction activities such as dredging and earth-moving could result in short-term increases in turbidity, decreases in dissolved oxygen, increases in nutrients, and increases in contaminants in areas where contaminated sediments occur (e.g., heavy metals and organic chemicals) adsorbed on suspended sediments or dissolved in the water in the sediments, thus degrading water quality. These impacts would generally be confined to the immediate vicinity of the dredging activities, though impacts may remain detectable short distances away depending on current.

Periodic monitoring of the water column would be conducted to ensure that turbidity increases and/or decreases in dissolved oxygen do not result in significant impacts. The monitoring would be conducted in accordance with standard USACE protocol in which the USACE would implement a Water Quality Monitoring Plan at the dredge and placement sites. This protocol consists of weekly monitoring of water quality parameters (salinity, pH, dissolved oxygen, temperature, total suspended solids, and percent light transmissivity) with an instrument package at four stations. The four stations are situated relative to the dredge and placement site release point, at 100’ upcurrent, 100’ downcurrent, 300’ downcurrent, and a control station located outside of any sediment plume. Monthly water samples are taken from the station 300’ downcurrent of the dredge for analysis of total suspended solids, TRPH, and for any contaminants of concern identified during sediment sampling and analysis to be conducted during the design phase of the project.

Should monitoring show an increase in turbidity or a decrease in dissolved oxygen, management procedures would be implemented to reduce the impacts. These measures may include slowing the dredge cycle, ensuring that the bucket is completely emptied over the disposal barge, or, in extreme cases, the use of silt curtains to control turbidity. With implementation of these water quality monitoring and management strategies as part of project design, proposed Project impacts would be less-than-significant, and mitigation is not required.

Impact WQ-2: The proposed Project would not substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin.

Impact Determination

Because the proposed Project would not directly change the quantity of the groundwater and groundwater would not be used as part of the project, no impacts associated with groundwater supply depletion or groundwater recharge interference would occur and mitigation is not required.

Impact WQ-3: The proposed Project would not substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:

- ***Result in substantial erosion or siltation on- or off-site.***
- ***Substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite.***
- ***Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or***
- ***Impede or redirect flood flows.***

Impact Determination

Proposed dredging activities and construction activities would not alter drainage patterns that could result in substantial soil erosion or increase the rate or amount of surface runoff that could result in flooding. All construction would occur within the water, or on disturbed and existing paved areas. Therefore, no impacts pertaining to drainage pattern alterations would occur. Proposed dredging activities and construction activities would not alter drainage patterns or increase impervious surfaces. All construction would occur within the water, or on disturbed and existing paved areas. Therefore, no impacts pertaining to drainage pattern alterations would occur and mitigation is not required.

No structures that would impede or redirect flood flows are proposed as a part of the proposed Project. The site would remain relatively level and drainage patterns would be similar to existing conditions. As such, the proposed Project would not impede, or redirect flood flows compared to existing conditions. Therefore, no impacts would occur, and mitigation is not required.

Impact WQ-4: The proposed Project would not risk release of pollutants due to project inundation in flood hazard, tsunami, or seiche zones.

Impact Determination

The project site is within the Tsunami Hazard Zone as mapped by the California Emergency Management Agency. Further, tsunami flood hazard conditions already exist for much of the Port area, and the proposed Project would not contribute toward intensifying this condition. Impacts would be less than significant, and mitigation is not required.

Seiches are seismically induced water waves that surge back and forth in an enclosed basin and could occur in the harbor as a result of earthquakes. Dredging of approximately 7 mcy of sediments would result in moderate alterations of the bottom topography of the harbor. Container channels would be deepened from an average water depth of –50 to –55 feet mean lower low water (MLLW), and the Approach Channel would be deepened to -80 feet MLLW. The Port is an industrial area where previous dredging has been completed. Dredging would temporarily disrupt underwater depositional processes; however, similar to prior dredging episodes in this area, depositional equilibrium would be reestablished within a short period of time. Therefore, impacts would be less than significant, and mitigation is not required.

Impact WQ-5: The proposed Project would not conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan.

Impact Determination

Because the proposed Project would not conflict with any water quality control plans or sustainable groundwater management plans, no impacts would occur, and mitigation is not required.

Impact WQ-6: The proposed Project would not substantially alter water circulation or currents or result in the long-term detrimental alteration of harbor circulation that would cause reduced water quality.

Impact Determination

The proposed Project would deepen existing channels, basins, and slips, but not substantially from existing conditions: the deepened federal channels and associated berths constitute a small percentage of the harbor area. The small changes in depth could result in a slight increase in tidal flushing, but not in substantial alterations to water circulation or currents. The slightly increased flushing volume could incrementally improve water quality in the area, although the effect would likely be small. Impacts would be less than significant, and mitigation is not required.

12.2.9 Land Use/Planning

Environmental Setting

The environmental setting for land use and planning is described in Section 3.11. Briefly, the proposed Project would occur in water areas of Long Beach Harbor; a small land area would be used for temporary construction staging. The project site is designated as Harbor within the City of Long Beach General Plan and is zoned IP for industrial zones within the Port Master Plan (PMP).

Impacts and Mitigation

Significance Criteria

Impacts to land use would be considered significant if the proposed Project would:

- **LU-1: Conflict with any applicable land use plan, policy, or regulation of any agency with jurisdiction over the proposed Project adopted for the purpose of avoiding or mitigating an environmental effect;**
- **LU-2: Introduce uses or activities incompatible with existing and future land uses; and/or**
- **LU-3: Physically divide an established community.**

Impacts

Impact LU-1: The proposed Project would not conflict with any applicable land use plan, policy, or regulation of any agency with jurisdiction over the proposed Project adopted for the purpose of avoiding or mitigating an environmental effect.

Impact Determination

According to the General Plan Land Use Element, land uses within the Port boundaries are designated and controlled by the PMP; therefore, the project's land use consistency with the PMP is analyzed below (Long Beach 1989). The PMP identifies land uses specific to the Port that the City of Long Beach General Plan does not. The PMP is also a requirement of the California Coastal Act, to which the Port is subject (Chapter 8, Section 30705(a), Section 30708(a), (c) and Section 30233(a)). The proposed Project does not fall within the categories of appealable development identified in Section 30715 (a)(1)-(6) of the Coastal Act; therefore, it would not be appealable. The proposed Project is not an appealable project because it is not a development for the storage, transmission, or processing of liquefied natural gas and crude oil in such quantities as would have a significant impact upon the oil and gas supply of the state or nation or both. The POLB defines a development with a significant impact as a development that would (1) substantially increase or decrease the oil and gas supply of the nation, or both; or (2) substantially increase or decrease the value of the oil and gas facilities of the state or nation, or both. The proposed Project is not a significant development under this standard.

The proposed Project would facilitate the safe and efficient transportation of all types of cargo into and out of the POLB because larger vessels are calling at the POLB that need deeper and wider channels in order to safely operate. Currently, these vessels must engage in lightering, where some of the petroleum material is transferred to a second ship offshore so both ships need less depth when they enter the POLB, or light loading, where larger ships are not fully loaded to ensure they can safely navigate, which results in more trips (and significantly higher transportation costs) to transport the same amount of product. The quantity of oil and gas deliveries will not materially change due to the proposed Project; it will simply be handled in a safer and more cost-effective manner. The proposed Project would have national significance because it will improve transportation efficiencies, decrease costs, and improve conditions for vessel operations and safety, not because it will significantly increase the oil and gas supply of California or the nation (IFR, Section 1.4 Purpose and Need). As such, the proposed Project would have little to no impact on the oil and gas supply of the state or nation and is not an appealable project under Section 30715(a)(1).

The proposed Project is consistent with (a) permitted Port-related industrial uses and navigation uses associated with these Harbor Planning Districts; and (b) overall goals stipulated in the PMP and the long-range planning goal for the Terminal Island, Middle Harbor, and Southwest Harbor Planning Districts to increase Primary Port use, as well as the goal of Navigation and Outer Harbor Planning Districts to help navigation. The proposed Project would improve existing navigation channels within the Port complex and would not require zone changes or changes to existing land uses.

As such, the proposed Project would be consistent with the applicable land use designations and zoning and would also be consistent with a PMP goals to encourage maximum use of facilities by improving the efficiency of cargo handling facilities and developing land for primary Port facilities and Port-related uses. Therefore, the project would not conflict with applicable land use plans, policies, or regulations. No impacts would occur, and mitigation is not required.

Impact LU-2: The proposed Project would not introduce uses or activities incompatible with existing and future land uses

Impact Determination

The proposed project would not introduce any uses or activities that are incompatible with existing Port operations. Dredging activities are common within Port environments for channel deepening and maintenance of existing channels. No impacts would occur, and mitigation is not required.

Impact LU-3: The proposed Project would not physically divide an established community.

Impact Determination

The proposed Project would occur entirely within the boundaries of the Port. There are no residential uses within the proposed Project site. Therefore, no communities would be physically divided by the proposed Project. No impacts would occur, and mitigation is not required.

12.2.10 Noise

Environmental Setting

The environmental setting for noise is described in Section 3.8. The Port environment is a generally noisy industrial setting, characterized by traffic noise, container handling noise, and train and vessel horns. Ambient noise levels measured at the Port have ranged between 64.1 and 71.8 dBA L_{eq}, depending on the time of day and day of the week. However, the Outer Harbor water areas in which most of the project would take place are quieter than land areas (because marine terminal and roadway activities do not occur there) and are not located adjacent to any residential areas or other sensitive uses.

Impacts and Mitigation

Significance Criteria

Impacts on noise during construction would be considered significant if the proposed Project would:

- **NOI-1: Result in a substantial temporary or permanent increase (3 dBA or more in Leq) in ambient noise levels at the property line of a noise-sensitive receptor;**
- **NOI-2: Exceed Land Use Noise District noise levels allowed by the LBMC;**
- **NOI-3: Result in exposure of persons to or generation of ground-borne vibration in excess of the standards established by the LBMC; and/or**
- **NOI-4: Result in a substantially increased number of vibration events that exceed the standards established by the LBMC.**

Impacts

Impact NOI-1: The proposed Project would not result in a substantial temporary or permanent increase (3 dBA or more in Leq) in ambient noise levels at the property line of a noise-sensitive receptor.

Impact Determination

Construction activities, including dredging activities, would generate increased noise levels. The type of dredge that would most likely be used generates an L_{eq}[16] of 71.5 A-weighted decibels (dBA) at 50 feet (Parsons Engineering Science, Inc. 1996). Increased noise emissions resulting from dredging activities could affect nearby sensitive receptors. However, there are no sensitive receptors (residences, schools, and community facilities) located within 1.25 miles of the proposed Project site. At a distance of 3,000 feet (approximately 0.6 mile) away from the dredging source, it is expected that noise levels will have reduced to approximately 29.5 dB; therefore, it is expected that by 1.25 miles, sensitive receptors will not be able to detect construction-related noise emissions. Noise associated with vehicle trips would be negligible due to the small number of daily trips (maximum of 240) throughout the construction period. Noise levels would return to ambient conditions upon project completion. Accordingly, impacts would be less than significant, and mitigation is not required.

Impact NOI-2: The proposed Project would not exceed Land Use Noise District noise levels allowed by the LBMC.

Impact Determination

The proposed Project is entirely located in Noise Land Use District Four, which is characterized as predominantly industrial with other land use types present. The exterior noise limit for District 4 is 70 dBA any time of day or night. Construction activities would have the potential to exceed maximum noise levels allowed by the City. However, as discussed above, there are no sensitive receptors (residences, schools, and community facilities) located within 1.25 miles of the proposed Project area. At a distance of 3,000 feet (approximately 0.6 mile) away from the dredging source, it is expected that noise emissions will have reduced to approximately 29.5 dB; therefore, it is expected that by 1.25 miles, sensitive receptors will not be able to detect construction-related noise emissions. Noise associated with vehicle trips would be negligible due to the small number of daily trips (maximum of 240) throughout the construction period. Noise levels would return to ambient conditions upon project completion. Accordingly, impacts would be less than significant, and mitigation is not required.

Impact NOI-3: The proposed Project would not result in exposure of persons to or generation of ground-borne vibration in excess of the standards established by the LBMC.

Impact Determination

Construction of the proposed Project would generate varying degrees of groundborne vibration, depending on the construction procedure and the construction equipment used. Operation of

[16] Equivalent Sound Level (L_{eq}) is the most common metric used to describe short-term average noise levels. The L_{eq} describes the average acoustical energy content of noise for an identified period of time, commonly 1 hour. Thus, the L_{eq} of a time-varying noise and that of a steady noise are the same if they deliver the same acoustical energy over the duration of the exposure. For many noise sources, the L_{eq} will vary, depending on the time of day. A prime example is traffic noise, which rises and falls, depending on the amount of traffic on a given street or freeway.

construction equipment generates vibrations that spread through the ground and diminish in amplitude with distance from the source. The effects of vibration can range from no perceptible effects at the lowest vibration levels, to low rumbling sounds and perceptible vibration at moderate levels, to slight damage at the highest levels. Ground-borne vibrations from construction activities rarely reach levels that damage structures. Groundborne vibration sources associated with the project include dredging as well as potential pile driving. However, both of these activities would generate vibration at the ocean floor below the water surface and away from landside structures. Additionally, the closest buildings are all industrial structures within the Port that are not typically susceptible to damage from groundborne vibration. There are no sensitive receptors (e.g., homes) within 1.25 mile of the proposed dredging activity. At these distances, project-generated groundborne vibration would be completely imperceptible. Therefore, impacts would be less than significant, and mitigation is not required.

Impact NOI-4: The proposed Project would not result in a substantially increased number of vibration events that exceed the standards established by the LBMC.

Impact Determination

As discussed above, the proposed project would not generate groundborne vibration that could affect sensitive receptors and would not substantially increase the number of vibration events. Therefore, impacts would be less than significant, and mitigation is not required.

12.2.11 Population/Housing

Environmental Setting

The environmental setting for population and housing is described in Section 3.10. Briefly, the Port is part of the City of Long Beach, which has a population of approximately 467,000. The City of Los Angeles community of Wilmington, with a population of approximately 53,000, is adjacent to the western side of the Port. In both areas, the Port is an important source of employment; the unemployment rate is approximately 4.7 percent.

In addition to the analysis of impacts on population and housing required by CEQA, this section includes a discussion of the extent to which the significant impacts of the proposed Project could disproportionately affect minority or low-income populations.

Impacts and Mitigation

Significance Criteria

Impacts on population/housing would be considered significant if the proposed Project would:

- **POP-1: Induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure); and/or**
- **POP-2: Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere.**

Impacts

Impact POP-1: The proposed Project would not induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure).

Impact Determination

The proposed Project would not induce unplanned population growth in the area. Jobs generated during construction of the proposed Project would be expected to be filled from the local population and would be nominal. Therefore, no impacts pertaining to substantial unplanned population growth would occur and mitigation is not required, and mitigation is not required.

Impact POP-2: The proposed project would not displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere.

Impact Determination

The proposed Project would neither displace existing housing nor require the construction of replacement housing. Therefore, no impact would occur, and mitigation is not required.

Minorities and Low-Income Populations

The following discussion supplements information presented in Chapter 10 regarding federal regulations governing the analysis of impacts of federal actions on minority and low-income populations. This discussion is not an environmental justice assessment as the term is used in the National Environmental Policy Act, because NEPA requirements do not apply to CEQA documents and CEQA contains no requirement for such analysis. However, NEPA's underlying principles and the environmental justice assessment prepared in Section 10.1.1 under Executive Order 12898 have been used to direct this discussion.

California Government Code Section 65040.12 defines environmental justice as, "the fair treatment of people of all races, cultures, and incomes with respect to the development, adoption, implementation, and enforcement of environmental laws, regulations, and policies."

Minority and low-income populations are defined as the following:

- Minority: Any person who has identified themselves as having one of the following origins as defined by the U.S. Census categories for race including: "Hispanic," "Asian-American," "Native Hawaiian and other Pacific Islander," "Black or African-American," "American Indian or Alaskan Native," or "Some Other Race." For the purposes of this discussion, when a minority population of the potentially affected area is greater than 50 percent or the minority population is meaningfully greater than the general population or other appropriate unit of geographic analysis.
- Low-Income: Any person with income below annual poverty thresholds established by the U.S. Census. CEQ environmental justice guidance (CEQ, 1997) also suggests that low-income populations be identified using the national poverty thresholds from the Census Bureau. For the purposes of this discussion, an affected geographic area is considered to consist of a low-income population if: 1) the percentage of low-income persons is greater than 50 percent, or 2) is

meaningfully greater than the low-income population percentage in the general population or other appropriate unit of geographic analysis.

Area of Influence

The area of influence for this discussion was determined in accordance with CEQ guidance for identifying the "affected community," which requires consideration of the nature of likely impacts from the proposed Project and identification of a corresponding unit of geographic analysis. The area of influence was based on a 1-mile radius around the proposed Project area, a 15.79 square-mile area. As the proposed Project consists primarily of dredging activities in harbor waters and the land within a mile of the project boundaries is industrial in nature, the affected area of project influence has a population of 3 (per the USEPA's EJScreening.

To ensure a more conservative analysis, the Port included populations within the City of Long Beach, since this area would potentially experience off-Port impacts from the proposed Project. As such, the demographic information described in Section 10.1.1, derived using the USEPA's EJScreen Tool, was used. **Table 10-1** provides a summary of the demographics used in this discussion. The complete EJScreen reports are available in Appendix K.

As discussed in Section 10.1.1 and shown in **Table 10-1**, the aggregate minority population of the City of Long Beach is 72 percent, while the minority population in the area of project influence comprises about 63 percent. The aggregate population percentage in the area of influence and in the City of Long Beach do exceed 50 percent. However, the affected area minority population percentage in the area of project influence is slightly higher (1 percentage point) than the minority population percentage in the state of California as a whole at 62 percent, but lower than the percentage in the City of Long Beach which is 72 percent. Therefore, the area of project influence and the City of Long Beach area constitute minority populations.

As shown in **Table 10-1**, 0 percent of the population in the area of project influence and 42 percent in the City of Long Beach are considered below the poverty level. The percentages in these areas do not exceed 50 percent. The area of project influence low-income population percentage is not greater than the low-income population in the City of Long Beach (42 percent) or the State of California, which is 35 percent. Therefore, the area of project influence does not contain a high concentration of low-income population. However, the percentage of low-income population in the City of Long Beach, 42 percent, is higher than the state percentage of 35 percent. Therefore, the City of Long Beach area could be considered a "low-income population" because the proportion of low-income persons in the City is greater than the percentage of low-income persons in the general population of the State of California.

Regulatory Background

In addition to Executive Order 12898 (see Section 10.1.1), several state and local regulations and guidance documents govern the determination of whether projects would result in disproportionately high and adverse human health or environmental impacts on minority and low-income populations.

California Coastal Commission Environmental Justice Policy

Pursuant to an amendment to the CCA in 2016 (AB 2616 [Burke]), the CCC was given new authority to consider environmental justice in their permitting process. The CCC adopted an environmental justice policy in March 2019 that provides a framework for considering environmental justice when making permit decisions. This legislation cross-references existing non-discrimination and civil rights law in the government code and requires the governor to appoint an environmental justice commissioner (CCC 2019b).

California State Lands Commission

The California State Lands Commission (CSLC) adopted an Environmental Justice Policy and Implementation Blueprint in December 2018, wherein CSLC pledges to continue and enhance its operations, programs, and policies with environmental justice as an essential consideration by, among other actions, "promoting equity and advancing environmental justice through more inclusive decision-making that considers the disproportionate burdens on disadvantaged communities and Native Nations" (CSLC 2018). The policy also cites the definition of environmental justice in state law and points out that this definition is consistent with the Public Trust Doctrine principle that the management of trust lands is for the benefit of all people.

Public Resources Code

Public Resources Code Section 71113 states that the mission of the CalEPA includes conducting any activities that substantially affect human health or the environment in a manner that ensures the fair treatment of people of all races, cultures, and income levels, including minority and low-income populations of the state.

As part of its mission, CalEPA was required to develop a model environmental justice mission statement for its boards, departments, and offices. CalEPA was tasked to develop a Working Group on Environmental Justice to assist it in identifying any policy gaps or obstacles impeding the achievement of environmental justice. An advisory committee including representatives of numerous state agencies was established to assist the Working Group pursuant to the development of a CalEPA intra-agency strategy for addressing environmental justice. Public Resources Code Sections 71110–71116 charge CalEPA with responsibilities regarding the following provisions and others listed in the code: conducting programs and enforcement to ensure fair treatment; ensuring greater public participation, information sharing, and consultation; improving related research; and developing an agency-wide strategy to identify gaps that would impede achievement of environmental justice.

California Government Code

California Government Code Section 11135 states that "No person in the State of California shall, on the basis of sex, race, color, religion, ancestry, national origin, ethnic group identification, age, mental disability, physical disability, medical condition, genetic information, marital status, or sexual orientation, be unlawfully denied full and equal access to the benefits of, or be unlawfully subjected to discrimination under, any program or activity that is conducted, operated, or administered by the state or by any state agency, is funded directly by the state, or receives financial assistance from the state."

California Government Code Sections 65040–65040.12 identify the governor's Office of Planning and Research (OPR) as the comprehensive state agency responsible for long-range planning and development. Among its responsibilities, OPR is tasked with serving as the coordinating agency in state government for environmental justice issues. Specifically, OPR is required to consult with CalEPA, the state Resources Agency, the Working Group on Environmental Justice, and other state agencies as appropriate, and share information with CEQ, the USEPA, and other federal agencies as appropriate to ensure consistency.

CalEPA released its final Intra-Agency Environmental Justice Strategy in August 2004. The document sets forth the agency's broad vision for integrating environmental justice into the programs, policies, and activities of its departments. It contains a series of goals, including the integration of environmental justice into the development, adoption, implementation, and enforcement of environmental laws, regulations, and policies.

South Coast Air Quality Management District

The SCAQMD began its environmental justice program in 1997 and focuses on air quality policies that protect the health of all residents, regardless of demographic characteristics. The SCAQMD created an Environmental Justice Advisory Group to assist in policies that reduce and prevent air pollution to the public and in particular, to communities that are impacted the most by poor air quality (SCAQMD 2019).

Analysis of Disproportionate Effects

Significance Criteria

No formal, commonly accepted significance criteria have been adopted for environmental justice issues under CEQA; however, application of Executive Order 12898 and CEQ guidance (CEQ, 1997) suggest that the primary question to be examined is:

- **Would any significant adverse human health or environmental effects of the proposed project disproportionately affect minority or low-income persons?**

Because no specific CEQA significance criteria exists, it is reasonable to assume, based on the result of the proposed Project-specific and cumulative analyses, that the proposed Project would not affect minority or low-income populations near the proposed Project site. This analysis considers all unavoidable significant effects (i.e., those that would remain significant after application of all feasible mitigation measure), specifically as they may affect minority and low-income populations in the area of influence and the City of Long Beach. The only resource area in which the proposed Project would have residual significant and unavoidable impacts is Air Quality; accordingly, this analysis focuses on the degree to which the proposed Project's significant and unavoidable air quality impacts (AQ-1 and AQ-2) would disproportionately affect minority and low-income populations.

Analysis of Effects

Impact AQ-1: The proposed Project would produce emissions that would exceed the SCAQMD thresholds for nitrogen oxides (NOx) during each construction year, 2024 through 2027.

Mitigation Measures AQ-1 through AQ-5 would apply controls to equipment used during construction. In addition, certain construction practices would also reduce air quality impacts during construction. With implementation of mitigation measures AQ-1 through AQ-5 during construction, $PM_{2.5}$, NO_x, CO, and VOC emissions would be reduced. However, NO_x would remain above significance thresholds in years 2024, 2025, 2026, and 2027. $PM_{2.5}$, CO, and VOC would remain above significance thresholds in 2025. In addition, mitigated construction activities for the proposed Project would contribute emissions of these pollutants and would exceed the daily construction emission thresholds for NOx. Therefore, Impact AQ-1 would potentially constitute a disproportionately high and adverse effect on minority populations within the project area of influence and on minority and low-income populations in the City of Long Beach.

Impact AQ-2: The proposed Project would produce offsite ambient pollutant emissions that exceed the NAAQS for 1-hour NO2.

With implementation of mitigation measures AQ-1 through AQ-5, while NO_2 concentrations would be reduced, NO_2 concentrations would still exceed the 1-hour federal NAAQS and would remain significant and unavoidable. In addition, mitigated construction activities for the proposed Project would contribute emissions of these pollutants and would exceed the 1-hour federal NAAQS for NO_2. Therefore, Impact AQ-1 would potentially constitute a disproportionately high and adverse effect on minority populations within the project area of influence and on minority and low-income populations in the City of Long Beach.

Impact AQ-4: TAC emissions during construction of the proposed Project would generate less than significant health impacts.

Most of the construction activities for the proposed Project would occur over water and further from population centers than other Port projects. As such, it is reasonable to conclude the non-cancer acute impacts and population cancer burden would be lower than other Port projects, which have consistently been below SCAQMD thresholds. The maximum estimated cancer risks and non-cancer chronic hazard index impacts due to construction activities are all below the thresholds of significance at all receptor types, including residential/sensitive and occupational. The proposed Project is not expected to contribute to significant cumulative health risks, due to the distance to sensitive receptors. Impact AQ-4 would not constitute a disproportionately high and adverse impact on low-income or minority populations.

12.2.12 Public Services and Safety

Environmental Setting

The environmental setting for public services and safety is described in Section 3.13. Briefly, Emergency response/fire protection for the Port is provided by seven Long Beach Fire Department stations, including fireboat stations within the harbor. Other organizations that provide emergency assistance include the Long Beach Harbor Patrol, Long Beach Police Department, USCG, U.S. Department of Homeland Security, U.S. Customs and Border Protection, Federal Bureau of Investigation, and CDFW. The USCG maintains navigational aids (buoys and lights) within and near the harbor and has vessels at a station in the Port of Los Angeles. The Long Beach Police Department also has an on-water presence in the harbor that conducts security patrols.

Impacts and Mitigation

Significance Criteria

Impacts on public services and safety would be considered significant if the proposed Project would:

- **PSS-1: Require the addition, expansion, modification, or relocation of an existing government facility to maintain acceptable service ratios, response times, or other performance objectives, the construction or operation of which could cause significant environmental impacts; and/or**
- **PSS-2: Result in substantial adverse physical impacts on existing school or park facilities or create a need for new or physically altered school or park facilities, the construction or operation of which could cause significant environmental impacts, to maintain acceptable service ratios or other performance objectives.**

Impacts

Impact PSS-1: The proposed Project would not require the addition, expansion, modification, or relocation of an existing government facility to maintain acceptable service ratios, response times, or other performance objectives, the construction or operation of which could cause significant environmental impacts.

Impact Determination

Implementation of the proposed Project would not increase demand for fire or police protection services given the limited amount of equipment involved and the temporary nature of the project. Accordingly, there would be no increase in demand over the baseline level of public service currently required that would require construction of new facilities.

The Multi-Service Center (MSC), a nonresidential facility designed to provide one-stop access to resources for homeless individuals and families within the City, is located within the Harbor District at 1301−1327 West 12th Street. The MSC is operated by the City of Long Beach Department of Health and Human Services, along with 12 public and private partner organizations as part of the City's Continuum of Care System, a communitywide planning effort to address issues of homelessness in a coordinated manner. Implementation of the proposed Project is not expected to increase demand on the baseline level of public service currently provided by the MSC that would require construction of new facilities.

Because the proposed Project would not increase demand for fire, police, and other public services, nor necessitate the construction of new public service facilities, no impacts would occur, and mitigation is not required.

Impact PSS-2: The proposed Project would not result in substantial adverse physical impacts on existing school or park facilities or create a need for new or physically altered school or park facilities, the construction or operation of which could cause significant environmental impacts, to maintain acceptable service ratios or other performance objectives.

Impact Determination

The proposed Project does not include the development of residential land uses that would result in an increase in population or increased enrollment at schools in the proposed Project area and would not increase population in a manner that would generate an increase in demand on existing public or private parks or other recreational facilities that would either result in or increase physical deterioration of the facility. Therefore, no impacts would occur, and mitigation is not required.

12.2.13 Recreation

Environmental Setting

As described in Section 3.12, numerous marina and aquatic recreational facilities are located within and adjacent to the Port, although there are no live-aboard residents in the vicinity of the proposed Project. The Outer Harbor area, particularly in the vicinity of the Pier J approach channel, is used for recreational boating and commercial and recreational fishing; shoreline recreational facilities include a public fishing area on Pier J and visitor-serving facilities on Pier H.

Impacts and Mitigation

Significance Criteria

Impacts on recreation would be considered significant if the proposed Project would:

- **REC-1: Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated; and/or**
- **REC-2: Require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment.**

Impacts

Impact REC-1: The proposed Project would not increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated.

Impact Determination

Because no residential uses are proposed, the proposed Project would not increase population in a manner that would generate an increase in demand on existing public or private parks or other recreational facilities that would either result in or increase physical deterioration of the facility. Therefore, no impacts would occur, and mitigation is not required.

Impact REC-2: The proposed Project would not require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment.

Impact Determination

The proposed project does not involve the construction or expansion of recreation facilities, nor other land uses that would require the provision of such facilities. Therefore, no impacts would occur, and mitigation is not required.

12.2.14 Ground Transportation

Environmental Setting

The environmental setting for ground transportation is described in Section 3.11. Briefly, ground access to the Port is provided by a network of freeways, arterial facilities and local streets. The study area includes 15 intersections in the vicinity of the proposed land-side work sites and potential launch sites. Levels of service are considered acceptable or better (LOS D or better) at all 15 intersections under existing conditions for the morning, midday, and afternoon peak hours (defined as occurring between 7:00 and 8:00 AM, 2:00 PM and 3:00 PM, and 4:00 and 5:00 PM, respectively).

Impacts and Mitigation

Significance Criteria

Criteria for determining the significance of impacts on transportation are based on the City's traffic impact analysis guidelines, at the time of this document's preparation. The 2019 CEQA Guidelines, Appendix G (Environmental Checklist), requires a VMT analysis be included after July 1, 2020. As of the time of this document, the City of Long Beach has not yet developed and adopted VMT thresholds. VMT is disclosed, but since an analysis methodology and thresholds have not yet been established, the transportation impact analysis is based on the existing City of Long Beach significance criteria (LOS) shown in the table below. For future projects, a VMT analysis will be conducted when the methodology and thresholds have been adopted by the City.

Table 12-13 Traffic Level of Service Thresholds

City of Long Beach, Port of Long Beach, and City of Carson (Signalized Intersections)	
LOS without the Project	LOS or Change in V/C with the Project
A, B, C, or D	To E or F
E, F	0.02 or greater
City of Los Angeles and Port of Los Angeles (Signalized Intersections	
Final LOS (with Project)	Proposed Plan-Related Increase in V/C
C	> 0.040
D	> 0.020
E or F	> 0.010
Roadways (All Jurisdictions) Los Angeles County Metropolitan Transportation Authority Congestion Management Plan	
Cause an increase of 0.02 or more in the V/C ratio with a resulting LOS of E or F at either a Metro CMP freeway monitoring station or a non-CMP roadway segment analyzed in the traffic study area.	
Final LOS (with Project)	Proposed Plan-Related Increase in V/C
E or F	> 0.02
Key: > = greater than; Metro = Los Angeles County Metropolitan Transportation Authority; CMP = Congestion Management Plan; LOS = level of service; V/C = volume-to-capacity	

Impacts on Ground Transportation would be considered significant if the proposed Project would:

- **TRANS-1: Increase an intersection's V/C ratio in accordance with the guidelines, which show traffic impact thresholds of significance for intersections (signalized and unsignalized) of the affected jurisdictions in the area of influence for the proposed project;**
- **TRANS-2: Cause an increase of 0.02 or more in the V/C ratio with a resulting LOS E or F at an analyzed freeway segment;**
- **TRANS-3: Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities; and/or**
- **TRANS-4: Result in inadequate emergency access.**

Impacts

Impact TRANS-1: The proposed Project would not increase an intersection's V/C ratio in accordance with the guidelines, which show traffic impact thresholds of significance for intersections (signalized and unsignalized) of the affected jurisdictions in the area of influence for the proposed project.

Impact Determination

Construction of the proposed Project would result in vehicle trips from construction crews that would operate the clamshell dredge and hopper dredge. As shown in Appendix M, the traffic activity associated with the construction is estimated between 54 and 240 daily trips, with the peak of 240 expected to occur for only 2 months in early in 2026 (associated with the simultaneous dredging at the approach channel with the hopper dredge and the main channel widening with the clam shell dredge). During all other months, the project is estimated to generate fewer than 150 daily trips. For analysis purposes, the peak of 240 daily trips is used to be conservative and to account for unexpected overlap in phases.

The morning, midday, and afternoon peak hours, for traffic impact analysis purposes, are defined as occurring between 7:00 and 8:00 AM, 2:00 PM and 3:00 PM, and 4:00 and 5:00 PM, respectively. Because it is not known when shift changes would occur, these estimates assume that they would coincide with the peak hours of traffic within the Port. Of the 240 peak daily trips, 80 trips would occur in the AM peak hour, 80 trips would occur in the midday peak hour, and 80 trips would occur in the PM peak hour. The 80 trips during each peak hour includes 40 inbound trips and 40 outbound trips.

For dredging activity, workers would be conveyed by the contractor's support vessels from one of three potential launch sites: Pier T, Pier S, or a location near Pier D Street and Pico Avenue. Primary access routes connecting the regional freeway system with each landside work site and each launch site under consideration were identified and are shown in Appendix M. The three main access routes are via Long Beach Freeway (I-710), the Harbor Freeway (I-110), and the Terminal Island Freeway (SR-47/SR-103). These access routes would be for both truck access and for workers commuting to the project site.

As shown in Appendix M, good levels of service (LOS D or better) are shown under existing baseline and future conditions for the three analyzed weekday peak hours. Construction of the proposed Project would occur between 2024 and 2029. Given the relatively modest peak hour trip generation (up to 80 trips in any one hour), the broad distribution of those trips across the study area, and the relatively uncongested setting in which they would occur, it can be concluded that the addition project traffic would result in less-than-significant impacts according to the City of Long Beach's criteria.

With completion of the proposed Project, the operations at all the facilities would continue as usual and are not anticipated to result in additional vehicular traffic. Therefore, impacts would be less than significant, and mitigation is not required.

Impact TRANS-2: The proposed Project would not cause an increase of 0.02 or more in the V/C ratio with a resulting LOS E or F at an analyzed freeway segment.

Impact Determination

As discussed above, the construction traffic would be nominal with a maximum of 240 daily trips. This negligible number of trips would not have the potential to increase the V/C ratio of a freeway segment by 0.02 or more. Impacts would be less than significant, and mitigation is not required.

Impact TRANS-3: The proposed Project would not conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities.

Impact Determination

The proposed project would not affect existing public transit, bicycle, or pedestrian facilities or otherwise decrease the performance of such facilities. All construction work would occur within the areas of the harbor that are not served by public transportation nor support bicycle, pedestrian, or other non-vehicular transportation modes. Therefore, no impacts would occur, and mitigation is not required.

Impact TRANS-4: The proposed Project would not result in inadequate emergency access.

Impact Determination

Construction of the proposed Project would not affect emergency access. All local roads would be maintained during construction. Any emergency procedures or design features required by city, state, and federal guidelines would be implemented during construction of the proposed Project. Therefore, no impacts pertaining to emergency access would occur and mitigation is not required.

VMT Discussion

CEQA Guidelines section 15064.3 establishes vehicle miles traveled (VMT) as the new standard by which to evaluate impacts on transportation. The POLB estimates that the trip lengths to the construction site could be up to 50 miles. This analysis assumes that vehicle one-way trips to and from the construction site for both workers and material delivery trucks would average 25 miles. Based on the estimated 240 daily one-way trips, the project-related average daily VMT would be approximately 6,000 miles. Of the five full years of construction, Year 2 (2025) has the highest annual average VMT with an estimated 1,204,500 miles. While the Port/City of Long Beach does not have a specific threshold for VMT, the proposed Project VMT is considered nominal during construction from construction worker commute trips and deliveries, and the proposed Project would not generate long-term operational traffic.

12.2.15 Vessel Transportation

Environmental Setting

The environmental setting for vessel transportation is described in Section 3.11.5. Briefly, the Port experiences over 2,000 vessel calls per year. Established navigational controls and systems in the approaches to the Port and within the harbor manage that traffic to ensure safe navigation. The systems are maintained and operated by several governmental and commercial entities and include designated vessel travel lanes and a Precautionary Area, navigational aids, and data collection facilities such as radar and sensor buoys. Vessel traffic in and near San Pedro Bay is regulated by the USCG Captain of the Port and the Marine Exchange of Southern California via the Vessel Traffic Service (VTS). The VTS monitors traffic in the approach and departure lanes and inside the harbors. It uses radar, radio, and visual inputs to gather real time vessel traffic information and broadcast traffic advisories and summaries to assist mariners. The system provides information on vessel traffic and ship locations so that vessels can avoid dangerous incidents in the Port Complex. Use of a Port Pilot for transit in and out of the San Pedro Bay area and adjacent waterways is required for all vessels of foreign registry, and for those U.S. vessels enrolled as not having a federally licensed pilot onboard. Pilotage in Long Beach Harbor is provided by a commercial pilot company.

Impacts and Mitigation

Significance Criteria

Impacts on vessel transportation would be considered significant if the proposed Project would:

- ***VT-1: Result in a* change *in vessel traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks.***

Impacts

Impact VT-1: The proposed Project would not result in a change in vessel traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks.

Impact Determination

The proposed dredging activities involve barges and tugs that would occur over an approximately three-year period. These activities would be scheduled by the POLB and the construction contractors to minimize potential conflicts with vessel traffic in the Approach Channel, Main Channel, West Basin, Pier J Basin, and Pier J Approach areas. Construction operators contracted by the POLB are required to have completed training in protocols specific to Long Beach Harbor and POLB marine navigation. The proposed Project would be subject to the USACE restrictions and requirements specified in the conditions of the USACE construction permit. Those conditions require the contractor to undertake a number of coordination and monitoring activities. For example, the contractor would have to publish a Notice to Mariners describing project activities and schedule; coordinate vessel activities with the Marine Exchange, USCG, and Port Pilots; monitor VHF Channel 16 (the marine safety channel); and provide regular reports of activities. Dredges would also be required to display appropriate lights and day shapes warning approaching vessels of the nature of the work and of the restricted ability of the dredge to maneuver, and to perform their work in a manner that does not obstruct navigation. With these controls in place, impacts would be less than significant, and mitigation is not required.

12.2.16 Utilities, Service Systems, and Energy Conservation

Environmental Setting

The environmental setting for utilities, service systems, and energy conservation is described in Section 3.15. As an in-water construction project, the proposed Project would not require public utilities. There are no utility lines (pipelines, electrical/telecommunications lines) in the dredging footprint that would require relocation.

Impacts and Mitigation

Significance Criteria

Impacts on utilities, service systems, and energy conservation would be considered significant if the proposed Project would:

- **UTIL-1: Require or result in the relocation or construction of new, or expansion of, water, wastewater, storm drains, natural gas, electrical utility lines or facilities, or oil lines, the construction or relocation of which could cause significant environmental effects;**
- **UTIL-2: Exhaust or exceed existing water supply, wastewater treatment, electrical power, or landfill capacities;**
- **UTIL-3: Result in potentially significant environmental impacts due to wasteful, inefficient, or unnecessary consumption of energy resources during project construction or operation; and/or**
- **UTIL-4: Conflict with or obstruct a state or local plan for renewable energy or energy efficiency.**

Impacts

Impact UTIL-1: The proposed Project would not require or result in the relocation or construction of new, or expansion of, water, wastewater, storm drains, natural gas, electrical utility lines or facilities, or oil lines, the construction or relocation of which could cause significant environmental effects.

Impact Determination

The proposed Project would not require the relocation or expansion of any existing utility or the construction of any new utility infrastructure. Impacts would be less than significant, and mitigation is not required.

Impact UTIL-2: The proposed Project would not exhaust or exceed existing water supply, wastewater treatment, electrical power, or landfill capacities.

Impact Determination

The proposed Project would not require an increase in water supply, does not involve wastewater treatment facilities, and would not generate significant amounts of solid waste. All dredged sediments would be disposed of at permitted in-water sites. Therefore, no impacts associated with solid waste generation in excess of state or local standards would occur and mitigation is not required.

Impact UTIL-3: The proposed Project would not result in potentially significant environmental impacts due to wasteful, inefficient, or unnecessary consumption of energy resources during project construction or operation.

Impact Determination

Construction-period energy consumption would result from the use of construction equipment, material delivery and hauling, and worker commute trips. The temporary increase in energy use during the construction period would not be considered a wasteful, inefficient, or unnecessary consumption of energy resources because it would be required for project implementation. Therefore, impacts would be less than significant, and mitigation is not required.

Impact UTIL-4: The proposed Project would not conflict with or obstruct a state or local plan for renewable energy or energy efficiency.

Impact Determination

The proposed Project would not conflict with or obstruct any state or local plan for renewable energy or energy efficiency; therefore, impacts would be less than significant, and mitigation is not required.

12.2.17 Global Climate Change

The environmental setting for greenhouse gases is described in Section 3.6. The following information supplements the data and information presented in Section 3.5 for the purposes of the CEQA analysis. This section describes the existing conditions pertaining to global climate change (GCC), describes types of greenhouse gas (GHG) emissions, the current scientific understanding of GCC, observations and predictions of sea level rise (SLR), and summarizes applicable regulations.

Environmental Setting

It is well documented that the Earth's climate has fluctuated throughout its history. However, scientific evidence now indicates a correlation between increasing global temperatures over the past century and the worldwide proliferation of GHG emissions by humankind. GCC change is expressed as global changes in the average weather of the Earth, as measured by changes in wind patterns, storms, precipitation, and temperature. GCC is predicted to produce negative environmental, economic, and social consequences across the globe and, in turn, would manifest as impacts on resources and ecosystems in California.

GHG Emissions and Effects

GHGs trap heat in the atmosphere and are emitted from both natural processes and human activities. Examples of GHGs produced both by natural processes and human activity include carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O). Examples of GHGs emitted through human activities alone include fluorinated gases and sulfur hexafluoride (SF_6). The natural balance of GHGs in the atmosphere regulates the Earth's temperature; without this natural greenhouse effect, the earth's surface would be approximately 60 degrees Fahrenheit (°F) cooler (USGCRP 2018).

Numerous studies document the recent trend of rising atmospheric concentrations of CO_2. The longest continuous record of CO_2 monitoring extends back to 1958 (Keeling 1960, Scripps Institution of Oceanography 2019). These data show that atmospheric CO_2 levels have risen an average of 1.6 parts per million (ppm) per year over the last 60 years (NOAA 2019). As of 2018, CO_2 levels are approximately 40 percent higher than the highest levels estimated for the 800,000 years preceding the industrial revolution, as determined from CO_2 concentrations analyzed from air bubbles in Antarctic ice core samples (USGCRP 2018).

The most recent assessment of climate change impacts in California conducted by the State of California (California's Fourth Climate Change Assessment) predicts that temperatures will increase by 5.6°F or 8.8°F by 2100, based on scenarios of moderate GHG emission reductions from current levels or a continuation of current GHG emission levels (business as usual) (Representative Concentration Pathways [RCP] 4.5 and 8.5 scenarios, respectively, as developed in the IPCC Fifth Assessment Report) (Bedsworth, et al. 2018). Predictions of long-term negative environmental impacts in California include exacerbation of air quality problems, a substantial reduction in potential municipal water supply from the Sierra snowpack, sea-level rise (SLR) that would inundate and/or displace coastal development, an increase in wildfires, damage to ecosystems and infrastructure, reductions in agricultural production, and an increase in the incidences of human health problems (Bedsworth, et al. 2018).

Effects of Sea Level Rise on the California Coast

SLR is defined as the change in global mean sea level over time. SLR rise is a long-term environmental impact of GCC attributed to increasing global temperatures and polar ice melt, which increases the likelihood and risk of coastal flooding. Over the past century, sea level along much of the California coast rose by an average of about 6 inches (Sievanen, et al. 2018) and is predicted to increase in the future. Available predictions for SLR in California vary widely and depend on analysis methods, years of interest, emission scenarios, and probability rankings. For example, the Fourth Assessment predicts that mean SLR for the Los Angeles area under the RCP4.5 (moderate GHG emission reductions from current levels) and RCP8.5 (business as usual) scenarios would be the following (Hall, Berg and Reich 2018):

- For year 2050, mean values of 0.5 and 0.6 feet, respectively; and
- For year 2100, mean values of 2.1 and 4.2 feet.

The mean SLR projections developed for the Fourth Assessment are slightly higher than those defined by the California Ocean Protection Council (OPC) in their preparation of the State of California Sea-Level Rise Guidance (OPC 2018), as each program uses somewhat different inputs and modeling methods. Since there is considerable uncertainty in these results, the Fourth Assessment projections are meant for research purposes while the OPC projections are meant for regulatory and planning purposes (Bedsworth, et al. 2018).

SLR would affect all waters of the Long Beach Harbor. Coastal flooding could cause physical problems and economic impact. SLR would reduce bridge clearance, which could reduce the size of ships able to pass or could restrict their movements to times of lower tide. In addition, higher sea levels would cause ships to sit higher in relation to current dock elevations, possibly resulting in less-efficient port operations. Mitigation is important to minimize and to avoid these and other effects related to GCC, and in the short term, Port facilities such as wharves, bridges, and breakwaters have sufficient capacity to accommodate a certain amount of SLR. In the longer term, however, adaptation actions such as modifying facilities and coastal infrastructure may be the only feasible way to address the future effects of SLR at the Port. The California Climate Adaptation Strategy acknowledges this as a possible adaption strategy to SLR for ports (CNRA 2018a). The Port has developed vulnerability assessments and adaptation strategies for SLR and climate change impacts as part of its Climate Adaptation and Coastal Resiliency Plan (CRP).

California GHG Emissions

CARB performs an annual GHG inventory for emissions and sinks of the major GHGs. In 2016, California produced 429 million gross metric tons (MMT) of CO_2e (CO_2 equivalent), 12 MMT lower than 2015 levels, and just below California's 2020 target of 431 MMT (CARB 2018). These reductions have been achieved despite California's continuing economic growth.

The inventory is divided into seven broad sectors and categories: Agriculture, Commercial, Electricity Generation, Forestry, Industrial, Residential, and Transportation. Transportation is the sector with the largest percentage of GHG emissions (41 percent), followed by the industrial sector (23 percent), and electricity generation (10 percent).

GCC Regulatory Setting

Although all levels of government have some responsibility to protect air quality through adoption and enforcement of regulations, the regulation of GHG emissions is a relatively new component of air quality. This section describes the state and local GHG regulations that would apply to the proposed Project.

State GHG Plans, Policies, Regulations, and Laws

To date, California is one of 23 states that have set GHG emission targets. EO S-3-05 and AB 32, the California Global Warming Solutions Act of 2006, promulgated targets to achieve reductions in GHGs to 1990 levels by the year 2020. This target-setting approach allows progress to be made in addressing climate change and is a forerunner to setting emission limits. CARB is responsible for regulating GHGs in California.

EO S-3-05 (2005) and AB 32 (2006)

Executive Order (EO) S-3-05 set statewide GHG emission-reduction targets as follows: by 2010, reduce GHG emissions to 2000 levels; by 2020, reduce GHG emissions to 1990 levels; and by 2050, reduce GHG emissions to 80 percent below 1990 levels.

Assembly Bill (AB) 32, California Global Warming Solutions Act of 2006 codified EO S-3-05 into law. AB 32 also required CARB to establish a program to track and report GHG emissions, to approve a scoping plan for achieving technologically feasible and cost-effective measures that reduce GHG emissions, and to adopt, implement, and enforce regulations to ensure the achievement of the required GHG emission reductions.

EO B-30-15 (2015) and SB 32 (2016)

EO B-30-15 extended AB 32 goals and set a GHG reduction goal of 40 percent below 1990 levels by 2030. The EO also addressed the need for climate adaptation and directed state governments to take a number of actions, including factoring climate change in state agencies' planning and investment decisions. SB 32 codified EO B-30-15.

AB 32 Scoping Plans

AB 32 required the CARB to develop a Scoping Plan, setting a framework for California's GHG reduction efforts. The first Scoping Plan was approved by CARB in 2008. The First Update to the Climate Change

Scoping Plan was approved by the board in 2014 and identified regulatory actions for vehicles and fuels and several measures that target movement of goods and port operations. The Scoping Plan also identified challenges to meeting future electrical demand, including building transmission lines for sources of renewable energy and modernizing electricity infrastructure. In 2016, statewide GHG emissions were 429 MMT of CO_2e, which for the first time achieved the AB32 2020 target of 431 MMT (1990 levels) (CARB 2018).

In December 2017, CARB approved the 2017 Climate Change Scoping Plan, which proposed new GHG reduction measures from all sectors of the economy to enable the state to meet the 2030 GHG target codified in SB 32 (CARB 2017a).

EO S-01-07 (2007)

EO S-01-07 mandates that: 1) a statewide goal be established to reduce the carbon intensity of California's transportation fuels by at least 10 percent by 2020 and 2) a low carbon fuel standard for transportation fuels be established for California. CARB adopted the final standard in November 2009, and the standard became effective in 2011.

AB 1493 – Vehicular Emissions of Greenhouse Gases (2002)

AB 1493, enacted in July 2002, required CARB to develop and adopt regulations that reduce GHGs emitted by passenger vehicles and light-duty trucks. Regulations adopted by CARB apply to 2009 model year and later vehicles. CARB estimated that the regulation will reduce GHGs emissions from light-duty passenger vehicle fleet by 18 percent in 2020 and 27 percent in 2030. USEPA granted California the authority to implement GHG emission-reduction standards for new passenger cars, pickup trucks, and sport utility vehicles on June 30, 2009.

Sea Level Rise Programs

EO S-13-08 enhanced California's management of potential effects of climate change. The EO directed the California Natural Resources Agency (CNRA) to do the following:

- Initiate California's first statewide climate change adaptation strategy to assess the state's expected climate change impacts, identify where California is most vulnerable, and recommend climate adaptation policies by early 2009;
- Request the National Academy of Sciences (NAS) to establish an expert panel to report on SLR impacts in California to inform state planning and development efforts;
- Issue guidance to state agencies for how to plan for SLR in designated coastal and floodplain areas for new projects; and
- Initiate a report on critical existing and planned infrastructure projects vulnerable to SLR.

The CNRA issued guidance on SLR in the 2009 California Climate Adaptation Strategy and in the 2018 Update called Safeguarding California Plan (CNRA 2018b). The guidance document provides the agency's summary of the latest science on how climate change could impact the state and recommendations on how to manage against those threats in seven sector areas, including public health, biodiversity and habitat, ocean and coastal resources, water management, agriculture, forestry, and transportation and energy infrastructure.

The Coastal and Ocean Working Group of the California Climate Action Team (CO-CAT), with science support provided by the OPC's Science Advisory Team and the California Ocean Science Trust, released SLR guidance that recommended a range of SLR estimates for years 2030 to 2100 for state agencies to consider for planning development projects. The National Research Council (NRC) of the NAS released their final report on SLR for California in June 2012 (NRC 2012) and CO-CAT updated their SLR Interim Guidance Document the following year based on these findings (CO-CAT 2013).

In 2018, the California Coastal Commission (CCC) adopted the Update to the Sea Level Rise Policy Guidance. The updated guidance includes a range of SLR projections for a given emission scenario (and an extreme SLR scenario), based on the likelihood of occurrence or probability of a sea level height. The guidance also recommends an approach for low, medium-high, and extreme risk aversion decisions, which equate to 66, 95, and 99.5 percentile SLR values for a given scenario (CCC 2018).

Renewables Portfolio Standard

California's Renewable Portfolio Standard (RPS) is a key program for advancing renewable energy in California. The RPS, amended several times, sets escalating renewable energy procurement requirements for the state's electric utilities. As of 2018, the RPS requires that 33 percent, 60 percent, and 100 percent of total retail sales of electricity be procured from eligible renewable sources by the end of 2020, 2030 and 2045, respectively.

The Short-Lived Climate Pollutant Reduction Strategy

Short-lived climate pollutants (SLCPs) are powerful climate forcers that, although remain in the atmosphere for a shorter period of time than longer-lived climate pollutants, such as CO_2, have greater warming potencies. SLCPs include methane, fluorinated gases, and black carbon. The SLCP Reduction Strategy, initiated by SB 605 in 2014 and SB 1383 in 2016, approved by CARB in 2017 , lays out a framework for 40 percent reduction in methane and hydrofluorocarbon emissions below 2013 levels by 2030 and a 50 percent reduction in anthropogenic black carbon emissions below 2013 levels by 2030 (CARB 2017b). The SLCP Reduction Strategy has been integrated into the 2017 Climate Change Scoping Plan Update.

Local GHG Plans and Policies

Port of Long Beach Green Port Policy (2005)

The POLB Green Port Policy includes initiatives that reduce emissions of criteria pollutants and TACs from operations at the Port. Many of these measures also would result in GHG emission reductions.

San Pedro Bay Ports Clean Air Action Plan (2007, 2010, and 2017)

As a means to implement the Green Port Policy, the POLB implements the San Pedro Bay Ports CAAP process. Many CAAP measures designed to reduce criteria pollutants would also result in GHG reductions. The 2017 CAAP Update includes new strategies that have been guided by ongoing regional air quality compliance efforts and, notably, the goals of the CSFAP. As articulated in the CSFAP, to support the ultimate goal of zero-emissions goods movement, the ports must develop strategies that include the introduction of clean vehicles and equipment, infrastructure, freight efficiency, and energy planning. The 2017 CAAP Update continues the health risk and emission-reduction targets set in the 2010 CAAP Update and it promotes two new emission-reduction targets:

- Reduce GHGs from port-related sources to 40 percent below 1990 levels by 2030.
- Reduce GHGs from port-related sources to 80 percent below 1990 levels by 2050.

The 2017 CAAP Update also incorporates the recent commitment by the mayors of Los Angeles and Long Beach to move toward zero emissions at the ports, including setting goals of zero-emissions CHE by 2030 and zero-emissions drayage trucks by 2035.

Port of Long Beach Framework to Reduce Greenhouse Gas Emissions (2008)

The Port's commitment to protecting the environment from the harmful effects of Port operations, as stated in the Green Port Policy, addresses the development of programs and projects to reduce GHG emissions. In September 2008, the Port's BHC adopted a formal resolution establishing a framework for reducing GHG emissions. The framework outlined efforts that are well underway at the Port toward addressing climate change:

- The Port collaborated with other City departments to produce the City's first voluntary GHG emissions inventory (calendar year 2007), which was submitted to the California Climate Action Registry (CCAR); the Port continues to develop an annual inventory of GHG emissions for Harbor District activities. The reporting portion of CCAR has since transitioned to The Climate Registry.
- The Port joined other City departments in preparing a plan to increase energy efficiency in City-owned facilities, thereby reducing indirect GHG emissions from energy generation. This initiative is known as the SCE 2009-2011 Local Government Partnership.
- In February 2010, the City adopted the Long Beach Sustainable City Action Plan that includes initiatives, goals, and actions that will move Long Beach toward becoming a sustainable city. The Sustainable City Action Plan includes initiatives to reduce the City's carbon footprint and sets a goal to reduce GHG emissions from City facilities and operations 15 percent by 2020, relative to 2007 levels.
- The Port participates in tree planting and urban forest renewal efforts through its support of the City's Urban Forest Master Plan. Tree planting reduces GHG emissions by sequestering CO2.
- Port staff consulted with the Long Beach Gas and Oil Department and Tidelands Oil Production Company to evaluate potential opportunities for capturing CO2 produced by oil operations in the Harbor District and reinjecting it back into subsurface formations through wells at the Port (a form of sequestration).
- Beginning in 2006, the POLB annual air pollutant emissions inventory quantifies GHG emissions from oceangoing vessels (OGVs), heavy-duty trucks, CHE, harbor craft, and locomotives.
- The Port's Renewable Energy Working Group has developed strategies to expand the use and production of renewable energy at the Port. Criteria will be established to evaluate emerging technologies in a manner similar to the CAAP Technology Advancement Program.
- The Port's Renewable Energy Working Group finalized a Solar Energy Technology and Siting Study (Solar Siting Study) that reviewed available solar technologies and estimated the solar energy generation potential for the entire Harbor District. The study determined that there are many sites where solar energy technologies could be developed on building rooftops and at ground level.
- Based on the Solar Siting Study, Port staff is developing a program to provide incentive funding to Port tenants for the installation of solar panels on tenant-controlled facilities.

In May 2013, the Port BHC adopted the POLB Energy Policy to guide efforts to secure a more sustainable and resilient supply of power as demand grows. Under the policy, the Port of Long Beach will implement measures to increase efficiency, conservation, resiliency, and renewable energy in collaboration with various groups, including port tenants, utilities, other City departments, industry stakeholders, labor unions, universities, and the Port of Los Angeles.

The Port is developing a Greenhouse Gas Strategic Plan (GHG Plan). This plan will examine GHG impacts for all activities within the Harbor District and will identify strategies for reducing the overall carbon footprint of those activities. Similar to the CAAP, the Port's GHG Plan will identify strategies for activities under direct Port control and those that are controlled by third parties, such as tenants. The GHG Plan also will be used to mitigate potential project-specific and cumulative GHG impacts from future projects through modernization and/or upgrading of marine terminals and other facilities in the Harbor District.

Long Beach Sustainable City Action Plan (2010)

The Long Beach Sustainable City Action Plan is intended to guide operational, policy, and financial decisions to create a more sustainable Long Beach. Although the plan is mostly focused on City property, buildings, and public transportation, some elements refer to Port activities. This includes Action 1 of Transportation Initiative 4, which seeks to reduce emissions from Port mobile sources through implementing mitigation incentive measures to modernize fleets, retrofit older engines, and use cleaner fuels.

City of Long Beach General Plan – Mobility Element, The Mobility of Goods (2013)

The City of Long Beach General Plan, Mobility Element was developed to improve the way people, goods, and resources are moved in Long Beach. The Mobility of Goods section does not identify specific strategies to reduce GHG emissions, but it does call for the improvement of Citywide infrastructure, especially increase of on-dock rail facilities. The Mobility of Goods section notes that, without rail infrastructure improvements, more containers will be shipped by truck to near-dock and off-dock rail yards; the result would be more truck trips on freeways and roadways near the Port.

City of Long Beach Construction and Demolition Recycling Program

The City of Long Beach Construction and Demolition Recycling Program, set forth in Municipal Code Section 18.67.090, encourages the use of green building techniques in new construction and promotes reuse or salvaging of recyclable materials in demolition, deconstruction, and construction projects. Much of construction and demolition debris, which represents an estimated 22 percent of the total disposed waste stream in local landfills, can be reused or recycled, conserving natural resources and saving valuable landfill space. In response to state-mandated waste reduction goals and as part of the City's commitment to sustainable development, the City adopted an ordinance that requires certain demolition and/or construction projects to divert at least 60 percent of waste either through recycling, salvage, or deconstruction (City of Long Beach 2011).

Climate Adaptation and Coastal Resiliency Plan (2016)

The Port developed the Climate Adaptation and Coastal Resiliency Plan (CRP) in accordance with California Assembly Bill 691 (2014) to manage the direct and indirect risks associated with climate change and coastal hazards and to ensure continuity of Port operations within the Harbor District (POLB 2016b). The following steps were taken to develop the CRP:

- Review the best available and most current climate science to determine primary stressors and potential impacts;
- Complete an inventory of Port assets (terminals, infrastructure, ecological resources, and public access/recreational facilities) and a vulnerability assessment;
- Complete inundation mapping for six sea level rise scenarios based on the most appropriate sea level rise model(s) for Port assets;
- Develop vulnerability profiles for Port assets by system;
- Identify near- and long-term adaptation strategies; and
- Develop five detailed adaptation strategies that will make the Port more resilient to climate change, including integration strategies into Port guidelines and policies and adding sea level rise analyses to the Harbor Development Permit process.

CRP development included a comprehensive inventory to identify and organize all Port assets and operations. The inventory identifies piers, wharves, utilities, roadways, rail, and critical buildings and backland areas essential to Port operations. This type of inventory assisted in prioritizing and developing actions necessary to avoid or minimize impacts on Port assets. Assets were organized by system (e.g., transportation network, piers, utilities, breakwater, etc.), which became the basis for vulnerability profiles devised for each system. The primary climate change hazards identified in the CRP include flooding events from anticipated sea level rise, increased precipitation, riverine flooding, and storm surge. Impacts from a flood event can vary; for example, assets such as paved roads may be temporarily closed when flooded but regain normal function once floodwaters recede. Some assets may remain fully functional if the inundation is limited to a few inches or less, while other assets such as railway systems may be completely shut down if significant inundation occurs. If flooding events become more frequent, severe, or even permanent, the Port will need to assess structural enhancements to its facilities.

Southern California Association of Governments (SCAG) 2016–2040 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS) (2016)

The SCAG developed the 2016–2040 RTP/SCS with the primary goal of increasing mobility for the region’s residents and visitors but also with an emphasis on sustainability, pursuant to SB 375 (Sustainable Communities and Climate Protection Act of 2008). This law set regional targets for GHG emission reductions from passenger vehicle use for 2020 and 2035 and it requires that SCAG include an SCS in the RTP that would reduce GHG emissions from passenger vehicles. The RTP/SCS also includes strategies for goods movement.

The RTP/SCS Goods Movement Appendix identifies strategies for regional highway improvements, regional rail improvements (i.e., on-dock and near-dock rail), and San Pedro Bay Ports access projects. The RTP/SCS Goods Movement Appendix also identifies goods movement environmental strategies such as the short-term deployment of commercially available lower-emission trucks and locomotives and the longer-term development of a zero- and near-zero emission freight system. The Proposed Plan promotes these goods movement strategies through development goals, as it proposes to increase on-dock rail capacity, to re-design terminals to improve the efficiency of goods movement, and to support implementation of the Green Port Policy initiatives, such as the 2017 CAAP Update and its objective to achieve zero- and near-zero emission CHE and drayage trucks.

Impacts and Mitigation

Significance Criteria

CEQA Guidelines allow the lead agency discretion in how to address and evaluate significance of GHG emissions. After considering CEQA Guidelines and Port-specific climate change impact issues, the Port established criteria for determining the significance of impacts on global climate change that are based on the 2019 CEQA Guidelines, Appendix G (Environmental Checklist) and modified to reflect Port operations within a highly urbanized, industrial complex. Impacts during construction or operation would be considered significant if the proposed Project would:

- **GCC-1: Cause GHG emissions to exceed the SCAQMD interim significant emissions threshold for industrial projects of 10,000 MT CO2e per year (SCAQMD 2019b);**
  While the SCAQMD developed this threshold for stationary sources, it is used in this analysis to evaluate mobile sources of GHGs. Other lead agencies, such as the Port of Los Angeles, use this same approach for CEQA purposes. In accordance with SCAQMD guidance, total construction emissions were amortized over 30 years for comparison to the threshold (SCAQMD, 2008) by summing the total construction GHG emissions and dividing them by the 30-year amortization period.
- **GCC-2: Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing GHG emissions; or**
- **GCC-3: Expose people and structures to a significant risk of loss, injury, or death involving flooding as a result of sea-level rise.**

Impacts

Impact GCC-1:The proposed Project would not cause GHG emissions to exceed the SCAQMD interim significant emissions threshold for industrial projects of 10,000 MT CO2e per year (SCAQMD 2019b).

Impact Determination

Construction of the proposed Project has the potential to generate GHG emissions. **Table 12-14** summarizes the annual GHG emissions associated with construction activities and presents the 30-year-amortized construction emissions for comparison to the significance threshold. The table shows GHG emissions prior to implementation of MM-AQ-1 (clamshell dredge electrification); therefore, the emissions reflect a diesel clamshell dredge and no construction of an electrical substation at Pier J.

Table 12-14 Annual GHG Emissions

Source Category	Emissions CO_2e (mty)
2024	
Off-road construction equipment	55
On-road construction vehicles	14
Fugitive emissions	0
Marine equipment	257
Total Construction Year 2024	**326**
2025	
Off-road construction equipment	0
On-road construction vehicles	0
Fugitive emissions	0
Marine equipment	13,160
Total Construction Year 2025	**13,160**
2026	
Off-road construction equipment	0.0
On-road construction vehicles	0.0
Fugitive emissions	0.0
Marine equipment	6,030
Total Construction Year 2026	**6,030**
2027	
Off-road construction equipment	0.0
On-road construction vehicles	0.0
Fugitive emissions	0.0
Marine equipment	2,004
Total Construction Year 2027	**2,004**
Amortized Construction Emissions [a]	717
Significance threshold	10,000
Significant?	**No**

Notes:
mty = metric tons per year.

a. Total construction emissions were amortized over 30 years in accordance with SCAQMD guidance (SCAQMD, 2008).

Table 12-14 shows that the proposed Project's amortized GHG emissions would not exceed the SCAQMD interim significant emissions threshold for industrial projects of 10,000 MT CO_2e per year (SCAQMD 2019). Impacts would be less than significant, and mitigation is not required.

Impact GCC-2:The proposed Project would not conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing GHG emissions.

Impact Determination

The proposed Project would not conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing GHG emissions. **Table 12-15** evaluates relevant plans, policies, and regulations adopted for the purpose of reducing GHG emissions and describes whether the plans, policies, and regulations are applicable on a project-specific basis. It also shows that the project would not conflict with any of the applicable federal, state, regional, or local GHG emission-reduction plans, policies, or regulations. Therefore, impacts would be less than significant, and mitigation is not required.

Table 12-15 Relevant GHG Plan, Policy, and Regulatory Evaluation

Plan or Policy	Applicability	Evaluation of Project and Build Alternatives
EO S-3-05 (2005) established the following GHG emission-reduction targets for California state agencies: 1) Year 2000 levels by 2010, 2) year 1990 levels by 2020, and 3) 80 percent below 1990 levels by 2050.	Established statewide goals that are not directly applicable to a project-level analysis. Nonetheless, certain elements of the Action Alternative serve to facilitate state goals by allowing for more efficient cargo transport.	EO S-3-05 established state targets and directed state legislature to develop legislation to address those targets. The goal of the Action Alternative is to provide more efficient cargo transport by optimizing navigable depth and removing channel restrictions to increase vessels' loading capacity, thereby resulting in fewer vessel trips to transport forecasted cargo. The Action Alternative analysis has quantified GHG impacts. The analysis is conservative because it considers only GHG emission-reduction technologies pursuant to existing regulations and does not consider GHG emission reductions anticipated due to future regulatory efforts. EO S-3-05 did not identify project-level measures. The Action Alternative would comply with existing regulations applicable to project activities and would, by law, comply with future regulatory requirements applicable to project activities. The Action Alternative, therefore, would not preclude the state's compliance with EO S-3-05.
AB 32 – California Global Warming Solutions Act (2006) codified the following S-3-05 targets: 1) Year 2000 levels by 2010 and 2) Year 1990 levels by 2020.	Established statewide goals that are not directly applicable to a project-level analysis. Nonetheless, certain elements of the Action Alternative serve to facilitate state goals by allowing for more efficient cargo transport.	AB 32 codified S-3-05 targets through 2020 and directed state regulatory agencies to develop rules and regulations to meet the 2020 state targets, but it did not identify project-level measures. The Action Alternative would not preclude the state's compliance with AB 32. See evaluation for EO S-3-5.
California Air Resources Board's AB 32 Scoping Plan (2008) set a statewide roadmap for achieving the following AB 32 state	Includes general recommendations to reduce GHG emissions from various sources. The most relevant to the Action Alternative are the	The AB 32 Scoping Plan describes California's approach to achieve the GHG emissions reduction goal of 1990 emission levels by 2020. The Scoping Plan's GHG reduction actions include direct regulations, alternative

Plan or Policy	Applicability	Evaluation of Project and Build Alternatives
targets: 1) Year 2000 levels by 2010 and 2) Year 1990 levels by 2020.	goods movement recommendations, which are not directly applicable to the Action Alternative. Nonetheless, certain elements of the Action Alternative serve to facilitate state goals by allowing for more efficient cargo transport.	compliance mechanisms, monetary and non-monetary incentives, voluntary actions, market-based mechanisms such as a cap-and-trade system, and an AB 32 program implementation fee regulation to fund the program. The Scoping Plan's reduction actions do not identify specific direct project-level measures. The Scoping Plan identified discrete early-action regulations (i.e., vessel electrification while at berth) and recommendations to reduce GHG from transportation activities associated with the movement of freight within the state. Measure T-6 is described as "Goods Movement Efficiency Measures – System-Wide Efficiency Improvements." These measures do not directly apply to the Action Alternative. The goal of the Action Alternative is to provide more efficient cargo transport by optimizing navigable depth and removing channel restrictions to increase vessels' loading capacity, thereby resulting in fewer vessel trips to transport forecasted cargo. Therefore, the Action Alternative would not preclude the state's compliance with AB 32 Scoping Plan. See evaluation for EO S-3-5.
AB 32 Scoping Plan Update (2014) built upon the 2008 Scoping Plan with new strategies to achieve the following AB 32 state target: Year 1990 levels by 2020.	Includes general recommendations to reduce GHG emissions from various sources. The most relevant to the Action Alternative are the goods movement recommendations, which are not directly applicable to the Action Alternative. Nonetheless, certain elements of the Action Alternative serve to facilitate state goals by allowing for more efficient cargo transport.	The AB 32 Scoping Plan Update highlights the state's progress toward meeting the 2020 GHG emission-reduction goal, identifies funding opportunities to reduce GHG emissions through planning and low carbon investments, identifies climate change priorities for 5 years, and sets the groundwork to reach long-term goals of EO S-3-05. The Scoping Plan Update includes specific recommended actions for lead agencies, identifies possible regulatory actions for vehicles and fuels, and introduces the need for a sustainable freight initiative and the 2014 Sustainable Freight Strategy (technical assessments that identify near-term and 2020 actions for each freight sector). The goal of the Action Alternative is to provide more efficient cargo transport by optimizing navigable depth and removing channel restrictions to increase vessels' loading capacity, thereby resulting in fewer vessel trips to transport forecasted cargo. The Action Alternative would not interfere with attainment of any Scoping Plan Update objective and, therefore, would not conflict with the Scoping Plan Update.

Plan or Policy	Applicability	Evaluation of Project and Build Alternatives
EO B-30-15 (2015) established a statewide GHG emissions-reduction target of 40 percent below 1990 levels by 2030.	Established statewide goals that are not directly applicable to a project-level analysis. Nonetheless, certain elements of the Action Alternative serve to facilitate state goals by allowing for more efficient cargo transport.	EO B-30-15 established a state GHG target of 40 percent below 1990 levels by 2030 and directed the state legislature to develop legislation to address this target. This target was established to ensure California meets the EO S-3-05 target of reducing GHG emissions to 80 percent below 1990 levels by 2050. EO B-30-15 did not identify project-level measures. The Action Alternative analysis has quantified GHG impacts. The analysis is conservative because it considers only GHG emission-reduction technologies pursuant to existing regulations and does not consider GHG emission reductions anticipated due to future regulatory efforts. In addition, the goal of the Action Alternative is to provide more efficient cargo transport by optimizing navigable depth and removing channel restrictions to increase vessels' loading capacity, thereby resulting in fewer vessel trips to transport forecasted cargo. The Action Alternative would comply with existing regulations applicable to project activities and would, by law, comply with future regulatory requirements applicable to project activities. The Action Alternative, therefore, would not preclude the state's compliance with EO B-30-15.
SB 32 (2016) codified the B-30-15 target: 40 percent reduction below 1990 levels by 2030.	Established statewide goals that are not directly applicable to a project-level analysis. Nonetheless, certain elements of the Action Alternative serve to facilitate state goals by allowing for more efficient cargo transport.	SB 32 codified the EO B-30-15 target through 2030 and directed state regulatory agencies to develop rules and regulations to meet the 2030 target but did not identify project-level measures. See the evaluation for EO B-30-15.
AB 32 Scoping Plan Update (2017) built on the 2008 and 2014 Scoping Plans with new strategies to achieve the following AB 32 state target: a 40 percent reduction in GHGs by 2030 compared to 1990 levels.	Includes general recommendations to reduce GHG emissions from various sources. The most relevant to most projects at the Port are the sustainable freight goals, which are not directly relevant to the Action Alternative. Nonetheless, certain elements of the Action Alternative serve to facilitate state goals by allowing for more efficient cargo transport.	The Final 2017 Scoping Plan Update provides further guidance on how to meet the statewide GHG reduction goal of 40 percent below 1990 emission levels by 2030. The 2017 Plan Update also discusses its relation to the 2050 GHG reduction target under the EO B-30-15, which is 80 percent below 1990 levels. The transportation sustainability guidance in the Final Plan Update notes that the state's transportation system, while providing benefits such as economic growth and greater accessibility, also has adverse consequences, including GHG emissions, air pollutants, and traffic congestion. The Final Plan Update identifies the transportation system, as a

Plan or Policy	Applicability	Evaluation of Project and Build Alternatives
		whole, as the largest emitter of GHG emissions in California. The 2017 Scoping Plan Update emphasizes the need for freight and goods movement systems to improve efficiency and to maximize the use of near-zero and zero-emission vehicles and equipment powered by renewable energy. Since the Action Alternative is primarily a construction project designed to provide more efficient cargo transport by optimizing navigable depth and removing channel restrictions to increase vessels' loading capacity, thereby resulting in fewer vessel trips to transport forecasted cargo, the Action Alternative would not preclude the state's compliance with the 2017 Scoping Plan Update.
Port of Long Beach Green Port Policy (2005)	Applicable.	The POLB Green Port Policy serves as a guide for decision-making and establishes a framework for environmentally friendly Port operations. One of the policy's guiding principles is to promote sustainability. Another is to reduce harmful air emissions from Port activities. The sustainability element identifies GHG-reducing measures such as green building principles, recycling programs, landscaping projects, and energy/fuel efficiency. The Action Alternative would support implementation of the POLB Green Port Policy initiatives by facilitating more efficient cargo transport by optimizing navigable depth and removing channel restrictions to increase vessels' loading capacity, thereby resulting in fewer vessel trips to transport forecasted cargo. Therefore, the Action Alternative would not conflict with the POLB Green Port Policy.
San Pedro Bay Ports 2006 Clean Air Action Plan (CAAP) (2007), CAAP Update (2010), and 2017 CAAP Update (2017)	Applicable. The CAAP and its updates include requirements to reduce criteria pollutants that also would reduce GHG emissions from the San Pedro Bay ports' goods movement operations.	While the 2006 CAAP and 2010 Update were primarily designed to reduce criteria pollutants and air toxics, many of the CAAP strategies also would reduce GHG emissions. The CAAP 2017 Update furthers the goals of the previous CAAPs. The 2017 CAAP Update also incorporates two new emission-reduction targets: • Reduce GHGs from port-related sources to 40 percent below 1990 levels by 2030. • Reduce GHGs from port-related sources to 80 percent below 1990 levels by 2050. The goal of the Action Alternative is to provide more efficient cargo transport by optimizing navigable depth and removing channel restrictions to increase vessels' loading capacity, thereby resulting in fewer vessel trips

Plan or Policy	Applicability	Evaluation of Project and Build Alternatives
		to transport forecasted cargo. Therefore, the Action Alternative would be consistent with the CAAPs, and it would promote achievement of the GHG goals in the 2017 CAAP Update.
Long Beach Sustainable City Action Plan (February 2010)	Applicable.	The Long Beach Sustainable City Action Plan is intended to guide operational, policy, and financial decisions to create a more sustainable Long Beach. Although the Plan is mostly focused on city property, buildings, and public transportation, some elements refer to Port activities. The Transportation section defers to the CAAP for criteria pollutant emission reductions; GHG emission reductions are not explicitly addressed (in the 2007 CAAP), but their reduction would be a benefit of CAAP compliance. The Action Alternative would comply with the CAAP. In addition, the goal of the Action Alternative is to provide more efficient cargo transport by optimizing navigable depth and removing channel restrictions to increase vessels' loading capacity, thereby resulting in fewer vessel trips to transport forecasted cargo. Therefore, the Action Alternative would not conflict with the Sustainable City Action Plan.
Key: AB = Assembly Bill; CAAP = Clean Air Action Plan; EO = Executive Order; GHG = greenhouse gas; POLB or Port = Port of Long Beach; RTP = Regional Transportation Plan; SB = Senate Bill; SCAG = Southern California Association of Governments; SCS = Sustainable Communities Strategy; VMT = vehicle miles traveled		

Impact GCC-3:The proposed Project would not expose people and structures to a significant risk of loss, injury, or death involving flooding as a result of sea-level rise.

Impact Determination

Nearly all of the proposed Project components would consist of in-water dredging and disposal. The small land-side areas temporarily required to support construction activities are not located within the areas predicted to be inundated as part of the 16-inch or the 55-inch SLR scenarios according to the Climate Adaptation and Coastal Resiliency Plan (CRP) (POLB 2016). In addition, the current POLB Harbor Development Permit process requires SLR analyses to ensure that any future project is designed to avoid significant risks from SLR. Impacts would be less than significant, and mitigation is not required.

12.3 Impacts Following Mitigation

This section describes the impacts associated with implementation of Mitigation Measure MM-AQ-1.

12.3.1 Description of Mitigation

As described in Section 12.2.3, Air Quality and Health Risk, Mitigation Measure MM-AQ-1 would be required to minimize air quality impacts. MM-AQ-1 requires the use of an electric clamshell dredge during the entire construction period. To support the dredge, an electrical substation would be constructed at Pier J. The new substation would consist of a pad approximately 30 feet square to hold the transformer, control units, and cabinets. Additionally, a 4,250-foot-long trench would be cut from the existing substation at the north end of Pier J to the proposed new substation. This trench would contain the electrical duct bank for the substation power lines. Asphalt removal would be required for the trench and the area occupied by the substation.

12.3.2 Impact Analysis of Mitigation

While the use of an electric dredge as part of Mitigation Measure MM-AQ-1 would reduce air quality impacts, the construction of the substation to support the electric dredge would have impacts as described below.

Aesthetics/Visual Resources

Implementation of Mitigation Measure MM-AQ-1 and associated construction of the electric substation at Pier J would not result in aesthetic/visual resources impacts. The site is not located within an officially designated scenic vista. The substation would be unnoticeable in the context of the heavy industrial land uses of the Port that dominate the landscape and viewshed. Accordingly, the substation within the Port complex would be consistent with the existing viewshed and landscape, and the mitigation would not adversely affect a scenic vista or otherwise affect the visual character of the area. Impacts would be less than significant.

Agriculture and Forest Resources

No agricultural or forest resources exist within the Port area. Therefore, no impacts would occur from implementation of Mitigation Measure MM-AQ-1 and associated construction of the electric substation at Pier J.

Air Quality and Health Risk

The substation would eliminate emissions associated with diesel-powered clamshell dredging. These reductions would be partially offset by small amounts of emissions from the construction of the substation and associated trenching but would still result in a net reduction of project emissions, as shown in **Table 12-7**, **Table 12-10**, and **Table 12-11**. Impacts would be significant and unavoidable.

Biota and Habitats

Implementation of Mitigation Measure MM-AQ-1 and associated construction of the electric substation at Pier J would not result in any additional impacts to biota and habitats as the substation site and trenching areas are fully paved and do not contain habitat for biological species. No impacts would occur.

Historic and Tribal Cultural Resources

Implementation of Mitigation Measure MM-AQ-1 and associated construction of the electric substation at Pier J would not result in any additional impacts to historic and tribal cultural resources. These features are located on recently developed constructed fill materials, which would not have the potential to contain such resources. No impacts would occur.

Geology, Soils, and Seismic Conditions

Implementation of Mitigation Measure MM-AQ-1 and associated construction of the electric substation at Pier J would not result in additional impacts to geology, soils, and seismic conditions. Construction would not involve inhabitable structures that could pose risks to human life from geologic or seismic conditions. Compliance with state and local building codes for construction of the substation would adequately avoid any potential impacts. Landside excavation would involve previously disturbed soils, and therefore would not encounter unique paleontological resources or geologic features. No impacts would occur.

Hazards and Hazardous Materials

Implementation of Mitigation Measure MM-AQ-1 and associated construction of the electric substation at Pier J would not result in additional impacts to hazards and hazardous materials. The site is not known to contain any contaminated soils or otherwise handle hazardous materials. The Port's standard conditions would involve requiring a Safety Plan, if warranted, to address any exposure to hazardous materials. The Safety Plan would include proper personal protective equipment (PPE) work requirements, soil and air space monitoring requirements, documentation and reporting requirements, and action levels. Prior to the start of construction, Permittee shall provide the Safety Plan to the POLB Director of Environmental Planning for review and approval. With these precautions in place, impacts would be less than significant.

Hydrology and Water Quality

Implementation of Mitigation Measure MM-AQ-1 and associated construction of the electric substation at Pier J would not result in additional impacts to hydrology and water quality. Construction of the substation is located on existing impervious surface and would not result in changes post-construction. The construction area would be less than one acre, which would require completion of a stormwater BMP checklist and implementation of best management practices (BMPs) as identified in the checklist, which would include installing, constructing and implementing all control measure requirements described in the stormwater BMP checklist and other stormwater BMPs that may be appropriate during construction. Impacts would be less than significant.

Land Use/Planning

Implementation of Mitigation Measure MM-AQ-1 and associated construction of the electric substation at Pier J would not result in additional impacts to land use. The electric substation and use of an electric dredge would be compatible with the Port Master Plan, General Plan, CCA, and Zoning, and would help to implement the San Pedro Bay CAAP. No impacts would occur.

Noise

Implementation of Mitigation Measure MM-AQ-1 and associated construction of the electric substation at Pier J would not result in additional impacts to noise. In addition, it is likely that the electric dredge would produce less noise than the diesel-powered dredge it would replace. Construction activities are over one mile from the substation location, and construction noise would not be perceptible to sensitive receptors. Impacts would be less than significant.

Population and Housing

Implementation of Mitigation Measure MM-AQ-1 and associated construction of the electric substation at Pier J would not result in additional impacts to population and housing. The construction crew for the substation involves approximately 15 employees, which would not induce population growth in the area. No impacts would occur.

Public Services and Safety

Implementation of Mitigation Measure MM-AQ-1 and associated construction of the electric substation at Pier J would not result in additional impacts to public services and safety. Existing police and fire services are available to address potential construction-related emergencies from the substation and would not require construction of new facilities. Impacts would be less than significant.

Recreation

Implementation of Mitigation Measure MM-AQ-1 and associated construction of the electric substation at Pier J would not result in additional impacts to recreation. The substation would not displace existing recreational facilities, nor result in population that would otherwise deteriorate existing recreational facilities. No impacts would occur.

Relevant GHG Plan, Policy, and Regulatory Evaluation

Ground Transportation

Implementation of Mitigation Measure MM-AQ-1 and associated construction of the electric substation at Pier J would not result in additional impacts to ground transportation. The construction crew for the substation would involve approximately 15 workers over three-month period. This is estimated to generate up to 54 daily vehicle trips. This nominal number of trips does not have the potential to adversely affect traffic in the area. Following construction, the substation may generate two employees twice per year to perform routine maintenance. The addition of this operational traffic is negligible and would not result in any significant traffic impacts at the study intersections, per the impact significance criteria. Impacts would be less than significant.

Vessel Transportation

Implementation of Mitigation Measure MM-AQ-1 and associated construction of the electric substation at Pier J would not result in additional impacts to vessel transportation. No additional vessels would be required to support construction of the substation. No impacts would occur.

Utilities, Service Systems, and Energy Conservation

Implementation of Mitigation Measure MM-AQ-1 and associated construction of the electric substation at Pier J would not result in additional impacts to utilities, service systems and energy conservation. The electrical substation would require extension of electrical power lines, which would be housed in a 4,250-foot-long trench from the existing substation at the north end of Pier J. No additional infrastructure beyond the substation or connection would be required. Construction-period energy consumption would be nominal from the use of construction equipment, material delivery and hauling, and worker commute trips. The temporary increase in energy use during the construction period would not be considered a wasteful, inefficient, or unnecessary consumption of energy resources. Therefore, impacts would be less than significant.

Global Climate Change

Table 12-16 summarizes the annual GHG emissions associated with construction activities after implementation of MM-AQ-1 (clamshell dredge electrification), and also presents the 30-year-amortized construction emissions for comparison to the SCAQMD threshold. As required by MM-AQ-1, the emissions account for electricity consumption by the electric clamshell dredge and construction of an electrical substation at Pier J. The table shows that, after mitigation, GHG emissions would be reduced, and amortized GHG emissions would remain below the SCAQMD interim significant emissions threshold for industrial projects of 10,000 MT CO_2e per year (SCAQMD 2019). Impacts would be less than significant.

Table 12-16 Annual GHG Emissions with Mitigation

Source Category	CO2e Emissions with MM-AQ-1 (mty)
2024	
Off-road construction equipment	62
On-road construction vehicles	25
Fugitive emissions	0
Marine equipment	257
Total Construction Year 2024	**344**
2025	
Off-road construction equipment	0
On-road construction vehicles	0
Fugitive emissions	0
Marine equipment	10,411
Electricity generation	1,408
Total Construction Year 2025	**11,819**
2026	
Off-road construction equipment	0.0
On-road construction vehicles	0.0
Fugitive emissions	0.0
Marine equipment	3,282
Electricity generation	1,408
Total Construction Year 2026	**4,689**
2027	
Off-road construction equipment	0.0
On-road construction vehicles	0.0
Fugitive emissions	0.0
Marine equipment	1,091
Electricity generation	468
Total Construction Year 2027	**1,559**
Amortized construction [a]	614
Significance threshold	10,000
Significant?	**No**

Notes:
mty = metric tons per year.
a. Total construction emissions were amortized over 30 years in accordance with SCAQMD guidance (SCAQMD, 2008).

With respect to sea level rise, the electrical substation would not be located within the areas predicted to be inundated as part of the 16-inch or the 55-inch SLR scenarios according to the Climate Adaptation and Coastal Resiliency Plan (CRP) (POLB 2016). Therefore, no impacts would occur.

12.4 Cumulative Impacts

12.4.1 Introduction

CEQA Guidelines (Section 15130) require an analysis of the significant cumulative impacts of a proposed project. Cumulative impact is referred to as "two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts" (CEQA Guidelines Section 15355).

Section 15355 describes cumulative impacts as:

- The individual effects may be changes resulting from a single project or a number of separate projects (CEQA Guidelines Section 15355[a]).
- The cumulative impact from several projects is the change in the environment which results from the incremental impact of the project when added to other closely related past, present, and reasonably foreseeable probable future projects. Cumulative impacts can result from individually minor but collectively significant projects taking place over a period of time (CEQA Guidelines Section 15355[b]).

Furthermore, according to CEQA Guidelines Section 15130(a)(1):

> As defined in Section 15355, a cumulative impact consists of an impact which is created as a result of the combination of the project evaluated in the EIR together with other projects causing related impacts. An EIR should not discuss impacts that do not result in part from the project evaluated in the EIR.

In addition, as stated in CEQA Guidelines Section 15064(h)(4), it should be noted that:

> The mere existence of significant cumulative impacts caused by other projects alone shall not constitute substantial evidence that the proposed project's incremental effects are cumulatively considerable.

The Port, as part of its cumulative impacts analysis, is responsible for identifying area(s) in which the effects of the proposed Project will be felt; the effects that are expected in those area(s) from the proposed Project; past, present, and reasonably foreseeable future actions that have or that are expected to have impacts in the same area; impacts or expected impacts from these other actions; and the overall impact(s) that can be expected if the individual impacts are allowed to accumulate.

12.4.2 Projects Considered in the Cumulative Impact Analysis

The cumulative projects considered in the following analyses generally considered those projects in San Pedro Bay as the Region of Influence (ROI). Specifically, the ROI is defined as from the Inner Harbor Channels of the Ports of Los Angeles and Long Beach in the north to the outer breakwater in the south. The only predicted impacts from the proposed project are construction impacts. Cumulative projects, therefore, are limited to those that could overlap with the construction period of 2025-2027. **Table 6-1** includes a listing of those projects considered to be reasonably foreseeable during the construction period.

12.4.3 Cumulative Impact Analysis

Aesthetics/Visual Resources

Construction and operation of the reasonably foreseeable related projects within the San Pedro Bay Harbor Complex would result in some changes to visual conditions within the Harbor area and would increase overall night lighting and glare. These types of aesthetic changes have been determined to be negligible changes in the context of the existing active Port operations. Additionally, many of the projects would involve removal of older, traditional lighting fixtures with improved controlled fixtures (e.g., low-energy fixtures regulated by timers and light spillover reduction features), which would minimize the potential for light and glare impacts.

The proposed Project's contribution to the cumulative impacts would negligible. The majority of the construction activities occur beneath the surface of the water and would not be visible, with the exception of the dredges, tugboats, and barges on the surface of the water. Additionally, minor landside construction and support activities would not be visible from outside of the Port. Their effects would be minimal and temporary and would be visually compatible with the Harbor District's existing industrial character. These effects would also not occur within any scenic vista that can be viewed from a designated scenic route or highway. Therefore, the proposed Project's contribution to cumulative impacts on aesthetics would be less than cumulatively considerable.

Air Quality and Health Risk

The greatest cumulative impact on the air quality of the regional air basin would be the incremental addition of pollutants from the use of heavy equipment and trucks associated with the construction, and operations of ocean-going vessels, terminal equipment, and trucks from the cumulative projects. Air quality impacts from the cumulative projects would result in cumulatively significant impacts, which would exceed the emission thresholds for VOC, CO, NOx, PM10, and PM2.5 and possibly SOx. Additionally, many of the cumulative projects could also contribute to significant health risks.

Mitigated construction activities for the proposed Project would contribute emissions of these pollutants and would exceed the SCAQMD daily construction emission thresholds for PM2.5, NOx, CO, and VOC. Therefore, emissions from the proposed Project would make a cumulatively considerable contribution to a significant cumulative impact to air quality. The Port would impose a special condition on the HDP that would require implementing and funding the Community Grants Program (CGP; see below). However, implementation of the CGP would not mitigate the proposed Project's contribution to a significant cumulative impact, and that contribution would remain cumulatively considerable. The proposed Project's health risk impact would be less than significant, and due to the distance to sensitive receptors, is not expected to make a cumulatively considerable contribution to significant cumulative health risks.

Special Condition. Community Grants Program (CGP). In 2016, the Port adopted a Community Grants Program (CGP) following a public hearing process. The CGP contains mitigation measures for environmental impacts as policies and requirements within the program. As applied to projects within the Harbor District, projects must mitigate environmental impacts to the extent feasible, and when impacts remain, compliance with the CGP can be a condition of project approval such that the project must provide funding to future projects that apply to the CGP for such grant awards. The Port will participate and fund the CGP, as determined by the methodology described below. The timing of the payment will be made by the later of the following two dates: (a) the date that the Port issues a Notice to Proceed (NTP) or otherwise authorizes commencement of construction; or (b) the date that the Final EIS/EIR is conclusively determined to be valid, either by operation of PRC Section 21167.2 or by final judgment or final adjudication.

Contribution to the CGP was considered for pollutants that would exceed the SCAQMD peak day significance thresholds, following mitigation. Emissions greater than the threshold were multiplied by the cost per ton of emissions, per SCAQMD Rule 301, July 1, 2019. Table III. The CGP funding contribution for the proposed Project is expected to be $146,753.

Biota and Habitats

Candidate, sensitive, or special status birds could be affected directly or indirectly by construction and operation of the cumulative projects. The most significant region-wide impacts on biological resources would be associated with habitat modification and loss. Indirect cumulative impacts could also occur from the increased potential for invasive species (including invasive aquatic species), particularly associated with increased vessel calls. The potential for port operations to degrade water, sediment, and habitat quality are addressed in existing Port policies, particularly the Water Resources Action Plan (WRAP) and Green Port Policy. The Port of Long Beach, in collaboration with the Port of Los Angeles, conducts a San Pedro Bay Port Complex-wide assessment of biological resources and habitat conditions on a recurring basis. As demonstrated by the results of the latest (2013 to 2014) harbor-wide assessment (MBC and Merkel & Associates 2016), the San Pedro Bay Port Complex continues to support healthy and robust biological communities and improvements in water, sediment, and habitat quality that began in the 1970s and are continuing to the present despite concurrent increases in operational intensity. Accordingly, the related projects do not have a significant cumulative impact on biological resources.

The proposed Project's impacts related to sensitive species, including birds and marine mammals, sensitive habitats, and other biological resources such as managed fish species, invasive species, and special ecological areas would be less than significant. Accordingly, the proposed Project would not make a cumulatively considerable contribution to significant cumulative impacts related to biological resources.

Historical and Tribal Cultural Resources

Cultural resources such as prehistoric sites, historic properties, and cultural landscapes are non-renewable resources, so adverse effects can be permanent. Because the number of cultural and historical resources is finite, limited, and non-renewable, any assessment of cumulative impacts must take into consideration the impacts of the proposed Project on the resources within the general region, the extent to which those impacts degrade the integrity of the region's resource base and impacts other projects may have on the regional resource base. Creation and repetitive expansion of the Ports of Long Beach and Los Angeles within the San Pedro Bay and associated dredging have likely resulted in the loss of historic and possibly prehistoric archaeological resources in the area. The local terrain has been extensively modified through grading, dredging, cutting, and filling. Cultural and archaeological resources associated with disturbed areas may have been either destroyed or buried. Nonetheless, some resources potentially remain deeply buried below alluvium or recent fill. Built-environment resources (buildings, structures, and infrastructures) constructed in the Port during the late 1960s are now exceeding 50 years of age, and during the next 20 years, resources constructed during the 1970s and 1980s will become potential historical resources. Some resources that were recorded in the past have been destroyed, so the resource base has already suffered from expansion and technological changes, which is considered a significant cumulative impact.

Because there are no structures present on the site or in the water that could be affected by the project that are considered significant historic resources, the proposed Project would not adversely change the significance of any historical resources and would not have any impacts on historic properties. Additionally, construction activities associated with the proposed Project would not have the potential to uncover archaeological resources because all Project-related activities would occur within sediments of the bay and landside activities are located on fill material. However, in the event of an unanticipated discovery, standard conditions in the permits and contracts issued by the USACE and POLB would, as described in Section 10.2, require construction activities to be halted, archeological experts to be notified, and the USACE to complete an evaluation of the significance of those resources and determine the appropriate resolution of any potential adverse effects. With these precautions in place, the proposed Project would not make a cumulatively considerable contribution to a significant cumulative impact.

Tribal cultural resources are highly threatened in the region. However, the Ports do not contain substantial tribal resources due to the open water and largely recent fill upland areas. The local terrain has been extensively modified through grading, dredging, cutting, and filling. Tribal cultural resources associated with disturbed areas may have been either destroyed or buried. Nonetheless, some resources potentially remain deeply buried below alluvium or recent fill. The Port as a lead agency under CEQA provides consultation notices and invitations to tribes that request consultation. These processes are in place to minimize potential project and cumulative impacts to tribal resources. The proposed Project involves dredging under water and minimal landside activities on fill material. Therefore, no impacts are expected to occur to tribal cultural resources. The Port has undertaken appropriate outreach to invite consultation by Native American tribes in accordance with AB 52, and no tribes requested consultation. There is no evidence of tribal resources occurring in the area that could be affected. Therefore, the proposed Project would not make a cumulatively considerable contribution to a significant cumulative impact on tribal cultural resources.

Geology, Soils, and Seismic Conditions

Impacts related to geology and soils generally relate to a project's ability to exacerbate existing geologic hazards, which could expose people or structures to harm or risk. While seismic risks do occur within the project area from nearby faults, the impacts on a project from the existing environment are not considered under CEQA. The cumulative projects all must incorporate modern construction engineering and safety standards, which are design to minimize or avoid impacts associated with erosion, risks to life or property associated with seismic activities or expansive soils, or risks of directly or indirectly destroying unique geologic features. Therefore, the cumulative impact associated with geology and soils would be less than significant.

The proposed Project would not include the structural development of any inhabitable structures and involves primarily dredging of the harbor. All construction would incorporate modern construction engineering and safety standards. Thus, the proposed Project's contribution to cumulative impacts would be less than cumulatively considerable.

Hazards and Hazardous Materials

Many of the cumulative projects have the potential to contribute to the risk of hazardous materials spills or releases during construction as a result of normal usage of lubricants, fuels, and hydraulic fluids. However, implementation of normal construction standards, including BMPs and applicable regulations and practices would minimize the potential for an accidental release of hazardous materials or fuels during construction activities. In addition, the effects of minor fluid spills that may result from construction are likely to be isolated to the construction site. Therefore, the contributions from construction of related projects to cumulative impacts are less than significant. During operations of cumulative projects, releases of hazardous materials is also possible. Liquid bulk projects would be required to comply with the RMP requirements of the POLB and, therefore, no highly populated areas would be exposed to hazardous materials releases. In addition, the WRAP reduces the potential for impacts. Abandoned oil wells are a potential issue throughout the region for a number of cumulative projects. The state Division of Oil and Gas and Geothermal Resources requires re-abandonment procedures in certain cases and the limiting of buildings to areas that are not directly over abandoned oil wells. Therefore, cumulative impacts on hazards and hazardous materials would be less than significant.

The proposed Project's contribution to cumulative hazardous materials impacts would be similar to most construction projects. The proposed Project has the potential to result in material spills or releases from the dredging barges or other equipment that may use lubricants, fuels, and hydraulic fluids. Implementation of normal construction standards, including BMPs and applicable regulations and practices would minimize the potential for an accidental release of hazardous materials or fuels during construction activities. Therefore, the proposed Project would not make a cumulatively considerable contribution to significant cumulative hazards and hazardous materials impacts.

Hydrology and Water Quality

The cumulative projects could collectively result in cumulative impacts to water and sediment quality if dredging activities should occur at the same time. Cumulatively considered, these projects could potentially increase turbidity in the study area and contribute to a decrease in water quality. Potential cumulative impacts may occur if more than one project involving dredging occurs simultaneously or immediately before or after the proposed action in the same vicinity. Chances of overlap are considered to be slight due to the short-term nature of dredging projects and the relatively long interval between maintenance dredging projects in the Ports of Long Beach or Los Angeles in the vicinity of the proposed Project. Thus, the cumulative projects would not have a significant cumulative impact related to hydrology and water quality.

Because the project would result in short-term localized turbidity that has a low potential for overlapping with turbidity resulting from other projects, and any overlap that would occur would also be short term, no significant long-term cumulative impacts to water resources are anticipated. Therefore, the proposed Project's contribution to cumulative impacts to hydrology and water quality would be less than cumulatively considerable.

Land Use

The existing industrial land uses and land use plans and policies governing development within the San Pedro Bay Port Complex minimize the potential for cumulative land use impacts. Past and present actions within the San Pedro Bay Port Complex have been developed to ensure proposed projects are consistent with applicable land use plans and policies, including the Coastal Zone Management Act, CCA, Tidelands Trust, and 1990 PMP as amended. Furthermore, construction and operation of foreseeable related projects have been and will continue to be modified during the project review process to ensure consistency with applicable land use plans and policies. Cumulative impacts on land use associated with buildout of the reasonably foreseeable related projects would be less than significant.

The proposed Project's contribution to this cumulative impact would be negligible because it would comply with all applicable land use plans and policies adopted for avoiding or mitigating environmental effects, including the CZMA, CCA, Tidelands Trust, City of Long Beach General Plan and Zoning Ordinance, 1990 PMP as amended, as well as the 2020 PMP Update. Therefore, the proposed Project's contribution to cumulative impacts on land use would be less than cumulatively considerable.

Noise

Cumulative projects have the potential to general substantial noise from both construction and operational activities. The largest sources of construction noise are related to pile driving activities, with other sources associated with building activities, construction equipment, and trucks. Cumulative construction impacts could be significant when two or more projects occur in proximity to one another and overlap in construction activities. Operational noises occur from terminal activities associated with moving containers around, as well as impacts from trucks and trains both within and outside of Port boundaries. The growth within the Port area could contribute to cumulative noise impacts associated with operational activities, thereby resulting in significant cumulative noise impacts.

The proposed Project construction activities would generate increased noise levels. However, there are no sensitive receptors (residences, schools, and community facilities) located within 1.25 miles of the proposed Project site. Thus, the noise levels would not be perceptible. No operational noise would occur following construction. Therefore, noise impacts from the proposed Project would be less than cumulatively considerable.

Population and Housing

An increase in Port operations and capacity associated with the cumulative projects could increase the amount of commercial and retail activity and have the potential to create new jobs in the region and maintain a strong workforce. Construction activities associated with the Proposed Plan would also likely result in additional direct, indirect, and induced number of jobs. However, there are approximately 330,000 construction-related jobs throughout the five-county region and, with recent jobs losses in the industry between 2007 and 2015, it would be expected that the local labor supply would be able to fill any construction-related employment. The current and reasonably foreseeable Port operations would reassert the Port's contribution to the local economy through employment and income-generating activities and is likely to be a source of direct, indirect, and induced population growth for the area. However, based on its history, population growth associated with the Port would likely not result in a substantial unplanned population growth. Thus, cumulative impacts related to population and housing are less than significant.

Construction of the proposed Project would result in between 15 and 120 workers at any one time, which would be a negligible contribution to employment. This small construction crew would not result in any growth inducing impacts or contribute to population increases. Therefore, the proposed project would result in a less than cumulatively considerable impact on population and housing.

Public Services and Safety

During the time frame for the past, present and potentially foreseeable future projects throughout the Port anticipate a growing work force with more ground and vessel transportation, which could affect the demand for public service personnel, equipment, and facilities to adequately serve Port operations. The existing public service facilities and personnel serving the POLB adequately support current and anticipated future construction needs that are required of a functioning and operational Port. Public services available at the Port are continually being evaluated and support the ever-changing needs of a functioning and operational Port, which would ensure that cumulative impacts would not rise to a significant level.

The proposed Project only generates a small construction crew that would work at the Port for a temporary period of time and would not require an increase in public service demands. Therefore, the proposed Project would not result in a considerable contribution to significant cumulative impacts on public services and safety.

Recreation

None of the cumulative projects would contribute to population growth, which could in turn result in additional demands and uses of existing neighborhood and regional parks or other recreational facilities. Therefore, the cumulative impacts on recreation are less than significant.

The proposed project does not have the potential to generate demands on recreational facilities. Therefore, the project's contribution is also less than cumulatively considerable.

Ground Transportation

Construction activities associated with the cumulative projects would generate temporary increases in traffic but would not make a cumulatively considerable contribution to significant cumulative impacts on the study area intersections and freeway segments operating conditions, conflict with local plans and policies, or interfere with emergency routes. However, operations of cumulative projects would generate substantial vehicle traffic resulting in potential decreases in service and functions on local and regional transportation facilities. These transportation impacts are considered cumulatively significant.

Transportation impacts from the proposed Project are negligible due to the small construction crews. Cumulative impacts would not be significant when considering the other reasonably foreseeable projects since few (if any) projects would require the use of the same routes for construction vehicles at the same time of the proposed Project construction activities and would not generate substantial traffic. No operational traffic would occur following construction.

Vessel Transportation

Vessel traffic levels are highly regulated by the USCG COTP and the Marine Exchange via the VTS to ensure the total number of vessels transiting the Port does not exceed the design capacity of the federal channel limits. All recently completed and future projects at the Port of Long Beach and the adjacent Port of Los Angeles, involving vessel transportation are considered by the PMP for each port. These documents provide for the analysis of future projects and, therefore, the associated cumulative impacts to ensure that those impacts are less than significant or are mitigated to the level of less than significant. Therefore, the cumulative projects would not cause a significant cumulative impact from vessel transportation activities.

The proposed project would contribute to vessel activity within the Harbor from both the clamshell dredge and the hopper dredge, as well as the transport of dredge materials for disposal. These activities would be well coordinated with the Marine Exchange to minimize any potential conflicts with other vessels. Therefore, implementation of the proposed Project would not result in cumulatively considerable impact to transportation.

Utilities, Service Systems, and Energy Conservation

Due to the number of reasonably foreseeable related projects that would place additional demands on utilities and service systems, cumulative impacts could occur. The cumulative projects are anticipated to adhere to utility provider requirements, current design standards, and municipal code requirements which would reduce the potential for cumulatively significant environmental impacts associated with the construction and/or expansion of utility infrastructure.

The proposed Project would not result in a demand for water, wastewater, or solid waste utilities, and would not contribute to cumulative impacts. Construction activities would be minimal and would not result in a cumulatively considerable impact on utilities or service systems.

The cumulative projects would require energy expenditures during construction activities, which would be short term, occurring periodically during the construction phases of these projects. Construction activities would be planned and sequenced to maximize the efficiency of construction and would be conducted in accordance with the Port's Green Port Policy and Energy Initiative Roadmap that require implementation of energy conservation techniques and technologies. Therefore, construction activities would not cause significant cumulative environmental effects.

Operation of cumulative projects would generate increased demands on electricity and non-renewable energy sources. Operational energy consumption by the cumulative projects would increase, but many of the projects would upgrade older equipment with more modern technologies and equipment, which would offset increases in energy consumption due to greater efficiency of new technologies. However, electrical power demands are not anticipated to exhaust or exceed existing supplies and would not be substantial relative to the regional electrical supply. In addition, new equipment would be required to meet California energy efficiency standards, including Title 24 and City building code requirements. Operational activities would be conducted in accordance with the Port's Green Port Policy and Energy Initiative Roadmap that require implementation of energy conservation techniques and technologies. In addition, new buildings would be Leadership in Energy and Environmental Design-certified, reducing building energy consumption within the Port.

The proposed Project's contribution to cumulative impacts on renewable energy and energy efficiency plans would be less than cumulatively considerable because construction would adhere to the Port's Green Port Policy and Energy Initiative Roadmap energy conservation requirements, including use of an electric dredge to minimize fossil fuels and reduce air quality impacts. Thus, the proposed Project's impacts on energy would be less than cumulatively considerable.

Global Climate Change

GHG and global climate change impacts are inherently cumulative impacts. These impacts are discussed in the previous sections; therefore, no additional discussion related to cumulative impacts is provided.

12.5 Alternatives Analysis

12.5.1 Introduction

CEQA Guidelines Section 15126.6(a) states that an EIR shall describe a range of reasonable alternatives to the project, or to the location of the project, which would feasibly attain most of the basic objectives of the project but would avoid or substantially lessen any of the significant effects of the project and evaluate the comparative merits of the alternatives. An EIR need not consider every conceivable alternative to a project. Rather, it must consider a reasonable range of potentially feasible alternatives that will foster informed decision-making and public participation. This section summarizes the alternatives, compares their impacts, and identifies an environmentally superior alternative, as required by CEQA and the CEQA Guidelines.

CEQA Guidelines Section 15126.6(b) and (e) state that an EIR alternatives analysis is required to achieve the following:

- Focus on potentially feasible alternatives to the project or its location that are capable of avoiding or substantially lessening significant effects of the project, even if these alternatives would impede to some degree the attainment of the project objectives or would be more costly.
- Identify an “environmentally superior” alternative to the proposed Project.
- Include analysis of the “No Project” Alternative, assuming the reasonable future use of the project site if the project was not approved. If the environmentally superior alternative is the No Plan Alternative, the EIR must identify an additional “environmentally superior” choice among the other project alternatives.

The POLB as lead agency under CEQA is responsible for selecting a range of project alternatives for examination and must publicly disclose its reasoning for selecting those alternatives. The purpose of the Port of Long Beach Deep Draft Navigation Feasibility Study is to identify and evaluate alternatives to increase transportation efficiencies for container and liquid bulk vessels operating in the Port, for both the current and future fleet, and to improve conditions for vessel operations and safety. From a CEQA perspective, the POLB has developed the following objectives:

- Reduce transportation costs by allowing a more efficient future fleet mix (e.g., displace Panamax and smaller-scale Post-Panamax vessels with larger-scale Post-Panamax vessels, which have increased cargo capacity).
- Reduce vessel congestion in the Port.
- Increase channel depths to encourage shippers to replace smaller, less efficient vessels with larger, more efficient vessels on Long Beach route services.
- Remove channel restrictions to increase vessels' maximum practicable loading capacity, thereby resulting in fewer vessel trips to transport the forecasted cargo.
- Reduce loading and unloading delays for deeper drafting liquid bulk vessels and provide a safe area to anchor adjacent to the Main Channel during equipment failures.

This CEQA evaluation presents a reasonable range of alternatives that are consistent with the POLB's legal mandates under the California Coastal Act of 1976, which identifies the POLB and its facilities as a primary economic/coastal resource of the state and an essential element of the national maritime industry for promotion of commerce, navigation, fisheries, environmental preservation, and public recreation. To comply with CEQA requirements, all alternatives considered in the EIR have been evaluated in accordance with the following:

- Does the alternative accomplish all or most of the basic objectives of the proposed Project?
- Is the alternative potentially feasible (from economic, environmental, legal, social, and technological standpoints)?
- Does the alternative avoid or substantially lessen any significant effects of the proposed Project, including consideration of whether the alternative itself could create significant effects greater than those of the proposed Project?

12.5.2 Alternatives Considered

Three action alternatives, in addition to the proposed Project, were carried forward to meet the Project's needs and objectives. Numerous scenarios were explored to determine the most prudent and practicable designs, which are described in more detail in Section 4. The following alternatives are analyzed in this CEQA document (as mentioned above, Alternative 3 is the proposed Project):

- Alternative 1. No Project Alternative.
- Alternative 2. Container terminal channels deepened to -53 feet MLLW, Approach Channel deepened to -78 feet MLLW.
- Alternative 3 (Proposed Project). Container terminal channels and berths deepened to -55 feet MLLW, Approach Channel deepened to -80 feet MLLW.
- Alternative 4. Container terminal channels deepened to -57 feet MLLW, Approach Channel deepened to -83 feet MLLW; berths J266–J270 within the Pier J South Slip and berth T140 along Pier T deepened to -57 feet MLLW; wharf improvements possibly implemented to accommodate the deepening.
- Alternative 5. Container terminal channels deepened to -55 feet MLLW, Approach Channel deepened to -80 feet MLLW. New Standby Area dredged to -67 feet MLLW, with a 600-foot-diameter center anchor placement at a proposed depth of -73 feet MLLW.

All four action alternatives include widening the Main Channel, deepening the added width to the authorized depth of -76 feet MLLW, and constructing reinforcement of the Pier J breakwaters. These activities are needed to fully implement the GNF discussed above and to allow the POLB to fully realize all of the economic benefits of the project. These features are designed to prepare wharves for the selected channel depths and to deepen berths to match the selected channel depths. Reduced features would not fully enable the POLB to realize all project benefits and were not considered. Enhanced measures would result in greater costs with no increase in benefits and were also excluded.

12.5.3 Comparative Analysis of Alternatives

Chapter 5 provides a detailed co-equal analysis of the alternatives. For the purposes of CEQA, a qualitative comparison of the impacts associated with each alternative are compared to the respective impacts associated with the proposed Project. **Table 12-17** provides a summary comparison of the impacts relative to the proposed Project; the basis for the determinations in **Table 12-17** are discussed below. The anticipated significance of each impact is shown, along with a relative comparison to the proposed Project denoted by either (-) representing fewer impacts, (+) representing greater impacts, or (0) representing equivalent impacts.

Table 12-17 Comparison of Impacts for Alternatives to the Proposed Project

Resource Area	Proposed Project (Alt 3)	No Project	Alt 2	Alt 4	Alt 5
Aesthetics/Visual Resources	Less Than Significant	No Impact (-)	Less Than Significant (0)	Less Than Significant (0)	Less Than Significant (0)
Air Quality and Health Risk	Significant	No Impact (-)	Significant (-)	Significant (+)	Significant (+)
Biota and Habitats	Less Than Significant	No Impact (-)	Less Than Significant (-)	Less Than Significant (+)	Less Than Significant (+)
Historic and Tribal Cultural Resources	Less Than Significant	No Impact (-)	Less Than Significant (0)	Less Than Significant (0)	Less Than Significant (0)
Geology, Soils, and Seismic Conditions	Less Than Significant	No Impact (-)	Less Than Significant (0)	Less Than Significant (0)	Less Than Significant (0)
Hazards and Hazardous Materials	Less Than Significant	No Impact (-)	Less Than Significant (0)	Less Than Significant (0)	Less Than Significant (0)
Hydrology and Water Quality	Less Than Significant	No Impact (-)	Less Than Significant (-)	Less Than Significant (+)	Less Than Significant (+)
Land Use	Less Than Significant	No Impact (-)	Less Than Significant (0)	Less Than Significant (0)	Less Than Significant (0)
Noise	Less Than Significant	No Impact (-)	Less Than Significant (-)	Less Than Significant (+)	Less Than Significant (+)
Population and Housing	No Significant	No Impact (-)	No Impact (0)	No Impact (0)	No Impact (0)
Public Services and Safety	Less Than Significant	No Impact (-)	Less Than Significant (0)	Less Than Significant (0)	Less Than Significant (0)
Recreation	Less Than Significant	No Impact (-)	Less Than Significant (0)	Less Than Significant (0)	Less Than Significant (0)
Ground Transportation	Less Than Significant	No Impact	Less Than Significant	Less Than Significant	Less Than Significant

Resource Area	Proposed Project (Alt 3)	No Project	Alt 2	Alt 4	Alt 5
		(-)	(-)	(+)	(+)
Vessel Transportation	Less Than Significant	No Impact (-)	Less Than Significant (-)	Less Than Significant (+)	Less Than Significant (+)
Utilities, Service Systems, and Energy Conservation	Less Than Significant	No Impact (-)	Less Than Significant (0)	Less Than Significant (0)	Less Than Significant (0)
Global Climate Change	Less Than Significant	No Impact (-)	Less Than Significant (-)	Less Than Significant (+)	Less Than Significant (+)
Relative Impact Score	**-**	**-16**	**-7**	**+7**	**+7**

Notes:
(+) = Alternative would increase impact when compared with the proposed Project.
(0) = Alternative would have similar impacts when compared with the proposed Project and would be considered neutral.
(–) = Alternative would reduce impact when compared with the proposed Project.

No Project Alternative

Alternative Description

Under the No Project Alternative, no dredging or disposal would take place, and no wharf or breakwater improvements would be constructed. The baseline configuration of channels and basins would be maintained, and the Port's ability to accommodate large cargo vessels and increased vessel traffic would remain unchanged from baseline conditions.

Impacts and Mitigation

As described in Chapter 5, because there would be no construction and no changes to the physical environment, the No Project Alternative would have no direct impacts under any of the resource areas considered in this environmental document.

Alternative 2

Alternative Description

As described in Section 4.6, Alternative 2 would deepen the Pier J channel and the West Basin channel and create a turning basin off Pier J all to a depth of -53 feet MLLW; would widen the Main Channel to the design depth (-76 feet MLLW); and would deepen the Approach Channel to -78 feet MLLW (**Figure 4-2**). Approximately 4.9 mcy of sediment would be dredged and disposed of (**Table 4-11**). Sheet piling and armor rock would be placed along portions of the Pier J Breakwater to accommodate the adjacent deepened Pier J channel. As with the proposed Project, pile driving would not occur at night.
Dredging would be accomplished by a hydraulic hopper dredge and a clamshell dredge operating simultaneously for approximately 21 months. The hopper dredge would travel to the disposal sites to dispose of dredged material whereas the clamshell dredge would place dredged material on a barge that would be hauled to disposal sites. Disposal sites would include the nearshore Surfside-Sunset site off Huntington Beach and the LA-2 and LA-3 offshore disposal sites. As shown in **Table 4-13**, the nearshore

site is expected to receive approximately 2.5 mcy of material from the Approach Channel, Main Channel, and West Basin dredging and the two ocean disposal sites would receive the remaining 2.4 mcy of material from the Pier J and West Basin dredging.

Impacts and Mitigation

Impacts of Alternative 2 are described in detail in Chapter 5. In brief, as shown in **Table 12-17**, Alternative 2 would have similar impacts as the proposed Project in the areas of aesthetics, cultural resources, geology and soils, hazards and hazardous materials, land use, population and housing, public services and safety, recreation, and utilities and service systems. This is because the geographic scope and nature (i.e., type of activities and equipment) of this alternative are very similar to those of the proposed Project.

Alternative 2 would have fewer or less severe impacts than the proposed Project in the areas of air quality, biota, hydrology and water quality, noise, ground and vessel transportation, and climate change. This is because Alternative 2 would involve less dredging (4.9 mcy versus 7.4 mcy), which would mean less equipment activity, fewer worker commutes, and less disruption of biological habitats and water quality.

As described in Chapter 5, all of the impact determinations under CEQA would, like those of the proposed Project, be either no impact or less than significant impact, with the exception of air quality. Air quality would represent a significant impact. Mitigation measures MM-AQ-1 through MM-AQ-4, as described above for the proposed Project, would be imposed on Alternative 2, but even after mitigation, impacts on air quality would be significant and unavoidable.

Alternative 3

Alternative Description

Alternative 3 is the proposed Project, and its impacts and mitigation are described in Section 12.3, above.

Impacts and Mitigation

The proposed Project would have significant, unavoidable impacts on air quality, but in all other resource areas there would be either no impacts or impacts would be less than significant.

Alternative 4

Alternative Description

As described in Section 4.6, Alternative 4 would deepen the Pier J channel and the West Basin channel and create a turning basin off Pier J, all to a depth of -57 feet MLLW; would widen the Main Channel to the design depth (-76 feet MLLW); and would deepen the Approach Channel to -80 feet MLLW (**Figure 4-2**). Approximately 11.9 mcy of sediment would be dredged and disposed of (**Table 4-11**). Sheet piling and armor rock would be placed along portions of the Pier J Breakwater to accommodate the adjacent deepened Pier J channel. In addition, Alternative 4 would require modifications of the wharves at Pier J and Pier T to accommodate the deeper (-57 feet MLLW) berths. These modifications would include pile driving and rock placement. As with the proposed Project, pile driving would not occur at night.

Dredging would be accomplished by a hydraulic hopper dredge and a clamshell dredge operating simultaneously for approximately 36 months. The hopper dredge would travel to the disposal sites to dispose of dredged material whereas the clamshell dredge would place dredged material on a barge that would be hauled to disposal sites. Disposal sites would include the nearshore Surfside-Sunset site off Huntington Beach and the LA-2 and LA-3 offshore disposal sites. As shown in **Table 4-15**, the nearshore site is expected to receive approximately 2.5 mcy of material from the Approach Channel dredging, and the two ocean disposal sites would receive the remaining 9.4 mcy of material.

Impacts and Mitigation

Impacts of Alternative 4 are described in detail in Chapter 5. In brief, as shown in **Table 12-17**, Alternative 4 would have similar impacts as the proposed Project in the areas of aesthetics, cultural resources, geology and soils, hazards and hazardous materials, land use, population and housing, public services and safety, recreation, and utilities and service systems. This is because the geographic scope and nature (i.e., type of activities and equipment) of this alternative are very similar to those of the proposed Project.

Alternative 4 would not have fewer or less severe impacts than the proposed Project in any resource area. Alternative 4 would have greater impacts than the proposed Project in the areas of air quality, biota, hydrology and water quality, noise, ground and vessel transportation, and climate change. This is because Alternative 4 would involve more dredging (11.9 mcy versus 7.4 mcy), which would mean correspondingly more equipment activity, worker commutes, and disruption of biological habitats and water quality.

In addition to increased noise from equipment activity, construction of Alternative 4 would generate more high-intensity underwater noise from pile driving at the Pier J and Pier T wharves. As described in POLB (2019), high-intensity underwater noise can adversely affect marine organisms by damaging their auditory systems, disrupting behavior and communication, and causing mortality through swim bladder damage. These effects would be limited to a small area near the pile driving activity, and the USACE has determined that they would not represent a significant impact on marine mammals, managed fish species, and other marine resources. Furthermore, pile-driving activities would include a "soft-start" feature (described below) by which the construction contractor would be required to initiate pile driving at reduced force. This measure would give animals the opportunity to vacate the area before full-force driving began, thus further reducing the potential for adverse effects on marine resources.

As described in Chapter 5, all of the impact determinations under CEQA would, like those of the proposed Project, be either no impact or less than significant impact, with the exception of air quality, human health risk, and biota. Air quality would represent a significant impact. Alternative 4 would have a significant human health risk impact that the other alternatives would not have: the maximum estimated cancer risk at a residential/sensitive receptor would be 1.3×10^{-5} (13 in a million), which exceeds the SCAQMD significance threshold of 1.0×10^{-5} (10 in a million). Mitigation measures MM-AQ-1 through MM-AQ-4, as described above for the proposed Project, would be imposed on Alternative 4, but even after mitigation, impacts on air quality and human health risk would be significant and unavoidable.

Soft Start Measure. 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 pile installation will include establishment of a safety zone, by a qualified marine mammal professional, and the area surrounding the operations (including the safety zones) will be monitored for marine mammals by a qualified marine mammal observer. The pile driving site will move with each new pile; therefore, the safety zones will move accordingly.

Alternative 5

Alternative Description

As described in Section 4.6, Alternative 5 would deepen the Pier J channel and the West Basin channel and create a turning basin off Pier J, all to a depth of -55 feet MLLW; would widen the Main Channel to the design depth (-76 feet MLLW); and would deepen the Approach Channel to -80 feet MLLW (**Figure 4-2**). A Standby Area adjacent to the Main Channel would be created by dredging to -67 feet MLLW with a 300-ft-diameter area in the center dredged to -73 feet MLLW. Approximately 8.4 mcy of sediment would be dredged and disposed of (**Table 4-11**). Sheet piling and armor rock would be placed along portions of the Pier J Breakwater to accommodate the adjacent deepened Pier J channel. As with the proposed Project, pile driving would not occur at night. Alternative 5 would not require wharf modifications.

Dredging would be accomplished by a hydraulic hopper dredge and a clamshell dredge operating simultaneously for approximately 36 months. The hopper dredge would travel to the disposal sites to dispose of dredged material whereas the clamshell dredge would place dredged material on a barge that would be hauled to disposal sites. Disposal sites would include the nearshore Surfside-Sunset site off Huntington Beach and the LA-2 and LA-3 offshore disposal sites. As shown in **Table 4-16**, the nearshore site is expected to receive approximately 2.5 mcy of material from the Approach Channel dredging, and the two ocean disposal sites would receive the remaining 5.9 mcy of material.

Impacts and Mitigation

Impacts of Alternative 5 are described in detail in Chapter 5. In brief, as shown in **Table 12-17**, Alternative 5 would have similar impacts as the proposed Project in the areas of aesthetics, cultural resources (after mitigation), geology and soils, hazards and hazardous materials, land use, population and housing, public services and safety, recreation, and utilities and service systems. This is because the geographic scope and nature (i.e., type of activities and equipment) of this alternative are very similar to those of the proposed Project.

Alternative 5 would have greater impacts than the proposed Project in the areas of air quality, biota, hydrology and water quality, noise, ground and vessel transportation, and climate change. This is because Alternative 5 would involve more dredging (8.4 mcy versus 7.4 mcy), which would mean correspondingly more equipment activity, worker commutes, and disruption of biological habitats and water quality.

As described in Chapter 5, all of the impact determinations under CEQA would, like those of the proposed Project, be either no impact or less than significant impact, with the exception of air quality and biota. Air quality would represent a significant impact. Mitigation measures MM-AQ-1 through MM-AQ-4, as described above for the proposed Project, would be imposed on Alternative 5, but even after mitigation, impacts on air quality would be significant and unavoidable.

12.5.4 Environmentally Superior Alternative

In compliance with CEQA, an EIR must identify an environmentally superior alternative. The No Project Alternative would be the environmentally superior alternative because it would likely result in none of the adverse environmental impacts of the proposed Project. However, the No Project Alternative would achieve none of the project objectives described in Section 12.1. it should also be recognized that there could be adverse economic and environmental consequences from making no or limited improvements to the existing Port of Long Beach Deep Draft Navigation Study area, and none of the benefits that could occur under the proposed Project would occur under the No Project Alternative scenario.

Pursuant to CEQA regulations (see CEQA Guidelines Section 15126.6(e)(2)), when the No Project Alternative is identified as the environmentally superior alternative, the EIR will also identify an environmentally superior alternative from among the other alternatives. Alternative 2 would likely result in a reduction in the severity and extent of impacts compared to the proposed Project. However, this alternative would not avoid significant and unavoidable air quality impacts. Additionally, Alternative 2 would not achieve the project objectives and would not realize economic benefits to the fullest. Alternatives 4 and 5 would achieve the project objectives, but both would have more severe impacts, including an additional significant impact for Alternative 4, than the proposed Project.

12.6 Unavoidable Significant Impacts

Significant unavoidable impacts would occur as a result of the proposed Project in the following resource areas:

- Air Quality

12.7 Significant Irreversible Impacts

12.7.1 Introduction

Pursuant to CEQA Guidelines Section 15126.2(c), an EIR must consider any significant irreversible environmental changes that would be caused by the proposed Project should it be implemented. Section 15126.2(c) states:

> Uses of nonrenewable resources during the initial and continued phases of the project may be irreversible since a large commitment of such resources makes removal or nonuse thereafter unlikely. Primary impacts and, particularly, secondary impacts (such as highway improvement which provides access to a previously inaccessible area) generally commit future generations to similar uses. Also, irreversible damage can result from environmental accidents associated with the project. Irretrievable commitments of resources should be evaluated to assure that such current consumption is justified.

12.7.2 Analysis of Irreversible Changes

The proposed Project would require the use of non-renewable resources, such as fuels for the construction components of the proposed Project. However, the proposed Project does not represent an uncommon construction project that uses an extraordinary amount of raw materials in comparison to other urban or industrial development projects of similar scope and magnitude.

Fossil fuels and energy would be consumed in the form of diesel, oil, and gasoline used for equipment and vehicles during construction and operation activities. During operations, diesel, oil, and gasoline would be used by ships, terminal (e.g., cargo handling) equipment, and vehicles. Electrical energy and natural gas would be consumed during construction and operations. These energy resources would be irretrievable and irreversible.

Non-recoverable materials and energy would be used during construction and operations, but the amounts needed would be easily accommodated by existing supplies. Although the increase in the amount of materials and energy used would be insignificant, they would nevertheless be unavailable for other uses.

CEQA Guidelines Section 15126.2(c) requires that an EIR evaluate the irretrievable commitments of resources to assure that current consumption is justified. The irretrievable commitment of resources required by the proposed Project is justified by the objectives of the Project.

12.8 Growth Inducement

12.8.1 Introduction

CEQA Guidelines require an EIR to discuss the ways in which a project could foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment. This includes ways in which the proposed Project would remove obstacles to population growth or trigger the construction of new community services facilities that could cause significant effects (CEQA Guidelines Section 15126.2).

12.8.2 Direct Growth-Inducing Impacts

A project would directly induce growth if it would remove barriers to population growth (e.g., by proposing new homes and businesses). This type of project is not anticipated to trigger new residential development in the proposed Project area for the following reasons: (1) the proposed Project does not include the development of new housing or population generating uses; and (2) the proposed Project would not significantly affect the economy of the region in ways that would generate significant direct growth inducing impacts.

The primary decision criteria for identifying the NED Plan includes reasonably maximizing net benefits while remaining consistent with the federal objective of protecting the nation's environment. Contribution to NED are increases in the net value of the national output of goods and services, expressed in monetary units. For the proposed Project, benefits were derived mainly from transportation cost savings (e.g., increased loads for existing vessels, switching to larger vessels, enhanced maneuverability, and delay reduction), or higher net income to commodity users or producers (as a result of lower transportation costs) during the economic period of analysis. While these are considered economic benefits, they would have a negligible effect on the local economy.

Additionally, while the proposed Project would result in larger vessels calling at the Port, the efficiencies afforded by accommodating these larger vessels would in turn reduce the total number of smaller vessels calling at the Port over time. Furthermore, while these larger vessels could accommodate larger cargo and liquid bulk loads, the overall throughput at the Port would not be affected by the proposed Project. The primary factor related to throughput is the backland storage areas, which are constrained and at capacity. Therefore, the efficiencies would not increase throughput, thereby contributing to added operational effects within the Port.

Therefore, because the proposed Project: (1) would not involve the development of new housing; (2) would not significantly affect the economy of the region; and (3) would not increase throughput of cargo or liquid bulk, the proposed Project would not generate significant direct growth-inducing impacts.

12.8.3 Indirect Growth-Inducing Impacts

A project would indirectly induce growth if it would trigger the construction of new community service facilities that could increase the capacity of infrastructure in an area that currently meets the demands (e.g., an increase in the capacity of a sewer treatment plant or the construction or widening of a roadway beyond that which is needed to meet existing demand).

The proposed Project construction would result in only minimal direct effects on employment and economic growth. The proposed Project would indirectly increase earnings to some firms and households throughout the region as proposed Project expenditures are realized throughout the region. The short-term indirect effects from construction would incrementally increase activity in nearby retail establishments as a result of construction workers patronizing local establishments. However, the long-term effects from the proposed Project would be negligible relative to the size of the regional economy in terms of population, employment, and housing. Overall, the proposed Project would not generate significant growth-inducing impacts.

13 PUBLIC INVOLVEMENT AND AGENCY COORDINATION

13.1 Agency Coordination

The USACE is the lead agency for NEPA, and the City of Long Beach (acting through the Port of Long Beach) is the lead agency for CEQA. This IFR is prepared as a joint document. The implementation or construction phase will be cost-shared with the non-Federal Sponsor. Therefore, this document is prepared in compliance with NEPA and CEQA regulations.

The proposed action was coordinated with the concerned resource agencies during preparation of the Draft IFR to ensure that the proposed action complies with the requirements of the applicable laws and regulations. Pursuant to specific legislative mandates and to assist in the preparation of this document, formal and informal coordination has been initiated with various agencies. A large part of the coordination was done relative to NEPA requirements for public involvement and interagency coordination during the Feasibility Study. Additional coordination was done with resource agencies as part of the CAR process. A summary of coordination is provided in the following paragraphs.

13.1.1 ESA Preliminary Coordination and Informal Consultation

Preliminary coordination with the USFWS and NMFS was conducted relatively early in the planning phase. A formal species list request was made to NMFS on July 31, 2014. A formal response was received on August 29, 2014. Copies of these letters are included in Appendix A. The USFWS no longer prepares species lists but has deferred to an online system allowing federal agencies to define the study area generating an online species request via their ECOS portal. An initial species list was generated on February 18, 2015, with a follow-up request on March 10, 2015, because of a modification to the study area. Copies of this correspondence are also included in Appendix A. Species lists were used to provide initial input to Section 3 to discuss potential listed species present in the study area. The Draft IFR was used as the basis for informal coordination with the USFWS and NMFS.

Telephone discussions were held with the NMFS on February 23, 2021, and July 28, 2021 to discuss effects to green sea turtle. On July 29, 2021, the USACE submitted a written request for informal consultation to the NMFS. This was followed up with a conference call held on August 4, 2021, that resulted in the preparation of a revised request dated August 9, 2021. The August 9, 2021, letter also serves as the biological assessment. The USACE determined the project may affect not likely to adversely affect green sea turtles. NMFS concurred with the may affect not likely to adversely affect determination in a letter dated August 31, 2021. Correspondence can be found in Appendix A, Attachment 4.1.

13.1.2 Fish and Wildlife Coordination Act

Coordination with the USFWS, in accordance with the Fish and Wildlife Coordination Act, was also started early in the planning process. A Scope of Work was provided to USFWS in May 2015 to initiate award of a task order to USFWS to prepare a PAR and a CAR. The task order was awarded on September 30, 2015. A Final PAR was submitted to the USACE on June 30, 2016. A Final CAR was submitted to the USACE on April 14, 2021. A copy of the Final CAR can be found in Appendix I. Recommendations made in the Final CAR were considered and discussed in Appendix A.

13.1.3 State Historic Preservation Officer and Tribal Governments

Pursuant to Section 106 of the NHPA, the USACE coordinated with the SHPO regarding the potential of the proposed project to affect historic properties and received a concurring comment of no historic properties affected. Tribal governments were also notified and given an opportunity to comment on the potential of properties of a religious or cultural nature to be affected by the proposed project. No comments were received.

13.1.4 Southern California Dredged Material Management Team

The project has undergone preliminary coordination with the Southern California Dredged Material Management Team (SC-DMMT). The SC-DMMT is a multi-agency management team set up jointly by the USACE and the USEPA. The SC-DMMT has expanded to include participation by the various Regional Water Quality Control Boards, California Coastal Commission, USFWS, NMFS, and CDFW. Preliminary plans for the proposed Project, including placement/disposal options, have been discussed at monthly meetings of the SC-DMMT. These informal discussions were meant to keep SC-DMMT member agencies appraised of the status of the proposed project, including identification of alternatives and plans to conduct a full sediment sampling and analysis program during the project's PED phase.

13.1.5 U.S. Army Corps of Engineers, Regulatory Division

The proposed Project has been coordinated with the USACE Regulatory Division, which is responsible for issuing permits to the POLB for the LSF, including deepening Pier J Basin, berth dredging at J266-270 in the Pier J Slip, and Pier J breakwater improvements. The USACE Regulatory Division would use the IFR to support its permit actions. Coordination with USACE Regulatory Division is on-going.

13.1.6 South Coast Air Quality Management District

The USACE and POLB worked with the SCAQMD to find credits contained in the state's set aside budget for emissions that will support USACE's determination of conformity. Refer to Section 5.5 for details. SCAQMD's letter, dated April 14, 2021, is included in Appendix A. The final conformity determination is included in Appendix H5.

13.1.7 California Coastal Commission

The USACE will continue coordinating with California Coastal Commission (CCC) throughout the NEPA process and construction activities. The USACE is preparing a Consistency Determination (CD) in accordance with Federal Coastal Zone Management Act (CZMA), 16 U.S.C. §1455(d), and regulations at 15 C.F.R. § 930, et seq for submittal during PED. The CD is being delayed until PED in accordance with a policy exception granted by ASA(CW) on June 4, 2021, a copy of which can be found in Appendix A.

13.1.8 Regional Water Quality Control Board

To satisfy requirements of the CWA, the USACE submitted the Draft IFR, a Section 401 certification application, and appropriate technical documentation to the Los Angeles RWQCB for their review for CWA Section 401 certification. The USACE will obtain water quality certification from the RWQCB during PED.

13.2 Public Involvement

Public involvement is a process by which interested and affected individuals, organizations, agencies, and government entities are consulted and included in the decision-making process of a planning effort. In providing public service, the Federal role in water resources planning is to respond to what the public perceives as problems and opportunities and to formulate and select alternative plans that reflect public preferences. In addition, the National Environmental Policy Act (PL 91-190), among other Federal laws and regulations, mandate public involvement. Federal planning policies, USACE practice, and regulations have consistently required and encouraged this practice. All this must occur, however, with the awareness that the USACE cannot relinquish its legislated decision-making responsibility.

Public participation through the NEPA/CEQA review process is through both a formal public scoping period and a public and agency review period. To announce the start of the report scoping, a public notice was issued to local residents, Federal, State, and Local agencies, and interested groups. The recipients were invited to provide input to the study, including the scoping of environmental issues that should be addressed throughout the study. The Notice of Intent (NOI) to prepare and environmental impact statement was published in the Federal Register on January 5, 2016. The POLB published a Notice of Preparation (NOP) to prepare an environmental impact report on November 2, 2016. The POLB published an amended NOP on January 29, 2019. The notice also announced a public scoping meeting, where the public were given the opportunity to comment. The Notice of Availability (NOA) was published in the Federal Register on October 25, 2019 and was amended on November 29, 2019. The Draft EIS/EIR was released for a 45-day public review period (October 25, 2019 through December 9, 2019). Two public hearings, co-hosted by the USACE and POLB, were held during the public review of the Draft EIS/EIR on November 13, 2019, at the POLB's Administration Building in the City of Long Beach, California. A copy of the NOI, NOP and amended NOP, and NOA and amended NOA, the distribution list and copies of all letters received in response to the NOP and NOA are provided in Appendix A.

USACE responses to comments provided by the public, government agencies, and private entities in response to the NOA and during the two public meetings are provided in Appendix O.

14 LIST OF PREPARERS

Agencies and contractors responsible for preparation of this IFR include the following:

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15 RECOMMENDATIONS

I concur with the findings presented in this IFR. The Recommended Plan developed is technically sound, economically justified, and socially and environmentally acceptable.

I recommend that the existing deep-draft navigation project at the Port of Long Beach be modified to provide for implementation of a Federal project for deeper draft commercial vessels. The estimated project first cost for the General Navigation Features (GNF) is $136,780,00. The value of lands, easements, rights-of-way, and relocations (LERR), estimated to be $1,462,000, is 100 percent non-Federal expense. The estimated Federal and non-Federal shares for GNF is $67,659,000 and $69,121,000, respectively (FY 2021 Price Level).

In addition to the non-Federal Sponsor's estimated share of the project first cost for GNF, the non-Federal Sponsor must pay an additional 10 percent of the cost of the GNF of the project less credit for LERR, in cash over a period not to exceed 30 years with interest. The additional 10 percent payment is estimated to be $12,069,800.

Aids to navigation (ATONS), which have an estimated cost of $653,000, would be provided at 100 percent Federal cost (U.S. Coast Guard). Associated local service facility costs, estimated to be $18,316,000, for Pier J breakwater improvements as well as dredging Pier J Basin and berthing areas adjacent to the basin will be the responsibility of the non-Federal Sponsor. Project cost apportionment after the 10 percent payment of GNF and associated ATONS and LSF costs brings the estimated cost share to $56,242,000 Federal and $99,507,000 non-Federal (FY 2021 Price Level).

Based on a FY 2021 discount rate of 2.5 percent and a 50-year period of analysis (2027-2076), the equivalent annual benefits and costs are estimated at $20,960,000 and $5,868,000, respectively. The project is estimated to provide annual net benefits of $15,092,000 and a benefit-to-cost ratio of 3.6.

The Recommended Plan conforms to the essential elements of the U.S. Water Resources Council's Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies and complies with other Administration and legislative policies and guidelines on project development. If the project were to receive funds for federal implementation, it would be implemented subject to the cost sharing, financing, and other applicable requirements of federal law and policy for navigation projects including WRDA 1986, as amended; and would be implemented with such modifications, as the Chief of Engineers deems advisable within his discretionary authority. ATONS are to be funded by the U.S. Coast Guard. Federal implementation is contingent upon the non-Federal Sponsor agreeing to comply with applicable federal laws and policies. Prior to implementation, the non-Federal Sponsor shall agree to:

a. Provide 50 percent of construction of the GNFs attributable to dredging to a depth in excess of -50 MLLW as further specified below:
    (1) Provide 50 percent of design costs in accordance with the terms of a design agreement entered into prior to commencement of design work for the project;
    (2) Provide, during construction, any additional funds necessary to make its total contribution equal to 50 percent of construction costs of the GNFs attributable to dredging to a depth in excess of -50 MLLW;
b. Provide all lands, easements, rights-of-way (LER), including those necessary for the borrowing of material and the disposal of dredged or excavated material, and perform or assure the performance

of all relocations, including utility relocations, all as determined by the federal government to be necessary for the construction or operation and maintenance of the GNFs;

c. Pay with interest, over a period not to exceed 30 years following completion of the period of construction of the GNFs, an additional amount equal to 10 percent of the total cost of construction of GNFs less the amount of credit afforded by the federal government for the value of the LER, and relocations, including utility relocations, provided by the non-Federal Sponsor for the GNFs. If the amount of credit afforded by the federal government for the value of LER, and relocations, including utility relocations, provided by the non-Federal Sponsor equals or exceeds 10 percent of the total cost of construction of the GNFs, the non-Federal Sponsor shall not be required to make any contribution under this paragraph, nor shall it be entitled to any refund for the value of LER and relocations, including utility relocations, in excess of 10 percent of the total cost of construction of the GNFs;
d. Provide, operate, and maintain, at no cost to the federal government, the local service facilities in a manner compatible with the project's authorized purposes and in accordance with applicable federal and state laws and regulations and any specific directions prescribed by the Government;
e. Provide 50 percent of the excess cost of operation and maintenance of the project over that cost which the federal government determines would be incurred for operation and maintenance if the project had a depth of -50 feet MLLW;
f. Give the federal government a right to enter, at reasonable times and in a reasonable manner, upon property that the non-Federal Sponsor owns or controls for access to the project for the purpose of completing, inspecting, operating and maintaining the GNFs;
g. Hold and save the United States free from all damages arising from the construction or operation and maintenance of the project, any betterments, and the local service facilities, except for damages due to the fault or negligence of the United States or its contractors;
h. Perform, or ensure performance of, any investigations for hazardous substances as are determined necessary to identify the existence and extent of any hazardous substances regulated under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), 42 USC 9601–9675, that may exist in, on, or under LER that the federal government determines to be necessary for the construction or operation and maintenance of the GNFs. However, for lands, easements, or rights-of-way that the federal government determines to be subject to the navigation servitude, only the federal government shall perform such investigation unless the federal government provides the non-Federal Sponsor with prior specific written direction, in which case the non-Federal Sponsor shall perform such investigations in accordance with such written direction;
i. Assume complete financial responsibility, as between the federal government and the non-Federal Sponsor, for all necessary cleanup and response costs of any hazardous substances regulated under CERCLA that are located in, on, or under LER that the federal government determines to be necessary for the construction or operation and maintenance of the project.
j. Agree, as between the federal government and the non-Federal Sponsor, that the non-Federal Sponsor shall be considered the operator of the project for the purpose of CERCLA liability, and to the maximum extent practicable, perform its obligations in a manner that will not cause liability to arise under CERCLA; and
k. Comply with the applicable provisions of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, Public Law 91-646, as amended (42 U.S.C. 4601-4655) and the Uniform Regulations contained in 49 CFR 24, in acquiring lands, easement, and rights-of-way, necessary for construction, operation and maintenance of the project including those necessary for relocations, the borrowing of material, or the disposal of dredged or excavated material; and inform all affected persons of applicable benefits, policies, and procedures in connection with said act.

The recommendation contained herein reflects the information available at this time and current departmental policies governing formulation of individual projects. It does not reflect program and budgeting priorities inherent in the formulation of a national civil works construction program or the perspective of higher review levels within the executive branch. Consequently, the recommendation may be modified before it is transmitted to the Congress as a proposal for authorization and implementation funding. However, prior to transmittal to the Congress, the State of California, the Port of Long Beach (the non-Federal Sponsor), interested Federal agencies, and other parties will be advised of any significant modifications and will be afforded an opportunity to comment further.

Julie A. Balten
Colonel, US Army
District Engineer
Los Angeles District

16 LIST OF ACRONYMS AND ABBREVIATIONS

24/7	24 hours a day/7 days a week
ac	acre(s)
ACHP	Federal Advisory Council on Historic Preservation
a.m.	Ante meridiem, before noon
APE	Area of Potential Effects
ARB	Air Resources Board
ATONS	Aids to Navigation
BMPs	Best Management Practices
CAA	Clean Air Act
CAAA	Clean Air Act Amendments of 1990
CAAQS	California Ambient Air Quality Standards
CARB	California Air Resources Board
CCAA	California Clean Air Act
CCAT	California Climate Action Team
CCC	California Coastal Commission
CCD	Coastal Consistency Determination
CDFG	California Department of Fish and Game
CDFW	California Department of Fish and Wildlife
ºC	degrees Celsius
CEC	California Energy Commission
CEQ	Council on Environmental Quality
CEQA	California Environmental Quality Act of 1970
CESA	California Endangered Species Act
CFR	Code of Federal Regulations
CH_4	methane
CHRIS	California Historical Resources Information System
CNDDB	California Natural Diversity Database
CNEL	Community Noise Equivalent Level
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	CO_2-equivalency
CNPS	California Native Plant Society
CSC	California Species of Special Concern
CSLC	California State Lands Commission
CWA	Clean Water Act of 1977
cy	cubic yard(s)
CZMA	Coastal Zone Management Act
dBA	decibels
DDT	dichlorodiphenyltrichloroethane
dGPS	Differential Global Positioning System
EA	Environmental Assessment
EEZ	Exclusive Economic Zone
EFH	Essential Fish Habitat
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
EPA	U.S. Environmental Protection Agency

ER	Engineer Regulation
ER-L	Effects Range-Low
ER-M	Effects Range-Median
ERNS	Emergency Response Notification System
ºF	degrees Fahrenheit
FC	Federal candidate species for listing
FE	Federal-listed, endangered species
FESA	Federal Endangered Species Act of 1973
FIP	Federal Implementation Plan
FMP	Fishery Management Plan
FPE	Federally proposed for listing as endangered species
FT	Federal-listed, threatened species
ft	ft/foot
ft/sec	ft/foot per second
ft^2	square feet
FY	fiscal year
GHG	greenhouse gas
GIS	Geographic Information System
HAPC	Habitat Areas of Particular Concern
HFC	hydrofluorocarbon
hp	horsepower
HTRW	hazardous, toxic, or radioactive waste
in	inch(es)
IPCC	Intergovernmental Panel on Climate Change
kg	kilograms
km	kilometer(s)
km^2	square kilometer(s)
km^3	cubic kilometer(s)
lbs	pounds
kHz	kilohertz
LCFS	Low Carbon Fuel Standard
LCP	Local Coastal Program
L_{dn}	Day-night average noise level
L_{eq}	Average equivalent noise level
LOS	Level of Service
LSF	Local Service Facilities
LUP	Land Use Plan
LUSTs	Leaking Underground Storage Tanks
m	meter(s)
m^2	square meter(s)
m^3	cubic meter(s)
MACT	Maximum Available Control Technology
Magnuson-Stevens Act	Magnuson-Stevens Fishery Conservation and Management Act
MBTA	Migratory Bird Treaty Act
mcy	million cubic yards
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
MGD	million gallons per day
MHHW	mean higher high water

MHTL	mean high tide line
MHW	mean high water
mi	mile(s)
mi^2	square mile(s)
mL	milliliter(s)
MLLW	mean lower low water
MLPA	Marine Life Protection Act
mm	millimeter(s)
MMPA	Marine Mammal Protection Act of 1972
MMT	million metric tons
MPA	marine protected areas
MPN	most probable number
MSL	Mean Sea Level
MT	metric tons
MTL	Mean Tide Level
NAAQS	National Ambient Air Quality Standards
NAS	National Academy of Science
NAVD	North American Vertical Datum
NED	National Economic Development
NEPA	National Environmental Policy Act of 1969
NFMP	Nearshore Fishery Management Plan
NGVD	National Geodetic Vertical Datum; equivalent to +2.72 feet MLLW in the study area
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service
NO_2	nitrogen dioxide
NOAA	National Oceanographic and Atmospheric Administration
NOI	Notice of Intent
NOP	Notice of Preparation
NOx	oxides of nitrogen
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historic Places
NTU	Nephelometric Turbidity Unit(s)
N_2O	nitrous oxide
OHP	Office of Historic Preservation
OPR	California Office of Planning and Research
OSHA	Occupational Safety and Health Administration
O_3	Ozone
PAHs	polycyclic aromatic hydrocarbons
Pb	lead
PCBs	polychlorinated biphenyls
PFC	perfluorocarbons
p.m.	Post meridiem, after noon
PM_{10}	particulate matter equal to or less than 10 microns in size
$PM_{2.5}$	fine particulate matter equal to or less than 2.5 microns in size
pphm	parts per hundred million
ppm	parts per million
ppt	parts per thousand
PRC	Public Resources Code
ROD	Record of Decision

ROG	reactive organic gases
RTP	Regional Transportation Plan
RWQCB	Regional Water Quality Control Board
SF_6	sulfur hexafluoride
SHPO	State Historic Preservation Officer
SIP	State Implementation Plan
SLR	Sea Level Rise
SMCA	State Marine Conservation Area
SO_2	sulfur dioxide
SOx	oxides of sulfur
SPCC	Spill Prevention Control and Countermeasure Plan
SQUIRT	Screening Quick Reference Table
ST	State-listed, threatened species
SWPPP	Storm Water Pollution Prevention Plan
SWRCB	California State Water Resources Control Board
TAC	Toxic Air Contaminant
TDS	total dissolved solids
TOC	total organic carbon
TRPH	Total reportable petroleum hydrocarbon
TSP	total suspended particulates
TSS	total suspended solids
USACE	U.S. Army Corps of Engineers, Los Angeles District
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
VOCs	volatile organic compounds
WOP	without project
yd	yard(s)
yd^2	square yard(s)
yd^3	cubic yard(s)
yd^3/ft	cubic yard(s) per foot
µg/kg	micrograms per kilogram
µg/L	micrograms per liter
%	percent
‰	parts per thousand

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FINAL INTEGRATED FEASIBILITY REPORT AND ENVIRONMENTAL IMPACT STATEMENT / ENVIRONMENTAL IMPACT REPORT (EIS/EIR)

APPENDIX A: AGENCY COORDINATION AND PUBLIC INVOLVEMENT

PORT OF LONG BEACH
DEEP DRAFT NAVIGATION STUDY
Los Angeles County, California

October 2021

US Army Corps of Engineers®

Port of LONG BEACH THE PORT OF CHOICE

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TABLE OF CONTENTS

Attachments

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1 INTRODUCTION

The environmental review of the Port of Long Beach Deep Draft Navigation Study is being conducted in accordance with state and federal regulations. The Port of Long Beach (POLB) is acting as lead agency for purposes of compliance with the California Environmental Quality Act (CEQA). The United States Army Corps of Engineers, Los Angeles District, (USACE) is the lead agency for purposes of compliance with the National Environmental Policy Act (NEPA). The public scoping requirements for each of these regulations differs slightly; however, the intent of each process remains the same — to initiate public scoping to assist in the preparation of the Integrated Feasibility Report (IFR) by providing information about the Project to, and solicit information that will be helpful in the environmental review process from, the public.

This appendix documents the issues and concerns expressed by members of the public, government agencies, and organizations during the public scoping period. After the release of the Notice of Preparation (NOP), the POLB and the USACE held a 30-day public scoping period under CEQA. The comment period allowed the public and regulatory agencies an opportunity to comment on the scope of the environmental document, comment on the alternatives considered, and to identify issues that should be addressed in the IFR. An earlier public review and comment period was previously conducted by the USACE as part of the review process under NEPA.

The POLB and the USACE have prepared an IFR, which evaluates the potential environmental impacts associated with the Project and identifies mitigation measures to reduce these impacts to an insignificant level, where possible.

1.1 Purpose of Scoping

The process of determining the focus and content of an IFR is known as scoping. Scoping helps to identify environmental features, areas of local concern, update local conditions, and eliminate from detailed study those issues that are not pertinent to the final decision on the Project. The scoping process is not intended to resolve differences of opinion regarding the Project or evaluate its merits. Instead, the process allows all interested parties to express their concerns regarding the Project and thereby ensures that all opinions and comments are considered in the environmental analysis. Scoping is an effective way to bring together and address the concerns of the public, affected agencies, and other interested parties. Members of the public, relevant federal, state, regional, and local agencies, interest groups, community organizations, and other interested parties may participate in the scoping process by providing comments or recommendations regarding issues to be investigated in the IFR.

Comments received during the scoping process are part of the public record as documented in this scoping report. The comments and questions received during the public scoping process have been reviewed and considered by the POLB and the USACE in determining the appropriate scope of issues to be addressed in the IFR.

The purpose of the scoping for Project was to:

- Inform the public and relevant public agencies about the Project, CEQA and NEPA requirements, and the environmental impact analysis process;
- Identify potentially significant environmental resources for consideration in the IFR; and

- Compile a mailing list of public agencies and individuals interested in future Project meetings and notices.

1.2 Notice of Preparation (NOP)

As required by CEQA Guidelines §15082, the POLB issued a NOP on November 3, 2016, that summarized the Project, stated its intention to prepare a joint IFR, and requested comments from interested parties (see Attachment 1). The NOP also included notice of the public scoping meeting that was held on November 19, 2016 at 2:00 pm. The NOP was filed with the State Clearinghouse (SCH# 2016111014), which began the 30-day public scoping period. An amended NOP was filed by the POLB on January 29, 2019. The amended NOP was filed with the State Clearinghouse (SCH# 20162016111014), which began the 30-day public scoping period. The amended NOP also included notice of the public scoping meeting that was held on February 13, 2019, at 2:00 pm.

1.3 Notice of Intent (NOI)

NEPA, among other Federal laws and regulations, mandate public involvement. Federal planning policies, USACE practice, and regulations have consistently required and encouraged this practice. The NOI was published in the Federal Register on January 5, 2016. The NOI summarized the Project, stated USACE's intention to prepare a joint environmentmental impact statement/environmental impact report (EIS/EIR), and requested comments from interested parties (Attachment 1). The NOI also included notice of the public scoping meeting that was held on January 19, 2016 at 2:00 pm.

1.3.1 Scoping Comments

Attachment 2 contains copies of all written (and emailed) comments received from the general public, government agencies, and private companies during the scoping periods. All written and oral comments received during the public comment period, during the public scoping meetings, and through email were reviewed for the IFR.

1.4 Notice of Availability

The Notice of Availability (NOA) was published in the Federal Register on October 25, 2019 and was amended on November 29, 2019 (Attachment 1). The NOA summarized the purpose of the study and project description and requested comments from interested parties. The Draft IFR with EIS/EIR had a review period of 45 days from October 25, 2019 to December 9, 2019. Two public meetings were held on November 13, 2019, at the POLB's Administration Building in the city of Long Beach, California. Transcripts from both meetings are included as Attachment 3.

1.4.1 Public Meeting Comments

Attachment 2 of Appendix O contains copies of all comments (written, oral, and mailed) received from the public, government agencies, and private entities during the two public meetings and in response to the NOA. USACE responses to comments received are provided in Appendix O.

2 AGENCY COORDINATION

2.1 Endangered Species Act Preliminary Coordination and Informal Consultation

Preliminary coordination with the U.S. Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (NMFS) was conducted relatively early in the planning phase. A formal species list request was made to NMFS on July 31, 2014. A formal response was received on August 29, 2014. Copies of these letters are included in Appendix I of the main report. The USFWS no longer prepares species lists but has deferred to an online system allowing federal agencies to define the study area generating an online species request via their ECOS portal. An initial species list was generated on February 18, 2015, with a follow-up request on March 10, 2015, because of a modification to the study area. Copies of this correspondence are also included in this appendix under Attachment 4.

Recent information has shown a low probability of green sea turtles in the vicinity of the Surfside Borrow Site Nearshore Placement Area (Bredvik et al., 2019; Hanna et al. 2020). Telephone discussions were held with the NMFS on February 23, 2021 and July 28, 2021, to discuss effects to green sea turtle. On July 29, 2021, the USACE submitted a written request for informal consultation to the NMFS. This was followed up with a conference call held on August 4, 2021, that resulted in the preparation of a revised request dated August 9, 2021.The USACE determined the project may affect not likely to adversely affect green sea turtles. NMFS concurred with the may affect not likely to adversely affect determination in a letter dated August 31, 2021. Correspondence can be found in Attachment 4.1.

2.2 Fish and Wildlife Coordination Act

Coordination with the USFWS, in accordance with the Fish and Wildlife Coordination Act, was also started early in the planning process. A Scope of Work was provided to USFWS in May 2015 to initiate award of a task order to USFWS to prepare a Planning Aid Report (PAR) and a Coordination Act Report (CAR). The task order was awarded on September 30, 2015. A Final PAR was submitted to the USACE on June 30, 2016. A copy of the PAR can be found in Appendix I. A Draft CAR was submitted to the USACE on March 12, 2021. A Final CAR was submitted to the USACE on April 14, 2021. A copy of the Final CAR can be found in Appendix I.

2.2.1 Planning Aid Report (PAR)

The PAR included six recommendations for the study.

PAR Recommendations

1. USACE should use dredge materials, as contaminant levels in the dredge materials allow, to construct areas of shallow water fish habitats (areas of water less than -20 feet MLLW).

2. Within the center of the area of created shallow water fish habitats noted above, USACE should create a least tern/snowy plover nesting island with dredge materials. We suggest that the Outer Harbor in areas of low shipping traffic would likely be a functional location for this purpose, particularly areas adjacent to (behind) the existing Middle or Long Beach breakwaters. The middle of this island(s) should be at least several acres in size and relatively flat with the surface constructed of typical least tern nesting soil matrix materials.

3. USACE should implement a construction schedule for the project that avoids the least tern breeding season, if feasible.

4. Turbidity from dredge and fill activities in the vicinity of the shallow water habitats should not extend over an area greater than 5 acres of shallow waters (i.e., areas less than 20 feet deep) at any one time during the April-to-September breeding season of the California least tern. Monitoring of project-related turbidity, as provided for in measure 5 below, should be based on visually observed differences between ambient surface water conditions and any visible dredging turbidity plume.

5. USACE should provide a qualified least tern biologist, acceptable to the Service and Department, and approved by USACE, to help monitor and manage project activities. This program should be carried out during project activities. The biologist should coordinate with the Service and the Department and:

   a. If the areas associated with project activities (such as staging areas) would occur within upland areas of the Port that are capable of supporting sensitive species, USACE should provide an education program for construction crews, including the identity of the least tern and their nests, restricted areas and activities, and actions to be taken if least tern nesting sites are found outside the designated least tern nesting sites/within project activity areas.

   b. Visually monitor and report to the dredging contractor or USACE contract manager and Service/Department any turbidity from project dredging which extends over an area greater than 5 acres of shallow waters.

6. If least tern or other protected species nests are found within the project's direct footprint in upland areas during construction, then all work in the immediate area should be halted, and the USACE biologist be notified immediately. An appropriate buffer zone around the nest for exclusion of project-related activities should be specified by the biologist in coordination with the Service and the Department.

PAR Recommendations Responses

We are not able to include any of the recommendations provided for reasons discussed below.

Recommendations 1 and 2 will be discussed together as they relate to the same thing, i.e. construction of shallow water habitat. There are no safe areas within the POLB where such a habitat could be safely constructed that would not obstruct shipping or would not erode away leading to sedimentation of the federal navigation channels. The majority of the sediments to be dredged are also considered to be too fine grained to be useful for the construction of such habitats. The Approach Channel is the only area expected to have a high sand content. Sediments from this area are proposed to be beneficially reused to fill in the borrow area for Surfside-Sunset. This would have an equivalent effect to the recommended measures. However, creation of an island in this area is not possible as it would obstruct recreational navigation and fishing in the area.

Recommendation 3 is not feasible. The least tern breeding season runs from April 15 to September 15. Avoiding this season for a multi-year effort would double the length of time required for construction. In addition, the USACE has determined that construction activities would have no effect on the species if conducted during the breeding season. This measure would not provide any protections to this species but would result in substantial cost and time delays in completing the proposed project.

Recommendation 4 is not applicable. There are no shallow water areas close enough to proposed dredge operations where turbidity would extent over them. Monitoring of project-related turbidity would continue over the duration of the project, including outside the California least tern breeding season. This monitoring would be based on instrument packages taking measurements throughout the water column, a standard practice by the USACE. It is a better measure of turbidity than observations of ambient surface water conditions.

Recommendation 5. As discussed in Section 5.4 of the main report, the USACE has made a determination that the Proposed Project would not affect California least tern. Inclusion of a least tern biologist to monitor construction activities would be an unnecessary measure adding delays and expenses to the proposed project that are considered to be unnecessary. None of the upland areas are suitable nest sites for this, or any other species of migratory bird.

Recommendation 6. None of the upland areas within the project's direct footprint are suitable nest sites for this, or any other species of bird. They are all developed with no sandy, unvegetated areas suitable for nesting.

2.2.2 Coordination Act Report (CAR)

The Final CAR included four recommendations for the study.

CAR Recommendations

1. As part of the proposed project, the Corps should create a least tern/snowy plover nesting island in the project region with rock and dredge materials. We suggest that the San Pedro Bay breakwater area, in a zone of low fleet/shipping/boating traffic, would likely be a functional location for this purpose, particularly areas adjacent to (shoreward of) the existing Middle or Long Beach breakwaters.6 Other functional locations away from shore likely exist in the project region. This island should be at least 9 acres in size and relatively flat with the main surface of the island constructed of typical least tern nesting soil matrix materials (e.g., light-colored sand). To accommodate snowy plovers and the haul-out of some pinniped marine mammals, a portion of the island should have a zone of low gradient shoreline sloped down to the water within a protected cove, likely adjacent to and facing the existing breakwater for swell/wave energy protection. Other features such as subaquatic reefs constructed of rock are also suggested around the island, to provide shallow rocky reef habitats and to additionally help prevent erosion of the island cove shoreline surface materials (sand and gravel) through dissipation of wave energy. The configuration and slope surface of the noted island cove shore should be constructed of surface sand and gravel (possibly partially cemented or grouted in place for erosion control) or other compatible materials for snowy plover chick foraging: the configuration should be such that the cove areas remain open to tide-borne deposition of natural beach wrack and would otherwise support (e.g., shore slope angle) snowy plover chick and adult foraging. The remainder of the island (outside of the sand/gravel shore portion) would likely need to be edged by riprap or similar materials to avoid erosion of the island by wave and wind energy. Possibly waste rock and/or dredging materials could be used for this purpose. It is preferred that the

surface/shore of this island not be utilized for human recreation and be protected from unauthorized entry.

2. Consistent with the general recommendations provided by Pacific Fisheries Management Council (2019), the Corps should, to the extent feasible, offset all likely adverse effects to important marine fish habitats from new dredging. Specifically, the dredged material may provide a beneficial re-use opportunity to restore aquatic ecosystem structures and functions in East San Pedro Bay. The Corps should evaluate the feasibility of re-using the dredged material that would be provided by the project (as contaminant levels in the dredge materials allow) to support various restoration measures (e.g., to create: areas of shallow water habitats at depths less than -20 feet MLLW, nearshore wetlands, a sandy island as noted above) that would require fill material, as described in the Corps' East San Pedro Bay Ecological Restoration Project feasibility study.

3. We recommend that the Corps consider the risks of potential injury and disturbance impacts to green sea turtles in their determination of whether this species may be adversely affected by proposed project activities (NOAA 2019). In particular, we recommend that the Corps consider the risks of injury associated with hopper dredge activities, including transit between dredging and the Nearshore/Sunset/Surfside location outside the entrance to Anaheim Bay. Hopper dredge encounters with sea turtles known to occur in the southeastern U.S. have been formally consulted upon numerous times by Corps and NMFS (NOAA 2019). We recommend that the Corps engage in consultation with NMFS Protected Resources Division in Long Beach, California. Appropriate project monitoring for sea turtles by qualified individuals should be incorporated into the project, including monitoring for avoidance of project vessel strikes, as well as improved understanding of sea turtle use of the project area/region and potential effects associated with temporarily increased turbidity, with guidance developed in consultation with NMFS.

4. The Corps should further analyze potential ecological impacts associated with Pier J structural improvements, as outlined herein. Compensatory mitigation should be developed and implemented for any permanent loss of fish or reef habitats due to fill associated with proposed Pier J structural improvements.

CAR Recommendations Responses

Recommendation 1 (create a least tern/snowy plover nesting island in the project region with rock and dredge materials) is not feasible. Generally, the USACE would not propose to develop such an island for species as part of the navigation project unless it is justified as mitigation or offsets for adverse effects. The USACE has determined that the proposed project would not affect the California least tern. Western snowy plover habitat does not occur within the project study area, are not considered to be present, and were therefore nt evaluated in the IFR. In addition, there is no feasible location for such an island. There are no safe areas within the POLB where such a habitat could be safely constructed that would not obstruct shipping or would not erode away leading to sedimentation of the federal navigation channels. The area shoreward of the middle breakwater is a frequent location of local boating traffic, as well as mooring locations for the POLB. The area shoreward of the Long Beach breakwater is a frequently used mooring location for the nearby Naval Weapon Station Seal Beach. The majority of the sediments to be dredged are also considered to be too fine grained to be useful for the construction of such habitats. The Approach Channel is the only area expected to have a high sand content. Sediments from this area are proposed to be beneficially reused to fill in the borrow area for

Surfside-Sunset. This would have an equivalent effect to the recommended measures. However, creation of an island in this area is not possible as it would obstruct recreational navigation and fishing in the area.

Recommendation 2 (evaluate the feasibility of re-using the dredged material that would be provided by the project (as contaminant levels in the dredge materials allow) to support restoration measures and beneficial reuse in East San Pedro Bay) will be evaluated further during project design once sediment sampling and analysis have been completed as described in the IFR. Examination of any beneficial re-use of the dredged material is already planned to be done in Preconstruction Engineering and Design (PED) phase that includes contributing sediments to the East San Pedro Bay Ecosystem Restoration Project, if authorized, as well as to any other beneficial reuse options available at the time and for which the sediments are found to be suitable. Beneficial reuse is the preferred option for all dredged sediments within the Los Angeles District. The USACE has attempted to retain flexibility in the proposed project to increase beneficial reuse of dredged sediments by including possible use of dredged materials as part of the proposed project for the East San Pedro Bay Ecosystem Restoration Feasibility Study. Other beneficial reuse options may be identified prior to the start of construction, including beach nourishment (if sediment testing shows unexpected areas of beach compatible material) and port development projects should any be identified and in construction at the same time.

USACE concurs with Recommendation 3 (consider risks of injury to green sea turtle and engage in consultation with NMFS) and initiated informal consultation with NMFS on August 9, 2021.

Recommendation 4 requests that the USACE further analyze potential ecological impacts associated with Pier J structural improvements. Under the Recommended Plan, there are no improvements proposed to Pier J. There are improvements planned to the Pier J breakwaters. Pier J breakwater structural improvements would not result in the loss of fish or reef habitats as all potential construction methods leave the structure underwater and result in only a very small area of conversion from soft to hard bottom habitat. Compensatory mitigation is not required.

2.3 Southern California Dredged Material Management Team

The project has undergone preliminary coordination with the Southern California Dredged Material Management Team (SC-DMMT). The SC-DMMT is a multi-agency management team set up jointly by the USACE and the USEPA. The SC-DMMT has expanded to include participation by the various Regional Water Quality Control Boards, the California Coastal Commission, USFWS, NMFS, and CDFW. Preliminary plans for the Project, including placement/disposal options, have been discussed at monthly meetings of the SC-DMMT. These informal discussions were meant to keep SC-DMMT member agencies appraised of the status of the Project, including identification of alternatives and plans to conduct a full sediment sampling and analysis program during the Project's PED phase.

2.4 U.S. Army Corps of Engineers, Regulatory Division

The Project has been coordinated with the USACE Regulatory Division, which is responsible for issuing permits to the POLB for the local service facilities, including deepening Pier J Basin, berth dredging, and Pier J breakwater improvements. The USACE Regulatory Division would use the IFR to support its permit actions. Coordination with USACE Regulatory Division is ongoing.

2.5 South Coast Air Quality Management District (SCAQMD)

POLB staff has been consulting with the SCAQMD on measures to ensure that the proposed project is in conformance with the State Implementation Plan (SIP), as required by federal regulation. Refer to Sections 5.5 and 10 (Clean Air Act) of the Main IFR for details. The SCAQMD has agreed to include the project emissions within its Air Quality Management Plan (AQMP) emissions budget resulting in the following finding of conformity. The Recommended Plan will conform to the latest US Environmental Protection Agency (EPA) approved AQMP as the emissions from the project are accommodated within the AQMP's emissions budgets, and the proposed project is not expected to result in any new or additional violations of the National Ambient Air Quality Standards (NAAQS) or impede the projected attainment of the NAAQS. Correspondence is included in this appendix under Attachment 4.

2.6 California Coastal Commission

The USACE will continue coordinating with California Coastal Commission (CCC) throughout the NEPA process and construction activities. The USACE is preparing a Consistency Determination (CD) in accordance with Federal Coastal Zone Management Act (CZMA), 16 U.S.C. §1455(d), and regulations at 15 C.F.R. §930 et seq for submittal during PED. The CD is being delayed until PED in accordance with a policy exception granted by ASA(CW) on June 4, 2021, a copy of which is included in this appendix under Attachment 4. The CCC provided a letter of support dated October 22, 2020, included in this appendix under Attachment 4.

2.7 Regional Water Quality Control Board

To satisfy requirements of the Federal Clean Water Act (CWA), the USACE submitted the Draft IFR, a Section 401 certification application, and appropriate technical documentation to the Los Angeles Regional Water Quality Control Board (RWQCB) for their review for CWA Section 401 certification. The USACE will obtain water quality certification from the RWQCB during PED. However, the RWQCB provided a letter of support dated April 23, 2021, included in this appendix under Attachment 4.

2.8 Essential Fish Habitat Consultation

NMFS encourages streamlining the consultation process using review procedures under NEPA, Fish and Wildlife Coordination Act, CWA, and/or Endangered Species Act provided that documents meet requirements for EFH assessments under Section 600.920(g). EFH assessments must include (1) a description of the proposed action, (2) an analysis of effects, including cumulative effects, (3) the Federal agency's views regarding the effects of the action on EFH, and (4) proposed mitigation, if applicable. An EFH assessment has been prepared in conjunction with this IFR. NMFS provided their conservation recommendation letter on December 23, 2019. USACE response to recommendations provided to NMFS on July 22, 2020. The correspondence is included in this appendix under Attachment 4.

2.9 Clean Air Act General Conformity Determination

Section 176(c) of the Clean Air Act (CAA) requires all Federal projects to conform to USEPA approved or promulgated SIPs. CAA Applicability Analysis is addressed for this action in Section 5.5 of the IFR. On 24 May 2021, the USACE notified the USEPA, California Air Resources Board (CARB), SCAQMD, and federally recognized tribes of the draft conformity determination in accordance with 40 CFR 93.155. The correspondence is included in this appendix under Attachment 4. On 24 May 2021, the USACE made public, for a 30-day comment period, its draft general conformity determination (DGCD) by publishing a notice of availability and placing a notice in the Long Beach Press-Telegram in accordance with 40 CFR 93.156(b). The USACE received four letters on the DGCD, which are included in Attachment 4. The USEPA and three federally recognized tribes, including the Northern Chumash, Santa Ynez Band of Chumash, and Xolon Salinan Tribe, provided “No Comments” on the DCGD. No other comments were received from the public. The notice of availability and newspaper announcement are included in this appendix under Attachment 4. The final general conformity determination is included in Appendix H5 of the Final IFR. On June 24, 2021, the USACE made public its final conformity determination by issuing notices to USEPA, CARB, SCAQMD, and federally recognized tribes and in the Long Beach Press Telegram in accordance with 40 CFR 93.155(b) and 40 CFR 93.156(d). These notices are included in this appendix under Attachment 4.

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Attachment 1

<u>Notices of Preparation, Notice of Intent, and Notice of Availability</u>

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4801 Airport Plaza Drive, Long Beach, CA 90815 Tel 562.283.7000 www.polb.com

Port of
LONG BEACH
The Green Port

NOTICE OF PREPARATION OF A DRAFT ENVIRONMENAL IMPACT REPORT

Date: November 14, 2016

To: Agencies, Organizations, and Interested Parties

Subject: **Port of Long Beach Deep Draft Navigation Study**

The Port of Long Beach (POLB) and the U.S. Army Corps of Engineers (USACE) are preparing a Port of Long Beach Deep Draft Navigation Feasibility Study and joint Environmental Impact Report/Environmental Impact Statement (EIR/EIS). The Federal lead agency responsible for implementing the National Environmental Policy Act (NEPA) is the USACE, Los Angeles District. The USACE published a Notice of Intent (NOI) for the preparation of the EIS in the January 5, 2016 Federal Register. A scoping meeting for the EIS was held at the POLB Interim Administration Building on January 19, 2016.

The Port of Long Beach (POLB), pursuant to the California Environmental Quality Act (CEQA), will act as the Lead Agency in the preparation of an Environmental Impact Report (EIR) for the subject study, which is further described below. The POLB has prepared a Notice of Preparation (NOP) under CEQA and is soliciting input from agencies, organizations, and interested parties on the scope of environmental issues to be addressed in the EIR for the subject project. Since the lead agency has determined that an EIR will be prepared for the subject project, an initial study has not been prepared and is not included as an attachment.

Project Applicant: Port of Long Beach

Project Location: The potential project area includes portions of the POLB complex as shown on Figure 1, including the channels and berths serving Pier J, Pier T/West Basin, the Southeast basin, anchorage area adjacent to the main channel, and the approach channel extending seaward from the Queen's Gate opening of the Long Beach Breakwater.

Project Description: The purpose of the Port of Long Beach Deep Draft Navigation Study is to identify and evaluate improvements to existing navigation channels within the POLB. The study will focus on improving conditions for current and future container and liquid bulk vessel operations in regards to safety, reliability, and waterborne transportation efficiencies. The study will evaluate costs, benefits, and environmental impacts of the project alternatives to confirm federal interest in dredging to deepen channels and areas in the Port of Long Beach.

Tide restrictions, light loading of container vessels and lightering of liquid bulk vessels to reduce vessel draft, and other operational inefficiencies result in economic inefficiencies that translate into increased costs for the national economy at the Nation's second busiest port. Container movements along the secondary channels serving Pier J, Pier T/West Basin, and the Southeast basin, and liquid bulk vessel movements along the main channel, have been identified as constrained by current conditions.

Navigation improvements for liquid bulk vessels include deepening the Approach Channel (extending seaward from the Queen's Gate opening of the Long Beach Breakwater) up to -82 feet Mean Lower Low Water (MLLW) and constructing an anchorage area for ultra-large liquid bulk vessels adjacent to the Main Channel to a depth of up to -75 ft. MLLW. Navigation improvements for container vessels include deepening the Pier J approach channel, berths, and constructing a turning basin to Pier J up to a depth of -57 ft. MLLW; deepening the Southeast Basin and associated berths up to -57 ft. MLLW, and deepening the Pier T/West Basin and berths up to -57 ft. MLLW. The exact depths of dredging will be determined based on an economic analysis of costs and benefits, but are not expected to exceed the depths given above.

An estimated total volume of up to 10 million cubic yards (cy) of material would be dredged. Dredging would be performed by clamshell, hydraulic, or hopper dredge barges. Potential disposal locations for the dredged material may include, but are not limited to, designated U.S. EPA ocean disposal sites LA-2 (offshore of Los Angeles/Long Beach) and LA-3 (offshore of Newport Beach), surfside borrow pits off Huntington Beach/Seal Beach, and Port fill sites.

In addition to the dredging, improvements/modifications may need to be performed to several of the berths within the project areas to accommodate the proposed dredge depths. Types of modifications may include installation of steel bulkheads and other structural modifications to reinforce the wharf design. A new dredge electrical substation may be constructed landside within the Harbor District to provide electricity to the dredge equipment that is not able to access the existing dredge electrical substation on Pier T.

Potential Impacts: It is anticipated that the following environmental resource areas may be affected by the project and therefore will be addressed in the EIR: topography, geology and geography, oceanographic characteristics and coastal processes, water and sediment quality, biological resources, cultural resources, air quality, greenhouse gases, noise, socioeconomics and environmental justice, transportation, land use, recreation, aesthetics, public safety, and public utilities.

Document Availability: A copy of this draft NOP is available for public review at the locations listed below:

- Online on the POLB's website at: www.polb.com/ceqa.
- Port of Long Beach Interim Administration Building, 4801 Airport Drive, Long Beach
- Long Beach City Clerk, 333 W. Ocean Boulevard, Long Beach
- Long Beach Main Library, 101 Pacific Avenue, Long Beach
- San Pedro Regional Branch Library, 931 S. Gaffey Street, San Pedro
- Wilmington Branch Library, 1300 N. Avalon Boulevard, Wilmington

Comments: The POLB is seeking comments on the proposed project. Accordingly, please provide comments at your earliest convenience but no later than **Tuesday, December 20, 2016.**

Comments should be mailed **or** emailed to the POLB. Please list a contact person for your agency or organization, include a valid U.S. mail or email address, and send your comments to:

Heather A. Tomley
Director of Environmental Planning
Port of Long Beach
4801 Airport Plaza Drive
Long Beach, CA 90815
heather.tomley@polb.com

Scoping Meeting: A scoping meeting will be held to receive comments (Spanish and sign language translation services provided) on the proposed project on November 16, 2016, starting at 5:30 p.m. in the Board Room at the Port Interim Administration Building, 4801 Airport Plaza Drive, Long Beach, California 90815. Oral or written comments may be submitted at that time.

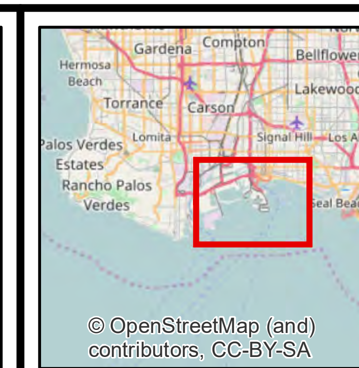
For additional information, please contact Janna Watanabe at 562-283-7100 or janna.watanabe@polb.com.

Sincerely,

Heather A. Tomley
Director of Environmental Planning

JW

Attachment: Figure 1



Legend

- Main Channel Widening
- Pier T West Basin
- Pier J Approach
- Southeast Basin
- Main Channel
- Standby Area (Anchorage)
- 300' Anchorage Center (79' deep)
- Standby Area (Anchorage) - 3300'
- Approach Channel
- POLB Boundary

N

SOURCES:

Imagery Background:
Image Copyright
2015 DigitalGlobe Inc

Coordinate System:
NAD 1983 StatePlane
California V FIPS 0405 Feet

0 1,500 3,000 Feet

1 inch = 3,000 feet

POLB NAVIGATION IMPROVEMENTS

MAIN POLB MAP

Date: 10/21/2016

U.S. ARMY CORPS OF ENGINEERS
LOS ANGELES DISTRICT

4801 Airport Plaza Drive, Long Beach, CA 90815 Tel 562.283.7000 www.polb.com

Port of
LONG BEACH
The Green Port

**AMENDED NOTICE OF PREPARATION
OF AN ENVIRONMENAL IMPACT REPORT FOR THE
PORT OF LONG BEACH DEEP DRAFT NAVIGATION FEASIBILITY STUDY AND
CHANNEL DEEPENING PROJECT**

Date: January 29, 2019

To: All Interested Agencies, Organizations, and Persons

-AND-

County of Los Angeles
Registrar-Recorder County Clerk
Business Filings and Registration
12400 Imperial Highway, Room 1201
Norwalk, California 90650

Office of Planning and Research
State Clearinghouse
1400 Tenth Street
Sacramento, California 95814

From: City of Long Beach Harbor Department
Port of Long Beach
4801 Airport Plaza
Long Beach, California 90815

Subject:	**Amended Notice of Preparation of a Draft Joint Environmental Impact Report/Environmental Impact Statement; SCH# 2016111014**
Project Title:	Port of Long Beach Deep Draft Navigation Feasibility Study and Channel Deepening Project
Lead Agency:	City of Long Beach Harbor Department Port of Long Beach
Project Location:	Port of Long Beach channels and berths serving Pier J, Pier T/West Basin, anchorage area adjacent to the main channel, the main channel, and the approach channel extending seaward from the Queen's Gate opening of the Long Beach Breakwater. The project is located in the City of Long Beach.
County:	Los Angeles

The Port is issuing this Amended Notice of Preparation (NOP) to notify agencies and interested parties that the City of Long Beach Harbor Department (Port of Long Beach [Port or POLB]) and the U.S Army Corps of Engineers (USACE) are preparing a joint Environmental Impact Report/Environmental Impact Statement (EIR/EIS) for the proposed Deep Draft Navigation Feasibility Study and Channel Deepening Project (Proposed Project). The Port will be the Lead Agency for the preparation of the EIR/EIS in accordance with the California Environmental Quality Act (CEQA). The Federal lead agency responsible for implementing the National Environmental Policy Act (NEPA) is the USACE, Los Angeles District.

On November 4, 2016, the Port of Long Beach issued the original NOP for the Port of Long Beach Deep Draft Navigation Feasibility Study and joint EIR/EIS. A scoping meeting for the EIS was held at the POLB Interim Administration Offices on January 19, 2016. The Port and USACE are now proposing to alter the original project title from "Port of Long Beach Deep Draft Navigation Feasibility Study" to "Port of Long Beach Deep Draft Navigation Feasibility Study and Channel Deepening Project." The update to the Project Title clarifies that in addition to the feasibility study, channel deepening and related activities will occur as well. In addition, the scope of the project has been updated – dredging in the Southeast Basin is no longer being considered as part of the Proposed Project. The Port is issuing this Amended NOP to notify public agencies and the public of these updates and to request input regarding the scope and content of the Draft EIR in light of this modification of the Proposed Project.

Project Description: The purpose of the Port of Long Beach Deep Draft Navigation Feasibility Study and Channel Deepening Project is to identify, evaluate, and improve existing navigation channels within the POLB. The Proposed Project will focus on improving conditions for current and future container and liquid bulk vessel operations in regards to safety, reliability, and waterborne transportation efficiencies. The Proposed Project will evaluate costs, benefits, and environmental impacts of the project alternatives to confirm federal interest in dredging to deepen channels and areas in the Port of Long Beach as shown in the attached figure 'Proposed Dredge Locations.'

Tide restrictions, light loading of container vessels and lightering of liquid bulk vessels to reduce vessel draft, and other operational inefficiencies result in economic inefficiencies that translate into increased costs for the national economy at the nation's second busiest port. Container movements along the secondary channels serving Pier J and Pier T/West Basin and liquid bulk vessel movements along the main channel have been identified as constrained by current conditions. Navigation improvements for liquid bulk vessels include deepening the Approach Channel (extending seaward from the Queen's Gate opening of the Long Beach Breakwater) up to 80 feet below mean lower low water (MLLW) and constructing an anchorage area for very-large liquid bulk vessels adjacent to the Main Channel to a depth of up to -76 ft MLLW. Navigation improvements for container vessels include deepening the Pier J approach channel, berths, and constructing a turning basin to Pier J up to a depth of -57 ft MLLW. Navigational improvements for container vessels will also include deepening the Pier T/West Basin and berths up to -57 ft MLLW. The exact depths of dredging will be determined based on an economic analysis of costs and benefits, but are not expected to exceed the depths given above.

An estimated total volume of up to 8.3 million cubic yards (cy) of material would be dredged. The expected volume of dredge material has decreased by approximately 1.6 million cy since the 2016 NOP was issued. Dredging would be performed by clamshell, hydraulic, or hopper dredge barges. Potential disposal locations for the dredged material may include, but are not limited to, designated U.S. EPA ocean disposal sites LA-2 (offshore of Los Angeles/Long Beach) and LA-3 (offshore of Newport Beach), surfside borrow pits off Huntington Beach/Seal Beach, and Port fill sites.

In addition to the dredging, improvements/modifications may need to be performed to several of the berths within the project areas to accommodate the proposed dredge depths. Types of modifications may include installation of pilings, steel bulkheads, rock toes, and other structural modifications to reinforce the wharf design. A new dredge electrical substation may be constructed landside within the Harbor District to provide electricity to the dredge equipment that is not able to access the existing dredge electrical substation on Pier T.

Environmental Factors Potentially Affected: The potential environmental effects of the Proposed Project to be addressed in the EIR/EIS will include, but may not be limited to the following: topography, geology and geography, oceanographic characteristics and coastal processes, water and sediment quality, biological resources, cultural resources, air quality, greenhouse gas emissions, noise, socioeconomics and environmental justice, transportation, land use, recreation, aesthetics, public safety, public utilities, and cumulative effects. The Draft EIR/EIS will also address other CEQA and NEPA mandated topics, including alternatives, energy consumption, and growth inducement.

Public Review and Comment Period: The Amended NOP is available for public review at the following locations:

- Online at the Port's website at www.polb.com/ceqa
- Port of Long Beach Interim Administration Offices, 4801 Airport Plaza Drive, Long Beach
- Long Beach City Clerk, 333 W. Ocean Boulevard., Long Beach
- San Pedro Regional Branch Library, 931 S. Gaffey Street, San Pedro
- Wilmington Branch Library, 1300 N. Avalon Boulevard, Wilmington

Written comments on the Amended NOP can be submitted anytime during the 30-day public review and comment period beginning on January 30, 2019 and ending on March 1, 2019 at 4 p.m. Please identify a contact person for your agency or organization and include a valid mailing address. Comments submitted via email should also include the project title in the subject line of the email message. Please submit comments via mail or email to:

Mail: **Director of Environmental Planning**
Port of Long Beach
4801 Airport Plaza Drive
Long Beach, California 90815

E-mail: **CEQA@polb.com**

Public Information and Scoping Meeting: A public scoping meeting will be held to present updated information on the Proposed Project and to solicit input and comments on the scope and content of the EIR/EIS. Spanish and sign language translation services will be provided. Written comments may be submitted at the Scoping Meeting or at any time during the review and comment period.

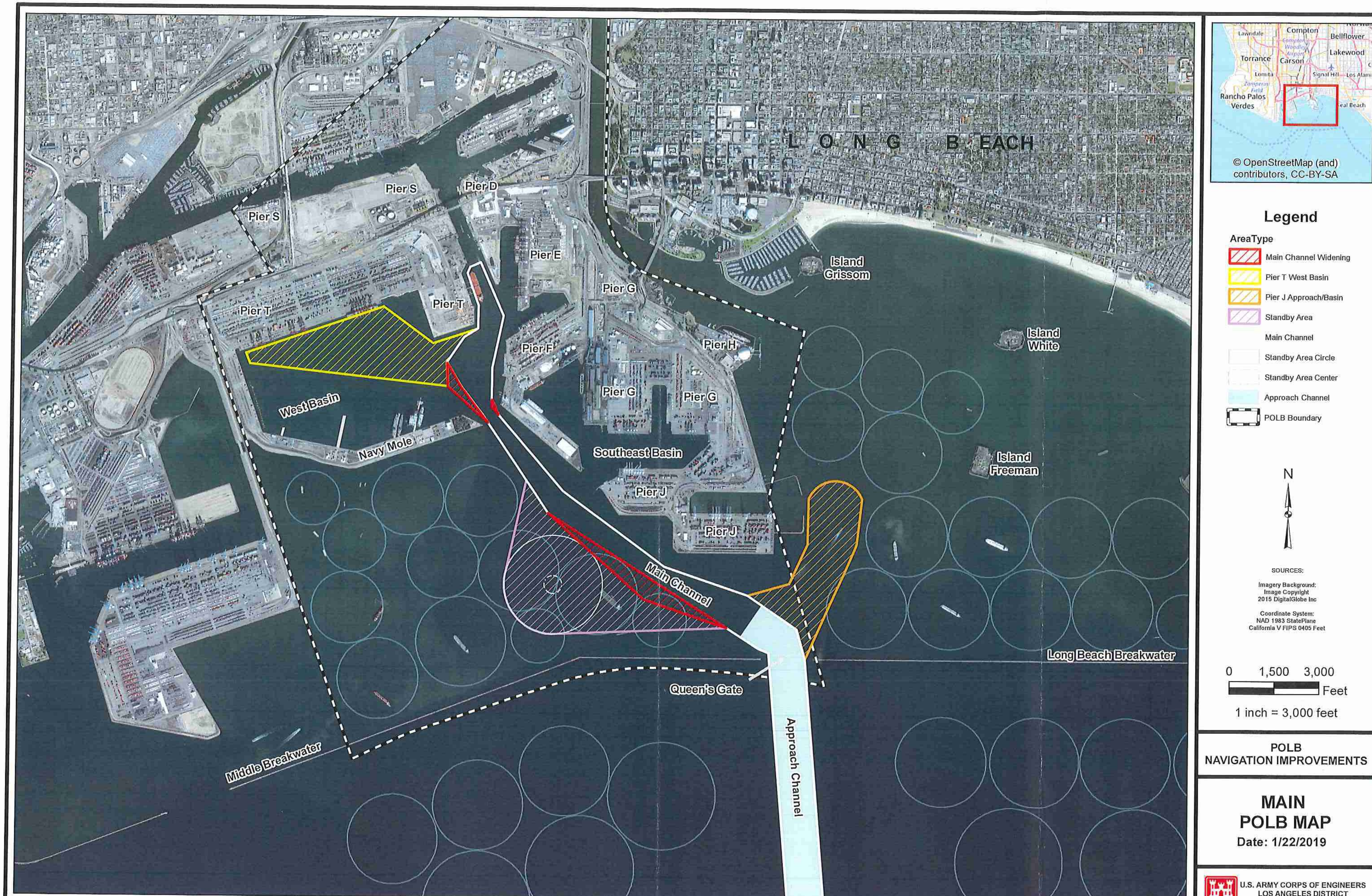
Date:	**Wednesday, February 13, 2019**
Time:	**6:00 p.m.**
Location:	**Port of Long Beach Interim Administrative Offices – Board Room** **4801 Airport Plaza Drive** **Long Beach, California 90815**

Project Contact: Please direct any project-related questions to the Project Manager:

Baron Barrera, Environmental Specialist Associate
Phone: (562) 283-7137
E-mail: baron.barrera@polb.com

Signature: Matthew Arms **Title:** Acting Director of Environmental Planning

Attachments Figure - Proposed Dredge Locations, Deep Draft Navigation Feasibility Study and Deepening Project


LONG BEACH
Pier S
Pier S
Pier D
Pier E
Pier T
Pier T
Pier G
Pier F
Pier H
Pier G
Pier G
Pier J
Pier J
Island Grissom
Island White
Island Freeman
West Basin
Navy Mole
Southeast Basin
Main Channel
Queen's Gate
Approach Channel
Long Beach Breakwater
Middle Breakwater
Compton
Bellflower
Lawndale
Torrance
Carson
Lakewood
Lomita
Signal Hill
Rancho Palos Verdes
© OpenStreetMap (and) contributors, CC-BY-SA
Legend
AreaType
Main Channel Widening
Pier T West Basin
Pier J Approach/Basin
Standby Area
Main Channel
Standby Area Circle
Standby Area Center
Approach Channel
POLB Boundary
N
SOURCES:
Imagery Background: Image Copyright 2015 DigitalGlobe Inc
Coordinate System: NAD 1983 StatePlane California V FIPS 0405 Feet
0 1,500 3,000
Feet
1 inch = 3,000 feet
POLB NAVIGATION IMPROVEMENTS
MAIN POLB MAP
Date: 1/22/2019
U.S. ARMY CORPS OF ENGINEERS LOS ANGELES DISTRICT

Print Form

Appendix C

Notice of Completion & Environmental Document Transmittal

Mail to: State Clearinghouse, P.O. Box 3044, Sacramento, CA 95812-3044 (916) 445-0613
For Hand Delivery/Street Address: 1400 Tenth Street, Sacramento, CA 95814

SCH #2016111014

Project Title: Port of Long Beach Deep Draft Navigation Feasibility Study and Channel Deepening Project

Lead Agency: Port of Long Beach — Contact Person: Baron Barrera
Mailing Address: 4801 Airport Plaza Drive — Phone: (562) 283-7100
City: Long Beach — Zip: 90815 — County: Los Angeles

Project Location: County: Los Angeles — City/Nearest Community: Long Beach
Cross Streets: N/A — Zip Code: 90802
Longitude/Latitude (degrees, minutes and seconds): ____° ____′ ____″ N / ____° ____′ ____″ W Total Acres: ____
Assessor's Parcel No.: ____ Section: ____ Twp.: ____ Range: ____ Base: ____
Within 2 Miles: State Hwy #: SR-47, I-710 — Waterways: San Pedro Bay, Long Beach Harbor
Airports: Long Beach — Railways: UPRR, BNSF — Schools: ____

Document Type:

CEQA: [X] NOP [ ] Early Cons [ ] Neg Dec [ ] Mit Neg Dec [ ] Draft EIR [ ] Supplement/Subsequent EIR (Prior SCH No.) ____ Other: ____
NEPA: [ ] NOI [ ] EA [ ] Draft EIS [ ] FONSI
Other: [ ] Joint Document [ ] Final Document [ ] Other: ____

Local Action Type:

[ ] General Plan Update [ ] General Plan Amendment [ ] General Plan Element [ ] Community Plan
[ ] Specific Plan [ ] Master Plan [ ] Planned Unit Development [ ] Site Plan
[ ] Rezone [ ] Prezone [ ] Use Permit [ ] Land Division (Subdivision, etc.)
[ ] Annexation [ ] Redevelopment [X] Coastal Permit [ ] Other: ____

Development Type:

[ ] Residential: Units ____ Acres ____
[ ] Office: Sq.ft. ____ Acres ____ Employees ____
[ ] Commercial: Sq.ft. ____ Acres ____ Employees ____
[ ] Industrial: Sq.ft. ____ Acres ____ Employees ____
[ ] Educational: ____
[ ] Recreational: ____
[ ] Water Facilities: Type ____ MGD ____
[ ] Transportation: Type ____
[ ] Mining: Mineral ____
[ ] Power: Type ____ MW ____
[ ] Waste Treatment: Type ____ MGD ____
[ ] Hazardous Waste: Type ____
[X] Other: Dredging

Project Issues Discussed in Document:

[X] Aesthetic/Visual
[ ] Agricultural Land
[X] Air Quality
[X] Archeological/Historical
[X] Biological Resources
[X] Coastal Zone
[ ] Drainage/Absorption
[X] Economic/Jobs
[ ] Fiscal
[ ] Flood Plain/Flooding
[ ] Forest Land/Fire Hazard
[X] Geologic/Seismic
[ ] Minerals
[X] Noise
[ ] Population/Housing Balance
[X] Public Services/Facilities
[X] Recreation/Parks
[ ] Schools/Universities
[ ] Septic Systems
[ ] Sewer Capacity
[ ] Soil Erosion/Compaction/Grading
[ ] Solid Waste
[ ] Toxic/Hazardous
[X] Traffic/Circulation
[ ] Vegetation
[X] Water Quality
[ ] Water Supply/Groundwater
[ ] Wetland/Riparian
[ ] Growth Inducement
[X] Land Use
[ ] Cumulative Effects
[ ] Other: ____

Present Land Use/Zoning/General Plan Designation:

IP - Port industrial; Port Master Plan Harbor Districts 4,6,7,8, and 10

Project Description: *(please use a separate page if necessary)*
The Port of Long Beach Deep Draft Navigation Feasibility Study and Channel Deepening Project will evaluate dredging to deepen several channels, basins, and standby areas within the Port to improve waterborne transportation efficiencies and navigational safety for current and future container and liquid bulk vessel operations. Project areas include the approach channel extending seaward from the Queen's Gate opening of the Long Beach Breakwater; approach channel, berths, and turning basin to Pier J; and associated berths; and the Pier T/West Basin and berths. Additionally, structural improvements may need to be performed to several of the berths within the project areas to reinforce the wharf design to accommodate the proposed dredging. A new electrical substation may be constructed landside to provide electricity to the dredge equipment.

Note: The State Clearinghouse will assign identification numbers for all new projects. If a SCH number already exists for a project (e.g. Notice of Preparation or previous draft document) please fill in.

Reviewing Agencies Checklist

Lead Agencies may recommend State Clearinghouse distribution by marking agencies below with and "X".
If you have already sent your document to the agency please denote that with an "S".

- S Air Resources Board
- ___ Boating & Waterways, Department of
- ___ California Emergency Management Agency
- ___ California Highway Patrol
- S Caltrans District #7
- ___ Caltrans Division of Aeronautics
- ___ Caltrans Planning
- ___ Central Valley Flood Protection Board
- ___ Coachella Valley Mtns. Conservancy
- S Coastal Commission
- ___ Colorado River Board
- ___ Conservation, Department of
- ___ Corrections, Department of
- ___ Delta Protection Commission
- ___ Education, Department of
- ___ Energy Commission
- S Fish & Game Region #5
- ___ Food & Agriculture, Department of
- ___ Forestry and Fire Protection, Department of
- ___ General Services, Department of
- ___ Health Services, Department of
- ___ Housing & Community Development
- S Native American Heritage Commission
- S Office of Historic Preservation
- ___ Office of Public School Construction
- ___ Parks & Recreation, Department of
- ___ Pesticide Regulation, Department of
- S Public Utilities Commission
- S Regional WQCB #4
- ___ Resources Agency
- ___ Resources Recycling and Recovery, Department of
- ___ S.F. Bay Conservation & Development Comm.
- ___ San Gabriel & Lower L.A. Rivers & Mtns. Conservancy
- ___ San Joaquin River Conservancy
- ___ Santa Monica Mtns. Conservancy
- S State Lands Commission
- ___ SWRCB: Clean Water Grants
- ___ SWRCB: Water Quality
- ___ SWRCB: Water Rights
- ___ Tahoe Regional Planning Agency
- S Toxic Substances Control, Department of
- ___ Water Resources, Department of
- ___ Other: ___
- ___ Other: ___

Local Public Review Period (to be filled in by lead agency)

Starting Date January 30, 2019 Ending Date March 1, 2019

Lead Agency (Complete if applicable):

Consulting Firm: ICF
Address: 49 Discovery, Suite 250
City/State/Zip: Irvine, CA 92618
Contact: Chad Beckstrom
Phone: 949-929-3576

Applicant: Port of Long Beach
Address: 4081 Airport Plaza Drive
City/State/Zip: Long Beach, CA 90815
Phone: 562-283-7100

Signature of Lead Agency Representative: [signature] **Date:** 1-28-19

Authority cited: Section 21083, Public Resources Code. Reference: Section 21161, Public Resources Code.

4801 Airport Plaza Drive, Long Beach, CA 90815 Tel 562.283.7000 www.polb.com

Port of
LONG BEACH
The Green Port

January 29, 2019

Office of Planning and Research
State Clearinghouse
1400 Tenth Street, Room 121
Sacramento, California 95814

Subject: Amended Notice of Preparation of an Environmental Impact Report for the Port of Long Beach Deep Draft Navigation Feasibility Study and Channel Deepening Project; SCH Number 2016111014

In accordance with the California Environmental Quality Act (CEQA), the Port of Long Beach, as the Lead Agency, has prepared an amended Notice of Preparation (NOP) for the Port of Long Beach Deep Draft Navigation Feasibility Study and Channel Deepening Project. The NOP was originally submitted to the State Clearinghouse on November 4, 2016, under assigned SCH Number 2016111014.

The Port is updating the original project title from "Port of Long Beach Deep Draft Navigation Feasibility Study" to "Port of Long Beach Deep Draft Navigation Feasibility Study and Channel Deepening Project." The update to the Project Title clarifies that in addition to the feasibility study, channel deepening and related activities will occur as well. The scope of the project has also been modified to no longer consider dredging activities in the Southeast Basin as part of the Proposed Project. The public review and comment period will begin on January 30, 2019 and end on March 1, 2019.

The Notice of Completion & Environmental Document Transmittal Form has been revised to reflect the project changes and ensuing public review period and is included herein as an attachment to this letter.

For additional information, or if there are any questions, please contact Baron Barrera of my staff at (562) 283-7137 or baron.barrera@polb.com.

Sincerely,

Matthew Arms
Acting Director of Environmental Planning

Attachment: Notice of Completion & Environmental Document Transmittal Form
Amended Notice of Preparation, SCH #2016111014

Print Form

Appendix C

Notice of Completion & Environmental Document Transmittal

Mail to: State Clearinghouse, P.O. Box 3044, Sacramento, CA 95812-3044 (916) 445-0613
For Hand Delivery/Street Address: 1400 Tenth Street, Sacramento, CA 95814

SCH #

Project Title: Port of Long Beach Deep Draft Navigation Study

Lead Agency: Port of Long Beach — Contact Person: Heather A. Tomley
Mailing Address: 4801 Airport Plaza Drive — Phone: (562) 283-7100
City: Long Beach — Zip: 90815 — County: Los Angeles

Project Location: County: Los Angeles — City/Nearest Community: Long Beach
Cross Streets: N/A — Zip Code: 90802
Longitude/Latitude (degrees, minutes and seconds): ____° ____′ ____″ N / ____° ____′ ____″ W Total Acres: ____
Assessor's Parcel No.: ____ Section: ____ Twp.: ____ Range: ____ Base: ____
Within 2 Miles: State Hwy #: SR-47, I-710 — Waterways: San Pedro Bay, Long Beach Harbor
Airports: Long Beach — Railways: UPRR, BNSF — Schools: ____

Document Type:

CEQA: ☒ NOP ☐ Early Cons ☐ Neg Dec ☐ Mit Neg Dec ☐ Draft EIR ☐ Supplement/Subsequent EIR (Prior SCH No.) ____ Other: ____
NEPA: ☐ NOI ☐ EA ☐ Draft EIS ☐ FONSI
Other: ☐ Joint Document ☐ Final Document ☐ Other: ____

Local Action Type:

☐ General Plan Update ☐ General Plan Amendment ☐ General Plan Element ☐ Community Plan
☐ Specific Plan ☐ Master Plan ☐ Planned Unit Development ☐ Site Plan
☐ Rezone ☐ Prezone ☐ Use Permit ☐ Land Division (Subdivision, etc.)
☐ Annexation ☐ Redevelopment ☒ Coastal Permit ☐ Other: ____

Development Type:

☐ Residential: Units ____ Acres ____
☐ Office: Sq.ft. ____ Acres ____ Employees ____
☐ Commercial: Sq.ft. ____ Acres ____ Employees ____
☐ Industrial: Sq.ft. ____ Acres ____ Employees ____
☐ Educational: ____
☐ Recreational: ____
☐ Water Facilities: Type ____ MGD ____
☐ Transportation: Type ____
☐ Mining: Mineral ____
☐ Power: Type ____ MW ____
☐ Waste Treatment: Type ____ MGD ____
☐ Hazardous Waste: Type ____
☒ Other: Dredging

Project Issues Discussed in Document:

☒ Aesthetic/Visual ☐ Agricultural Land ☒ Air Quality ☒ Archeological/Historical ☒ Biological Resources ☒ Coastal Zone ☐ Drainage/Absorption ☒ Economic/Jobs
☐ Fiscal ☐ Flood Plain/Flooding ☐ Forest Land/Fire Hazard ☒ Geologic/Seismic ☐ Minerals ☒ Noise ☐ Population/Housing Balance ☒ Public Services/Facilities
☒ Recreation/Parks ☐ Schools/Universities ☐ Septic Systems ☐ Sewer Capacity ☐ Soil Erosion/Compaction/Grading ☐ Solid Waste ☐ Toxic/Hazardous ☒ Traffic/Circulation
☐ Vegetation ☒ Water Quality ☐ Water Supply/Groundwater ☐ Wetland/Riparian ☐ Growth Inducement ☒ Land Use ☐ Cumulative Effects ☐ Other: ____

Present Land Use/Zoning/General Plan Designation:
IP - Port industrial; Port Master Plan Harbor Districts 4,6,7,8, and 10

Project Description: *(please use a separate page if necessary)*
The Port of Long Beach Deep Draft Navigation Study will evaluate dredging to deepen several channels, basins, and standby areas within the Port to improve waterborne transportation efficiencies and navigational safety for current and future container and liquid bulk vessel operations. Study areas include the approach channel extending seaward from the Queen's Gate opening of the Long Beach Breakwater; approach channel, berths, and turning basin to Pier J; the Southeast Basin and associated berths; and the Pier T/West Basin and berths. Additionally, structural improvements may need to be performed to several of the berths within the project areas to reinforce the wharf design to accommodate the proposed dredging. A new electrical substation may be constructed landside to provide electricity to the dredge equipment.

Note: The State Clearinghouse will assign identification numbers for all new projects. If a SCH number already exists for a project (e.g. Notice of Preparation or previous draft document) please fill in.

Reviewing Agencies Checklist

Lead Agencies may recommend State Clearinghouse distribution by marking agencies below with and "X".
If you have already sent your document to the agency please denote that with an "S".

S	Air Resources Board	S	Office of Historic Preservation
	Boating & Waterways, Department of		Office of Public School Construction
	California Emergency Management Agency		Parks & Recreation, Department of
	California Highway Patrol		Pesticide Regulation, Department of
S	Caltrans District # 7	S	Public Utilities Commission
	Caltrans Division of Aeronautics	S	Regional WQCB # 4
	Caltrans Planning		Resources Agency
	Central Valley Flood Protection Board		Resources Recycling and Recovery, Department of
	Coachella Valley Mtns. Conservancy		S.F. Bay Conservation & Development Comm.
S	Coastal Commission		San Gabriel & Lower L.A. Rivers & Mtns. Conservancy
	Colorado River Board		San Joaquin River Conservancy
	Conservation, Department of		Santa Monica Mtns. Conservancy
	Corrections, Department of	S	State Lands Commission
	Delta Protection Commission		SWRCB: Clean Water Grants
	Education, Department of		SWRCB: Water Quality
	Energy Commission		SWRCB: Water Rights
S	Fish & Game Region # 5		Tahoe Regional Planning Agency
	Food & Agriculture, Department of	S	Toxic Substances Control, Department of
	Forestry and Fire Protection, Department of		Water Resources, Department of
	General Services, Department of		
	Health Services, Department of		Other:
	Housing & Community Development		Other:
S	Native American Heritage Commission		

Local Public Review Period (to be filled in by lead agency)

Starting Date November 3, 2016 Ending Date December 9, 2016

Lead Agency (Complete if applicable):

Consulting Firm:
Address:
City/State/Zip:
Contact:
Phone:

Applicant:
Address:
City/State/Zip:
Phone:

Signature of Lead Agency Representative: [signature] **Date:** 11/2/16

Authority cited: Section 21083, Public Resources Code. Reference: Section 21161, Public Resources Code.

Revised 2010

STATE OF CALIFORNIA
GOVERNOR'S OFFICE *of* PLANNING AND RESEARCH
STATE CLEARINGHOUSE AND PLANNING UNIT

EDMUND G. BROWN JR.
GOVERNOR

KEN ALEX
DIRECTOR

Memorandum

Date: November 14, 2016

To: All Reviewing Agencies

From: Scott Morgan, Director

Re: SCH # **2016111014**

Port of Long Beach Deep Draft Navigation Study

Pursuant to the attached letter, the Lead Agency has *extended* the review period for the above referenced project to **December 20, 2016** to accommodate the review process. All other project information remains the same.

cc: Heather A. Tomley
Port of Long Beach
4801 Airport Plaza Drive
Long Beach, CA 90815

4801 Airport Plaza Drive, Long Beach, CA 90815 Tel 562.283.7000 www.polb.com

Port of
LONG BEACH
The Green Port

November 14, 2016

Office of Planning and Research
State Clearinghouse
1400 Tenth Street, Room 121
Sacramento, CA 95814

Subject: **Notice of Time Extension of Public Comment Period for the Port of Long Beach Deep Draft Navigation Study Notice of Preparation (SCH# 2016111014)**

In accordance with the California Environmental Quality Act (CEQA), the Port of Long Beach (Port), as the CEQA Lead Agency, prepared a Notice of Preparation (NOP) for the Port Deep Draft Navigation Study. The NOP was previously provided to the State Clearinghouse on November 3, 2016, and has been assigned number SCH# 2016111014. This notice is to announce that the comment period, which was set to end on December 9, 2016, **has been extended to December 20, 2016.** The Notice of Completion and Environmental Document Transmittal form has been revised with the new public comment period and is included as an attachment to this letter.

For additional information, please contact Janna Watanabe at 562-283-7100 or janna.watanabe@polb.com.

Sincerely,

Heather A. Tomley
Director of Environmental Planning

Governor's Office of Planning & Research
NOV 14 2016
STATE CLEARINGHOUSE

JW

Attached: Revised Notice of Completion and Environmental Document Transmittal Form

Print Form

Appendix C

Notice of Completion & Environmental Document Transmittal

Mail to: State Clearinghouse, P.O. Box 3044, Sacramento, CA 95812-3044 (916) 445-0613
For Hand Delivery/Street Address: 1400 Tenth Street, Sacramento, CA 95814

SCH # 2016111014

Project Title: Port of Long Beach Deep Draft Navigation Study

Lead Agency: Port of Long Beach | Contact Person: Heather A. Tomley
Mailing Address: 4801 Airport Plaza Drive | Phone: (562) 283-7100
City: Long Beach | Zip: 90815 | County: Los Angeles

Project Location: County: Los Angeles | City/Nearest Community: Long Beach
Cross Streets: N/A | Zip Code: 90802
Longitude/Latitude (degrees, minutes and seconds): ___° ___′ ___″ N / ___° ___′ ___″ W Total Acres:
Assessor's Parcel No.: | Section: | Twp.: | Range: | Base:
Within 2 Miles: State Hwy #: SR-47, I-710 | Waterways: San Pedro Bay, Long Beach Harbor
Airports: Long Beach | Railways: UPRR, BNSF | Schools:

Document Type:

CEQA: ☒ NOP ☐ Early Cons ☐ Neg Dec ☐ Mit Neg Dec ☐ Draft EIR ☐ Supplement/Subsequent EIR (Prior SCH No.) Other:
NEPA: ☐ NOI ☐ EA ☐ Draft EIS ☐ FONSI
Other: ☐ Joint Document ☐ Final Document ☐ Other:

Governor's Office of Planning & Research
NOV 14 2016
STATE CLEARINGHOUSE

Local Action Type:

☐ General Plan Update ☐ General Plan Amendment ☐ General Plan Element ☐ Community Plan
☐ Specific Plan ☐ Master Plan ☐ Planned Unit Development ☐ Site Plan
☐ Rezone ☐ Prezone ☐ Use Permit ☐ Land Division (Subdivision, etc.)
☐ Annexation ☐ Redevelopment ☒ Coastal Permit ☐ Other:

Development Type:

☐ Residential: Units ___ Acres ___
☐ Office: Sq.ft. ___ Acres ___ Employees ___
☐ Commercial: Sq.ft. ___ Acres ___ Employees ___
☐ Industrial: Sq.ft. ___ Acres ___ Employees ___
☐ Educational:
☐ Recreational:
☐ Water Facilities: Type ___ MGD ___
☐ Transportation: Type
☐ Mining: Mineral
☐ Power: Type ___ MW
☐ Waste Treatment: Type ___ MGD
☐ Hazardous Waste: Type
☒ Other: Dredging

Project Issues Discussed in Document:

☒ Aesthetic/Visual ☐ Agricultural Land ☒ Air Quality ☒ Archeological/Historical ☒ Biological Resources ☒ Coastal Zone ☐ Drainage/Absorption ☒ Economic/Jobs
☐ Fiscal ☐ Flood Plain/Flooding ☐ Forest Land/Fire Hazard ☒ Geologic/Seismic ☐ Minerals ☒ Noise ☐ Population/Housing Balance ☒ Public Services/Facilities
☒ Recreation/Parks ☐ Schools/Universities ☐ Septic Systems ☐ Sewer Capacity ☐ Soil Erosion/Compaction/Grading ☐ Solid Waste ☐ Toxic/Hazardous ☒ Traffic/Circulation
☐ Vegetation ☒ Water Quality ☐ Water Supply/Groundwater ☐ Wetland/Riparian ☐ Growth Inducement ☒ Land Use ☐ Cumulative Effects ☐ Other:

Present Land Use/Zoning/General Plan Designation:

IP - Port industrial; Port Master Plan Harbor Districts 4,6,7,8, and 10

Project Description: *(please use a separate page if necessary)*

The Port of Long Beach Deep Draft Navigation Study will evaluate dredging to deepen several channels, basins, and standby areas within the Port to improve waterborne transportation efficiencies and navigational safety for current and future container and liquid bulk vessel operations. Study areas include the approach channel extending seaward from the Queen's Gate opening of the Long Beach Breakwater; approach channel, berths, and turning basin to Pier J; the Southeast Basin and associated berths; and the Pier T/West Basin and berths. Additionally, structural improvements may need to be performed to several of the berths within the project areas to reinforce the wharf design to accommodate the proposed dredging. A new electrical substation may be constructed landside to provide electricity to the dredge equipment.

Note: The State Clearinghouse will assign identification numbers for all new projects. If a SCH number already exists for a project (e.g. Notice of Preparation or previous draft document) please fill in.

Reviewing Agencies Checklist

Lead Agencies may recommend State Clearinghouse distribution by marking agencies below with and "X".
If you have already sent your document to the agency please denote that with an "S".

- S Air Resources Board
- ___ Boating & Waterways, Department of
- ___ California Emergency Management Agency
- ___ California Highway Patrol
- S Caltrans District # 7
- ___ Caltrans Division of Aeronautics
- ___ Caltrans Planning
- ___ Central Valley Flood Protection Board
- ___ Coachella Valley Mtns. Conservancy
- S Coastal Commission
- ___ Colorado River Board
- ___ Conservation, Department of
- ___ Corrections, Department of
- ___ Delta Protection Commission
- ___ Education, Department of
- ___ Energy Commission
- S Fish & Game Region # 5
- ___ Food & Agriculture, Department of
- ___ Forestry and Fire Protection, Department of
- ___ General Services, Department of
- ___ Health Services, Department of
- ___ Housing & Community Development
- S Native American Heritage Commission
- S Office of Historic Preservation
- ___ Office of Public School Construction
- ___ Parks & Recreation, Department of
- ___ Pesticide Regulation, Department of
- S Public Utilities Commission
- S Regional WQCB # 4
- ___ Resources Agency
- ___ Resources Recycling and Recovery, Department of
- ___ S.F. Bay Conservation & Development Comm.
- ___ San Gabriel & Lower L.A. Rivers & Mtns. Conservancy
- ___ San Joaquin River Conservancy
- ___ Santa Monica Mtns. Conservancy
- S State Lands Commission
- ___ SWRCB: Clean Water Grants
- ___ SWRCB: Water Quality
- ___ SWRCB: Water Rights
- ___ Tahoe Regional Planning Agency
- S Toxic Substances Control, Department of
- ___ Water Resources, Department of
- ___ Other: ___
- ___ Other: ___

Local Public Review Period (to be filled in by lead agency)

Starting Date November 14, 2016 Ending Date December 20, 2016

Lead Agency (Complete if applicable):

Consulting Firm: ___
Address: ___
City/State/Zip: ___
Contact: ___
Phone: ___

Applicant: ___
Address: ___
City/State/Zip: ___
Phone: ___

Signature of Lead Agency Representative: [signature] **Date:** 11/11/16

Authority cited: Section 21083, Public Resources Code. Reference: Section 21161, Public Resources Code.

NOP Distribution List

County: Los Angeles

SCH# 2016111014

Resources Agency

- ☒ **Resources Agency**
  Nadell Gayou
- ☐ **Dept. of Boating & Waterways**
  Denise Peterson
- ☒ **California Coastal Commission**
  Elizabeth A. Fuchs
- ☐ **Colorado River Board**
  Lisa Johansen
- ☐ **Dept. of Conservation**
  Elizabeth Carpenter
- ☐ **California Energy Commission**
  Eric Knight
- ☐ **Cal Fire**
  Dan Foster
- ☐ **Central Valley Flood Protection Board**
  James Herota
- ☐ **Office of Historic Preservation**
  Ron Parsons
- ☒ **Dept of Parks & Recreation**
  Environmental Stewardship Section
- ☐ **California Department of Resources, Recycling & Recovery**
  Sue O'Leary
- ☐ **S.F. Bay Conservation & Dev't. Comm.**
  Steve Goldbeck
- ☒ **Dept. of Water Resources**
  Resources Agency
  Nadell Gayou

Fish and Game

- ☐ **Depart. of Fish & Wildlife**
  Scott Flint
  Environmental Services Division
- ☐ **Fish & Wildlife Region 1**
  Curt Babcock
- ☐ **Fish & Wildlife Region 1E**
  Laurie Harnsberger
- ☐ **Fish & Wildlife Region 2**
  Jeff Drongesen
- ☐ **Fish & Wildlife Region 3**
  Craig Weightman
- ☐ **Fish & Wildlife Region 4**
  Julie Vance
- ☒ **Fish & Wildlife Region 5**
  Leslie Newton-Reed
  Habitat Conservation Program
- ☐ **Fish & Wildlife Region 6**
  Tiffany Ellis
  Habitat Conservation Program
- ☐ **Fish & Wildlife Region 6 I/M**
  Heidi Calvert
  Inyo/Mono, Habitat Conservation Program
- ☐ **Dept. of Fish & Wildlife M**
  William Paznokas
  Marine Region

Other Departments

- ☐ **Food & Agriculture**
  Sandra Schubert
  Dept. of Food and Agriculture
- ☐ **Depart. of General Services**
  Public School Construction
- ☐ **Dept. of General Services**
  Cathy Buck/George Carollo
  Environmental Services Section
- ☐ **Delta Stewardship Council**
  Kevan Samsam
- ☐ **Housing & Comm. Dev.**
  CEQA Coordinator
  Housing Policy Division

Independent Commissions, Boards

- ☐ **Delta Protection Commission**
  Erik Vink
- ☐ **OES (Office of Emergency Services)**
  Monique Wilber
- ☒ **Native American Heritage Comm.**
  Debbie Treadway
- ☒ **Public Utilities Commission**
  Supervisor
- ☐ **Santa Monica Bay Restoration**
  Guangyu Wang
- ☒ **State Lands Commission**
  Jennifer Deleong
- ☐ **Tahoe Regional Planning Agency (TRPA)**
  Cherry Jacques

Cal State Transportation Agency CalSTA

- ☐ **Caltrans - Division of Aeronautics**
  Philip Crimmins
- ☐ **Caltrans – Planning**
  HQ LD-IGR
  Terri Pencovic
- ☒ **California Highway Patrol**
  Suzann Ikeuchi
  Office of Special Projects

Dept. of Transportation

- ☐ **Caltrans, District 1**
  Rex Jackman
- ☐ **Caltrans, District 2**
  Marcelino Gonzalez
- ☐ **Caltrans, District 3**
  Eric Federicks – South
  Susan Zanchi - North
- ☐ **Caltrans, District 4**
  Patricia Maurice
- ☐ **Caltrans, District 5**
  Larry Newland
- ☐ **Caltrans, District 6**
  Michael Navarro
- ☒ **Caltrans, District 7**
  Dianna Watson
- ☐ **Caltrans, District 8**
  Mark Roberts
- ☐ **Caltrans, District 9**
  Gayle Rosander
- ☐ **Caltrans, District 10**
  Tom Dumas
- ☐ **Caltrans, District 11**
  Jacob Armstrong
- ☐ **Caltrans, District 12**
  Maureen El Harake

Cal EPA

Air Resources Board

- ☐ Airport & Freight
  Cathi Slaminski
  - ☐ Transportation Projects
    Nesamani Kalandiyur
  - ☐ Industrial/Energy Projects
    Mike Tollstrup
- ☐ **State Water Resources Control Board**
  Regional Programs Unit
  Division of Financial Assistance
- ☐ **State Water Resources Control Board**
  Cindy Forbes – Asst Deputy
  Division of Drinking Water
- ☐ **State Water Resources Control Board**
  Div. Drinking Water #________
- ☐ **State Water Resources Control Board**
  Student Intern, 401 Water Quality Certification Unit
  Division of Water Quality
- ☐ **State Water Resouces Control Board**
  Phil Crader
  Division of Water Rights
- ☐ **Dept. of Toxic Substances Control**
  CEQA Tracking Center
- ☐ **Department of Pesticide Regulation**
  CEQA Coordinator

Regional Water Quality Control Board (RWQCB)

- ☐ **RWQCB 1**
  Cathleen Hudson
  North Coast Region (1)
- ☐ **RWQCB 2**
  Environmental Document Coordinator
  San Francisco Bay Region (2)
- ☐ **RWQCB 3**
  Central Coast Region (3)
- ☒ **RWQCB 4**
  Teresa Rodgers
  Los Angeles Region (4)
- ☐ **RWQCB 5S**
  Central Valley Region (5)
  - ☐ **RWQCB 5F**
    Central Valley Region (5)
    Fresno Branch Office
  - ☐ **RWQCB 5R**
    Central Valley Region (5)
    Redding Branch Office
- ☐ **RWQCB 6**
  Lahontan Region (6)
  - ☐ **RWQCB 6V**
    Lahontan Region (6)
    Victorville Branch Office
- ☐ **RWQCB 7**
  Colorado River Basin Region (7)
- ☐ **RWQCB 8**
  Santa Ana Region (8)
- ☐ **RWQCB 9**
  San Diego Region (9)

- ☐ Other ____________
  ____
  ____
- ☐ ____________
  Conservancy

Last Updated 7/19/2016

EDMUND G. BROWN JR.
GOVERNOR

STATE OF CALIFORNIA

GOVERNOR'S OFFICE *of* PLANNING AND RESEARCH

STATE CLEARINGHOUSE AND PLANNING UNIT

KEN ALEX
DIRECTOR

Notice of Preparation

November 3, 2016

To: Reviewing Agencies

Re: Port of Long Beach Deep Draft Navigation Study
SCH# 2016111014

Attached for your review and comment is the Notice of Preparation (NOP) for the Port of Long Beach Deep Draft Navigation Study draft Environmental Impact Report (EIR).

Responsible agencies must transmit their comments on the scope and content of the NOP, focusing on specific information related to their own statutory responsibility, within 30 days of receipt of the NOP from the Lead Agency. This is a courtesy notice provided by the State Clearinghouse with a reminder for you to comment in a timely manner. We encourage other agencies to also respond to this notice and express their concerns early in the environmental review process.

Please direct your comments to:

Heather A. Tomley
Port of Long Beach
4801 Airport Plaza Dr
Long Beach, CA 90815

with a copy to the State Clearinghouse in the Office of Planning and Research. Please refer to the SCH number noted above in all correspondence concerning this project.

If you have any questions about the environmental document review process, please call the State Clearinghouse at (916) 445-0613.

Sincerely,

Scott Morgan
Director, State Clearinghouse

Attachments
cc: Lead Agency

1400 10th Street P.O. Box 3044 Sacramento, California 95812-3044
(916) 445-0613 FAX (916) 323-3018 www.opr.ca.gov

Document Details Report
State Clearinghouse Data Base

SCH# 2016111014
Project Title Port of Long Beach Deep Draft Navigation Study
Lead Agency Long Beach, Port of

Type NOP Notice of Preparation

Description Note: Review Per Lead

The Port of Long Beach Deep Draft Navigation Study will evaluate dredging to deepen several channels, basins, and standby areas within the Port to improve waterborne transportation efficiencies and navigational safety for current and future container and liquid bulk vessel operations. Study areas include the approach channel extending seaward from the Queen's Gate opening of the Long Beach Breakwater; approach channel, berths, and turning basin to Pier J; the Southeast Basin and associated berths; and the Pier T/West Basin and berths. Additionally, structural improvements may need to be performed to several of the berths within the project areas to reinforce the wharf design to accommodate the proposed dredging. A new electrical substation may be constructed landside to provide electricity to the dredge equipment.

Lead Agency Contact

Name Heather A. Tomley
Agency Port of Long Beach
Phone 562-283-7100 **Fax**
email
Address 4801 Airport Plaza Dr
City Long Beach **State** CA **Zip** 90815

Project Location

County Los Angeles
City Long Beach
Region
Cross Streets
Lat / Long
Parcel No.
Township **Range** **Section** **Base**

Proximity to:

Highways SR 47, I 710
Airports Long Beach
Railways UPRR, BNSF
Waterways San Pedro Bay, Long Beach Harbor
Schools
Land Use IP- Port Industrial; port master plan harbor districts 4,6,7,8, 10

Project Issues Aesthetic/Visual; Air Quality; Archaeologic-Historic; Biological Resources; Coastal Zone; Economics/Jobs; Geologic/Seismic; Noise; Public Services; Recreation/Parks; Traffic/Circulation; Water Quality; Landuse

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Reviewing Agencies Resources Agency; California Coastal Commission; Department of Parks and Recreation; Department of Water Resources; Department of Fish and Wildlife, Region 5; Native American Heritage Commission; Public Utilities Commission; State Lands Commission; California Highway Patrol; Caltrans, District 7; Regional Water Quality Control Board, Region 4

Date Received 11/03/2016 **Start of Review** 11/03/2016 **End of Review** 12/09/2016

Print Form

Appendix C

20161110 14

Notice of Completion & Environmental Document Transmittal

Mail to: State Clearinghouse, P.O. Box 3044, Sacramento, CA 95812-3044 (916) 445-0613
For Hand Delivery/Street Address: 1400 Tenth Street, Sacramento, CA 95814

SCH #

Project Title: Port of Long Beach Deep Draft Navigation Study

Lead Agency: Port of Long Beach — Contact Person: Heather A. Tomley
Mailing Address: 4801 Airport Plaza Drive — Phone: (562) 283-7100
City: Long Beach — Zip: 90815 — County: Los Angeles

Project Location: County: Los Angeles — City/Nearest Community: Long Beach
Cross Streets: N/A — Zip Code: 90802
Longitude/Latitude (degrees, minutes and seconds): ___° ___′ ___″ N / ___° ___′ ___″ W Total Acres: ___
Assessor's Parcel No.: ___ Section: ___ Twp.: ___ Range: ___ Base: ___
Within 2 Miles: State Hwy #: SR-47, I-710 — Waterways: San Pedro Bay, Long Beach Harbor
Airports: Long Beach — Railways: UPRR, BNSF — Schools: ___

Document Type:

CEQA: ☒ NOP ☐ Early Cons ☐ Neg Dec ☐ Mit Neg Dec ☐ Draft EIR ☐ Supplement/Subsequent EIR (Prior SCH No.) ___ Other: ___

NEPA: ☐ NOI ☐ EA ☐ Draft EIS ☐ FONSI — Other: ☐ Joint Document ☐ Final Document ☐ Other: ___

Governor's Office of Planning & Research
NOV 03 2016
STATE CLEARINGHOUSE

Local Action Type:

☐ General Plan Update ☐ General Plan Amendment ☐ General Plan Element ☐ Community Plan
☐ Specific Plan ☐ Master Plan ☐ Planned Unit Development ☐ Site Plan
☐ Rezone ☐ Prezone ☐ Use Permit ☐ Land Division (Subdivision, etc.)
☐ Annexation ☐ Redevelopment ☒ Coastal Permit ☐ Other: ___

Development Type:

☐ Residential: Units ___ Acres ___
☐ Office: Sq.ft. ___ Acres ___ Employees ___
☐ Commercial: Sq.ft. ___ Acres ___ Employees ___
☐ Industrial: Sq.ft. ___ Acres ___ Employees ___
☐ Educational: ___
☐ Recreational: ___
☐ Water Facilities: Type ___ MGD ___
☐ Transportation: Type ___
☐ Mining: Mineral ___
☐ Power: Type ___ MW ___
☐ Waste Treatment: Type ___ MGD ___
☐ Hazardous Waste: Type ___
☒ Other: Dredging

Project Issues Discussed in Document:

☒ Aesthetic/Visual ☐ Agricultural Land ☒ Air Quality ☒ Archeological/Historical ☒ Biological Resources ☒ Coastal Zone ☐ Drainage/Absorption ☒ Economic/Jobs
☐ Fiscal ☐ Flood Plain/Flooding ☐ Forest Land/Fire Hazard ☒ Geologic/Seismic ☐ Minerals ☒ Noise ☐ Population/Housing Balance ☒ Public Services/Facilities
☒ Recreation/Parks ☐ Schools/Universities ☐ Septic Systems ☐ Sewer Capacity ☐ Soil Erosion/Compaction/Grading ☐ Solid Waste ☐ Toxic/Hazardous ☒ Traffic/Circulation
☐ Vegetation ☒ Water Quality ☐ Water Supply/Groundwater ☐ Wetland/Riparian ☐ Growth Inducement ☒ Land Use ☐ Cumulative Effects ☐ Other: ___

Present Land Use/Zoning/General Plan Designation:

IP - Port industrial; Port Master Plan Harbor Districts 4,6,7,8, and 10

Project Description: *(please use a separate page if necessary)*

The Port of Long Beach Deep Draft Navigation Study will evaluate dredging to deepen several channels, basins, and standby areas within the Port to improve waterborne transportation efficiencies and navigational safety for current and future container and liquid bulk vessel operations. Study areas include the approach channel extending seaward from the Queen's Gate opening of the Long Beach Breakwater; approach channel, berths, and turning basin to Pier J; the Southeast Basin and associated berths; and the Pier T/West Basin and berths. Additionally, structural improvements may need to be performed to several of the berths within the project areas to reinforce the wharf design to accommodate the proposed dredging. A new electrical substation may be constructed landside to provide electricity to the dredge equipment.

Note: The State Clearinghouse will assign identification numbers for all new projects. If a SCH number already exists for a project (e.g. Notice of Preparation or previous draft document) please fill in.

NOP Distribution List

County: Los Angeles

SCH# 2016111014

Resources Agency

- [x] Resources Agency
  Nadell Gayou
- [ ] Dept. of Boating & Waterways
  Denise Peterson
- [x] California Coastal Commission
  Elizabeth A. Fuchs
- [ ] Colorado River Board
  Lisa Johansen
- [ ] Dept. of Conservation
  Elizabeth Carpenter
- [ ] California Energy Commission
  Eric Knight
- [ ] Cal Fire
  Dan Foster
- [ ] Central Valley Flood Protection Board
  James Herota
- [ ] Office of Historic Preservation
  Ron Parsons
- [x] Dept of Parks & Recreation
  Environmental Stewardship Section
- [ ] California Department of Resources, Recycling & Recovery
  Sue O'Leary
- [ ] S.F. Bay Conservation & Dev't. Comm.
  Steve Goldbeck
- [x] Dept. of Water Resources
  Resources Agency
  Nadell Gayou

Fish and Game

- [ ] Depart. of Fish & Wildlife
  Scott Flint
  Environmental Services Division
- [ ] Fish & Wildlife Region 1
  Curt Babcock
- [ ] Fish & Wildlife Region 1E
  Laurie Harnsberger
- [ ] Fish & Wildlife Region 2
  Jeff Drongesen
- [ ] Fish & Wildlife Region 3
  Craig Weightman
- [ ] Fish & Wildlife Region 4
  Julie Vance
- [x] Fish & Wildlife Region 5
  Leslie Newton-Reed
  Habitat Conservation Program
- [ ] Fish & Wildlife Region 6
  Tiffany Ellis
  Habitat Conservation Program
- [ ] Fish & Wildlife Region 6 I/M
  Heidi Calvert
  Inyo/Mono, Habitat Conservation Program
- [ ] Dept. of Fish & Wildlife M
  William Paznokas
  Marine Region

Other Departments

- [ ] Food & Agriculture
  Sandra Schubert
  Dept. of Food and Agriculture
- [ ] Depart. of General Services
  Public School Construction
- [ ] Dept. of General Services
  Cathy Buck/George Carollo
  Environmental Services Section
- [ ] Delta Stewardship Council
  Kevan Samsam
- [ ] Housing & Comm. Dev.
  CEQA Coordinator
  Housing Policy Division

Independent Commissions,Boards

- [ ] Delta Protection Commission
  Erik Vink
- [ ] OES (Office of Emergency Services)
  Monique Wilber
- [x] Native American Heritage Comm.
  Debbie Treadway
- [x] Public Utilities Commission
  Supervisor
- [ ] Santa Monica Bay Restoration
  Guangyu Wang
- [x] State Lands Commission
  Jennifer Deleong
- [ ] Tahoe Regional Planning Agency (TRPA)
  Cherry Jacques

Cal State Transportation Agency CalSTA

- [ ] Caltrans - Division of Aeronautics
  Philip Crimmins
- [ ] Caltrans – Planning
  HQ LD-IGR
  Terri Pencovic
- [x] California Highway Patrol
  Suzann Ikeuchi
  Office of Special Projects

Dept. of Transportation

- [ ] Caltrans, District 1
  Rex Jackman
- [ ] Caltrans, District 2
  Marcelino Gonzalez
- [ ] Caltrans, District 3
  Eric Federicks – South
  Susan Zanchi - North
- [ ] Caltrans, District 4
  Patricia Maurice
- [ ] Caltrans, District 5
  Larry Newland
- [ ] Caltrans, District 6
  Michael Navarro
- [x] Caltrans, District 7
  Dianna Watson
- [ ] Caltrans, District 8
  Mark Roberts
- [ ] Caltrans, District 9
  Gayle Rosander
- [ ] Caltrans, District 10
  Tom Dumas
- [ ] Caltrans, District 11
  Jacob Armstrong
- [ ] Caltrans, District 12
  Maureen El Harake

Cal EPA

Air Resources Board

- [ ] Airport & Freight
  Cathi Slaminski
  - [ ] Transportation Projects
    Nesamani Kalandiyur
  - [ ] Industrial/Energy Projects
    Mike Tollstrup
- [ ] State Water Resources Control Board
  Regional Programs Unit
  Division of Financial Assistance
- [ ] State Water Resources Control Board
  Cindy Forbes – Asst Deputy
  Division of Drinking Water
- [ ] State Water Resources Control Board
  Div. Drinking Water #________
- [ ] State Water Resources Control Board
  Student Intern, 401 Water Quality Certification Unit
  Division of Water Quality
- [ ] State Water Resouces Control Board
  Phil Crader
  Division of Water Rights
- [ ] Dept. of Toxic Substances Control
  CEQA Tracking Center
- [ ] Department of Pesticide Regulation
  CEQA Coordinator

Regional Water Quality Control Board (RWQCB)

- [ ] RWQCB 1
  Cathleen Hudson
  North Coast Region (1)
- [ ] RWQCB 2
  Environmental Document Coordinator
  San Francisco Bay Region (2)
- [ ] RWQCB 3
  Central Coast Region (3)
- [x] RWQCB 4
  Teresa Rodgers
  Los Angeles Region (4)
- [ ] RWQCB 5S
  Central Valley Region (5)
  - [ ] RWQCB 5F
    Central Valley Region (5)
    Fresno Branch Office
  - [ ] RWQCB 5R
    Central Valley Region (5)
    Redding Branch Office
- [ ] RWQCB 6
  Lahontan Region (6)
  - [ ] RWQCB 6V
    Lahontan Region (6)
    Victorville Branch Office
- [ ] RWQCB 7
  Colorado River Basin Region (7)
- [ ] RWQCB 8
  Santa Ana Region (8)
- [ ] RWQCB 9
  San Diego Region (9)

- [ ] Other ____________________
- [ ] ____________________
  Conservancy

Last Updated 7/19/2016

of the functions of the agency, including whether the information shall have practical utility; (b) the accuracy of the agency's estimate of the burden (including hours and cost) of the proposed collection of information; (c) ways to enhance the quality, utility, and clarity of the information to be collected; and (d) ways to minimize the burden of the collection of information on respondents, including through the use of automated collection techniques or other forms of information technology.

Comments submitted in response to this notice will be summarized and/or included in the request for OMB approval of this information collection; they also will become a matter of public record.

Dated: December 30, 2015.

Sarah Brabson,

NOAA PRA Clearance Officer.

[FR Doc. 2015–33152 Filed 1–4–16; 8:45 am]

BILLING CODE 3510–JE–P

DEPARTMENT OF DEFENSE

Department of the Army, Corps of Engineers

Intent To Prepare an Environmental Impact Statement for the Port of Long Beach Deep Draft Navigation Project, Los Angeles County, CA

AGENCY: Department of the Army, U.S. Army Corps of Engineers, DOD.

ACTION: Notice of Intent.

SUMMARY: The Los Angeles District intends to prepare an Environmental Impact Statement (EIS) to support a cost-shared feasibility study with the Port of Long Beach, California, for navigation improvements to existing navigation channels within the Port. The purpose of the feasibility study is to provide safe, reliable, and efficient waterborne transportation improvements to the Port of Long Beach. The EIS will analyze potential impacts of the recommended plan and a range of alternatives for navigation improvements. Alternatives will include both structural and non-structural measures.

ADDRESSES: You may submit your concerns in writing to the Los Angeles District at the address below. Comments, suggestions, and requests to be placed on the mailing list for announcements should be sent to Larry Smith, U.S. Army Corps of Engineers, Los Angeles District, 915 Wilshire Boulevard, Suite 930, Los Angeles, CA 90017–3401, or email to *lawrence.j.smith@usace.army.mil.*

FOR FURTHER INFORMATION CONTACT: For further information contact Mr. Larry Smith, Project Environmental Coordinator, (213) 452–3846.

SUPPLEMENTARY INFORMATION: Authorization: Resolution of the Senate Committee on Public Works adopted 11 May 1967 and the Resolution of the House Committee on Public Works adopted 10 July 1968. The Army Corps of Engineers intends to prepare an EIS to assess the environmental effects associated with proposed navigation improvements measures in the study area.

Study Area: The Port of Long Beach is on the coast of southern California in San Pedro Bay, approximately 20 miles south of downtown Los Angeles, California. The communities of San Pedro and Wilmington are to the west and northwest of San Pedro Bay, respectively, and to the northeast the city of Long Beach. The study area includes the waters in the immediate vicinity (and shoreward) of the breakwaters through the entire Port of Long Beach and the downstream reaches of the Los Angeles River that have direct impact on the Bay, including Outer Harbor, Inner Harbor, Cerritos Channel, West Basin, and the Back Channel.

Problems and Needs: The primary problem is the inefficient operation of deep draft vessels in secondary channels, which increases the Nation's transportation costs. This study will address inefficiencies to container movements only. The following problem statements summarize these inefficiencies.

(1) Due to depth limitations along channels accessing the Port's container terminals, existing container vessels cannot load to their maximum draft, which is causing light-loading of vessels at the point of origin and delays to an increasing number of containerships.

(2) The dimensions of the world-wide fleet of container vessels have increased significantly, and it is anticipated that this trend will continue into the future. Delays and light-loading due to container vessel draft limits will increase as new, larger vessels are added to the fleet.

(3) There are diminished recreation opportunities and environmental degradation in coastal areas outside of the study area.

Proposed Action and Alternatives: The Los Angeles District will investigate and evaluate all reasonable alternatives to address the problems and needs identified above. In addition to the NO ACTION alternative, both structural (deepen the secondary access channel to Pier J, deepen the secondary access channel to Pier T West Basin, construct a turning basin in the secondary access channel to Pier J, construct a turning basin in the secondary access channel to Pier T West Basin, deepen the approach channel, or deepen the anchorage along the main channel, beneficial use of dredged material for recreation or ecosystem restoration) and non-structural (high tide riding, light loading, and vessel re-routing) measures will be investigated.

Previous Actions: Port of Long Beach Main Channel Deepening Project, Pier T Marine Terminal, Middle Harbor Redevelopment.

Scoping: The scoping process is ongoing and has involved preliminary coordination with Federal, State, and local agencies. A public scoping meeting is scheduled on 19 January 2016, from 2:00 to 4:00 p.m. at the Port of Long Beach Harbor Department Interim Administrative Offices; 4801 Airport Plaza Drive, Long Beach, California. The public will have an opportunity to express opinions and raise any issues relating to the scope of the Feasibility Study and the EIS. The public as well as Federal, State, and local agencies are encouraged to participate by submitting data, information, and comments identifying relevant environmental and socioeconomic issues to be addressed in the study. Useful information includes other environmental studies, published and unpublished data, alternatives that could be addressed in the analysis, and potential mitigation measures associated with the proposed action. All comments enter into the public record.

Availability of the Draft EIS: The Draft EIS is scheduled to be published and circulated in late 2016, and a public hearing to receive comments on the Draft EIS will be held after it is published.

Dated: December 29, 2015.

Dennis P. Sugrue,

Lieutenant Colonel, U.S. Army, Acting Commander and Acting District Engineer.

[FR Doc. 2015–33166 Filed 1–4–16; 8:45 am]

BILLING CODE 3720–58–P

DEPARTMENT OF ENERGY

Orders Granting Authority To Import and Export Natural Gas, To Import and Export Liquefied Natural Gas, To Vacate Prior Authorization and Errata During November 2015

recreational areas, road sides, road cuts, construction sites, and rights-of-way. *Contact:* BPPD.

2. *File Symbol:* 91213–U. *Docket ID number:* EPA–HQ–OPP–2017–0336. *Applicant:* United States Department of Agriculture-Agricultural Research Service, 920 Valley Road, Reno NV 89512. *Product name: Pseudomonas fluorescens* strain ACK55 Technical. *Active ingredient:* Herbicide—*Pseudomonas fluorescens* strain ACK55 at 100%. *Proposed use:* Manufacturing use product. *Contact:* BPPD.

3. *File Symbol:* 93566–R. *Docket ID number:* EPA–HQ–OPP–2019–0550. *Applicant:* G.D.G Environment, 430 Rue Saint-Laurent, Trois-Rivieres (Quebec) G8T 6H3 Canada c/o Technology Sciences Group, USA, 1150 18th Street NW, Washington, DC 20036. *Product name:* Fraxiprotec. *Active ingredient:* Insecticide—*Beauveria bassiana* strain CFL-A at 12%. *Proposed use:* End use product/Control Emerald Ash Borer Beetle. *Contact:* BPPD.

Authority: 7 U.S.C. 136 *et seq.*

Dated: October 10, 2019.

Delores Barber,

Director, Information Technology and Resources Management Division, Office of Pesticide Programs.

[FR Doc. 2019–23361 Filed 10–24–19; 8:45 am]

BILLING CODE 6560–50–P

ENVIRONMENTAL PROTECTION AGENCY

[ER–FRL–9047–6]

Environmental Impact Statements; Notice of Availability

Responsible Agency: Office of Federal Activities, General Information 202–564–5632 or *https://www.epa.gov/nepa/.*

Weekly receipt of Environmental Impact Statements

Filed 10/14/2019 10 a.m. ET Through 10/21/2019 10 a.m. ET

Pursuant to 40 CFR 1506.9.

Notice

Section 309(a) of the Clean Air Act requires that EPA make public its comments on EISs issued by other Federal agencies. EPA's comment letters on EISs are available at: *https://cdxnodengn.epa.gov/cdx-enepa-public/action/eis/search*.

EIS No. 20190255, Draft Supplement, NRC, VA, Generic Environmental Impact Statement for License Renewal of Nuclear Plants—Supplement 6, Second Renewal Regarding Subsequent License Renewal for Surry Power Station Units 1 and 2, Comment Period Ends: 12/10/2019, Contact: Tam Tran 301–415–3617

EIS No. 20190256, Draft Supplement, NASA, CA, Draft Supplemental Environmental Impact Statement for Soil Cleanup Activities at Santa Susana Field Laboratory, Comment Period Ends: 12/09/2019, Contact: Peter Zorba *msfc-ssfl-information@mail.nasa.gov*

EIS No. 20190257, Final, RUS, WI, Cardinal-Hickory Creek 345-kV Transmission Line Project, Review Period Ends: 11/25/2019, Contact: Dennis Rankin 202–720–1953

EIS No. 20190258, Draft Supplement, NASA, FL, Supplemental Environmental Impact Statement for the Mars 2020 Mission, Comment Period Ends: 12/10/2019, Contact: George Tahu 202–358–0016

EIS No. 20190259, Final, BR, CA, Mendota Pool Group 20-Year Exchange Program, Review Period Ends: 11/25/2019, Contact: Rain Emerson 559–262–0335

EIS No. 20190260, Draft, BR, USACE, CA, Port of Long Beach Deep Draft Navigation Feasibility Study, Comment Period Ends: 12/09/2019, Contact: Larry Smith 213–452–3846

Amended Notice

EIS No. 20190254, Draft, USFS, AK, Rulemaking for Alaska Roadless Areas, Comment Period Ends:12/17/2019, Contact: Ken Tu 202–403–8991

Revision to FR Notice Published 10/18/2019; Correction to Comment Period Due Date from December 18, 2019 to December 17, 2019.

Dated: October 21, 2019.

Robert Tomiak,

Director, Office of Federal Activities.

[FR Doc. 2019–23313 Filed 10–24–19; 8:45 am]

BILLING CODE 6560–50–P

ENVIRONMENTAL PROTECTION AGENCY

[EPA–HQ–OPP–2019–0045; FRL–10001–12]

Pesticide Product Registration; Receipt of Applications for New Uses (September 2019)

AGENCY: Environmental Protection Agency (EPA).

ACTION: Notice.

SUMMARY: EPA has received applications to register new uses for pesticide products containing currently registered active ingredients. Pursuant to the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), EPA is hereby providing notice of receipt and opportunity to comment on these applications.

DATES: Comments must be received on or before November 25, 2019.

ADDRESSES: Submit your comments, identified by the docket identification (ID) number and the File Symbol of the EPA registration number of interest as shown in the body of this document, by one of the following methods:

- *Federal eRulemaking Portal: http://www.regulations.gov.* Follow the online instructions for submitting comments. Do not submit electronically any information you consider to be Confidential Business Information (CBI) or other information whose disclosure is restricted by statute.
- *Mail:* OPP Docket, Environmental Protection Agency Docket Center (EPA/DC), (28221T), 1200 Pennsylvania Ave. NW, Washington, DC 20460–0001.
- *Hand Delivery:* To make special arrangements for hand delivery or delivery of boxed information, please follow the instructions at *https://www.epa.gov/dockets/where-send-comments-epa-dockets.*

Additional instructions on commenting or visiting the docket, along with more information about dockets generally, is available at *https://www.epa.gov/dockets/about-epa-dockets.*

FOR FURTHER INFORMATION CONTACT: Michael Goodis, Registration Division (7505P), main telephone number: (703) 305–7090, email address: *RDFRNotices@epa.gov.* Anita Pease, Antimicrobials Division (AD) (7510P), main telephone number: (703) 305–7090; email address: *ADFRNotices@epa.gov.* The mailing address for each contact person is: Office of Pesticide Programs, Environmental Protection Agency, 1200 Pennsylvania Ave. NW, Washington, DC 20460–0001. As part of the mailing address, include the contact person's name, division, and mail code. The division to contact is listed at the end of each application summary.

SUPPLEMENTARY INFORMATION:

I. General Information

A. Does this action apply to me?

You may be potentially affected by this action if you are an agricultural producer, food manufacturer, or pesticide manufacturer. The following list of North American Industrial Classification System (NAICS) codes is not intended to be exhaustive, but rather provides a guide to help readers determine whether this document applies to them. Potentially affected entities may include:

- Crop production (NAICS code 111).
- Animal production (NAICS code 112).

Agreement and Schedule F Info Filings to be effective 1/1/2020.

Filed Date: 11/21/19.

Accession Number: 20191121–5170.

Comments Due: 5 p.m. ET 12/12/19.

Docket Numbers: ER20–441–000.

Applicants: Southwest Power Pool, Inc.

Description: § 205(d) Rate Filing: 2841R1 Smoky Hills/Evergy Kansas Central Meter Agent Agr to be effective 11/1/2019.

Filed Date: 11/21/19.

Accession Number: 20191121–5166.

Comments Due: 5 p.m. ET 12/12/19.

Docket Numbers: ER20–442–000.

Applicants: Wildcat I Energy Storage, LLC.

Description: Baseline eTariff Filing: Market-based Rate Tariff and Application to be effective 11/23/2019.

Filed Date: 11/22/19.

Accession Number: 20191122–5053.

Comments Due: 5 p.m. ET 12/13/19.

Docket Numbers: ER20–443–000.

Applicants: Acorn I Energy Storage, LLC.

Description: Baseline eTariff Filing: Market-based Rate Tariff and Application to be effective 11/23/2019.

Filed Date: 11/22/19.

Accession Number: 20191122–5054.

Comments Due: 5 p.m. ET 12/13/19.

Docket Numbers: ER20–444–000.

Applicants: Midcontinent Independent System Operator, Inc.

Description: § 205(d) Rate Filing: 2019–11–22_SA 3374 Entergy Louisiana-Amite Solar GIA (J909) to be effective 11/7/2019.

Filed Date: 11/22/19.

Accession Number: 20191122–5073.

Comments Due: 5 p.m. ET 12/13/19.

Docket Numbers: ER20–445–000.

Applicants: Mountain Wind Power, LLC.

Description: § 205(d) Rate Filing: Revisions to Market-Based Rate Tariff and Requests for Waivers to be effective 11/23/2019.

Filed Date: 11/22/19.

Accession Number: 20191122–5074.

Comments Due: 5 p.m. ET 12/13/19.

Docket Numbers: ER20–446–000.

Applicants: Mountain Wind Power II LLC.

Description: § 205(d) Rate Filing: Revisions to Market-Based Rate Tariff and Requests for Waivers to be effective 11/23/2019.

Filed Date: 11/22/19.

Accession Number: 20191122–5075.

Comments Due: 5 p.m. ET 12/13/19.

Docket Numbers: ER20–447–000.

Applicants: Spring Canyon Energy III LLC.

Description: § 205(d) Rate Filing: Revisions to Market-Based Rate Tariff and Requests for Waivers to be effective 11/23/2019.

Filed Date: 11/22/19.

Accession Number: 20191122–5078.

Comments Due: 5 p.m. ET 12/13/19.

Docket Numbers: ER20–448–000.

Applicants: Spring Canyon Energy II LLC.

Description: § 205(d) Rate Filing: Revisions to Market-Based Rate Tariff and Requests for Waivers to be effective 11/23/2019.

Filed Date: 11/22/19.

Accession Number: 20191122–5085.

Comments Due: 5 p.m. ET 12/13/19.

Docket Numbers: ER20–449–000.

Applicants: California Independent System Operator Corporation.

Description: § 205(d) Rate Filing: 2019–11–22 Amendment to Facilitate Data Sharing in Response to a Cyber Exigency to be effective 2/5/2020.

Filed Date: 11/22/19.

Accession Number: 20191122–5126.

Comments Due: 5 p.m. ET 12/13/19.

Docket Numbers: ER20–450–000.

Applicants: ISO New England Inc., New England Power Pool Participants Committee, Eversource Energy Service Company (as agent), Vermont Electric Power Company, Inc.

Description: § 205(d) Rate Filing: ISO–NE and NEPOOL; Interconnection Service Capability Changes to be effective 1/22/2020.

Filed Date: 11/22/19.

Accession Number: 20191122–5129.

Comments Due: 5 p.m. ET 12/13/19.

Docket Numbers: ER20–451–000.

Applicants: PJM Interconnection, L.L.C.

Description: Tariff Cancellation: Notice of Cancellation of ISA SA No. 4327; Queue No. AA1–057 to be effective 11/29/2019.

Filed Date: 11/22/19.

Accession Number: 20191122–5166.

Comments Due: 5 p.m. ET 12/13/19.

Docket Numbers: ER20–452–000.

Applicants: Inland Empire Energy Center, LLC.

Description: Tariff Cancellation: Notice of Cancellation of MBR Tariff to be effective 12/31/2019.

Filed Date: 11/22/19.

Accession Number: 20191122–5168.

Comments Due: 5 p.m. ET 12/13/19.

Take notice that the Commission received the following electric securities filings:

Docket Numbers: ES20–10–000.

Applicants: AEP Appalachian Transmission Company, Inc., AEP Indiana Michigan Transmission Company, Inc., AEP Kentucky Transmission Company, Inc., AEP Oklahoma Transmission Company, Inc., AEP Southwestern Transmission Company, Inc., AEP West Virginia Transmission Company, Inc.

Description: Application Under Section 204 of the Federal Power Act for Authorization to Issue Securities of AEP Appalachian Transmission Company, Inc., et al.

Filed Date: 11/22/19.

Accession Number: 20191122–5103.

Comments Due: 5 p.m. ET 12/13/19.

Take notice that the Commission received the following PURPA 210(m)(3) filings:

Docket Numbers: QM19–4–000.

Applicants: Southwestern Public Service Company.

Description: Supplement to September 5, 2019 Application to Terminate the Requirement to Enter Into New Contracts or Obligations with Qualifying Facilities of Southwestern Public Service Company.

Filed Date: 11/4/19.

Accession Number: 20191104–5115.

Comments Due: 5 p.m. ET 12/2/19.

The filings are accessible in the Commission's eLibrary system by clicking on the links or querying the docket number.

Any person desiring to intervene or protest in any of the above proceedings must file in accordance with Rules 211 and 214 of the Commission's Regulations (18 CFR 385.211 and 385.214) on or before 5:00 p.m. Eastern time on the specified comment date. Protests may be considered, but intervention is necessary to become a party to the proceeding.

eFiling is encouraged. More detailed information relating to filing requirements, interventions, protests, service, and qualifying facilities filings can be found at: *http://www.ferc.gov/docs-filing/efiling/filing-req.pdf.* For other information, call (866) 208–3676 (toll free). For TTY, call (202) 502–8659.

Dated: November 22, 2019.

Nathaniel J. Davis, Sr.,

Deputy Secretary.

[FR Doc. 2019–25918 Filed 11–27–19; 8:45 am]

BILLING CODE 6717–01–P

ENVIRONMENTAL PROTECTION AGENCY

[ER–FRL–9048–2]

Environmental Impact Statements; Notice of Availability

Responsible Agency: Office of Federal Activities, General Information 202–564–5632 or *https://www.epa.gov/nepa/.*

Weekly receipt of Environmental Impact Statements

Filed 11/18/2019 10 a.m. ET Through 11/25/2019 10 a.m. ET
Pursuant to 40 CFR 1506.9.

Notice

Section 309(a) of the Clean Air Act requires that EPA make public its comments on EISs issued by other Federal agencies. EPA's comment letters on EISs are available at: *https://cdxnodengn.epa.gov/cdx-enepa-public/action/eis/search.*

EIS No. 20190281, Draft, USACE, LA, Upper Barataria Basin, Louisiana Draft Feasibility Study, Comment Period Ends: 01/13/2020, Contact: Patricia Naquin 504–862–1544

EIS No. 20190282, Draft, USA, LA, Amite River and Tributaries East of Mississippi River, Louisiana, Comment Period Ends: 01/13/2020, Contact: US Army Corps of Engineers 504–862–1014

EIS No. 20190283, Final, USFS, UT, High Uintas Wilderness Colorado River Cutthroat Trout Habitat Enhancement, Review Period Ends: 12/31/2019, Contact: Ronald Brunson 435–781–5202

EIS No. 20190284, Draft, USACE, CA, Draft Integrated Feasibility Report and Environmental Impact Statement/Environmental Impact Report (IFR/EIS/EIR) for the East San Pedro Bay Ecosystem Restoration Feasibility Study, Comment Period Ends: 01/27/2020, Contact: Naeem Siddiqui 213–452–3852

Amended Notice

EIS No. 20190260, Draft, USACE, CA, Port of Long Beach Deep Draft Navigation Feasibility Study, Comment Period Ends: 12/09/2019, Contact: Larry Smith 213–452–3846 Revision to FR Notice Published 10/25/2019; Correcting Lead Agency from BR, USACE to USACE.

Dated: November 25, 2019.

Robert Tomiak,

Director, Office of Federal Activities.

[FR Doc. 2019–25877 Filed 11–27–19; 8:45 am]

BILLING CODE 6560–50–P

EXPORT-IMPORT BANK OF THE UNITED STATES

Sunshine Act Meeting; Notice of a Partially Open Meeting of the Board of Directors of the Export-Import Bank of the United States.

TIME AND DATE: Monday, December 16, 2019 at 2:00 p.m.

PLACE: The meeting will be held at Ex-Im Bank in Room 1125, 811 Vermont Avenue NW, Washington, DC 20571.

STATUS: The meeting will be open to public observation for Item No. 1 only.

MATTERS TO BE CONSIDERED: Item No. 1 Small Business Update

CONTACT PERSON FOR MORE INFORMATION: Members of the public who wish to attend the meeting should call Joyce Stone, Office of the General Counsel, 811 Vermont Avenue NW, Washington, DC 20571, (202) 565–3336 by close of business Thursday, December 12, 2019.

Joyce Brotemarkle Stone,

Assistant Corporate Secretary.

[FR Doc. 2019–25964 Filed 11–26–19; 11:15 am]

BILLING CODE 6690–01–P

FEDERAL DEPOSIT INSURANCE CORPORATION

RIN 3064–ZA13

Request for Information on a Framework for Analyzing the Effects of FDIC Regulatory Actions

AGENCY: Federal Deposit Insurance Corporation.

ACTION: Notice and request for information (RFI).

SUMMARY: The Federal Deposit Insurance Corporation (FDIC) is seeking comment on approaches it is considering to analyze the effects of its regulatory actions. The FDIC views analysis of the effects of regulatory actions and alternatives as an important part of a credible and transparent rulemaking process. The comments received will help the FDIC to strengthen its analysis of regulatory actions.

DATES: Comments must be received by January 28, 2020.

ADDRESSES: You may submit comments, identified by RIN 3064–ZA13, by any of the following methods:

- *Agency Website: http://www.fdic.gov/regulations/laws/federal/.* Follow the instructions for submitting comments on the Agency website.
- *Email: Comments@fdic.gov.* Include the RIN 3064–ZA13 in the subject line of the message.
- *Mail:* Robert E. Feldman, Executive Secretary, Attention: Comments, Federal Deposit Insurance Corporation, 550 17th Street NW, Washington, DC 20429.
- *Hand Delivery:* Comments may be hand-delivered to the guard station at the rear of the 550 17th Street Building (located on F Street) on business days between 7:00 a.m. and 5:00 p.m.
- *Public Inspection:* All comments received must include the agency name and RIN for this rulemaking. All comments received will be posted without change to *http://www.fdic.gov/regulations/laws/federal/*—including any personal information provided—for public inspection. Paper copies of public comments may be ordered from the FDIC Public Information Center, 3501 North Fairfax Drive, Room E–1002, Arlington, VA 22226 by telephone at (877) 275–3342 or (703) 562–2200.

FOR FURTHER INFORMATION CONTACT: For further information about this request for comments, contact George French (202–898–3929), or Ryan Singer (202–898–7352), Federal Deposit Insurance Corporation, 550 17th Street NW, Washington, DC 20429.

SUPPLEMENTARY INFORMATION: The FDIC has had a longstanding commitment to improving the quality of its regulations and policies, to minimizing regulatory burdens on the public and the banking industry, and generally to ensuring that its regulations and policies achieve legislative goals efficiently and effectively.[1] An objective and transparent analysis of the effects of regulatory actions and alternatives supports both good policy decisions and the meaningful involvement and trust of the public in the rulemaking process.

The FDIC is considering ways to improve the quality of its analysis of regulatory actions. The approaches being considered are consistent with, and supportive of, efforts to apply the FDIC's ''Statement of Policy on the Development and Review of Regulations.'' In broad terms, the FDIC is considering a more structured approach to regulatory analysis and one that incorporates a number of analytical practices identified in standard references. Comments received on this RFI will be of assistance to the FDIC in strengthening its analysis of the effects of regulatory actions.

As background, the FDIC is subject to a number of statutory mandates relevant to the effects of regulations. The Administrative Procedures Act (APA) governs the procedural requirements for all federal government rulemakings. The Regulatory Flexibility Act (RFA) requires the FDIC and other agencies to review the effects of regulatory actions on small entities, identify whether the actions would have a significant economic effect on a substantial number of small entities, and if so, consider whether the purpose of the rule could be achieved in a way that mitigates adverse impacts on small entities. The Paperwork Reduction Act requires the FDIC and other agencies to identify the

[1] See the FDIC's revised ''Statement of Policy on the Development and Review of Regulations'' at 63 FR 25157 May 7, 1998, and further revised at 77 FR 22771 April 17, 2013.

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Attachment 2

<u>Comment Letters Received in Response to NOPs/NOI</u>

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105

February 25, 2016

Larry Smith
U.S. Army Corps of Engineers
Los Angeles District, Project Management Division
915 Wilshire Boulevard, Suite 930
Los Angeles, CA 90017-3401

Subject: Notice of Intent to Prepare an Environmental Impact Statement for the Port of Long Beach Deep Draft Navigation Project, Los Angeles County, CA

Dear Mr. Smith:

The U.S. Environmental Protection Agency has received the above referenced Notice of Intent (NOI). We appreciate the opportunity to provide our recommendations on the scope of the upcoming Draft Environmental Impact Statement (DEIS). Our comments are provided pursuant to the National Environmental Policy Act, the Council on Environmental Quality NEPA Implementation Regulations at 40 CFR 1500-1508, and our NEPA review authority under Section 309 of the Clean Air Act.

According to the NOI, the U.S. Army Corps of Engineers (Corps) proposes to support a cost-shared feasibility study with the Port of Long Beach (Port) for navigation improvements to existing navigation channels within the Port. The primary problem stated in the NOI is the inefficient operation of deep draft vessels in secondary channels, and consequent inefficiencies to container movements and loading of vessels. The NOI further states that newer and larger vessels are anticipated, which will result in even greater delays, and that navigation improvements are needed to improve existing inefficiencies to container movements. The project is proposed in the South Coast Air Basin, which has some of the worst air quality in the nation, and is adjacent to communities that have a long history of experiencing adverse effects of goods movement. As such, it is critical that the Draft EIS for the proposed project include a robust analysis of the possible health and environmental impacts associated with the project, as well as measures to reduce those impacts. We encourage the Corps, and the Port of Long Beach, to include the neighboring communities in a transparent decision-making process and provide opportunities for the community to inform meaningful mitigation.

Please consider the following comments and recommendations while preparing the Draft EIS.

Analysis and Disclosure of Air Quality Impacts

The proposed project has the potential to result in increased air pollutants from dredging, operation of larger cargo vessels, and the rail and truck transport of the increased freight that a deeper channel will allow. EPA recommends that emissions from all of these sources be analyzed, disclosed, and mitigated to the extent feasible.

Emissions from Dredging
The DEIS should discuss the projected air pollutant emissions from the operation of dredging equipment for each alternative. The DEIS should discuss methods of improving dredging efficiency and measures to reduce emissions including, but not limited to, utilizing more efficient drive trains and dredge pumps, using new excavation tools, implementing strategies to recover waste heat, using alternative energy sources or energy management systems, and utilizing after-treatment technologies.

Emissions from Cargo Vessels
The DEIS should discuss the projected air pollutant emissions from vessels expected to call at the Port, under each alternative, including the No Action Alternative. The DEIS should also discuss the Port's Green Ship Incentive Program that provides incentives for cleaner ships.

Emissions from Rail Transport
EPA supports the maximum use of on-dock rail lines at the Port of Long Beach. We recommend that the DEIS identify the relative percentage of containers passing through the terminal that will use off-dock, near-dock and on-dock rail facilities, and provide air emissions projections associated with the use of these facilities under each alternative, including the No Action Alternative.

Emissions from Truck Transport
The DEIS should discuss the projected air pollutant emissions from truck transport of freight, and whether the proposed project is expected to increase operational air pollutant emissions. The DEIS should discuss programs that the Port has in place to minimize emissions from trucks (including zero emissions vehicles), systems that reduce drayage truck turn-around times and emissions, and idling reduction measures for drayage trucks. The DEIS should also provide information on the Port's Clean Trucks Program.

When a truck carrier cannot arrange for both an inbound and outbound shipment to a destination, the resulting empty truck trip increases traffic, fuel use, air pollutant emissions, and transportation costs. Reducing the percentage of empty export freight containers may represent a potentially fruitful opportunity for increasing dual transactions. The DEIS should estimate the number of trucks arriving at the Port that would involve single transactions, dual transactions, empty chassis, and any other categories of truck transactions and explain how dual transactions could be further increased in the future.

Mobile and Stationary Source Controls
EPA recommends that the proposed project include the following measures and that the DEIS identify all such measures that the Port and its partners would commit to for this project:

- Minimize use, trips, and unnecessary idling of heavy equipment.
- Maintain and tune engines per manufacturer's specifications to perform at EPA certification levels, where applicable, and to perform at verified standards applicable to retrofit technologies.
- Employ periodic, unscheduled inspections to limit unnecessary idling and to ensure that construction equipment is properly maintained, tuned, and modified consistent with established specifications. The California Air Resources Board (CARB) has a number of mobile source anti-idling requirements which should be employed (http://www.arb.ca.gov/msprog/truck-idling/truck-idling.htm).

- Prohibit any tampering with engines and require continuing adherence to manufacturer's recommendations.
- To the extent possible, construction activities should utilize grid-based electricity and/or onsite renewable electricity generation rather than diesel and/or gasoline powered generators.
- In general, commit to the best available emissions control technologies for project equipment.
  - *On-Highway Vehicles* - On-highway vehicles used for this project should meet, or exceed the EPA exhaust emissions standards for model year 2010 and newer heavy-duty on-highway compression-ignition engines (e.g., long-haul trucks, refuse haulers, shuttle buses, etc.).[1]
  - *Nonroad Vehicles & Equipment* - Nonroad vehicles & equipment used for this project should meet, or exceed the EPA Tier 4 exhaust emissions standards for heavy-duty nonroad compression-ignition engines (e.g., construction equipment, nonroad trucks, etc.).[2]
  - *Low Emission Equipment Exemptions* – The equipment specifications outlined above should be met unless: (1) a piece of specialized equipment is not available for purchase or lease within the United States; or (2) the relevant project contractor has been awarded funds to retrofit existing equipment, or purchase/lease new equipment, but the funds are not yet available.
  - *Advanced Technology Demonstration & Deployment* – To the extent feasible, the Port is encouraged to demonstrate and deploy technologies that exceed the latest emission performance standards for the equipment categories that are relevant for this project (e.g., plug-in hybrid-electric vehicles-PHEVs, battery-electric vehicles-BEVs, fuel cell electric vehicles-FCEVs, advanced technology locomotives and marine vessels, etc.).
- Utilize EPA or CARB verified emission control devices where suitable to reduce emissions of diesel particulate matter and other pollutants at the construction site.

Health Impacts and Environmental Justice Considerations

The DEIS should identify communities with potential environmental justice concerns that could be affected by the proposed project and assess potential health impacts and impact avoidance measures. Because the proposed project could result in increased mobile source air toxics (MSAT) and criteria pollutant emissions and increased traffic at the Port of Long Beach, there is potential to disproportionately impact low income and minority communities that may occur in and around the project area. Disproportionate impacts to communities with potential environmental justice concerns should be avoided and mitigated to the fullest extent practicable. In addition, the Corps should work with affected communities to identify appropriate mitigation measures.

The increased volume of freight traffic that will likely occur in conjunction with the navigation improvements may result in additional conventional truck traffic along the freight corridor, which would contribute to increases in roadway-related MSAT and criteria pollutant emissions impacting already heavily burdened, low income and minority communities along the I-710 Corridor and other freight corridors. Near roadway exposure to air pollution is linked to a variety of adverse health outcomes

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1 http://www.epa.gov/otaq/standards/heavy-duty/hdci-exhaust.htm

2 http://www.epa.gov/otaq/standards/nonroad/nonroadci.htm

including asthma and adverse birth and childhood outcomes.[3] In addition, there is a growing volume of evidence that low income and minority communities are more vulnerable to pollution impacts than other communities. The DEIS should disclose the amount of additional conventional truck traffic that this project will generate and discuss the potential health impacts on vulnerable populations, including children and communities with potential environmental justice concerns. The DEIS should evaluate near roadway health impacts on neighboring communities, and work with the affected community to develop mitigation measures to reduce emissions, reduce exposure to emissions, and compensate for near-roadway health impacts. EPA recently published a guidance document titled "Best Practices for Mitigating Near Roadway Pollution at Schools" (November 2015) which could serve as a useful resource for mitigating impacts.

The Corps should also consider conducting a corridor level EJ analysis of near roadway impacts, as recommended in the Draft 2016-2040 Southern California Association of Governments Regional Transportation Plan/Sustainable Communities Strategy.[4]

Children's Health
Executive Order 13045 on Children's Health and Safety directs that each Federal agency shall make it a high priority to identify and assess environmental health and safety risks that may disproportionately affect children, and shall ensure that its policies, programs, activities, and standards address these risks. To meet this priority, we recommend that the DEIS consider data on existing asthma rates, or indicators, and asthma severity among children and the general community near the project site; identify impacts of the project on asthma rates or indicators and quantify associated costs, to the extent feasible; and, consider impacts from noise on health and learning, especially near schools and daycare centers along the freight corridors and close to any construction work.

Mitigation of Health Impacts
The DEIS should discuss the Port Mitigation Grant Programs and the work that has been done to improve community health by reducing the impacts of Port-related air pollution and to decrease greenhouse gas emissions. The DEIS should describe whether the action alternatives will provide additional funding for community projects or grants. We also encourage the Port of Long Beach to describe programs intended to benefit the local community (e.g., job training and local hiring requirements).

Climate Change Impacts
The DEIS should identify the cumulative contributions to greenhouse gas emissions that will result from implementation of the proposed project, and discuss the potential impacts of climate change on the project. The DEIS should also identify any specific mitigation measures needed to: (1) protect the project from the effects of climate change (e.g., changes to storm surge, magnitude, or frequency), (2) reduce the project's adverse air quality effects, and/or (3) promote pollution prevention and environmental stewardship.

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[3] Padmanabhan, N. & Glenn, B. August 2009, EPA Research Focus on Health Effects of Near-Roadway Air Pollution. Air and Waste Management Association, EM Magazine. Available at: http://pubs.awma.org/gsearch/em/2009/8/padmanabhan.pdf
[4] http://scagrtpscs.net/Pages/DRAFT2016RTPSCS.aspx

Any sustainable design and operation measures that can be identified as reducing greenhouse gases should be identified in the DEIS with an estimate of the greenhouse gas emissions reductions that would result if such measures were implemented, and the DEIS should indicate whether these measures would be required. Attention should be paid to explaining the quality of each greenhouse gas mitigation measure – including its permanence, verifiability and enforceability.

Dredged Material Management

The NOI does not provide an estimate of the volume of dredged material associated with each action alternative. The DEIS should estimate dredged material volumes in as much detail as possible for each action alternative. Placement site capacity, impacts of dredging and placement, and degree of any benefits all relate directly to the volume of material at issue.

The DEIS should also estimate as specifically as possible the subsequent (post-construction) maintenance dredging needs for each action alternative and address whether modifications in channel configuration or depth may result in greater volumes needing to be maintenance-dredged in comparison to current (No Action) volumes. The DEIS should provide estimates for funding increases that may be needed to support these activities.

Comprehensive physical, chemical, and biological testing of sediment should be conducted and the results presented in the DEIS. Sediment testing and evaluation is required to determine suitability for ocean disposal. The DEIS should discuss the criteria associated with management and disposal of dredged material, including sediment characterization results (e.g. grain size, contaminant concentrations, and toxicity) or plans for sediment characterization sampling and analysis, and disposal options for sediment that cannot be beneficially reused. Sampling and analysis plans and sediment testing results must be reviewed by the Southern California Dredged Material Management Team (SC-DMMT), a Federal-State interagency review group, to ensure that that sediments proposed for dredging are adequately characterized in order to determine suitable placement options.

Absent sediment suitability determinations in advance from the appropriate agencies, the DEIS should presume that a percentage of the material to be dredged will not be suitable for all placement options, and the DEIS should identify how any toxic or contaminated material that does not meet placement criteria would be handled.

To the maximum extent practicable, alternatives to ocean disposal should be evaluated for all feasible beneficial reuse options, including but not limited to beach nourishment, marsh restoration, and construction fill. The Corps and the Port should target 100% of the material to be dredged for beneficial reuse, and not limit the evaluation of possible reuse options to the immediate Port vicinity. EPA will not concur on ocean disposal of any material that can practicably be reused.

Storm surge and subsidence are common along the coastal areas, and beneficial reuse of dredged material may provide protection to shore-side infrastructure endangered by coastal erosion, or be used to extend the area of recreational beaches where sand has been eroded by storm surge. Coastal marshes are also subject to erosion and subsidence, and these areas can be restored using suitable dredged material. We recommend that the Corps coordinate with EPA and other resource agencies on the relative merits of specific reuse opportunities to ensure that maximum benefits are realized and ancillary adverse impacts on existing habitats are avoided.

Aquatic Resource and Habitat Impacts

Clean Water Act Section 404(b)(1) Analysis

Section 404 of the Clean Water Act regulates the discharge of dredged or fill materials to waters of the United States. Compliance with the 404(b)(1) Guidelines (40 CFR 230) requires that permits be issued only for the Least Environmentally Damaging Practicable Alternative (LEDPA). The CWA Section 404(b)(1) alternatives analysis for this project will be used to determine the LEDPA and demonstrating project compliance with Federal Guidelines for Specification of Disposal Sites for Dredged or Fill Materials ("Guidelines"). Page 29 of the Corps South Pacific Division February 8, 2013 Regulatory Program Standard Operating Procedure for Preparing and Coordinating EISs (12509-SPD) states:

> Districts will make all reasonable efforts to ensure the NEPA alternatives analysis is thorough and robust enough to provide the information needed for the evaluation of alternatives under the section 404(b)(1) Guidelines and the public interest review. The goal of integrating the NEPA alternatives analysis and the CWA section 404(b)(1) alternatives analysis is to gain efficiencies, facilitate agency decision-making and avoid unnecessary duplication.

The practice of deferring, until later in the NEPA process, the disclosure of information needed for findings of compliance with the Guidelines makes it difficult for agencies and the public to provide timely and substantive input on the evaluation of alternatives, which could inform the Corps' decision-making process. Integrating the section 404(b)(1) alternatives analysis into the DEIS alternatives analysis would afford agencies and the public a more meaningful opportunity to evaluate impacts and provide relevant and timely feedback to inform these analyses and the Corps' decision. We recommend that the DEIS identify the LEDPA and include the CWA Section 404(b)(1) alternatives analysis within the document.

Benthic Habitat

Any alternative involving deepening or reconfiguring the existing channel(s) must address potential short-term and long-term impacts to benthic habitat, and discuss the need for mitigation of those impacts. We note that mitigation or otherwise offsetting measures could be required under either or both the Essential Fish Habitat and Endangered Species Act processes, as well as under Section 404 of the Clean Water Act, depending on the alternative selected.

Ocean Discharges from Ocean Going Vessels

The DEIS should discuss compliance with EPA's Final 2013 Vessel General Permit for discharges incidental to the normal operation of commercial vessels greater than 79 feet in length. We encourage the Port to raise awareness of the requirements of the General Permit among mariners.

Inefficiencies in Container Movements and Loading of Vessels

The NOI states that existing container vessels cannot load to their maximum draft, which is causing light-loading of vessels at the point of origin and delays to an increasing number of containerships. The DEIS should provide more detailed information on these issues including how many ships are currently affected by depth limitations in the channels, the degree that ships are light-loaded, estimates for the amount of freight which cannot be loaded, whether the freight is loaded onto the ship elsewhere, and the extent of delays. The DEIS should discuss how ship traffic and loading of container ships is anticipated to change in conjunction with each alternative, including anticipated increases of container freight and improvements in logistics.

Recreation Opportunities

The NOI presents three problem statements that summarize inefficiencies associated with operation of deep draft vessels in secondary channels. The third item mentions diminished recreation opportunities and environmental degradation in coastal areas outside of the study area. The DEIS should clarify what specific "diminished recreation opportunities" might be addressed by the proposed navigation deepening project.

We appreciate the opportunity to review this scoping notice and look forward to working with you on this project. Please send a hard copy of the DEIS to this office when it is officially filed via *e-NEPA*. If you have any questions, please contact me at 415-972-3545 or mcpherson.ann@epa.gov or Jeanne Geselbracht at 415-972-3853 or Geselbracht.jeanne@epa.gov.

Sincerely,

Ann McPherson
Environmental Review Section

CC (via email): Richard D. Cameron, Port of Long Beach
Christopher Cannon, City of Los Angeles Harbor Department
Cynthia Marvin, California Air Resources Board
Philip Fine, South Coast Air Quality Management District
Courtney Aguirre, Southern California Association of Governments

LOS ANGELES WATERKEEPER®

February 3, 2016

Mr. Lawrence Smith
Project Environmental Coordinator
U.S. Army Corps of Engineers
Los Angeles District
915 Wilshire Boulevard, Suite 390
Los Angeles CA 90017-3401

Via e-mail to: Lawrence.J.Smith@usace.army.mil
RE: Port of Long Beach Deep Draft Navigation Project

Dear Mr. Smith:

Thank you for the opportunity to comment on the proposed Port of Long Beach Deep Draft Navigation Project (Proposed Project). Founded in 1993, Los Angeles Waterkeeper (LAW) has approximately 3,000 members who live and/or recreate in and around the Los Angeles area. LAW is dedicated to the preservation, protection, and defense of the rivers, creeks, wetlands, tidelands, coastal waters and groundwater of Los Angeles County from all sources of pollution and degradation. For more than two decades, LAW has pursued these goals through a combination of education, advocacy, and impact litigation.

LAW would like to take this opportunity early in the stage of the Proposed Project to ask that the U.S. Army Corps of Engineers (USACE) evaluates the following in the Environmental Impact Statement (EIS):

1. The EIS should include an analysis of how the disposal sites for the dredged sediment will be chosen, and that analysis should assess the appropriate grain size of the sediment being disposed of as well as the impacts from potentially contaminated sediment.
2. The EIS' assessment of the water quality impacts from dredging and sediment disposal should evaluate impacts from an increased turbidity and suspended solids, particularly in sensitive habitat areas near the Proposed Project site.
3. The EIS' assessment of impacts on habitat/biota should focus on the Proposed Project's impacts on sensitive nearshore coastal and estuarine habitats; impacts on fisheries; the potential loss of benthic habitat; potential harm to species, particularly endangered species; and the newly dredged substrate's susceptibility to colonization by opportunistic and non-native, invasive species.
4. The EIS should also evaluate the Propose Project's impact on waterborne vessel traffic in the port. If the Proposed Project increases shipping efficiency as intended, will vessel traffic in the Port of Long Beach increase and what will be the environmental impacts of the increased traffic?

Thank you for the opportunity to comment, and we look forward to reviewing the EIS.

Sincerely,

Melissa Kelly
Law Fellow

DEPARTMENT OF TRANSPORTATION
DISTRICT 7 – Office of Regional Planning
100 S. MAIN STREET, MS 16
LOS ANGELES, CA 90012
PHONE (213) 897-9140
FAX (213) 897-1337
TTY 711
www.dot.ca.gov

Making Conservation a California Way of Life.

February 26, 2019

Matthew Arms
Acting Director of Environmental Planning
Port of Long Beach
4801 Airport Plaza Drive
Long Beach, CA 90815

RE: Long Beach Deep Draft Navigation Feasibility Study and Channel Deepening Project – Notice of Preparation (NOP)
SCH # 2016111014
GTS # 07-LA-2016-02241
Vic. LA-710/PM: 3.869

Dear Mr. Arms:

Thank you for including the California Department of Transportation (Caltrans) in the environmental review process for the above referenced project's Notice of Preparation (NOP). The Port of Long Beach Deep Draft Navigation Study will evaluate dredging to deepen several channels, basins, and standby areas within the Port to improve waterborne transportation efficiencies and navigational safety for current and future container and liquid bulk vessel operations. Study areas include the approach channel extending seaward from the Queen's Gate opening of the Long Beach Breakwater; approach channel, berths, and turning basin to Pier J; the Southeast Basin and associated berths; and the Pier T/West Basin and berths. Additionally, structural improvements may need to be performed to several of the berths within the project areas to reinforce the wharf design to accommodate the proposed dredging. A new electrical substation may be constructed landside to provide electricity to the dredge equipment.

Caltrans has reviewed the NOP and has the following comments:

In order to assist in evaluating this project's impact on state facilities, a traffic study should be prepared to analyze the following information:

- Please analyze the traffic impact to the Main Channel, Queen's Gate, Pier T, Pier J and all potentially impacted streets, intersections/crossroads and ramps associated with this project.

  Please include:

  - Trip counts on/off Interstate 710 and State Route 47 during construction
  - LOS analysis before, during and after the construction.
  - AM and PM peak hour volumes
  - A brief traffic discussion/map indicating the turning movements and directional flow of construction/operation vehicles
  - Any/all potential mitigation traffic analysis

Further information included for your consideration:

If VMT methodology is being used The Port should refer to the traffic study consultant of the Developer to OPR's website guidelines in the evaluation of traffic impact:

http://opr.ca.gov/docs/Revised_VMT_CEQA_Guidelines_Proposal_January_20_2016.pdf

Caltrans emphasizes that safety and mobility are the most important criteria. This needs to be the main consideration. Increased congestion on local arterial and freeways contributes to an increase in the number of accidents

In case the City of Los Angeles intends to use Level of Service (LOS) and HCM methodology for TIS, we recommend the use of "Caltrans Guide for the Preparation of Traffic Impact Studies" for traffic impact on the State highways and freeways and the appurtenant facilities. Please note that these guidelines are different than those applied in the Los Angeles County Congestion Management Program (CMP). For State thresholds and guidance on preparation of acceptable traffic studies, please refer to Caltrans (State) Guide for Traffic Impact Studies:

http://www.dot.ca.gov/hq/tpp/offices/ocp/igr_ceqa_files/tisguide.pdf

Caltrans seeks to promote safe, accessible multimodal transportation. Methods to reduce pedestrian and bicyclist exposure to vehicles improve safety by lessening the time that the user is in the likely path of a motor vehicle. These methods include the construction of physically separated facilities such as sidewalks, raised medians, refuge islands, and off-road paths and trails, or a reduction in crossing distances through roadway narrowing.

Caltrans recommends the project to consider the use of methods such as, but not limited to, pedestrian and bicyclist warning signage, flashing beacons, crosswalks, signage and striping, be used to indicate to motorists that they should expect to see and yield to pedestrians and bicyclists. Visual indication from signage can be reinforced by road design features such as lane widths, landscaping, street furniture, and other design elements.

Storm water run-off is a sensitive issue for Los Angeles County. Please be mindful that projects should be designed to discharge clean run-off water. Discharge of storm water run-off is not permitted onto State Highway facilities without a storm water management plan.

As a reminder, any transportation of heavy construction equipment and/or materials which requires use of oversized-transport vehicles on State highways will need a Caltrans transportation permit. We recommend large size truck trips be limited to off-peak commute periods

If you have any questions regarding these comments, please contact project coordinator Reece Allen, at reece.allen@dot.ca.gov and refer to GTS# 07-LA-2016-02241

Sincerely,

MIYA EDMONSON
IGR/CEQA Branch Chief

cc: Scott Morgan, State Clearinghouse

CALIFORNIA COASTAL COMMISSION

South Coast Area Office
301 E Ocean Blvd, Suite 300
Long Beach, CA 90802
(562) 590-5071

March 1, 2019

Director of Environmental Planning
Port of Long Beach
4801 Airport Plaza Drive
Long Beach, California 90815

RE: Port of Long Beach Deep Draft Navigation Feasibility Study and Channel Deepening Project Coastal Commission Staff Comments on Amended NOP of a DEIR/EIS (SCH# 2016111014)

Director of Environmental Planning:

Thank you for the invitation to comment on the Amended Notice of Preparation (NOP) of a Draft Joint Environmental Impact Report/Environmental Impact Statement (DEIR/EIS) for the Port of Long Beach (Port) Deep Draft Navigation Feasibility Study and Channel Deepening Project (Project). The Project, as proposed, is within the Coastal Zone and involves changes to the design of the Port's water and land areas to improve existing navigation channels focusing on improvements for container and liquid bulk vessel operations. A harbor development permit for the Project from the Port of Long Beach is required. Under Section 30715 of the Coastal Act, because the development is, in part, for the transmission of liquid bulk cargo in the Port, which includes large quantities of liquefied natural gas and crude oil, it is also appealable to the Coastal Commission. This letter provides direction on topics and issues that should be addressed in the DEIR/EIS.

The following are general comments on Coastal Act issues relevant to the Project:

A. **Consistency with the Port of Long Beach certified Port Master Plan (PMP).** The DEIR/EIS should include a thorough analysis of the Project's consistency with the Port of Long Beach's certified Port Master Plan (PMP), including all certified amendments to the PMP. In addition, under Section 30711 of the Coastal Act, projects listed as appealable shall be included in the Port's PMP and shall be consistent with the Chapter 3 policies of the Coastal Act. Thus, an amendment to the Port's certified PMP is necessary to add a description of the Project to the PMP and ensure the Project's consistency with the certified PMP.

B. **Consistency with the Coastal Act.** The DEIR/EIS should also include a thorough analysis of the Project's consistency with the Chapter 3 and Chapter 8 policies of the Coastal Act. These include, <u>but are not limited to</u>: *Section 30705*, which prohibits the dredging of water areas unless the dredging is consistent with the PMP, falls under one of the categories where dredging can be permitted, takes advantage of existing water depths, water circulation, siltation patterns and means to reduce controllable sedimentation, minimizes disruption of fish and bird breeding and migrations, marine habitats and water circulation, and balances socioeconomic and environmental factors; *Sections30233 and 30706* relating to fill of coastal waters (including fill resulting from addition of new piles, bulkheads, rock toes, etc.) and requiring that fill only be permitted in certain circumstances where there is no feasible alternative and where mitigation measures are provided; and *Sections 30230 and 30231*, which protect and, where feasible, enhance marine resources, biological productivity, and water quality. If any mitigation credits are proposed to be used as a result of this project, the DEIR/EIS should also include information on the Port's current mitigation credit balance and proposed use of mitigation credits.

C. **Ocean Disposal Requirements.** Section 30706 of the Coastal Act requires that any disposal of dredged materials within the jurisdiction of the Port shall minimize harmful effects to coastal resources. However, the Project, as proposed, also includes potential disposal of dredged material at offshore disposal sites outside the Port and seaward of the coastal zone boundary (e.g., LA-2 and LA-3). Disposal of dredged material at these locations will require the Port to prepare and submit to the Commission a federal consistency certification. The standard of review for dredged material disposal at these sites is Section 30233 of the Coastal Act rather than Section 30706. The DEIR/EIS should analyze dredge spoil disposal alternatives with the goal of maximizing beneficial reuse of dredged sediments and minimizing disposal volumes at ocean disposal sites. The DEIR/EIS should also note that proposed dredged material disposal in ocean waters must be reviewed by the interagency Southern California Dredged Material Management Team to determine the suitability of dredged materials for disposal.

Please note that the comments provided herein are preliminary in nature. More specific comments may be appropriate as the project develops. Coastal Commission staff requests notification of any future activity associated with this project or related projects. Thank you for the opportunity to comment on the Amended NOP. Please contact me at (562) 590-5071 with any questions.

Sincerely,

Dani Ziff
Coastal Program Analyst

South Coast
Air Quality Management District
21865 Copley Drive, Diamond Bar, CA 91765-4178
South Coast AQMD (909) 396-2000 · www.aqmd.gov

SENT VIA USPS AND E-MAIL: February 21, 2019
CEQA@polb.com
Director of Environmental Planning
Port of Long Beach
4801 Airport Plaza Drive
Long Beach, CA 90815

Amended Notice of Preparation of an Environmental Impact Report for the Proposed Deep Draft Navigation Feasibility Study and Channel Deepening

South Coast Air Quality Management District (SCAQMD) staff appreciates the opportunity to comment on the above-mentioned document. SCAQMD staff's comments are recommendations regarding the analysis of potential air quality impacts from the Proposed Project that should be included in the Environmental Impact Report (EIR). Please send SCAQMD a copy of the EIR upon its completion. Note that copies of the EIR that are submitted to the State Clearinghouse are not forwarded to SCAQMD. Please forward a copy of the EIR directly to SCAQMD at the address shown in the letterhead. **In addition, please send with the EIR all appendices or technical documents related to the air quality, health risk, and greenhouse gas analyses and electronic versions of all air quality modeling and health risk assessment files[1]. These include emission calculation spreadsheets and modeling input and output files (not PDF files). Without all files and supporting documentation, SCAQMD staff will be unable to complete our review of the air quality analyses in a timely manner. Any delays in providing all supporting documentation will require additional time for review beyond the end of the comment period.**

Air Quality Analysis

SCAQMD adopted its California Environmental Quality Act (CEQA) Air Quality Handbook in 1993 to assist other public agencies with the preparation of air quality analyses. SCAQMD recommends that the Lead Agency use this Handbook as guidance when preparing its air quality analysis. Copies of the Handbook are available from SCAQMD's Subscription Services Department by calling (909) 396-3720. More guidance developed since this Handbook is also available on SCAQMD's website at: http://www.aqmd.gov/home/regulations/ceqa/air-quality-analysis-handbook/ceqa-air-quality-handbook-(1993). SCAQMD staff also recommends that the Lead Agency use the CalEEMod land use emissions software. This software has recently been updated to incorporate up-to-date state and locally approved emission factors and methodologies for estimating pollutant emissions from typical land use development. CalEEMod is the only software model maintained by the California Air Pollution Control Officers Association (CAPCOA) and replaces the now outdated URBEMIS. This model is available free of charge at: www.caleemod.com.

SCAQMD has also developed both regional and localized significance thresholds. SCAQMD staff requests that the Lead Agency quantify criteria pollutant emissions and compare the results to SCAQMD's CEQA regional pollutant emissions significance thresholds to determine air quality impacts. SCAQMD's CEQA regional pollutant emissions significance thresholds can be found here: http://www.aqmd.gov/docs/default-source/ceqa/handbook/scaqmd-air-quality-significance-thresholds.pdf. In addition to analyzing regional air

[1] Pursuant to the CEQA Guidelines Section 15174, the information contained in an EIR shall include summarized technical data, maps, plot plans, diagrams, and similar relevant information sufficient to permit full assessment of significant environmental impacts by reviewing agencies and members of the public. Placement of highly technical and specialized analysis and data in the body of an EIR should be avoided through inclusion of supporting information and analyses as appendices to the main body of the EIR. Appendices to the EIR may be prepared in volumes separate from the basic EIR document, but shall be readily available for public examination and shall be submitted to all clearinghouses which assist in public review.

quality impacts, SCAQMD staff recommends calculating localized air quality impacts and comparing the results to localized significance thresholds (LSTs). LSTs can be used in addition to the recommended regional significance thresholds as a second indication of air quality impacts when preparing a CEQA document. Therefore, when preparing the air quality analysis for the Proposed Project, it is recommended that the Lead Agency perform a localized analysis by either using the LSTs developed by SCAQMD staff or performing dispersion modeling as necessary. Guidance for performing a localized air quality analysis can be found at: http://www.aqmd.gov/home/regulations/ceqa/air-quality-analysis-handbook/localized-significance-thresholds.

The Lead Agency should identify any potential adverse air quality impacts that could occur from all phases of the Proposed Project and all air pollutant sources related to the Proposed Project. Air quality impacts from both construction (including demolition, if any) and operations should be calculated. Construction-related air quality impacts typically include, but are not limited to, emissions from the use of heavy-duty equipment from grading, earth-loading/unloading, paving, architectural coatings, off-road mobile sources (e.g., heavy-duty construction equipment) and on-road mobile sources (e.g., construction worker vehicle trips, material transport trips). Operation-related air quality impacts may include, but are not limited to, emissions from stationary sources (e.g., boilers), area sources (e.g., solvents and coatings), and vehicular trips (e.g., on- and off-road tailpipe emissions and entrained dust). Air quality impacts from indirect sources, such as sources that generate or attract vehicular trips, should be included in the analysis.

In the event that the Proposed Project generates or attracts vehicular trips, especially heavy-duty diesel-fueled vehicles, it is recommended that the Lead Agency perform a mobile source health risk assessment. Guidance for performing a mobile source health risk assessment ("*Health Risk Assessment Guidance for Analyzing Cancer Risk from Mobile Source Diesel Idling Emissions for CEQA Air Quality Analysis*") can be found at: http://www.aqmd.gov/home/regulations/ceqa/air-quality-analysis-handbook/mobile-source-toxics-analysis. An analysis of all toxic air contaminant impacts due to the use of equipment potentially generating such air pollutants should also be included.

In addition, guidance on siting incompatible land uses (such as placing homes near freeways) can be found in the California Air Resources Board's *Air Quality and Land Use Handbook: A Community Health Perspective*, which can be found at: http://www.arb.ca.gov/ch/handbook.pdf. CARB's Land Use Handbook is a general reference guide for evaluating and reducing air pollution impacts associated with new projects that go through the land use decision-making process. Guidance[2] on strategies to reduce air pollution exposure near high-volume roadways can be found at: https://www.arb.ca.gov/ch/rd_technical_advisory_final.PDF.

Mitigation Measures

In the event that the Proposed Project generates significant adverse air quality impacts, CEQA requires that all feasible mitigation measures that go beyond what is required by law be utilized during project construction and operation to minimize these impacts. Pursuant to CEQA Guidelines Section 15126.4 (a)(1)(D), any impacts resulting from mitigation measures must also be discussed. Several resources are available to assist the Lead Agency with identifying potential mitigation measures for the Proposed Project, including:

- Chapter 11 "Mitigating the Impact of a Project" of SCAQMD'S *CEQA Air Quality Handbook.* SCAQMD's CEQA web pages available here: http://www.aqmd.gov/home/regulations/ceqa/air-quality-analysis-handbook/mitigation-measures-and-control-efficiencies

[2] In April 2017, CARB published a technical advisory, *Strategies to Reduce Air Pollution Exposure Near High-Volume Roadways: Technical Advisory*, to supplement CARB's Air Quality and Land Use Handbook: A Community Health Perspective. This technical advisory is intended to provide information on strategies to reduce exposures to traffic emissions near high-volume roadways to assist land use planning and decision-making in order to protect public health and promote equity and environmental justice. The technical advisory is available at: https://www.arb.ca.gov/ch/landuse.htm.

- SCAQMD's Rule 403 – Fugitive Dust, and the Implementation Handbook for controlling construction-related emissions and Rule 1403 – Asbestos Emissions from Demolition/Renovation Activities
- SCAQMD's Mitigation Monitoring and Reporting Plan (MMRP) for the 2016 Air Quality Management Plan (2016 AQMP) available here (starting on page 86): http://www.aqmd.gov/docs/default-source/Agendas/Governing-Board/2017/2017-mar3-035.pdf
- CAPCOA's *Quantifying Greenhouse Gas Mitigation Measures* available here: http://www.capcoa.org/wp-content/uploads/2010/11/CAPCOA-Quantification-Report-9-14-Final.pdf

Alternatives

In the event that the Proposed Project generates significant adverse air quality impacts, CEQA requires the consideration and discussion of alternatives to the project or its location which are capable of avoiding or substantially lessening any of the significant effects of the project. The discussion of a reasonable range of potentially feasible alternatives, including a "no project" alternative, is intended to foster informed decision-making and public participation. Pursuant to CEQA Guidelines Section 15126.6(d), the EIR shall include sufficient information about each alternative to allow meaningful evaluation, analysis, and comparison with the Proposed Project.

Permits and SCAQMD Rules

In the event that the Proposed Project requires a permit from SCAQMD, SCAQMD should be identified as a Responsible Agency for the Proposed Project in the EIR. The assumptions in the air quality analysis in the EIR will be the basis for permit conditions and limits. For more information on permits, please visit SCAQMD's webpage at: http://www.aqmd.gov/home/permits. Questions on permits can be directed to SCAQMD's Engineering and Permitting staff at (909) 396-3385.

General Conformity Review and Determination

In the event that the Proposed Project is subject to the General Conformity requirement of the Clean Air Act and is not exempt from General Conformity review and determination, the Lead Agency should quantify the Proposed Project's annual total emissions and compared those emissions to the de minimis thresholds in the EIR to determine if the Proposed Project's annual total emissions would exceed General Conformity de minimis thresholds. Any questions related to the SCAQMD General Conformity review process and determination can be directed to Ms. Sang-Mi Lee, Program Supervisor, at slee@aqmd.gov.

Data Sources

SCAQMD rules and relevant air quality reports and data are available by calling SCAQMD's Public Information Center at (909) 396-2039. Much of the information available through the Public Information Center is also available at SCAQMD's webpage at: http://www.aqmd.gov.

SCAQMD staff is available to work with the Lead Agency to ensure that project air quality and health risk impacts are accurately evaluated and mitigated where feasible. If you have any questions regarding this letter, please contact me at lsun@aqmd.gov or (909) 396-3308.

Sincerely,

Lijin Sun

Lijin Sun, J.D.
Program Supervisor, CEQA IGR
Planning, Rule Development & Area Sources

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Attachment 3

<u>Public Hearing Transcripts 1 and 2</u>

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STATE OF CALIFORNIA

PORT OF LONG BEACH and

UNITED STATES ARMY CORPS OF ENGINEERS:

DEEP DRAFT NAVIGATION FEASIBILITY STUDY

PUBLIC HEARING 3:00

415 West Ocean Boulevard

Wednesday, November 13, 2019

Long Beach, California

REPORTED BY: Katherine Henry-Sexton, CSR No. 13662

REPRESENTATIVES:

Colonel Aaron Barta, District Engineer and Commander, Army Corps of Engineers, LA District

Sean Gamette, Managing Director, Port of Long Beach

Heather Schlosser, Lead Environmental Planner, Army Corps of Engineers

Allyson Teramoto, Manager of CEQA/NEPA, Practices, Port of Long Beach

Justin Luedy and Janna Morimoto, Environmental staff, Port of Long Beach

Ed De Mesa, Chief of Planning, Army Corps of Engineers

Raina Fulton, Chief of Planning, Plan Formulation Branch, Army Corps of Engineers

Chris Lee, Project Manager, Army Corps of Engineers

Larry Smith, Environmental Coordinator, Army Corps of Engineers

John Goertz, Coastal Engineer, Army Corps of Engineers

Matt Arms, Environmental Planning, Port of Long Beach

Eric Paulsen and Derek Davis, Project Management, Port of Long Beach

SPEAKERS:

TRANSCRIPT OF PROCEEDINGS

3:08 P.M.

* * *

COL. BARTA: Welcome ladies and gentlemen. My name is Colonel Aaron Barta. I'm the Commander and District Engineer of the United States Army Corps of Engineers for the Los Angeles District covering southern California, Arizona and southern Nevada. I'm very happy to be here, and I'd like to thank you for taking the time to come out to today's public hearing as we look at the Port of Long Beach Deep Draft Navigation Feasibility Study.

The Corps and the Port of Long Beach are co-hosting this shared public event. So quickly to go over some administrative items -- to make our presentation as accessible as possible, we have an American Sign Language interpreter and a Spanish translator service available for this hearing. If there is anyone who would like to use either of these services, please let one of our folks know at this time. The restrooms are located outside the main door to the right, and emergency exit is located in the rear of room and exits out to the street.

So our purpose here today is to hear your concerns and your questions regarding the study findings up to this date, the array of alternatives which we formulated and evaluated, and more specifics on the identified tentatively selected plan. This meeting is part of a public review process that ends on the 9th of December.

Before I talk more about the details of this meeting and the public review timeframe which we'll cover a little later, let me first introduce a few of the key members here tonight who will be able to answer a lot of the details of this project.

So from staff I have Mr. Ed De Mesa, our chief of planning; Ms. Raina Fulton, chief of our planning division's plan formulation branch; Ms. Chris Lee, project manager for the study; Ms. Heather Schlosser, lead planner; Mr. Larry Smith, environmental coordinator; John Goertz, coastal engineer.

I'd also like to acknowledge the Port of Long Beach staff members in attendance including Mr. Sean Gamette, managing director; Matt Arms from environmental planning; Eric Paulsen and Derek Davis from project management; Ms. Allyson Teramoto, manager for the CEQA/NEPA practices; and Mr. Justin Luedy and Ms. Janna Morimoto from our environmental staff.

Thank you, everybody, for arranging this meeting and for your continuing support of the study and the sound partnership we've had ever since the very beginning of this study's initiation.

You, the public, have an important role with the Corps' National Environmental Policy Act, or NEPA, the process and the overall planning process. After all, the Army Corps of Engineers is here to serve the American people. The Corps' goal tonight is to exchange information in several ways. First, we'll briefly describe the feasibility process to date, the draft findings so far and what is to come in the next steps to study completion.

Most importantly, tonight we are seeking your input during the remainder of the public comment period for those interested in contributing comments on the study. Today we want to hear from anyone who wishes to make oral comments on the draft feasibility report. Alternatively, you have until December 9th to submit written comments to us via e-mail or by mail that we'll display at the end of this presentation.

When you signed in tonight, you were offered comment cards if you're interested in speaking tonight. They look like this. In addition, there's room on the back for submitting written comments also as well. If you did not have an opportunity to fill out a card, please do so now. We'll be around to collect any remaining cards in the next few minutes. We'll sort through the cards in the order received to identify those who checked they'd like to speak tonight.

If you do speak, we ask initially that you limit your comments to three minutes, which sometimes goes by pretty fast, to allow enough time for all interested parties to contribute their comments. If time permits, we'll open up the floor to others interested in speaking.

I'll speak more about the public comment period later; but first, I would like to invite Sean Gamette, managing director of the Port of Long Beach, to say a few words about the study.

MR. GAMETTE: Thank you. Good afternoon, everybody. Everybody hear me okay? I tend to be a little loud. My name is Sean Gamette, and I'm the managing director of engineering here at the Port of Long Beach. And I'm definitely happy and pleased to be here with you this evening to support this public meeting and the one that comes after it. And on behalf of the Port I just want to welcome all of you from the public who are here at our new facility adjacent to City Hall down here at 415 West Ocean Boulevard. I hope you'll enjoy your time in this facility. It's an amazing place.

Speaking on behalf the Port, we are excited to be back down here in downtown Long Beach and adjacent to our Port for a lot of different reasons. We need to be down here and interacting with our customers, our stakeholders and the public. And so we're definitely excited about that.

This proposed project has been around for some time, and we're all really excited to see it move forward. So we're here in support of that tonight. I first want to thank all of the hard working staff from both the Port of Long Beach and the Army Corps of Engineers for all the work they've done to move this project forward.

And I also want to thank and introduce Ms. Irantzu Pujadas. Would you raise your hand? Thank you, Irantzu. Irantzu is deputy district director for Congressman Lowenthal. And we just want to thank you, Irantzu, and the Congressman for your support of the Port of Long Beach and for being here tonight. So thank you very much for that.

I won't say a lot here. I'll just close up so we can get going with the meeting. But I do want to recognize that this is a great partnership. One of the secrets of being a great port is having a great partnership with the United States Army Corps of Engineers. A lot of times we talk about different things in the Port, different concerns that the community would like to engage us in related to development and different things like that. But one key element of any good port is our waterways, and that's what we're going to be talking about tonight -- making sure we've got adequate appropriate waterways in the Port of Long Beach for efficient movement of cargo.

So we're really excited about this partnership together. It's a big milestone tonight. We very much appreciate the public coming out for this meeting and are excited to receive your comments and input tonight on what we like to call our Long Beach Deep Draft Navigation Study. And so we're really excited about that and want to kind of -- Colonel, did you want to say a few more words, or are we going right to Heather? I can't remember.

So the Colonel is going to come back to say a few words. If anybody has any questions, we've got a great Port team that the Colonel introduced tonight. So again, thank you very much for coming.

COLONEL BARTA: Real quickly -- I'll turn this over to Heather, one of our lead marine managers. But the purpose tonight is to make sure everyone has a common understanding of what our study will look like in order to get approval and get the public to make sure we take considerations for everybody since we all share this port; and eventually turn this around for our chief engineers to submit to the Office of Management with the Executive Office and then eventually to Congress for funding.

With that, I'll let Heather address you.

MS. SCHLOSSER: Thank you, Sean, and Colonel Barta. Good afternoon. Thank you for coming to participate in this public hearing. As was mentioned previously, we are here to present the feasibility study process and the tentatively selected plan. We will then go over the next steps in the process and then hear from you.

The water resources project delivery process -- this is sort of an overview just so you know where we are in the process, and we'll show this again at the end so you get a little more detail on where we go in the next steps. The process starts when local interests such as the Port of Long Beach ask for Federal assistance in solving a water resources problem. Congress acts by authorizing and appropriating funds for the Corps to study the problem.

The general feasibility process is laid out in this graphic. The star indicates where we are in this process, which is in the midst of public review and other concurrent reviews. We'll organize and consolidate the comments into similar topics, report the findings to a panel of senior leaders at the agency's decision milestone to the Corps of Engineers at our headquarters in Washington, DC, for determining the recommended plan to go forward with.

After completing any additional refinements of the plan, we will finalize our feasibility report and present findings to a senior panel to seek an endorsement to move forward for final State and agency review. That is where we send out the final/final report. If that's the case, and the chief engineer signs a favorable report and the administration review is complete, the assistant secretary of the Army for civil works signs the record of decision completing the National Environmental Policy Act process or NEPA process.

Congress may then authorize the project's construction in a Water Resources Development Act. Project implementation can begin once Federal and local funds are appropriated.

Later on I'll discuss our proposed schedule to complete the planning phase and implement the project.

This study was conducted as an interim response to the resolution of the House Committee on Public Works adopted July 10, 1968. In summary, Congress has given the Corps of Engineers the authority to look at "promoting and encouraging the efficient, economic and logical development of the harbor complex." This may include "investigation of current shipping problems, adequacy of facilities, delays in intermodal transfers, channel dimensions, storage locations and capacities, and other physical aspects affecting waterborne commerce in the San Pedro Bay region."

As the nation's second busiest container seaport, activity at the Port of Long Beach supports over 51,000 jobs in Long Beach. Across the southern California the Port supports well over half a million jobs providing about $30 billion in income. Nation-wide the Port supports about 2.6 million jobs providing close to $127 billion in income.

The Port of Long Beach provides shipping terminals for nearly one-third of the waterborne trade moving through the West Coast. Today trade valued annually at more than $194 billion moves through the Port. The Port facilities include ten piers, 62 berths and 68 post-Panamax gantry cranes. The Port's ability to accommodate large containerships and handle additional cargo is a key objective of the Port of Long Beach.

In preparation of the next generation of vessels, the Port of Long Beach has a ten-year, $4 billion capital program to update infrastructure and facilities to improve the efficiency of cargo operations.

The program has a plan for projected spending of $2.3 billion over the next ten years. This includes Middle Harbor Redevelopment Project, the Gerald Desmond Bridge Replacement, the Pier B Rail Support Facility, the Pier G and J modification project and berth deepening.

Widening and enlargement of the Panama Canal has led to a new class of container vessels whose fully loaded drafts exceed current Federal channel and berth depths. This has led to one of the primary problems facing current operations, which is the inefficient operation of deep draft container vessels in secondary and Federal channels, which increases the nation's transportation costs.

Container vessels must either ride the tides, wait for a high tide, and enter and leave only on high tides or to light load the vessel in order to ensure a shallower draft required to safely enter and leave the Port, which means it wouldn't be ever fully loaded, maybe it doesn't reach maximum capacities where it actually should.

Additionally, liquid bulk vessels which transport petroleum products must enter and exit the two-mile long Approach Channel one at a time, which results in increased delays due to channel width limitations, or they must delay entry during wave swells and other conditions or, as mentioned, light load; or as you can see in this picture, lightering where they have to transfer to smaller vessels to be able to come into the Port. And these are all due to depth limitations along the Approach Channel.

The planning objectives for this study are to increase transportation efficiencies during the period analysis for container and liquid bulk vessels operating in the Port of Long Beach for both the current and future fleets and to improve conditions during the period of analysis for vessel operation and safety, including reducing constraints of harbor pilot operating practices.

There are three primary outcomes from navigation improvements that would induce changes in operations and composition of the future fleet mix at the Port of Long Beach. The first is an increase in a vessel's maximum loading capacity. That's how much the vessel can actually hold. Channel restrictions limit a vessel's capacity by limiting its draft, how deep it is in the water.

Deepening the channel reduces this constraint and the vessel's maximum capacity increases towards its design capacity. This increase in vessel capacity results in fewer vessel trips required to transport the forecasted cargo. The second effect is the increase in the reliability of water depth, which encourages the deployment of larger vessels to the Port of Long Beach.

The third effect is a consequence of the second -- the increase in larger post-Panamax vessels displaces the less economically efficient smaller post-Panamax vessels and Panamax class vessels. This would decrease the number of vessel trips overall at the Port of Long Beach. You can get more larger ships and fewer less efficient ships. That's a benefit.

These outcomes are what we consider national economic development, or NED, benefits. Contributions to the National Economic Development account represent the anticipated increase in the value of the national output of goods and services. This is one of the important criteria the Corps uses to evaluate the Federal interest in a project.

In the case of navigation projects such as this one, the increase in national output is in the form of reduced transportation costs, which we consider benefits. When consumers buy goods, the price includes the costs to have the goods transported from where they are produced to where they are sold. Where efficiencies are created, the lower cost of transporting the goods can be passed on to the consumers in the form of lower prices.

The container and liquid bulk design vessels that were used for the study were determined based on input and forecasts from the Port of Long Beach, professional judgment of harbor pilots and data collected and analyzed by the Corps. What we're looking at for the container design vessel would be a

1,300-foot long vessel with a maximum draft of 52 feet. This is roughly equivalent to what's called a Triple E or Generation 4 vessel class. The liquid bulk design vessel is 1,200 feet long with a maximum draft of 70 feet. This vessel is what's called a VLCC, a very or ultra large crude carrier class, also known as VLCC or ULCC.

An essential step when evaluating navigation improvements is to analyze types and volumes of cargo moving through the Port. Trends in cargo history can offer insights into a port's long-term trade forecasts; and thus, the estimated cargo volume upon which future vessel calls are based.

Under future without a project and also future with project conditions, this project, the same volume of cargo is assumed to move through the Port of Long Beach. So we're not assuming that this project is inducing additional cargo through the Port. We think that would happen without the project.

However, a deepening project will allow shippers to load, as I mentioned before, their vessels more efficiently or take advantage of larger vessels. This efficiency translates to savings and is the main driver of National Economic Development. Strong growth in throughput, as you can see on the right of this graph -- the throughput is projected to continue until the Port of Long Beach's facilities reach capacity, which is anticipated around 2035.

So we looked at management measures that can be implemented along the areas of the Port. These are generally categorized as either structural or non-structural. Preliminary alternatives are formulated by these measures and refined by combining, adapting and scaling management measures to best address the planning objectives.

Management measures were developed through brainstorming sessions during our reconnaissance phase, a kickoff meeting and a value engineering workshop. Each measure was assessed and a preliminary determination was made whether it should be retained for consideration and formulation of alternatives. You'll see for the non-structural measures -- you'll see the high tide riding and the lightering. It's non-structural, but that's also what is already being done. So that is considered future without a project condition.

The measures that were carried forward were to deepen the West Basin Channel and construct a turning basin. And you'll see this in the yellow area here -- which is expected to decrease delays and light loading for larger containerships. We're also looking at constructing an approach channel in the orange here. The orange area shows constructing an approach channel at Pier J, as well as a turning basin which is outside of Pier J South. And this is also expected to help with decreasing delays in light loading for containerships.

We also considered constructing or deepening this area called a standby area, which would be available for the liquid bulk vessels. It would be a waiting and passing area inside the breakwater, and would reduce delays for those deeper drafting liquid bulk vessels.

And then we also looked at deepening the approach channel here to help with the crude efficiency of liquid bulk vessels.

The measures carried forward are independent with the exception of fixed costs. Basically, it means that any of these could be constructed independent of the other measures. This creates a relatively large number of potential alternatives. To address this, the analysis was separated initially into measures impacting liquid bulk movements, which is the approach channel and standby area, as well as some improvements to the main channel, the Federal channel. And then for the containerships we also looked at Pier J South and the West Basin for container vessels.

The benefits and costs of deepening Queen's Gate, Main Channel, and the standby area for liquid bulk vessels were evaluated. So the depths analyzed ranged from 53 feet to 57 below mean lower low water in the Pier J approach channel, the new turning basin to Pier J, as well as the Pier T or West Basin area.

Measures considered to address the planning objectives for the liquid bulk vessels included deepening the Approach Channel with depths ranging from 78 feet to 83 feet below mean lower low water. And you'll see some areas in the main channel in red. That's the ease for -- where we had the pilots look at alternatives, it was noticed that they need a little bit more area in that going around some corners in those areas. So those areas in the red would be to the current Federally established.

An additional measure evaluated, as I mentioned, included deepening of the waiting or passing area or the standby area landward of the Middle Breakwater. The depth increments evaluated ranged from 67 feet to 73 feet below mean lower low water.

Also, what we have to consider when we look at our Federal projects are any local service facilities, which are actions that need to be taken in order to fully implement the project. These are actions that the Corps of Engineers cannot cost share, such as berth dredging. That is the responsibility of the local sponsor or Port of Long Beach.

Those actions include berth dredging in the West Basin. And for all the alternatives that we looked at, there were potential wharf improvements, deeper ducts that we needed at Piers J and T for the 57-foot alternative, as well as structural improvements to the Pier J breakwater, which is hard to see on this slide; but you have the turning basin here and then we'll have another channel in here. So in order to accommodate the channel improvements, strengthening needs to be done to the ends of the Pier J breakwaters.

So as I mentioned, these local service facilities are needed to fully implement the project and to allow the Port to realize all of the economic benefits of the project.

Based on the economic analysis, the combination of measures included deepening to 55 feet below mean lower low water for the containerships. So that's that West Basin and Pier J approach channel or turning basin, and 80 feet below mean lower low water for liquid bulk from the ocean provides the greatest contribution of net benefits and has been determined as what the Corps calls our National Economic Development Plan.

Alternative 3 is highlighted in yellow, and that is what is presented today as the tentatively selected plan. So Alternative 2 represents a smaller scale alternative with depths at 53 and 78 feet. And Alternative 4 is a larger scale alternative. A standby measure was also analyzed, as I mentioned before, but current results indicate that it is not independently economically justified.

However, it is included as a component of Alternative 5. So alternative 5 is basically Alternative 3 with the standby area added to it.

So here's the tentatively selected plan: As I mentioned, it would deepen the Approach Channel, the bright blue area here -- to 80 feet below mean lower low water, and widen parts of the main channel, and that's the areas of red -- to 76 feet below mean lower low water. And those would benefit the liquid bulk vessels and would construct an approach channel and turning basin to Pier J South to 55 feet below mean lower low water and deepen the West Basin to 55 feet below mean lower low water for containerships.

This would mean dredging approximately 7.4 million cubic yards of material, and they would be placed in a near shore site located nearby, as well as two EPA-designated offshore disposal sites.

In addition to the activities listed above, the Port of Long Beach would conduct berth dredging within the Pier J South Basin along Berths J266 to J277, and then Berth T140 along Pier T would be also deepened to 55 feet below mean lower low water. As I mentioned before, structural improvements would also be performed on the Pier J breakwaters to accommodate deepening in these areas -- there's a little "4" there (indicating).

Construction would take approximately three-and-a-half years beginning in 2024. The estimated cost is about $151 million with average net annual benefits of $18 million. The tentatively selected plan does have a benefit to cost ratio of 3.8 to one.

These are the dredged material placement sites: Three locations we identified for placement of material -- a nearshore placement site near Sunset Beach will be utilized. This area is currently and has been used in the past as a borrow site for areas for Corps projects to place sediment on Sunset beaches. And we estimate it could contain approximately 2.5 million cubic yards of material.

The Environmental Protection Agency or EPA maintains ocean disposal sites LA-2 you can see on the screen, as well as LA-3. LA-2 has an annual maximum disposal volume of one million cubic yards from all sources. And LA-3 has an annual maximum volume of 2.5 million cubic yards. So we've made assumptions for the study that we'd be able to place about 900,000 cubic yards a year at LA-2 and about 2.2 million yards a year at LA-3.

This assumes dredging will be performed using a hopper dredge as well as clamshell dredge. To minimize transit time, disposal of material from the hopper dredge will maximize use of the nearshore site, while a clamshell dredge will be used most likely for disposal at LA-2 and LA-3. To reduce air quality emissions, the construction of an electrical substation on Pier J would also be required to maximize the ability to use electric dredge equipment.

I mentioned the tentatively selected plan has a private cost $151 million. This shows the cost share. Different parts of the project are cost shared different ways; but the project costs of approximately $131 million, which is -- most of the dredging and mitigation would be cost shared between the sponsors here [phonetic] and the Port of Long Beach 50/50. It shows 65.6 million apiece.

And then the local service facilities, the additional berth dredging, the strengthening of the Pier J breakwaters, that is about $19-and-a-half million. And that would be 100 percent paid for by the co-sponsor.

So the integrated feasibility report considered the potential impacts of the proposed alternatives in addition to the No Action Alternative according to several resource categories: Geology and topography, oceanographic and coastal processes, water and sediment quality, air quality, greenhouse gases, aesthetics, cultural resources, noise, socioeconomics, transportation, land use, recreation, public safety and public utilities.

And just to note -- the draft document that is on the street is a combined environmental impact statement which complies with the National Environmental Impact Policy Act, NEPA. It's also an environmental impact report which satisfies CEQA, which is the California Environmental Quality Act. The Port is a lead agency for CEQA and, of course, the lead agency for NEPA.

So this is, obviously, a highly developed port complex which impacts will only be during construction. The Federal Endangered Species Act consideration -- we have the California Least Tern present seasonally, but project construction would not affect this species.

Temporary loss of benthic organisms resulting from any dredging or placement operations is possible. Air quality, significant levels -- we have ways to minimize the impacts with electric dredging at the site and emissions reduction at the site. And then we would do monitoring for water quality during dredging activities.

So we have significant unavoidable impacts to air quality that may occur from the emissions of air contaminants from construction equipment. So this is the impacts during construction -- not after construction. Mitigation measures would be implemented, but would not reduce impacts to below significance.

Therefore, mitigation measures identified, including the first one, which is the use of electric clamshell dredge -- would be required for the project during the entire construction period of the project and the construction of an electrical substation at Pier J would be required to provide electric power to the clamshell dredge.

Construction related harbor craft -- construction-related harbor craft with Category 1 or Category 2 marine engines shall meet USEPA Tier 3 emission standards for marine engines. Off-road construction equipment -- anything that's self-propelled, diesel-fueled off-road construction equipment, 25 horsepower or greater shall meet the USEPA/CARB Tier 4 emission standards for non-road equipment.

And then the last one would be additional mitigation for off-road construction equipment. Diesel-powered construction equipment shall comply with the following: Construction equipment shall be maintained according to manufacturer's specifications, and construction equipment shall not idle for more than five minutes when not in use.

So our environmental coordination is really related mostly to cultural resources -- consultation on the area of potential effects and the need to develop a programmatic agreement initiated in a letter sent to the State Historic Preservation Officer. The letter has been sent in October of this year. We have sent project initiation letters to tribal contacts in July and followup letters specifically describing the tentatively selected plan were also sent in October of this year.

And the Corps proposes to develop a programmatic agreement to fulfill the National Historic Preservation Section 106 responsibilities and phase future inventories.

So the Corps has undertaken initial coordination and outreach with Federal and State resource agencies. Concerns of the U.S. Fish and Wildlife Service and California Department of Fish and Wildlife may be potential concerns to the California Least Tern, which is known to forage in the study area only during its nesting season of mid-April to mid-September. The tern does not nest in the study area, and the closest nesting location is in the Port of Los Angeles.

Major issues are anticipated to be the temporary loss of benthic organisms resulting from dredging or in-water construction either by removal or burial and water quality impacts during dredging activities.

I'll turn it over to Allyson Teramoto.

MR. GAMETTE: I'm not Allyson, but if you don't mind before Allyson comes up -- I just want to thank and introduce Tina Ahmad [phonetic] from Assembly Member Patrick O'Donnell's office. Thank you for coming today. You might have already raised your hand, but thanks again for coming. And the Port of Long Beach wants to thank the Assembly Members' support of this public process and the Port of Long Beach. So thank you. Allyson.

MS. TERAMOTO: Thank you, Sean and Heather. Good afternoon. I'm Allyson Teramoto, and I am the manager of CEQA/NEPA Practices for the Port of Long Beach. As the local sponsor for the project, the Port of Long Beach is the local lead agency for the implementation of the California Environmental Quality Act, or See-Kwa. As such, an environmental impact report of EIR has been prepared and included in Chapter 12 of the Draft Integrated Feasibility Report and EIS/EIR.

Heather previously described the plan formulation and the array of alternatives. Similar to the NEPA EIS, Alternative 3 or the Army Corps' Tentatively Selected Plan or proposed action is the proposed project for the CEQA evaluation. For the purposes of CEQA the environmental study is used to determine the impacts associated with the proposed project and is based on the environmental conditions that existed at the time of the initial Notice of Preparation for this project, which was published in November, 2016.

In contrast, NEPA assumes the year 2027 as the base year for analysis, which is the end of construction, at which all the benefits of the proposed action are realized.

The EIR also evaluates the same environmental resource areas as the EIS. However, the CEQA document also evaluates environmental impacts to hazards and hazardous materials and global climate change. In addition, CEQA also requires an EIR to discuss the growth inducement potential of a proposed project, including ways in which the project could potentially foster economic or population growth or the construction of additional housing.

In summary, based on the analysis, potential significant and unavoidable impacts to air quality associated with construction activities would remain after the implementation of mitigations AQ-1 through AQ-4, which were previously described by Heather.

Direct air emissions of nitrogen oxides, particulate matter, carbon monoxide and volatile organic compounds are expected to exceed South Coast Air Quality Management District's thresholds during construction. Off-site ambient concentrations of nitrogen dioxide are expected to exceed the one-hour national ambient air quality standard.

In addition to the mitigation measures, we are proposing a special condition for the proposed project: The Port would contribute approximately $147,000 to the Port's Community Grants Program, which was originally established to mitigate projects' cumulative operational impacts. However, for the proposed project, the contribution to the grants program was considered for pollutants that would exceed the South Coast Air Quality Management District's peak daily significance thresholds during construction activities following the implementation of mitigation measures.

With this, I'll hand it back to Heather to go over the next steps. Thank you.

MS. SCHLOSSER: Thank you, Allyson. We are currently, as I mentioned, in the public and concurrent review phase of the study. So we will consider all comments received. And as mentioned before, the Corps will hold what's called an Agency Decision Milestone with senior leadership to determine if changes are needed to the tentatively selected plan.

The study will then move forward towards finalizing the report in December of 2020. And the Port of Long Beach Harbor Commission will consider CEQA certification of the Environmental Impact Report around April of 2021. The Corps is then looking towards gaining concurrence and approval from the Chief of Engineers of the Corps of Engineers in September of 2021.

The report would then be forwarded to the Assistant Secretary of the Army for Civil Works for its consideration and approval of the Record of Decision. At this time authorization of the project is anticipated in 2022 with construction starting in 2024 and, as Allyson mentioned, completion in 2027.

I will now turn the presentation back to Colonel Barta for closing remarks.

COL. BARTA: Thank you, Heather. So our meeting here tonight is not just a formality. I and we really do care about what you have to say. Make no mistake about it, your participation and contributions will be instrumental in helping us to develop a plan that far exceeds what we could develop just on our own. Your contributions are essential in helping us get to the decision needed to finalize the study. Today is the next step in this process.

So all this so far has been a warm-up, and now we are getting to the actual most important part of the meeting, which is the public comment section. So there are going to be several guidelines that we ask you to follow when you speak out of respect for others who are interested in these projects.

First, to ensure completeness of the record, please identify yourself clearly at the beginning of your comments and state the interest or organization that you represent. We ask that you provide comments applicable to this topic meeting, the Port of Long Beach Deep Draft Navigation Feasibility Study.

Please be brief and to the point when providing comments tonight, not more than three minutes. If you require more time and more detailed comments, you can provide those comments in writing on the comment cards provided. Please be respectful to the opinions and viewpoints of everyone who comes to speak tonight.

Given the time constraints, we do not plan to respond to the comments that you make tonight, but will be available for an informal and off-the-record discussion after the meeting by the poster for those of you who are interested parties.

If you do not want to speak tonight, but are still interested in providing comments, please take a comment card with you. Written comments can be sent to Mr. Ed De Mesa or Mr. Larry Smith's attention at the address shown on the card and this slide. The Web page listed on the slide also includes a link to the same mailbox for submitting e-mail comments. All comments postmarked by December 9th will be included in the final documentation.

After December 9th we'll consider all comments received in the coming months and inform the Corps of Engineers' senior leadership when we come back prior to the Agency Decision Milestone meeting where leaders will select a single recommended plan.

With that, let's begin with the first comments. I'll turn this over to Ed De Mesa.

MR. De MESA: Thank you. I have Ms. Heather Kryczka.

COL. BARTA: Do you mind stepping to the microphone?

MS. KRYCZKA: I'm Heather Kryczka. I'm an attorney with the National Resources Defense Council. So thanks so much to the staff for the presentation today, and I'd also like to thank the Long Beach Environmental staff for giving us some information about this project and meeting with us about this.

The draft CEQA and NEPA documents here take the position that the dredging project will not facilitate future growth at the Port. This position is flawed and the documents are inadequate because they fail to disclose or mitigate the impacts of growth that will be accommodated by the dredging project.

The stated purpose of the project gives away the fact that this project is inextricably linked to the Port's growth. The draft EIR and EIS states that the project is needed to reduce current inefficiencies in ship unloading and to expand the Port's capacity to bring in the larger ships of the future. Increasing the harbor's efficiency and capacity means that the Port will be able to bring in bigger ships carrying more cargo than it currently brings in. And indeed, deepening the harbor to accommodate mega ships that the Port expects to see in future years is an important component of its plan to grow and maintain its market share.

CEQA and NEPA require the Port and the Army Corps to analyze and mitigate the foreseeable environmental impacts of the project including the growth-inducing effects of the project. The agencies must analyze how the project will impact the Port's capacity for increasing its cargo throughput.

The agencies must also analyze how increased cargo throughput will result in overall higher levels of emissions, health impacts, truck traffic, noise, greenhouse gas emissions and other impacts on the community. Mitigation measures must be proposed for those operational impacts.

The EIR and EIS also failed to look at the direct impacts of bringing larger vessels into the harbor. Ultra large ships carry more cargo and will take longer to unload spending more time in the harbor. They also require more cargo handling equipment, rail and truck visits at any given time to handle the influx of the larger cargo loads resulting in higher concentrations of pollution.

The agencies treat forecasted growth and cargo throughput as a given in this draft EIR/EIS.

But growth is not a force of nature. Actions taken by the Port and the Army Corps impact the level of growth that will occur in the future. This deepening project is one of the actions that will majorly influence the Port's future capacity. The agencies are legally required to disclose the impacts that will result from accommodating more growth and larger ships in order to allow for an honest and informed decision-making process on this issue.

Thank you.

COL. BARTA: Thank you for your comments. For the future speakers, there is a light next to the speaker, and it's set for three minutes. When 30 seconds remains, it will turn yellow and turn red after three minutes.

MR. De MESA: We have Ms. Andrea Hricko.

MS. HRICKO: Hi. My name is Andrea Hricko, and I'm a professor emeritus from the USC Keck School of Medicine. Thank you for the opportunity to present comments on this proposal. I have the same key concerns that many others have raised in comment letters; namely, lack of an evaluation of air pollution and health effects resulting from brining in larger oil tankers and containerships in future years.

In February comments from USEPA stated that the proposed project has the potential to result in increased air pollutants from dredging, from larger cargo vessels and the rail and truck-transported increased freight that a deepening allows. EPA recommends that emissions from all of these sources be analyzed, disclosed and mitigated to the extent feasible.

I have two other concerns about the dredging itself. One is the use of Tier III tugboats and electric dredges as mitigation measures. And the second is the cursory and, I believe, flawed description of the contaminant levels in the sediment and where dredging materials would be disposed.

First the air quality mitigation measures call for tugboats and dredges. The draft EIR says tugboats should use Tier III engines. The City of Long Beach mitigated negative declaration for the Long Beach cruise terminal improvement project, and it is clear that small Tier III engine tugboats are not readily available in southern California. If the type of tugboats that are needed for this harbor deepening are actually not readily available, then the EIR must require that the Port of Long Beach purchase the needed Tier III engine tugboats for this major project.

The EIR also describes a clamshell electric dredge. Again, the EIR must require that the Port buy such a dredge or dredges. The Port cannot assume it will have access to an electric dredge. I have a question about whether there is any way to electrify the hopper dredges that will be dredging sediment material to the nearshore disposal site. And if there is a way to electrify them, then they should be required to be electrified.

Another major concern in the EIR is there appears to have not yet been any chemical contamination testing of the sediment that will be dredged other than some sampling done in 2018 of the Approach Channel. Obviously, more robust sampling with results must be made publicly available, and it must be done as part of this EIR.

Based on the cruise terminal project dredging soils report, there is likely to be moderate contamination. The EIR, however, states there is likely to be moderate contamination, and it states that will be okay for ocean disposal with no data backing that up. We need to see the actual results.

And the phrase "moderate contamination" of Port of Long Beach Harbor sediments had been interpreted in divergent ways. Back in 2009 there was testing done near the cruise terminal, and it showed moderate levels of contamination. We're talking arsenic, lead, chromium, zinc, and the material was deemed unsuitable for ocean disposal in 2009.

On the other hand, sediment sampling done -- my last sentence -- done in 2018 near the cruise terminal showed moderate contamination; yet, the City of Long Beach concluded that the disposal in the ocean was acceptable. The levels were higher in 2018 than they were in 2019 and in 2009; yet, in 2019 the Port and the City said that dumping it in the ocean was okay.

Thank you. I have a written comment, but I left out a draft, so I'll send you my written comments.

MS. SCHLOSSER: That wasn't our timer.

MS. HRICKO: It was my cellphone.

MR. De MESA: Next is William Johns.

MR. JOHNS: Hi, my name is William Johns. I'm with a company Utility Coordination, Incorporated, and I pretty much work with a lot of the pipeline companies and all. So my question is kind of geared towards that and appreciated your presentation.

I did have one question on how far into the main channel the depth -- I think it was 57 feet. If it goes 70 feet all the way to that Berth 121, which is the deep water oil facility -- but my comment is for the planning, taking care of, including permitting and then footprint for impacted utilities.

So if you find underground former dredge HDDs, things like that, that allows for in the permitting process -- it could take a mile away on each side of the project to impact a large petroleum line and crossing. So taking that into account is the permitting development and also the footprint for temporary construction easements and things like that.

On my statement -- I didn't write it down. I'm just winging it up here. So thank you.

COL. BARTA: Thank you. Those are all the registered comments. There's opportunity for anybody who had oral comments. No.

So with that, we will go ahead and end the formal portion. All the project management teams for Corps of Engineers and the Port will stick around to answer informal questions that you have to get more input and feedback from the public. So thank you for attending and thank you for being very cooperative.

(Proceedings concluded at 4:10 p.m.)

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REPORTER'S CERTIFICATE

I, the undersigned Certified Shorthand Reporter, holding a valid and current license issued by the State of California, do hereby certify:

That said proceedings were taken down by me in shorthand at the time and place therein set forth and thereafter transcribed under my direction and supervision.

I further certify that I am neither counsel for nor related to any party to said action, nor in any way interested in the outcome thereof.

IN WITNESS WHEREOF, I have subscribed my name on this date: November 21, 2019.

____
Certified Shorthand Reporter

STATE OF CALIFORNIA

PORT OF LONG BEACH and
UNITED STATES ARMY CORPS OF ENGINEERS:

DEEP DRAFT NAVIGATION FEASIBILITY STUDY

PUBLIC HEARING 6:00

415 West Ocean Boulevard

Wednesday, November 13, 2019

Long Beach, California

REPORTED BY: Katherine Henry-Sexton, CSR No. 13662

REPRESENTATIVES:

Colonel Aaron Barta, District Engineer and Commander, Army Corps of Engineers, LA District

Sean Gamette, Managing Director, Port of Long Beach

Heather Schlosser, Lead Environmental Planner, Army Corps of Engineers

Allyson Teramoto, Manager of CEQA/NEPA, Practices, Port of Long Beach

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Ed De Mesa, Chief of Planning, Army Corps of Engineers

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Chris Lee, Project Manager, Army Corps of Engineers

Larry Smith, Environmental Coordinator, Army Corps of Engineers

John Goertz, Coastal Engineer, Army Corps of Engineers

Matt Arms, Environmental Planning, Port of Long Beach

Eric Paulsen and Derek Davis, Project Management, Port of Long Beach

TRANSCRIPT OF PROCEEDINGS

6:03 P.M.

* * *

COL. BARTA: Welcome, everyone, ladies and gentlemen. My name is Colonel Aaron Barta. I'm the District Engineer and Commander of the United States Army Corps of Engineers, Los Angeles District, covering southern California, Arizona and southern Nevada. I'd like to thank you for taking the time to come out to today's public hearing as we look at the Port of Long Beach Deep Draft Navigation Feasibility Study.

The Corps and the Port of Long Beach are co-hosting this event for shared meeting. Before we start I'll go over some administrative items. One is to make our presentation as accessible as possible, we have an American Sign Language interpreter and a Spanish language translator service available for this hearing. Anyone who would like to use either of these services, please let one of our staff members know at this time. The restrooms are located outside the meeting doors to the right, and the emergency exit is located in the rear of room and exits out to Chestnut Avenue.

So our purpose why we're here tonight is to hear the public's concerns and your questions regarding the study findings up to this date, the array of alternatives we have formulated and evaluated, and more specifics on the identified tentatively selected plan. This meeting is part of a public review process that ends on the 9th of December.

Before I talk more about the details of this meeting and the public review timeframe a little later, let me first introduce some of the staff members here tonight. So joining me on my staff from the Corps of Engineers, we have Mr. Ed De Mesa, our chief of planning; Ms. Raina Fulton, our chief of our planning formulation; Ms. Chris Lee, project manager; Ms. Heather Schlosser, our lead planner; Mr. Larry Smith, environmental coordinator; and Mr. John Goertz, coastal engineer, and Chuck Mesa, coastal engineer.

I'd also like to acknowledge the Port of Long Beach staff members in attendance including Mr. Sean Gamette who is the managing director; Mr. Matt Arms from environmental planning; Mr. Eric Paulsen and Derek Davis from project management; Ms. Allyson Teramoto, manager for the CEQA/NEPA practices; and Mr. Justin Luedy and Janna Morimoto from our environmental staff.

So thank you to the Port for arranging tonight's meeting and your continued support for the study and the sound partnership we've had ever since the study was first initiated.

You, the public, have an important role with the Corps of Engineers and our National Environmental Policy Act also known as NEPA in its process, overall planning process. After all, the Army Corps of Engineers is designed to serve the people of the United States. The Corps' goal tonight is to exchange information in several ways. First, we'll briefly describe the feasibility study process to date, our draft findings so far and what is to come in the next steps to study completion.

Most importantly, tonight we are seeking the public's input during the remainder of the public comment period for those interested in contributing comments on the study. Today we want to hear from anyone who wishes to make oral comments on the draft feasibility report. Alternatively, you'll have until December 9th to submit written comments to us via e-mail or by mail that we'll display at the end of this presentation.

When you signed in tonight, you were also offered comment cards to notify us if you're interested in speaking tonight. These blue cards, they look like this. You can get them at the front desk. We'll be around, in addition, to collect any remaining cards in the next few minutes. We'll sort through the cards in the order received to identify the checked boxes that indicate your interest in speaking tonight.

We ask that you initially limit your comments to nor more than three minutes to allow enough time for all interested parties to contribute their comments. If time permits, we'll open up the floor for others interested in speaking.

I'll speak more about the public comment period later; but first, I would like to invite Sean Gamette, managing director of the Port of Long Beach, to say a few words about the study.

MR. GAMETTE: Thank you. Good evening everybody. My name is Sean Gamette, and I'm the managing director of engineering for the Port of Long Beach. And I'm definitely happy to be here tonight. I just want to say on behalf of the Port we welcome you to our new facility here at 415 West Ocean. It's an amazing place. We've been blessed to be back down from where we were located next to the Long Beach Airport to the Port that we love to be involved with here at the Harbor Department, City of Long Beach. So we're really happy to have you guys here.

We really want to thank all you guys who are out in the audience for attending tonight taking the time to come here.

The proposed project has been around for some time, and we're all really excited to see it move forward. With that said, I'd really like to thank the hard working staff of the Port of Long Beach and the U.S. Army Corps of Engineers for all the work they've done to bring us up to this point.

And I'd say a little bit more -- any successful port is going to have a successful and great partnership with the United States Army Corps of Engineers. And tonight we're going to be talking about why that is. We're not going to be taking about site improvements like we often do in public meetings -- terminal improvements, rails, things like that. We're going to be talking about having an adequate waterway, and that's what our partnership with the Army Corps of Engineers brings.

So we're really excited about this partnership together. It's a big milestone tonight.

We very much look forward to anyone from the public speaking tonight on the proposed project. And with that, those brief comments, I'd like to invite Heather Schlosser who will be giving a presentation on behalf of the Army Corps of Engineers. Thank you.

MS. SCHLOSSER: Thank you, Sean, and thank you, Colonel Barta. So this is our water resources project delivery process. It starts with local interest. The Port of Long Beach asked for Federal assistance in solving the water resource problem. Congress acts by authorizing and appropriating funds to the Corps to study the problem.

The general feasibility process is laid out on this graphic. The star indicates where we are in this process, which is in the midst of public review and other concurrent reviews. At the end of the presentation I'll talk more about the next steps when we get to authorization of the project.

This study was conducted as an interim response to the resolution of the House Committee on Public Works on July 10, 1968. In summary, Congress has given the Corps of Engineers the authority to look at "promoting and encouraging the efficient, economic and logical development of the harbor complex." This may include "investigation of current shipping problems, adequacy of facilities, delays in intermodal transfers, channel dimensions, storage locations and capacities, and other physical aspects affecting waterborne commerce in the San Pedro Bay region."

As the nation's second busiest container seaport, activity at the Port supports over 51,000 jobs in Long Beach. Across southern California the Port supports well over half a million jobs providing about $30 billion in income. Nation-wide the Port supports about 2.6 million jobs providing close to $127 billion in income.

The Port of Long Beach provides shipping terminals for nearly one-third of the waterborne trade moving through the West Coast. The Port's ability to accommodate large containerships and handle additional cargo is a key objective of the Port of Long Beach.

Widening and enlargement of the Panama Canal has led to a new class of container vessels whose fully loaded drafts exceed current Federal channel and berth depths. This has led to one of the primary problems facing current operations, which is the inefficient operation of deep draft container vessels in secondary and Federal channels, which increases the nation's transportation costs.

Container vessels must either ride the tides, enter and leave only on high tides or light load the vessel in order to ensure a shallower draft required to safely enter and leave the Port.

Additionally, liquid bulk vessels which transport petroleum products must enter and exit the two-mile long Approach Channel one at a time, which results in increased delays due to channel width limitations, or they must delay entry during wave swells and other conditions or light load at point of origin are depth limitations along the Approach Channel.

The planning objectives for this study are to increase transportation efficiencies during the period analysis for container and liquid bulk vessels operating in the Port of Long Beach for both the current and future fleets and to improve conditions during the period of analysis for vessel operation and safety, including reducing constraints of harbor pilot operating practices.

The container and liquid bulk design vessels were determined based on input and forecasts from the Port of Long Beach, professional judgment of harbor pilots and data collection and analysis by the

Corps of Engineers. The container design vessel characteristics include a 1,300-foot long ship with a maximum draft of 52 feet. This is roughly equivalent to what's called a Triple E or Gen 4 vessel class. The liquid bulk design vessel is a 1,200-foot long vessel with maximum draft of 70 feet. This vessel is within the very or ultra large crude carrier class, also known as VLCC and ULCC.

An essential step when evaluating navigation improvements is to analyze the types of volumes of cargo moving through the Port. Trends in cargo history can offer insights into a port's long-term trade forecasts; and thus, the estimated cargo volume upon which future vessel calls are based.

Under future without and future with project conditions, the same volume of cargo is assumed to move through the Port of Long Beach. However, a deepening project will allow shippers to load their vessels more efficiently or take advantage of larger vessels.

This efficiency translates to savings and is the main driver of what the Corps calls our National Economic Development. Strong growth in throughput, as you can see on the right side of the slide -- is to continue until the Port of Long Beach's facilities reach capacity, which is anticipated around 2035.

Management measures were developed through brainstorming sessions during our reconnaissance phase, a kickoff meeting and a value engineering workshop. Each measure was assessed and a preliminary determination made whether it should be retained for consideration and formulation of alternatives.

The measures that were carried forward were deepening the West Basin Channel and constructing a turning basin as shown here in yellow of this map -- which is expected to decrease delays and light loading for large containerships. Next would be to construct an approach channel and turning basin at the entrance to Pier J South shown in the orange here, which would also look to decrease delays in light loading for those large containerships.

According to the draft Corps Master Plan Update, the Pier J South slip may not be operational after year about 2047. And that has been taken into account in our analysis.

We also considered constructing or deepening this area called a standby area, which is in purple here. This would be a waiting and passing area inside the breakwater, and would reduce delays for those deeper drafting liquid bulk vessels and provide a safe area of anchor adjacent to the Approach Channel.

And then finally, we also looked at deepening Queen's Gate -- what you see in this blue area -- just inside the breakwater, as well as the Approach Channel up to two miles. This would be aimed at reducing delays and light loading for deeper drafting liquid bulk vessels.

So the measures carried forward are independent with the exception of certain fixed costs per staging equipment and placement site constraints. So basically, all the different colors you see on the map could be done as separate projects.

So this creates a relatively large number of potential alternatives. To address this, the analysis was separated initially into measures impacting the liquid bulk movements, which is the Approach Channel and standby area, and you'll see in the red area some thin easening or widening a little bit of the main channel. So that's for the liquid bulk containerships at the Pier J, Approach and turning as well as the West Basin.

For the containerships and for those measures, depths analyzed ranged between 53 feet to 57 feet below mean lower low water as in the Pier J approach channel and West Basin area.

Measures considered to address the planning objectives associated with liquid bulk vessels included deepening the Approach Channel with depths ranging from 78 feet to 83 feet below mean lower low water. And then the depths we looked at for the red area, the main channel, would just be equivalent to the current Federal channel, which is 76 feet. And then the areas we looked at for the standby area -- that's where we looked at the standby area -- included a depth that ranged from between 67 to 73 feet below mean lower low water.

Additionally, local services facilities would be those actions that would be needed to be take in order to fully implement the project, whether or not cost shared by the Corps of Engineers or whether they would be actions that would be paid for by the Port of Long Beach. Actions include berth dredging in Pier J South as well as along Pier T, as well as structural improvements of the Pier J breakwaters.

Based on the economic analysis, the

combination of measures included deepening to 55 feet below mean lower low water for the containerships and to 80 feet below mean lower low water for the liquid bulk -- provides the greatest contribution of net benefits and has been determined as what the Corps has identified as the National Economic Development Plan but is presented here as the Tentatively Selected Plan. And that is Alternative 3 I'm showing you in yellow.

Alternative 2 represents a smaller scale, and Alternative 4 is a larger scale alternative. A standby measure was also analyzed, but current results indicate that the standby part of the project is not independently economically justified.

However, it is included as a component of Alternative 5. So Alternative 5 is essentially Alternative 3 with the standby area added to it.

So the Tentatively Selected Plan would deepen the Approach Channel -- the bright blue area here -- as I mentioned, to 80 feet below mean lower low water, and widen parts of the main channel. And that's to 76 feet below mean lower low water for liquid bulk vessels and would construct an approach channel and turning basin to Pier J South to 55 feet below mean lower low water and deepen the West Basin to 55 feet as well. Approximately 7.4 million cubic yards of material would be placed in a nearshore site as well as two EPA-designated offshore disposal sites.

In addition to the activities listed above, the Port of Long Beach would conduct berth dredging within the Pier J South Basin along Berths J266 to J277. This is the area shown in the orange area here (indicating) -- and Berth T140 along Pier T, both of those would be deepened to 55 feet below mean lower low water. Structural improvements would also be performed -- there's a little "4" there -- on the Pier J breakwaters to accommodate deepening through the opening there.

Construction would take approximately three-and-a-half years beginning in 2024. The estimated cost is about $151 million with an average net annual benefit of $18 million. The Tentatively Selected Plan maximizes those net national economic development benefits and has a benefit cost ratio of 3.8.

This map shows the dredged material placement sites we have identified: A nearshore placement site near Sunset Beach shown at the top here. We're looking at utilizing this area. Right now it's the borrow pit that the Corps has used to get sand from this place for a beach sediment project. And we estimate that this nearshore site could hold about approximately 2.5 million cubic yards of material.

And then we also have the two EPA ocean disposal sites, LA-2 and LA-2. LA-2 has an annual maximum disposal capacity of one million cubic yards that it can take from all sources. We're assuming that we could utilize that and place about 900,000 cubic yards a year there. LA-3 has a capacity of 2.5 million cubic yards a year from all sources. And we're assuming that we'd be able to place about 2.2 million yards a year there in construction.

This assumes dredging will be performed using a hopper dredge as well as a clamshell dredge. To minimize transit time, disposal of material from the hopper dredge would maximize use of the nearshore site, while a clamshell dredge would be looked at for disposal at LA-2 and LA-3. And to reduce air quality emissions, the construction of an electrical substation on Pier J would also be required for the project to maximize the ability to use electric dredge equipment.

This shows the Tentatively Selected Plan.

It has a project cost $151 million. This shows the cost share. The Corps and the Port would cost share a portion of the dredging, including mitigation costs. So we would cost share about $131 million 50/50.

And then the local service facilities includes the berth dredging and the work at the Pier J breakwaters would be borne by the local sponsor. That is about almost $19-and-a-half million.

So this integrated feasibility report considered the potential impacts of the proposed alternatives in addition to the No Action Alternative according to several resource categories, including geology and topography, oceanographic and coastal processes, water and sediment quality, air quality, greenhouse gases, aesthetics, cultural resources, noise, socioeconomics, transportation, land use, recreation, public safety and public utilities.

This is, obviously, a highly developed port complex, and we estimate that impacts would only occur during construction. As far as looking at the Federal Endangered Species Act, we have the California Least Tern present seasonally, but project construction we don't think would have an effect on this species.

There's a potential for temporary loss of benthic organisms resulting from any dredging or placement operations. We are looking at air quality -- significant levels emissions for air quality during construction. And then we would need to monitor for water quality during dredging activities.

So significant unavoidable impacts to air quality may occur from the emissions of air contaminants from construction equipment. Mitigation measures would be implemented, but would not reduce impacts to below significance. The mitigation measures we have presented in the document include the use of an electric clamshell dredge -- would be used for the project during the entire construction period. And the construction of an electrical substation at Pier J, as I mentioned previously, would be required to provide electric power to that dredge.

Construction-related harbor craft with Category 1 or Category 2 marine engines shall meet USEPA Tier 3 emission standards for marine engines. For off-road construction equipment, self-propelled, diesel-fueled off-road construction equipment, 25 horsepower or greater shall meet the USEPA/CARB

Tier 4 emission standards for non-road equipment.

And then the last one, off-road, diesel-powered construction equipment shall comply with the following: Construction equipment shall be maintained according to the manufacturer's specifications; and construction equipment shall not be idle for more than five minutes when not in use.

This shows a snapshot of environmental coordination specifically related mostly to cultural resources. Consultation on the area of potential effects and the need to develop a programmatic agreement has been initiated with the State Historic Preservation Officer. The letter was sent in October of this year. We sent project initiation letters to tribal contacts in July and a followup letter specifically describing the Tentatively Selected Plan in October of this year.

And as I mentioned, the Corps proposes to develop a programmatic agreement to fulfill the National Historic Preservation Section 106 responsibilities and phase future inventories.

So the Corps has undertaken an initial coordination and outreach with Federal and State resource agencies. Concerns of the U.S. Fish and Wildlife Service and California Department of Fish and Wildlife will be potential impacts to the California Least Tern. The Least Tern is known to forage in the study area only during its nesting season defined as mid-April to mid-September. The tern does not nest in the study area, and the closest nesting location is in the Port of Los Angeles.

Major issues are anticipated to be the temporary loss of benthic organisms resulting from any dredging or any water construction either by removal or burial and water quality impacts during dredging activities and placement.

Now I'll turn it over to Allyson Teramoto.

MS. TERAMOTO: Thank you, Heather. I'm Allyson Teramoto, and I am the manager of CEQA/NEPA Practices for the Port of Long Beach. As the local sponsor for the project, the Port of Long Beach is the local lead agency for the implementation of the California Environmental Quality Act, or See-Kwa. As such, an environmental impact report of EIR has been prepared and included as Chapter 12 of the Draft Integrated Feasibility Report and EIS/EIR.

Heather previously described the plan formulation and the array of alternatives. Similar to the NEPA EIS, Alternative 3 or the Army Corps' Tentatively Selected Plan or proposed action is the proposed project for the CEQA evaluation. For the purposes of CEQA the environmental study is used to determine the impacts associated with the proposed project and is based on the environmental conditions that existed at the time of the initial Notice of Preparation for this project, which was published in November, 2016.

In contrast, NEPA assumes the year 2027 as the base year for analysis, which is the end of construction, at which time all the benefits of the proposed action are realized.

The EIR also evaluates the same environmental resource areas as the EIS. However, it also evaluates the potential environmental impacts to hazards and hazardous materials and global climate change. In addition, CEQA also requires an EIR to discuss the growth inducement potential of a proposed project, including ways in which the project could potentially foster economic or population growth or the construction of additional housing.

Based on the environmental analysis, potential significant and unavoidable impacts to air quality associated with construction activities would remain after the implementation of mitigation measures, AQ-1 through AQ-4, which were previously described by Heather.

Direct air emissions of nitrogen oxides, particulate matter, carbon monoxide and volatile organic compounds are expected to exceed South Coast Air Quality Management District's thresholds during construction activities. Off-site ambient concentrations of nitrogen dioxide are expected to exceed the one-hour national ambient air quality standard also during construction activities.

As a special condition for the proposed project, the Port would contribute approximately $147,000 to the Port's Community Grants Program, which was originally established to mitigate the projects' cumulative operational impacts. However, for the proposed project, the contribution to the grants program was considered for pollutants that would exceed the South Coast Air Quality Management District's peak daily significance thresholds during construction activities following the implementation of mitigation measures.

So with this, I'll hand it back to Heather to go over the next steps. Thank you.

MS. SCHLOSSER: Thank you, Allyson. We are currently, as I mentioned, in the public and concurrent review phase of the study. So we will consider all comments received. And the Corps will hold what's called an Agency Decision Milestone with senior leadership to determine if changes are needed to the Tentatively Selected Plan.

The study will then move forward towards finalizing the report in December of 2020. And the Port of Long Beach Harbor Commission will consider CEQA certification of the Environmental Impact Report around April of 2021. The Corps is then looking towards gaining concurrence and approval from the Chief of Engineers in September of 2021, a signed Chief's report.

That report would then be forwarded to the Assistant Secretary of the Army for Civil Works for its consideration and approval of the Record of Decision. At this time authorization of the project is anticipated to be in the year 2022 with construction starting in 2024 and completion in 2027.

I will now turn the presentation back to Colonel Barta for closing remarks.

COL. BARTA: Thank you, Heather. So our meeting here tonight is not just a formality. I and we really do care about what you have to say. Make no mistake, just being instrumental in helping us develop a plan which exceeds what we could have done just on our own. Your contributions are essential in helping us get to the decision needed to finalize the study. Today is the next step in this process.

So that was Part A, and now we go into the most important part -- giving an opportunity to the public to provide comments. So there are going to be several guidelines that we ask you to follow so we have respect for others who are interested in these projects.

MR. De MESA: I don't believe anybody has been identified to provide comments.

COL. BARTA: All right. Is there anybody here who would like to provide any open comments? No questions.

There is an opportunity to provide written comments via e-mail or on the back of your comments cards; and we will incorporate that into our study as well. I'll close the formal portion, and the staff will be around to ask any questions. Thank you.

(Proceeding concluded at 6:40 p.m.)

* * * *

REPORTER'S CERTIFICATE

I, the undersigned Certified Shorthand Reporter, holding a valid and current license issued by the State of California, do hereby certify:

That said proceedings were taken down by me in shorthand at the time and place therein set forth and thereafter transcribed under my direction and supervision.

I further certify that I am neither counsel for nor related to any party to said action, nor in any way interested in the outcome thereof.

IN WITNESS WHEREOF, I have subscribed my name on this date: November 21, 2019.

K. Henry Sexton

Certified Shorthand Reporter

Attachment 4

Agency Coordination Correspondence

4.1 National Marine Fisheries Service
4.2 U.S. Fish and Wildlife Service
4.3 South Coast Air Quality Management District
4.4 California Coastal Commission
4.5 Regional Water Quality Control Board
4.6 Assistant Secretary of the Army (Civil Works)
4.7 Clean Air Act General Conformity Determination

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4.1 National Marine Fisheries Service

DEPARTMENT OF THE ARMY
LOS ANGELES DISTRICT, U.S. ARMY CORPS OF ENGINEERS
915 WILSHIRE BOULEVARD, SUITE 930
LOS ANGELES, CALIFORNIA 90017

July 31, 2014

Office of the Chief
Planning Division

Mr. Bryant Chesney
National Marine Fisheries Service
501 West Ocean Boulevard, Suite 4200
Long Beach, California 90802-4221

Dear Mr. Chesney:

The U.S. Army Corps of Engineers (Corps) is initiating the Port of Long Beach Deep Draft Navigation Reconnaissance Study in order to improve navigation efficiencies. The study area is located in the city of Long Beach, Los Angeles County, California. A project vicinity map is enclosed.

To aid the planning process, the Corps requests a current list of any endangered, threatened, proposed or candidate species, pursuant to the Endangered Species Act of 1973, that may be within the vicinity of the study area. Please also include species of concern.

Also, enclosed for your review is a draft plan formulation document identifying preliminary problems, opportunities, objectives, and measures. Your review of the document and initial comments concerning resource constraints as well as avoidance and minimization measures that could further aid the planning process is solicited.

Comments, and the species list, should be forwarded by September 1, 2014, to:

Josephine R. Axt, Ph.D.
Chief, Planning Division
U.S. Army Corps of Engineers
Los Angeles District
915 Wilshire Boulevard, Suite 930
Attention: Mr. Larry Smith
Los Angeles, California 90017-3401

Should you require additional information or have any questions, please contact Mr. Larry Smith, Project Environmental Coordinator, at (213) 452-3846.

Sincerely,

Josephine R. Axt, Ph.D.
Chief, Planning Division

Enclosure

Port of Long Beach Deep Draft Navigation Reconnaissance Study.

1) Problems: The primary problem is the inefficient operation of deep draft vessels—liquid bulk and container—in the Federal channel and secondary channels, which increases the Nation's transportation costs

a. Existing container vessels cannot draft more than 43 feet, which causes lightering and delays to an increasing number of containerships.

b. Delays and lightering from container vessel draft limits will increase as new, larger vessels are added to the fleet.

c. Existing vessels drafting 55 feet or more with LOA of 900 feet cannot enter the Federal Approach Channel during periods of dynamic (high) wave events causing delays.

iv. The severity of delays from dynamic wave effects will increase as liquid bulk (crude oil) traffic increases.

d. Liquid bulk vessels drafting over 61 feet must enter and exit the 2-mile long Entrance Channel one-at-a-time increasing costs due to delays arriving at berths.

e. Oil tankers in VLCC or ULCC classes (+200,000 DWT) drafting over 61 feet have no anchorage within the Inner Harbor due to the lack of deep anchorages creating safety concerns in the event of propulsion or equipment failure, weather conditions, emergency repairs, or other possible berthing issues.

f. Oil tankers are lightering offshore.

2) Opportunities: A number of opportunities were identified in the initial and subsequent steps and iterations of the planning process.

a. Reduce the transportation cost of import and export trade through the Port of Long Beach and contribute to increases in national net income

b. Provide a more accessible channel and increased opportunities for vessel transit

c. Provide improved conditions for vessel operation

d. Reduce constraints of harbor pilot operating practices

e. Provide beneficial placement of sediment (e.g., beach nourishment)

3) Planning Objectives:

a. Contribute to National Economic Development by reducing the cost of transporting cargo volumes to and from the Port of Long Beach by examining improvements to channel dimensions and vessel operations

b. Reduce expected future vessel re-routings from the Port of Long Beach to alternate facilities by examining improvements to channel dimensions and vessel operations

c. Utilize dredged sediment for beneficial means when possible

4) Measures

a. Deepen the secondary access channel to Pier J

b. Deepen the secondary access channel to Pier T West Basin

c. Construct a turning basin in the secondary access channel to Pier J

d. Construct a turning basin in the secondary access channel to Pier T West Basin

e. Deepen the approach channel

f. Deepen Cerritos Channel

g. Construct a turning basin in Cerritos Channel

h. Deepen the Back Channel
i. Construct an inner harbor waiting area or deepen the anchorage along main channel

5) Preliminary Alternatives

a. Improvement to Container & Liquid Bulk Efficiency: Deepen the secondary access channels and construct turning basins to Pier J, Pier T West Basin, and Cerritos Channel. Deepen the approach channel. Construct an inner harbor waiting area and widen the main channel turning basin.

b. Improvement to Container Efficiency: Deepen the secondary access channels and construct turning basins to Pier J, Pier T West Basin, and Cerritos Channel.

c. Improvement to Container Efficiency at Pier J and Pier T West Basin: Deepen the secondary access channels and construct turning basins to Pier J and Pier T West Basin.

Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmap

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
West Coast Region
501 West Ocean Boulevard, Suite 4200
Long Beach, California 90802-4213

AUG 29 2014

Josephine Axt
Office of the Chief
Planning Division
U.S. Army Corps of Engineers
Los Angeles District
915 Wilshire Boulevard Suite 930
Los Angeles, California 90017

Dear Ms. Axt:

NOAA's National Marine Fisheries Service (NMFS) has reviewed a letter from the U.S. Army Corps of Engineers (Corps), received August 8, 2014, requesting a current list of any species that are listed as endangered or threatened, or candidate species for listing, under the Endangered Species Act (ESA) that may be found within the vicinity of Port of Long Beach (POLB) areas under study for modifications to accommodate deep draft vessels. The letter also requests a list of any species of concern that may be in this area. NMFS has also reviewed the supporting project description and background information provided by the Corps along with the August 8, 2014, letter. NMFS offers the following response pursuant to the ESA.

Proposed Project

The proposed project briefly describes the planning study of a suite of construction and dredging operations that could be undertaken to improve the capability of the Port of Long Beach to efficiently accommodate large container vessels (greater than 43 ft draft). The list of measures under study and consideration includes the deepening of several access channels within POLB, the construction of multiple turning basins near these access channels, the construction of an inner harbor waiting area or deepening of the anchorage along the main channel of POLB, and the deepening of the approach channel into POLB. Given the proposed project, NMFS assumes that the project area includes POLB areas within the Long Beach Breakwater, extending out into open marine waters adjacent to the approach channel of POLB.

Endangered Species Act Species List

The following species listed as threatened or endangered under the ESA may be found within the vicinity of the proposed project area:

Sea Turtles	
Leatherback sea turtle - *(Dermochelys corieacea)*	Endangered
Loggerhead turtle - North Pacific Ocean and South Pacific Ocean DPS(*Caretta caretta*)	Endangered
Olive ridley (*Lepidochelys olivacea*)	Endangered/Threatened*
Green turtle (*Chelonia mydas*)	Endangered/Threatened*
Marine Mammals	**Status**
Blue whale (*Balaenoptera musculus*)	Endangered
Fin whale (*Balaenoptera physalus*)	Endangered
Humpback whale (*Megaptera novaeangliae*)	Endangered
Gray whale, western North Pacific population (*Eschrichtius robustus*)	Endangered

* Globally listed as threatened, but populations associated with breeding populations along the Pacific Mexican coast are listed as endangered. Individuals found in southern California are assumed to be part of endangered populations.

As indicated above, there are ESA-listed species of sea turtles and marine mammals that may be found in the vicinity of the project area. Green sea turtles are known to reside and forage year-round in the Long Beach area, including areas within the vicinity of POLB, through observations of free-swimming and stranded animals, as well as through directed scientific research conducted by NMFS. Olive ridley and loggerhead turtles may also occasionally visit coastal areas all along southern California, including the POLB area, as evidenced by stranding records and observations. Several ESA-listed species of whales are also known to occasionally or frequently visit or transit through the coastal waters of Long Beach, as evidenced by observations by an extensive whale watching community, scientific research, and records of stranded individuals. Blue, humpback, and fin whales may seasonally be found in marine waters adjacent to POLB. Gray whales regularly transit through marine waters adjacent to POLB twice a year, during seasonal migrations back and forth from summer foraging grounds in Alaska to winter breeding grounds in Mexico. Most of the gray whales that travel past Long Beach belong to the Eastern North Pacific stock of gray whales, which is not listed under the ESA. However, recent observations have confirmed that individuals from the endangered Western North Pacific stock have been seen migrating along the U.S. west coast, and may pass through marine waters adjacent to POLB. At this time, there are no additional candidate species, species currently proposed for listing, or critical habitats designated under the ESA that occur in the project area.

There may be some additional species in the vicinity of the project area that have been designated as species of concern by NMFS. Based on a review of the current list, it is possible that cowcod (*Sebastes levis*), green abalone (*Haliotis fulgens*), and pink abalone (*Haliotis corrugate*) could be found in the vicinity of POLB and adjacent marine waters. It is also possible that basking sharks *(Cetorhinus maximus)* could occasionally be found in adjacent marine waters. NMFS retains no regulatory authority to protect species of concern, and may not necessarily be the best source of information for all of these species.

Thank you for your consideration of ESA-listed species during the development of your project planning. Upon request, NMFS Protected Resources staff in Long Beach, California is available to help in the determination of how any ESA-listed species may be directly or indirectly affected by the

Project, and assist the Corps with ESA compliance. NMFS staff may also be able to assist in further development of protective measures that can help minimize the potential for adverse effects to ESA-listed species. If you have any questions pursuant to this letter or other ESA issues, please contact Dan Lawson at (562) 980-3209 or Dan.Lawson@noaa.gov.

Sincerely,

fr William W. Stelle
Regional Administrator

cc: Administrative File: 151422WCR2014PR00212

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, LOS ANGELES DISTRICT
915 WILSHIRE BOULEVARD, SUITE 930
LOS ANGELES, CALIFORNIA 90017-3489

October 21, 2019

Mr. Bryant Chesney
National Marine Fisheries Service
501 West Ocean Boulevard, Suite 4200
Long Beach, California 90802-4221

Dear Mr. Chesney:

A copy of the Draft Integrated Feasibility Report (IFR) for the Port of Long Beach Deep Draft Navigation Feasibility Study located in Los Angeles County, California, is available for your review at:

https://www.spl.usace.army.mil/Missions/Civil-Works/Projects-Studies/Port-of-Long-Beach-Deep-Draft-Navigation-Study/

The purpose of the proposed project is to increase transportation efficiencies for both the current and future fleet of container and liquid bulk vessels operating in the Port of Long Beach, and to improve overall conditions for vessel operations and safety, in the event of vessel malfunction or weather-related events. The proposed project deepens existing and constructs new Federal channels and turning basins by dredging and disposing approximately 7.4 million cubic yards of sediment. Construction would begin in 2024 and take approximately three years to complete.

Please review the Draft IFR. This letter also requests your review and written comments for this project, pursuant to the Magnuson-Stevens Fishery Conservation and Management Act, as amended.

Public meetings will be held on Wednesday, November 13, 2019, in the Port of Long Beach Offices located at 415 W. Ocean Blvd, Long Beach, CA 90802 in their first floor multipurpose room. The first meeting will be 3:00 – 4:00 pm. A second meeting will be 6:00 – 7:00 pm.

Please respond with comments on the Draft IFR by December 9, 2019. Correspondence may be sent to:

Mr. Eduardo T. De Mesa
Chief, Planning Division
U.S. Army Corps of Engineers
Los Angeles District
ATTN: Mr. Larry Smith, CESPL-PDR-Q
915 Wilshire Boulevard, Suite 930
Los Angeles, California 90017-3849
EMAIL: POLB@usace.army.mil

If you have any questions regarding the project, please contact Mr. Larry Smith, Project Environmental Coordinator, at (213) 452-3846, FAX: (213) 452-4204, and EMAIL: POLB@usace.army.mil.

Thank you for your attention to this document.

Sincerely,

Eduardo T. De Mesa
Chief, Planning Division

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
West Coast Region
501 West Ocean Boulevard, Suite 4200
Long Beach, California 90802-4213

December 23, 2019

Mr. Eduardo T. De Mesa
Chief, Planning Division
U.S. Army Corps of Engineers
Los Angeles District
ATTN: Mr. Larry Smith, CESPL-PDR-Q
915 Wilshire Boulevard, Suite 930
Los Angeles, California 90017-3849

Dear Mr. De Mesa:

NOAA's National Marine Fisheries Service (NMFS) has reviewed the U.S. Army Corps of Engineers' (USACE) Port of Long Beach (POLB) Deep Draft Navigation Study Integrated Feasibility Report (IFR) and Environmental Impact Statement / Environmental Impact Report. NMFS offers the following comments pursuant to our responsibilities under the Magnuson-Stevens Fishery Conservation and Management Act (MSA), Fish and Wildlife Coordination Act (FWCA), Endangered Species Act (ESA), and Marine Mammal Protection Act (MMPA).

Consultation Background

The USACE requested an ESA species list request on July 31, 2014, and NMFS responded on August 29, 2014 that a number of listed species may occur in the project area. NMFS staff received your transmittal letter on October 21, 2019, regarding the public release of the Deep Draft Study with requested comment response by December 9, 2019. NMFS received notice of the release of the Draft Integrated Feasibility Report, including an Environmental Impact Statement/Environmental Impact Report for the East San Pedro Bay Ecosystem Restoration Study (Restoration Study) on November 27, 2019, which contained new information that affected the basis of our essential fish habitat (EFH) review. Therefore, on December 4, 2019, we requested the use of the expanded EFH consultation timeline (60 days) for our response to the Deep Draft Study. Also, we requested clarification of the dredging area and proposed changes in seafloor depth. The USACE accepted the revised timeline and addressed our information request on December 10, 2019, via electronic mail.

Proposed Project

The proposed project would deepen the entrance to the Main Channel (the Approach Channel through Queens Gate) to a depth of -80 feet (ft) mean lower low water (MLLW), widen portions of the Main Channel (bend easing) to a depth of -76 ft MLLW, construct a new approach channel and turning basin to Pier J South to a depth of -55ft MLLW, and deepen portions of the West Basin and West Basin Approach to a depth of -55 ft MLLW. The POLB would also deepen two additional locations within the harbor to a depth of -55 ft MLLW: the Pier J Slip, including berths J266-270, and berth T140 on Pier T. Structural improvements would also be implemented on the Pier J breakwaters at the entrance of the Pier J Slip to accommodate deepening of the Pier J Slip and Approach Channel to -55 ft MLLW. The total proposed dredging volume is approximately 7.4 million cubic yards (mcy) and total dredge area is approximately 880 acres. The project would expand the size of existing navigation channels and turning basin areas by approximately 345 acres.

According to the IFR, sediment in the proposed Pier J approach channel has not previously been dredged. This area was naturally deep enough to accommodate container vessels going to Pier J without dredging. Dredging in this area would be through sediments that have not historically been dredged, and are expected to be suitable for open ocean disposal. Based upon clarifying information provided by USACE, this new area of dredging would be approximately 241 acres.

Dredged material will be disposed of in a nearshore placement site (Surfside Borrow Site) and ocean-dredged material disposal sites (ODMDS) (LA-2 and LA-3). The nearshore placement site, approximately 5 miles from the project, can accommodate about 2.5 mcy of dredged material. LA-2 and LA-3, approximately 9 miles and 22 miles, respectively, from the project site, have an annual disposal volume limit of 1.0 and 2.5 mcy, respectively, from all sources. It is assumed that 0.9 mcy for LA-2 and 2.2 mcy for LA-3 is available for use by this project each year.

The IFR assumes that dredging will be performed using a hopper dredge as well as an electric clamshell dredge. In order to minimize transit time, disposal of material from the hopper dredge will maximize use of the nearshore site, while a clamshell dredge will be evaluated for disposal at ODMDS. Project construction is expected to last two and a half years. The Approach Channel will be completed in year one, utilizing the nearshore placement site and LA-2. The rest of the project areas, completed by the clamshell dredge, will take the full 2.5 years. One limiting factor on production is the disposal sites LA-2 and LA-3, due to their yearly disposal capacity. Another is the production rate that the clamshell dredge can achieve.

The IFR indicates that the POLB would implement structural improvements to the Pier J breakwaters to account for the deepened channels and need for increased structural stability. The types of improvements could consist of placing additional rock at the base of the existing structure, placing rock on the dredge slope and stepping it, or in extreme cases using ground improvement methods, or submerged bulkhead walls of steel sheet pile structures. The most likely ground improvement method would be injection grouting of cement grout at the base of the existing structure. However, the IFR does not specify the location, amount, and/or type of fill associated with these improvements.

Magnuson-Stevens Fishery Conservation and Management Act

Essential Fish Habitat Affected by the Project

The proposed project occurs within EFH for various federally managed fish species within the Pacific Coast Groundfish, Coastal Pelagic Species, and Highly Migratory Species Fishery Management Plans (FMP). In addition, the project occurs within the vicinity of estuarine and canopy kelp habitat, which are all considered habitat areas of particular concern (HAPC) for various federally managed fish species within the Pacific Coast Groundfish FMP. HAPC are described in the regulations as subsets of EFH which are rare, particularly susceptible to human-induced degradation, especially ecologically important, or located in an environmentally stressed area. Designated HAPC are not afforded any additional regulatory protection under MSA; however, federally permitted projects with potential adverse impacts to HAPC will be more carefully scrutinized during the consultation process.

The project area primarily consists of relatively deepwater soft bottom habitat. In addition, MBC (2016) observed kelp on the breakwaters protecting the harbors, riprap along the piers and wharves facing the open waters of the Outer Harbor, riprap along some piers and wharves not directly exposed to the Outer Harbor, and submerged rock dikes. Specific to the project area, they found kelp on both faces of the Long Beach and Middle breakwaters, both faces of Pier F and the Navy Mole, and the west-, south-, and east-facing outer faces of Pier J and both faces of the breakwaters protecting the Pier J slip.

Effects of the Action

The USACE indicated that the proposed activities related to deepening of the channel within the area of the proposed action would directly affect the identified FMP species in the following ways: 1) temporary disturbance and displacement of fish species; 2) increased sediment loads and turbidity in the water column; 3) temporary loss of food items to fisheries (vis-a-vis temporary loss of soft bottom habitat and associated benthic invertebrates); 4) limited sediment transport and re-deposition; and 4) temporary degradation of the water quality due to dredging and construction activities. Ultimately, the USACE determined that the project would not have a substantial, adverse impact to EFH.

The Pacific Fishery Management Council (PFMC) (2019, 1998) has identified broad types of potential adverse effects and recommendations to consider when evaluating dredging and disposal projects. In general, the potential adverse effects on EFH from dredging and disposal include: 1) loss and alteration of habitat; 2) altered hydrology and geomorphology; 3) sedimentation, siltation, and turbidity; 4) release of contaminants; 5) direct impact to organisms; and 6) noise. Of particular concern to NMFS are benthic impacts associated with new dredging, cumulative impacts associated with disposal at the Surfside Borrow Site, and potential fill impacts associated with structural repairs.

Many fishery species forage on infaunal and bottom-dwelling organisms, such as polychaete worms, crustacean, and other prey types. Dredging may adversely affect these prey species at the site by directly removing or burying these organisms. Recolonization studies suggest that recovery (generally meaning the later phase of benthic community development after disturbance when species that inhabited the area prior to disturbance begin to re-establish) may not be straightforward, and can be regulated by physical factors including particle size distribution, currents, and compaction/stabilization processes following disturbance. Rates of recovery listed in the literature range from several months to several years for estuarine muds to up to 2 to 3 years for sands and gravels. Recolonization can also take up to 1 to 3 years in areas of strong current but up to 5 to 10 years in areas of low current. Given the large dredging footprint (i.e. 880 acres) and expansion into previously undredged areas (i.e. 241 acres), NMFS believes the adverse effects to benthic foraging habitat are more than temporary and minimal.

As a result of southern California's large population and intense economic and recreational activity, very little coastal space exists that has not been subject to construction, mineral extraction, or other form of habitat alteration. Dredge and fill activities, shoreline armoring, and overwater structures are the primary causes of habitat alteration within southern California coastal habitats. At the Ports of Long Beach and Los Angeles, increasing global economic trade have resulted in the need for larger, deeper draft ships to transport cargo. This has led to a demand for new construction dredging to widen and deepen channels, turning basins, and slips to accommodate these larger vessels. The USACE's Restoration Study specifically identified habitat loss and declines in abundance and biodiversity of marine populations as the primary problems in the study area, which includes the majority of the area comprised by the Deep Draft Study. Consistent with the general recommendations provided by PFMC (2019), NMFS believes the USACE should, to the extent feasible, mitigate all adverse effects to EFH from new dredging. Specifically, the dredged material may provide a beneficial re-use opportunity to restore aquatic ecosystem structure and function in East San Pedro Bay. Therefore, NMFS believes the USACE should evaluate the feasibility of re-using the dredged material provided to support various restoration measures (e.g., shallow water habitat, wetlands, sandy island) requiring fill material described in the USACE's Restoration Study.

The disposal of dredged material may adversely affect EFH by 1) impacting or destroying benthic communities; 2) affecting adjacent habitats; 3) creating turbidity plumes and introducing contaminants and/or nutrients. Sediment disposal at the ODMDS sites has previously undergone significant environmental review during their designation as offshore disposal sites. In addition, dredged material proposed for these areas are evaluated through the Southern California Dredged Material Management Team approval process. NMFS believes these environmental review processes adequately address anticipated adverse impacts to EFH for the ODMDS sites.

The IFR indicates that the USACE still needs to investigate the potential to utilize the Surfside-Sunset Borrow Sites for sediment disposal, but assumes that 2.5 million cubic yards of sediment may be placed here. Placement of 2.5 mcy at the Surfside Borrow Site would fill in an underwater pit resulting in a flatter, more natural topography. However, the USACE did not consider the cumulative effects of sediment disposal at the Surfside Borrow Site associated with the U.S. Navy's Ammunition Pier and Turning Basin project at Naval Weapons Station Seal Beach. In addition, as the name implies, the Surfside Borrow Site provides source material for future USACE beach nourishment efforts at Surfside/Sunset Beach. Therefore, the benefit of restoring a natural topography in this area may be temporary depending upon future shoreline protection needs.

The Bolsa Chica Lowlands Restoration Project lies to the south of the Surfside Borrow Site and relies upon an open tidal inlet connection with the ocean. The USACE's existing beach nourishment program at Surfside/Sunset Beach may periodically increase sedimentation rates at the tidal inlet. If gross sediment transport increases due to a cumulative increase in sand nourishment at Surfside/Sunset Beach, sedimentation of the tidal inlet at Bolsa Chica may also increase. Increased sedimentation within the tidal inlet may increase tidal muting and/or risk of inlet closure, which may adversely affect the ecological condition of the Bolsa Chica project. In our EFH consultation response to the Navy's Seal Beach project, we recommended that the Navy should collaborate with USACE Civil Works program responsible for periodic beach nourishment at Surfside/Sunset to ensure there is not a net cumulative increase in sedimentation down coast that may impact sedimentation patterns within the tidal inlet channel connecting the Pacific Ocean to the full tidal basin within the Bolsa Chica Lowlands Restoration Project. Similarly, NMFS recommends that the USACE consider the cumulative disposal impacts at the Surfside Borrow Site on the Bolsa Chica project.

Another potential project concern is the spread of the invasive alga *Caulerpa taxifolia* from project activities. This invasive alga had been introduced to our coastline. Evidence of harm that can ensue as a result of an uncontrolled spread of the alga has already been seen in the Mediterranean Sea where it has destroyed local ecosystems, impacted commercial fishing areas, and affected coastal navigation and recreational opportunities. Although it is not known to be present within the project area, it had been detected in two other locations in Southern California. If the invasive alga is present within the project area, the dredging activities would adversely affect EFH by promoting its spread and increasing its negative ecosystem impacts. The IFR indicates that pre-construction surveys for *Caulerpa taxifolia* would be conducted in the Main Channel, proposed Pier J Channel and Turning Basin, and the Surfside Borrow Site. In addition, construction would not begin should *Caulerpa taxifolia* be identified until cleared to do so by NMFS. The proposed environmental commitment to survey appropriate locations for *Caulerpa taxifolia* adequately addresses our concern. According to the IFR, the Approach Channel is considered to be too deep and too rough for *Caulerpa taxifolia*, however, the Main Channel, proposed Pier J Channel and Turning Basin, and the Surfside Borrow Site are considered to be suitable habitat. NMFS generally agrees with this conclusion, and believes that the Surfside Borrow Site is also unlikely to be suitable habitat for *Caulerpa taxifolia*.

The IFR does not fully describe or analyze the structural improvements to the Pier J breakwater. It does indicate that the placement of a submerged sheet pile structure with associated rock protection to stabilize the Pier J breakwaters would have localized effects on marine biota, including marine mammals. Sheet pile installation would be by either a hammer or vibratory method, to be determined during design based on sediment characteristics. Likewise, other motile organisms are expected to leave during construction. Rock placement would bury soft bottom habitat, replacing it over time with a rocky reef type of habitat after colonization of the placed stone. As described in MBC Applied Environmental Sciences (2016), riprap supports a unique biological community associated with the rock substrate in the Port Complex. In addition, it supports canopy kelp HAPC and associated biogenic habitat. If present in the areas proposed for structural improvements, NMFS believes the use of concrete grouting in such locations would adversely affect canopy kelp HAPC via direct disturbances to the macroalgal and associated biogenic community, and may ultimately reduce habitat complexity, which is important as settlement substrate, foraging, and refuge, for various living marine resources. Given the limited information provided regarding the type, location, and effects of the Pier J structural improvements, NMFS believes additional consultation will be necessary to fully assess the effects of these structural improvements, and identify appropriate conservation recommendations. However, we offer preliminary conservation recommendations on these structural improvements below.

EFH Conservation Recommendations

Based upon the above effects analysis, NMFS has determined that the proposed project would adversely affect EFH for various federally managed fish species under the Coastal Pelagic Species, Pacific Coast Groundfish Species, and Highly Migratory Species FMPs. Therefore, pursuant to section 305(b)(4)(A) of the MSA, NMFS offers the following EFH conservation recommendations to avoid, minimize, mitigate, or otherwise offset the adverse effects to EFH.

1. The USACE should evaluate the feasibility of beneficially re-using suitable dredged material for ecosystem restoration purposes within East San Pedro Bay. Specifically, the USACE should evaluate the feasibility of utilizing dredged material to support restoration measures identified in the USACE's East San Pedro Bay Ecosystem Restoration Feasibility Study. Beneficial re-use for ecosystem restoration purposes would offset adverse effects associated with the extensive dredge footprint and disturbance of new areas not previously dredged within San Pedro Bay.
2. The USACE should evaluate the cumulative effects of sediment disposal at the Surfside Borrow Site and ensure there is not a net cumulative increase in sedimentation down coast that may impact sedimentation patterns within the tidal inlet channel connecting the Pacific Ocean to the full tidal basin within the Bolsa Chica Lowlands Restoration Project.
3. If the use of grouting is necessary for Pier J structural improvements to rock slope areas that currently support or have previously supported canopy kelp HAPC, the USACE should conduct pre- and post-construction surveys to document impacts to these communities. In addition, a contingency mitigation plan to offset any potential impacts to canopy kelp HAPC should be developed prior to conducting any repairs to rock slopes. Both the monitoring and mitigation plans should be developed in consultation with NMFS. Compensatory mitigation should be conducted, in consultation with NMFS, for any adverse impacts to canopy kelp HAPC.
4. Compensatory mitigation should be developed and implemented for any permanent loss of EFH due to fill associated with Pier J structural improvements. Mitigation may be provided at the POLB's existing Bolsa Chica Mitigation Bank and/or other USACE-approved sites.

Statutory Response Requirement

Please be advised that regulations at section 305(b)(4)(B) of the MSA and 50 CFR 600.920(k) of the MSA require your office to provide a written response to this letter within 30 days of its receipt and at least 10 days prior to final approval of the action. A preliminary response is acceptable if final action cannot be completed within 30 days. Your final response must include a description of measures to be required to avoid, mitigate, or offset the adverse impacts of the activity. If your response is inconsistent with our EFH conservation recommendations, you must provide an explanation of the reasons for not implementing those recommendations. The reasons must include the scientific justification for any disagreements over the anticipated effects of the proposed action and the measures needed to avoid, minimize, mitigate, or offset such effects.

Supplemental Consultation

Pursuant to 50 CFR 600.920(l), the USACE must reinitiate EFH consultation with NMFS if the proposed action is substantially revised in a way that may adversely affect EFH, or if new information becomes available that affects the basis for NMFS' EFH conservation recommendations. As previously stated, NMFS believes additional consultation will be necessary to fully assess the effects of Pier J structural improvements given the lack of information on these project components in the IFR.

Endangered Species Act Comments

As a federal agency and pursuant to section 7 of the ESA of 1973, as amended (16 U.S.C. § 1531 et. seq.), the USACE shall, in consultation with and with the assistance of NMFS, insure that any action it authorizes, funds, or carries out, does not jeopardize the continued existence of any species listed as threatened or endangered, or result in the destruction or adverse modification of designated critical habitat designated. In our 2014 letter to the USACE identifying the threatened or endangered species that may be found in the project area, we indicated that green sea turtles are known to reside and forage year-round in the Long Beach area, including areas within the vicinity of POLB, through observations of free-swimming and stranded animals, as well as through directed scientific research. In contrast, the USACE determined that federally-listed marine turtles do not occur in the study area, but are occasionally sighted in warm-water areas of estuaries and bays in the regions.

Consistent with our 2014 letter, NMFS believes the federally-listed endangered green sea turtle (*Chelonia mydas*) has the potential to occur within the project area. Various sightings and strandings have been documented in the POLB area (NMFS, unpublished data), and preliminary green sea turtle tagging results also indicate they are present (Bredvik *et al.*, 2019). NMFS recommends that the USACE consider the risks of potential injury, disturbance, and impacts to foraging habitats of green sea turtles in their determination of whether this species may be adversely affected by activities described in the IFR. In particular, NMFS recommends that the USACE consider the risks of injury associated with hopper dredge activities. In 2012, a dead green sea turtle was found near Encinitas with injuries consistent with contact from a hydraulic hopper dredge (Harris, 2014). NMFS understands that dredging activities permitted by the USACE were occurring in the vicinity of Encinitas during that time period. Hopper dredge encounters with sea turtles known to occur in the Southeastern U.S. have been formally consulted upon numerous times by Corps and NMFS. NMFS recommends that the USACE engage in consultation with NMFS Protected Resources Division in Long Beach, California, for assistance with ESA compliance. Upon request, NMFS staff may be able to help in the determination of how green sea turtles or any other ESA-listed species may be directly or indirectly affected by the Project. NMFS staff may also be able to assist in the development of protective measures that can help minimize the potential for adverse effects to ESA-listed species.

Marine Mammal Protection Act Comments

Harbor seal (*Phoca vitulina*) and California sea lion (*Zalophus californianus californianus*) are commonly observed within the Port complex. Cetaceans known to occur within the Port complex include bottlenose dolphin (*Tursiops* spp) and common dolphin (*Delphinus* spp). Both pinnipeds and cetaceans utilize the waters of the Port complex primarily to rest and forage (MBC 2016). Marine mammals are protected under the Marine Mammal Protection Act (MMPA; 16 U.S.C. § 1361 et. seq.). Under the MMPA, it is generally illegal to "take" a marine mammal without prior authorization from NMFS. "Take" is defined as harassing, hunting, capturing, or killing, or attempting to harass, hunt, capture, or kill any marine mammal. Except with respect to military readiness activities and certain scientific research conducted by, or on behalf of, the Federal Government, "harassment" is defined as any act of pursuit, torment, or annoyance which has the potential to injure a marine mammal in the wild, or has the potential to disturb a marine mammal in the wild by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering.

NMFS recommends that the USACE assess the potential for harassment or injury to marine mammals as a result of any activities that could occur under the proposed project. For example, the IFR indicates that structural improvements to Pier J may have localized effects on marine mammals. If the incidental take of marine mammals may be expected to occur as a result of the project, the USACE should apply for an Incidental Harassment Authorization (IHA) or Letter of Authorization (LOA) from NMFS well in advance of any work. NMFS staff is available to assist with this assessment and compliance with the MMPA, including any IHA or LOA applications, upon request from the USACE. If it becomes apparent to the USACE that impacts to marine mammals in the form of “take” that hasn’t been authorized by NMFS may be occurring as a result of any project activities, the USACE should cease operations and contact NMFS immediately to discuss appropriate steps going forward. In the unlikely event of an injury or mortality of a marine mammal due to project activities, please immediately contact our regional stranding coordinator, Justin Viezbicke, at (562) 980-3230.

Fish and Wildlife Coordination Act

The purpose of the FWCA is to ensure that wildlife conservation receives equal consideration, and is coordinated with other aspects of water resources development (16 U.S.C. 661). The FWCA establishes a consultation requirement for Federal departments and agencies that undertake any action that proposes to modify any stream or other body of water for any purpose, including navigation and drainage (16 U.S.C. 662(a)). Consistent with this consultation requirement, NMFS provides recommendations and comments to Federal action agencies for the purpose of conserving fish and wildlife resources. The FWCA allows the opportunity to offer recommendations for the conservation of species and habitats beyond those currently managed under the ESA and MSA.

In Section 10 of the IFR describing environmental compliance and commitments, the USACE describes extensive coordination with NMFS regarding the development of the proposed alternatives, environmental commitments, and potential mitigation measures. However, NMFS has no substantive record of coordination on these issues since the request for an ESA-species list in 2014. Therefore, NMFS recommends that the USACE remove references to extensive FWCA coordination with NMFS in the final IFR.

NMFS has determined that various benthic habitats within San Pedro Bay may be negatively impacted by proposed project activities. In addition, sediment disposal has the potential to negatively affect sedimentation patterns within the tidal inlet channel connecting the Pacific Ocean to the full tidal basin within the Bolsa Chica Lowlands Restoration Project.
As such, EFH Conservation Recommendations provided above also serve as FWCA recommendations to address these negative impacts.

Thank you for considering our comments. Please contact Mr. Bryant Chesney at (562) 980-4037, or via email at Bryant.Chesney@noaa.gov if you have any questions concerning our EFH comments. Please contact Dan Lawson at (206) 526-4740, Dan.Lawson@noaa.gov, if you have any questions pursuant to ESA, and Laura McCue at (562) 980-3232, Laura.McCue@noaa.gov, for MMPA questions.

Sincerely,

Penny Ruvelas
for

Chris Yates
Assistant Regional Administrator
for Protected Resources

cc: Administrative File: 150316WCR2019PR00241

References

Bredvik, J.J., Graham, S.E., and B.P. Saunders. 2019. Green Sea Turtle Satellite Tagging in Support of Naval Weapons Station Ammunition Pier and Turning Basin. Prepared for Naval Facilities Engineering Command (NAVFAC) Southwest. Submitted to National Marine Fisheries Service, California, September 2019.

Harris, H. 2014. Sea turtle necropsy report on SWFSC-MT-2012-10 recovered November 4, 2012 from Moonlight Beach near Encinitas, CA. Necropsy report completed by NOAA contract veterinarian Heather Harris on November 3, 2014.

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Pacific Fishery Management Council. 2019. Non-fishing effects on West Coast groundfish essential fish habitat and recommended conservation measures. Appendix D to Pacific Coast Groundfish Fishery Management Plan. https://www.pcouncil.org/wp-content/uploads/2019/06/Appendix-D-FINAL-Am28.pdf

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DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, LOS ANGELES DISTRICT
915 WILSHIRE BOULEVARD, SUITE 930
LOS ANGELES, CALIFORNIA 90017-3489

July 22, 2020

Mr. Chris Yates
Assistant Regional Administrator for Protected Resources
National Oceanic and Atmospheric (NOAA)
Fisheries West Coast Region
501 West Ocean Boulevard, Suite 4200
Attention: Mr. Bryant Chesney
Long Beach, California 90802-4213

Dear Mr. Yates:

This letter is our statutory required response (50 CFR 600.920(k)) to your letter (reference 150316WCR2019PR00241) dated December 23, 2019, that provided Essential Fish Habitat (EFH) comments and Conservation Recommendations from your agency on the Draft Integrated Feasibility Report with Environmental Impact Statement / Environmental Impact Report for the Port of Long Beach Deep Draft Navigation Study, Los Angeles County, California. The purpose of the proposed project is to identify and evaluate alternatives to increase transportation efficiencies for the current and future fleet of container and liquid bulk vessels operating in the Port of Long Beach, and to improve overall conditions for vessel operations and safety in the event of vessel malfunction or weather-related events.

The December 23, 2019, EFH Consultation letter contained four EFH Conservation Recommendations. The U.S. Army Corps of Engineers, Los Angeles Corps (Corps) plans to study the four measures and implement where the selected alternative warrants inclusion. See the enclosed for a complete discussion of all Conservation Recommendations and the rationale behind the Corps' intended actions.

If you have any questions regarding the project, please contact Mr. Larry Smith, Project Biologist, at (213) 452-3846 or via email at lawrence.j.smith@usace.army.mil.

Thank you for your attention to this document.

Sincerely,

DEMESA.EDUARDO.T.10
[redacted]

Digitally signed by
DEMESA.EDUARDO.T.[redacted]
Date: 2020.07.22 16:46:29 -07'00'

Eduardo T. De Mesa
Chief, Planning Division

Enclosure

Corps Response to NMFS EFH Conservation Recommendations:

EFH Conservation Recommendation #1.

1. The USACE should evaluate the feasibility of beneficially re-using suitable dredged material for ecosystem restoration purposes within East San Pedro Bay. Specifically, the USACE should evaluate the feasibility of utilizing dredged material to support restoration measures identified in the USACE's East San Pedro Bay Ecosystem Restoration Feasibility Study. Beneficial re-use for ecosystem restoration purposes would offset adverse effects associated with the extensive dredge footprint and disturbance of new areas not previously dredged within San Pedro Bay.

Corps Response to EFH Conservation Recommendation #1.

1. The possibility of using sediments from the proposed project for the East San Pedro Bay Project would be evaluated during the Preconstruction, Engineering and Design phase (PED) of the Port of Long Beach (POLB) project and a decision made based on sediment quality and the timing of construction for both projects. Sediments from the POLB would have to be uncontaminated and physically compatible with proposed project uses from the East San Pedro Bay Project and available when needed for construction of the East San Pedro Bay Project. Sediment quality and construction timing issues would have to be resolved in order for the U.S. Army Corps of Engineers (Corps) to take advantage of this opportunity. It is in the Corps' interests to maximize beneficial reuse and it is a policy of the Los Angeles District to do so as part of the Southern California Dredged Material Management Team (SC-DMMT).

EFH Conservation Recommendation #2.

2. The USACE should evaluate the cumulative effects of sediment disposal at the Surfside Borrow Site and ensure there is not a net cumulative increase in sedimentation down coast that may impact sedimentation patterns within the tidal inlet channel connecting the Pacific Ocean to the full tidal basin within the Bolsa Chica Lowlands Restoration Project.

Corps Response to EFH Conservation Recommendation #2.

2. The Surfside-Sunset Borrow Site is a non-dispersive site, which is why the site has not naturally filled in. Placement at the Surfside-Sunset Borrow Sites is not expected to have any impacts downcoast to the Bolsa Chica inlet. Sediments are expected to remain at the placement site providing habitat benefits to the site.

EFH Conservation Recommendation #3.

3. If the use of grouting is necessary for Pier J structural improvements to rock slope areas that currently support or have previously supported canopy kelp HAPC, the USACE should conduct pre- and post-construction surveys to document impacts to these communities. In addition, a contingency mitigation plan to offset any potential impacts to canopy kelp HAPC should be developed prior to conducting any repairs to rock slopes. Both the monitoring and mitigation

plans should be developed in consultation with NMFS. Compensatory mitigation should be conducted, in consultation with NMFS, for any adverse impacts to canopy kelp HAPC.

Corps Response to EFH Conservation Recommendation #3.

3. Pier J structural improvements are a local service feature. As such, the design and implementation are solely at the discretion of the Port of Long Beach. They would require an application for a permit under Section 404 of the Clean Water Act from the Corps' Regulatory Division. The permit process would include EFH consultation for the actual remedy identified and selected by the Port of Long Beach. This would include any use of grout and address the concerns related above to kelp HAPC.

EFH Conservation Recommendation #4.

4. Compensatory mitigation should be developed and implemented for any permanent loss of EFH due to fill associated with Pier J structural improvements. Mitigation may be provided at the POLB's existing Bolsa Chica Mitigation Bank and/or other USACE-approved sites.

Corps Response to EFH Conservation Recommendation #4.

4. Pier J structural improvements are a local service feature. As such, the design and implementation are solely at the discretion of the Port of Long Beach. They would require an application for a permit under Section 404 of the Clean Water Act from the Corps' Regulatory Division. The permit process would include EFH consultation for the actual remedy identified and selected by the Port of Long Beach. However, permanent EFH loss is not anticipated. Conversion of habitat from soft bottom to rock may occur. Preliminary remedies all remain subtidal in nature.

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS
LOS ANGELES DISTRICT
915 WILSHIRE BOULEVARD, SUITE 930
LOS ANGELES, CALIFORNIA 90017-3489

August 9, 2021

Ms. Penny Ruvelas
Protected Resources Division Branch Chief
National Marine Fisheries Service
501 West Ocean Boulevard, Suite 4200
Long Beach, California 90802-4221

Dear Ms. Ruvelas:

This letter serves as the request of the U.S. Army Corps of Engineers, Los Angles District (USACE), to initiate informal consultation under Section 7(a)(2) of the Endangered Species Act (ESA) of 1973, as amended, and implementing regulations at 50 CFR 402 regarding the effects of the Port of Long Beach (POLB) Deep Draft Navigation (DDN) Project on the federally threatened East Pacific Distinct Population Segment (DPS) of green sea turtles (*Chelonia mydas*). This request supersedes and replaces our request dated July 29, 2021. No critical habitat has been designated for the green sea turtle East Pacific DPS, therefore, no impacts to critical habitat would occur. The USACE requests your concurrence with the USACE's conclusion that the proposed project may affect, but is not likely to adversely affect, the East Pacific DPS of green sea turtle. This request incorporates information from the concurrence letter prepared for informal consultation for green sea turtles for the project proposed by the East San Pedro Bay Ecosystem Restoration Feasibility Study prepared by National Marine Fisheries Service (NMFS) (NMFS, 2021) that includes the habitat use in the study area and describes the avoidance and minimization measures for green sea turtles determined appropriate for that proposed project. Similar measures are proposed in the POLB DDN Feasibility Study for the DDN proposed project. The East San Pedro Bay Ecosystem Restoration informal consultation process should inform this consultation as well.

Consultation History

On October 21, 2019, the USACE provided their Draft Integrated Feasibility Report (IFR), which included an Environmental Impact Statement/Environmental Impact Report, for the POLB DDN Feasibility Study (Study) to the NMFS. The Draft IFR concluded that the proposed project would not affect green sea turtle due to absence of the species from the study area. NMFS provided comments on the Draft IFR on December 23, 2019, disagreeing with the no affect determination and provided further documentation on the potential presence of green sea turtles in the Study area. Additional comments and documentation were also provided as part of the final Coordination Act Report submitted by the U.S. Fish and Wildlife Service on April 14,

2021. Telephone discussions of the issue were held by NMFS and USACE on February 23, 2021, and July 28, 2021.

On July 29, 2021, the USACE submitted a written request for informal consultation to the NMFS. This was followed up with a conference call held on August 4, 2021, that resulted in the preparation of this revised request.

Proposed Action and Action Area

The POLB encompasses the eastern part of the San Pedro Bay, located in the southwestern portion of the city of Long Beach, in southern Los Angeles County, approximately 20 miles south of downtown Los Angeles (Figure 1). The Study area includes the waters in the immediate vicinity (and shoreward) of the breakwaters through the entire port and includes the LA-2 and LA-3 U.S. Environmental Protection Agency (USEPA)-designated ocean dredged material disposal sites (ODMDS), the Surfside Borrow Site Nearshore Placement Area, and the transit lanes to and from the disposal/placement sites.

The purpose of the Study is to identify and evaluate alternatives to increase transportation efficiencies for container and liquid bulk vessels operating in the POLB, for both the current and future fleet, and to improve conditions for vessel operations and safety in the event of vessel malfunction or weather-related events.

The proposed project for purposes of this consultation is Alternative 3. The Study identified Alternative 3, with a combination of measures for container vessels (constructing an Approach Channel to Pier J South and deepening the West Basin Channel to a new depth of -55 feet MLLW) and liquid bulk vessels (deepening the Approach Channel to -80 feet MLLW, and widening portions of the Main Channel through bend easing to match the currently authorized depth in the Main Channel of -76 feet MLLW), together the General Navigation Features that would be constructed by the USACE, and the local service facilities (LSF) that would be constructed by the sponsor as described below, provides the greatest contribution to net benefits and has been determined as the National Economic Development (NED) Plan (Figure 2). The POLB, as non-federal sponsor, has also expressed support for this plan. Accordingly, Alternative 3 was identified as the Tentatively Selected Plan (TSP) in the Draft IFR and will be the Recommended Plan in the Final IFR, which is currently being finalized.

General Navigation Features of the proposed project for liquid bulk vessels includes:

- deepening the Approach Channel from -76 feet to -80 feet MLLW; and
- bend easing within portions of the Main Channel from -70 feet to -76 feet MLLW.

General Navigation Features of the proposed project for container ships includes:

- constructing an approach channel to Pier J South to -55 feet MLLW;
- constructing a turning basin outside of Pier J South;
- deepening the West Basin from -50 feet MLLW to -55 feet MLLW; and
- constructing an electrical substation at Pier J South.

The proposed project includes the LSFs that would be constructed by the non-federal sponsor, the POLB, to fully realize all the benefits of the General Navigation Features discussed above. LSFs that would be constructed by the POLB require appropriate permits from the USACE Regulatory Division. Impacts from construction of LSFs are included in this informal consultation request because they are a part of the proposed project without which the full economic benefits of the project cannot be realized and would not be constructed if the General Navigation Features were not constructed.

The proposed project is composed of feasible dredging and placement/disposal measures in accordance with federal and state guidelines, including POLB environmental protection guidelines. Sediments dredged by a hopper dredge from deepening of the Approach Channel would be placed in the Surfside Borrow Site Nearshore Placement Area, and sediments dredged by an electric clamshell dredge from the remaining dredge areas would be disposed at LA-2 and LA-3. Figure 3 shows the location of the Surfside Borrow Site Nearshore Placement Area and approximate locations of the LA-2 and LA-3 ODMDS.

The General Navigation Features include dredging approximately 7.1 million cubic yards (mcy) of material, with placement of the dredged material in the Surfside Borrow Site Nearshore Placement Area and LA-2 and LA-3 ODMDS. Overall project duration is estimated at 39 months. To support dredging at the Pier J berth, the Approach Channel, and turning basin, a new dredge electric substation is required to be constructed to mitigate for air quality impacts.

LSFs include deepening Pier J Basin, berths J266-J270, within the Pier J South Slip and structural improvement to the Pier J breakwaters to accommodate dredging the Pier J Slip and approach channel. Approximately 337,000 cubic yards of dredged material would be placed in LA-2 and LA-3 ODMDS.

Proposed Avoidance and Minimization Measures

The following measures will be implemented by the responsible entity to avoid or minimize impacts to the federally threatened East Pacific DPS of green sea turtles. These commitments will be included in the Final IFR.

<u>Hopper Dredge Operations</u>

1) During dredging, transit to and from, and for placement of dredged material at the Surfside Borrow Site Nearshore Placement Area occurs, a qualified biologist with experience monitoring green sea turtles will be onboard the hopper dredge to monitor for the presence of green sea turtles. The green sea turtle monitor will have the authority to cease or alter operations to avoid impacts to green sea turtles.

2) During dredging, the biological monitor will periodically check in the hopper for the presence of green sea turtles.

3) Adequate lighting will be provided during nighttime operations (i.e., dredging, dredge material transport and placement) to allow the monitor to observe the surrounding area effectively.

4) All vessels associated with the project will not exceed eight (8) knots inside the breakwater (most vessels will be transiting outside the breakwater).

5) If a green sea turtle is observed within the vicinity of the project site during project operations, all appropriate precautions shall be implemented to avoid or minimize unintended impacts. These precautions include, but are not limited to:

   - Cessation of placement operations that is observed within 100 feet of a green sea turtle;
   - Operations may not resume until the green sea turtle has departed the monitoring zone by its own accord or has not been observed for a 15-minute period of time; and
   - Maneuver the hopper dredge to avoid any free-swimming green sea turtles observed during transit.

6) Biological monitors will maintain a written log of all green sea turtle observations during project operations. This observation log will be provided to the USACE and NMFS as an attachment to the post-construction report for the project. Each observation log will contain the following information:

   1. Observer name and title;
   2. Type of construction activity (maintenance dredging, etc.);
   3. Date and time animal first observed (for each observation);
   4. Date and time observation ended (for each observation). A green sea turtle observation will terminate if (1) an animal is observed exiting the monitoring zone or (2) after a 15-minute period of no observation (assumption is that animal has exited, but was not observed to do so);

5. Location of monitor (latitude/longitude), direction of green sea turtle in relation to the monitor, and estimated distance (in meters) of green sea turtle to the monitor; and
6. Nature and duration of equipment shutdown.

7) Any observations involving the potential “take” of green sea turtles will be reported to the USACE within 10 minutes of the incident and to the NMFS stranding coordinator immediately thereafter.

8) The contractor will implement an Environmental Protection Plan that will include a green sea turtle Monitoring and Avoidance Plan and an employee training program on green sea turtle observation protocols, avoidance, and minimization measures. The program will be conducted by the Biological Monitor and a record kept of dates of training, names and positions of attending employees, and an outline of the training presentation.

Clamshell Dredging and LSF Construction Activities

Similar commitments are expected to be included as requirements as part of any permit issued for LSFs by the USACE Regulatory Division.

1) During construction, a 100-foot (visually estimated) monitoring zone around all in-water equipment, vessels, and/or debris shall be implemented. Green sea turtle monitoring is not required for the transportation of material between dredging and disposal sites.

2) Visual monitoring of the monitoring zone (visually estimated) shall commence at least 15 minutes prior to the beginning of in-water construction activities each day and after each break of more than 30 minutes. If a green sea turtle is observed within the monitoring zone, all in-water project activities shall cease as soon as possible, in consideration of worker safety. Project activities shall not commence or continue until the green sea turtle has either been observed having left the monitoring zone, or at least 15 minutes have passed since the last sighting whereby it is assumed the green sea turtle has voluntarily left the monitoring zone.

3) The visual monitor shall maintain a written log containing all observations of green sea turtles including:

1. Observer name and title;
2. Type of activity (maintenance dredging, pile-driving, etc.);
3. Date and time animal first observed (for each observation);
4. Date and time observation ended (for each observation), including if the green sea turtle was observed exiting the monitoring zone or was assumed to have exited following a 15-minute period of no observation;

5. Location of observer (latitude/longitude), direction, and estimated distance to green sea turtle;
6. Nature and duration of equipment shutdown.

4) The green sea turtle observation log shall be provided by the visual monitor to the USACE for transmittal to NMFS within a reasonable time after completion of construction. Any observations involving potential take of green sea turtle shall be reported to the USACE and NMFS within 24 hours.

5) Adequate lighting will be provided during nighttime operations to allow the visual monitor to observe the surrounding area effectively.
6) The visual monitor will be trained in how to conduct visual monitoring and in the identification of green sea turtles by the biological monitor proposed for monitoring hopper dredge operations.

7) The contractor will implement an Environmental Protection Plan that will include a green sea turtle Monitoring and Avoidance Plan and an employee training program on green sea turtle observation protocols, avoidance, and minimization measures. The training program will be conducted by the biological monitor and a record kept of dates of training, names and positions of attending employees, and an outline of the training presentation.

Status of Special Status Species and Critical Habitat in the Action Area

Green sea turtle East Pacific DPS

The Green sea turtle (*Chelonia mydas*) East Pacific DPS was listed as threatened on April 6, 2016 (Federal Register, 2016). Critical habitat has not been designated for this DPS. A Recovery Plan (NMFS and USFWS, 1998) for this DPS was prepared to delineate reasonable actions which are believed to be required to recover and/or protect the species in January 1998. Recovery Plan goals are to protect nest sites, protect and manage East Pacific green turtle populations in the marine habitat, and protect and manage marine habitat, including foraging habitats.

A small population of green sea turtles persists in the San Gabriel River, and within Anaheim Bay and the Seal Beach National Wildlife Refuge (SBNWR) estuarine complex (Crear et al. 2016). The available information suggests that while green sea turtles are present in the San Gabriel River year-round, their presence may be more seasonal in other locations during the summer and fall when water temperatures are warmer, including Anaheim Bay, the SBNWR, Sunset/Huntington Harbor, and Alamitos Bay. Crear et al. (2016) showed that acoustically tagged juvenile sea turtles left SBNWR/Anaheim Bay and moved into the San Gabriel River during winter months, when temperatures dropped below 15° Celsius (C). Conversely, turtles moved through Anaheim Bay to get to the 7th Street Basin in the SBNWR during summer and fall months to forage on eelgrass beds. The bay and estuarine habitat areas in which green sea turtles appear to most frequently occur are primarily adjacent and inshore of the Surfside Borrow Site Nearshore Placement Area.

There is no known nesting by this species in the United States or in any territory under U.S. jurisdiction for the East Pacific DPS. The main nesting sites for the East Pacific GPS green sea turtle are located in the state of Michoacán, Mexico (Colola and Maruata Beaches) and in the Galapagos Islands, Ecuador. Sighting and stranding reports of "green" turtles along the west coast of the United States are probably mostly of the East Pacific green sea turtle. It is not known whether they regularly migrate from breeding grounds in Mexico to specific areas along the North American coast, or whether these turtles are vagrants that occasionally stray into more northern waters, perhaps moving with "El Niño" currents (NMFS and USFWS, 1998).

NMFS's Southwest Fisheries Science Center has been monitoring green turtles throughout southern California, including Anaheim Bay and the SBNWR, to characterize population structure, foraging ecology, and movement patterns. While the specific importance of eelgrass in East San Pedro Bay has not been characterized, eelgrass is likely an important habitat feature for green sea turtles that may be found within the project area. In addition to eelgrass, other important prey species identified in a study of green sea turtle in San Diego Bay included mobile and sessile invertebrates, as well as red and green algae to a lesser degree (Lemmons et al. 2011), which are not found in either the deep navigation channels or in the shallow nearshore parts of the action area.

In addition, the Navy, in collaboration with NMFS, has been implementing a green sea turtle satellite tagging study to help monitor and better understand impacts of the Navy actions on green sea turtles within the Anaheim Bay estuarine complex. Preliminary results from this effort indicate that habitat utilization is highest within the SBNWR, but a limited number of forays have occurred in the adjacent nearshore within the action area (Bredvik et al. 2019; Hanna et al. 2020). For example, tagging study results indicate limited use of shallow nearshore habitat in East San Pedro Bay, which harbors eelgrass habitat in various locations. In addition, preliminary tagging study results also indicate limited movements within and adjacent to the Surfside Borrow Site Nearshore Placement Area. Only two turtles of the sixteen tagged turtles swam into the outer bay near where dredged material transport vessels will be operating. It appears that turtles predominately stay in the estuarine complex mentioned above and only rarely swim into the outer bay.

While located in the vicinity of the local turtle community described above, due to the depths of the dredging footprint, lack of submerged aquatic vegetation needed for foraging, and the water temperatures, green sea turtles are unlikely to be present in any of the proposed dredge or LSF construction areas within or adjacent to the port complex.

Green turtles are generally found in fairly shallow waters (except when migrating) inside reefs, bays, and inlets (NMFS, undated). The LA-2 and LA-3 ODMDS are located several miles offshore and in very deep water. LA-2 is approximately 9-1/2 miles from the entrance to Queen's Gate and is approximately 6 miles from the nearest coast. LA-3 is approximately 22 miles from the entrance to Queen's Gate and is approximately 4-3/4 miles from the nearest coast. Figure 5 is a map using Google Earth showing the locations of the two ODMDS. The LA–2 site is located on the outer continental shelf, margin, and upper southern wall of the San Pedro Sea Valley at depths from approximately 360–1,115 ft. The depth of the center of the LA-3 site would be approximately 1,600 ft. Chances of green sea turtles occurring at either ODMDS are unlikely.

USACE's Effects Determination

The USACE has concluded that the proposed project may affect, but is not likely to adversely affect, the federally threatened East Pacific DPS of green sea turtles. The USACE has concluded that construction activities would not likely cause direct mortality, would not result in the direct loss of habitat for green sea turtles, and would only temporarily increase turbidity and noise in the action area. The USACE committed to several conservation measures that would avoid and/or minimize impacts to green sea turtles, which are described above.

<u>Effects of the Action</u>

Under the ESA, "effects of the action" are all consequences to listed species or critical habitat that are caused by the proposed action, including the consequences of other activities that are caused by the proposed action. A consequence is caused by the proposed action if it would not occur but for the proposed action and it is reasonably certain to occur. Effects of the action may occur later in time and may include consequences occurring outside the immediate area involved in the action (50 CFR 402.02). In our analysis, which describes the effects of the proposed action, we considered 50 CFR 402.17(a) and (b). When evaluating whether the proposed action is not likely to adversely affect listed species or critical habitat, the effects are evaluated to be completely beneficial, insignificant, or discountable. Completely beneficial effects are contemporaneous positive effects without any adverse effects to the species or critical habitat. Insignificant effects relate to the size of the impact and should never reach the scale where take occurs. Discountable effects are those extremely unlikely to occur.

The potential effects of the proposed action include risks of injury, general disturbance, loss/avoidance of habitat, and/or mortality to sea turtles because of project activities through the use of dredges and construction equipment needed to complete project activities. Green sea turtles may be affected through collisions with vessels that are transporting and disposing/placing dredged materials. The USACE has committed to several avoidance and minimization measures described above for the General

Navigation Features. The POLB has agreed to apply those measures to LSFs and they are expected to be included in any permit(s) issued by the USACE Regulatory Division for LSFs as standard measures applied to the POLB. These measures are expected to minimize the risk of potential adverse effects to green sea turtles caused by the proposed activities in the unlikely event that a turtle is encountered during the project.

Approach Channel

Approximately 2.5 mcy of sediments would be dredged from the Approach Channel by a hopper dredge, transported to the Surfside Borrow Site Nearshore Placement Area, placed there, and transit of the hopper dredge back to the Approach Channel. This activity is expected to take approximately 6 months operating 24 hours a day, seven days a week with an estimated eight transits per day to the Surfside Borrow Site Nearshore Placement Area. The expected transit route between the Approach Channel dredge area and the Surfside Borrow Site Nearshore Placement Area is shown on Figure 4.

Recent information has shown a low probability of green sea turtles in the vicinity of the Surfside Borrow Site Nearshore Placement Area (Bredvik et al., 2019; Hanna et al. 2020). Dredged sediments from the Approach Channel are the only sediments currently planned for placement in this area. All dredging in the Approach Channel would be conducted by a hopper dredge. Hopper dredges are slow moving vessels with maximum speed of 8-10 knots depending on load and sea conditions. While green sea turtles are not shown at the actual placement site, there is a low probability that transiting hopper dredges may encounter individual sea turtles.

Dredging in the Approach Channel will be in water depths ranging from -76 ft MLLW to -80 ft MLLW, with a project depth of -80 ft MLLW. Green sea turtles are highly unlikely to be in the area and less likely to interact with the suction head of the hopper dredge given the extreme depths of dredging. In the interests of caution, monitoring for green sea turtles will be conducted for dredging under the same conditions as for transit and placement of dredged sediments.

Direct Contact Injury

Considering the lack of foraging habitat near the Surfside Borrow Site Nearshore Placement Area and the expectation of turtles to avoid the project area due to noise generation disturbance, USACE does not expect there to be a significant presence of turtles in the project area during dredging operations.

The severity of injuries resulting from a collision between a green sea turtle and a project vessel typically depends on the size and speed of the vessel (Knowlton and Kraus 2001, Laist et al. 2001, Vanderlaan and Taggart 2007). For example, research has shown that lethality, defined as mortality or serious injury, increases with vessel speed. As described above in the proposed avoidance and minimization measures, vessels will be moving at relatively slow speeds while conducting project-related movements. The likelihood of collisions between sea turtles and project vessels moving at such slow speeds is remote, as we expect alert vessel operators, biological monitors, and turtles to be able to avoid collisions.

USACE expects that the implementation of the proposed avoidance and minimization measures will be effective at reducing the risks of direct contact between sea turtles and vessels and/or dredging equipment. Given the low likelihood that sea turtles will be in the project areas, and the additional impact minimization measures that can be triggered because of monitoring and avoidance measures, USACE concludes that the likelihood of direct contact with vessels resulting in severe injury or mortality because of the proposed dredging project is discountable.

The risks of direct contact injury for sea turtles because of dredge sediment placement are low as green sea turtles do not commonly occur near the Surfside Borrow Site Nearshore Placement Area. If any green sea turtles are in the project areas, we expect that those turtles will detect the commencement of project activities as they move into the area and will have an opportunity to move away. Avoidance measures will ensure that placement activities do not adversely affect green sea turtles. USACE concludes that the likelihood of direct contact with vessels resulting in severe injury or mortality because of the proposed dredging material placement is discountable.

General Disturbance

Given the lack of important foraging habitat features near the Surfside Borrow Site Nearshore Placement Area, we do not expect green sea turtles to spend a significant time near the placement operations. Therefore, USACE expects that any effects or disturbance resulting from exposure to project activities will be insignificant, given the low probability that turtles will be in the project area for extended periods of time and the lack of any expected impact on health and fitness that avoidance of these areas would have on green sea turtles.

Impacts to foraging habitat

Given the lack of important foraging habitat features near the Surfside Borrow Site Nearshore Placement Area USACE expects that any effects or disturbance resulting from exposure to project activities will be insignificant, given the low probability that turtles will be in the project area for extended periods of time and the lack of any expected impact on health and fitness that avoidance of these areas would have on green sea turtles.

Clamshell Dredging and Other Construction Activities

Approximately 4.6 mcy of sediments would be dredged from the remaining federal channels by an electrified clamshell dredge, transported to the LA-2 and LA-3 ODMDS by tug and barge, disposed there, and transit of the tug and barge back to the dredge site. Multiple barges would be employed allowing the dredging to continue into a different barge while a barge is in transit to the disposal site. This activity is expected to take approximately 39 months operating 24 hours a day, seven days a week with an estimated three transits per day to the LA-2 or LA-3 ODMDS. The expected transit route for ocean disposal is between the dredge area out Queens Gate to the disposal site.

Construction of General Navigation Features and LSFs were evaluated for potential effects to green sea turtles. Due to the depths of the dredging footprint (currently -50 ft MLLW with a project depth of -55ft MLLW), lack of submerged aquatic vegetation needed for foraging, high volume of vessel traffic, and the water temperatures, which typically ranges from 60 - 70 degrees Fahrenheit (POLB and POLA 2016), green sea turtles are unlikely to be present in that part of the Study area. Disposal of dredged sediments at the LA-2 and LA-3 ODMDS were evaluated separately by the USEPA (USEPA & USACE, 2005) with a determination of no affect to any listed species. Construction of the electrical substation would have no effect on green sea turtles as the site is entirely land based with no impacts to marine waters.

Direct Contact Injury

USACE expects that the implementation of the proposed avoidance and minimization measures will be effective at reducing the risks of direct contact between sea turtles and vessels and/or dredging equipment. Given the low likelihood that sea turtles will be in the project areas, and the additional impact minimization measures that can be triggered because of monitoring and avoidance measures, USACE concludes that the likelihood of direct contact with vessels resulting in severe injury or mortality because of the proposed dredging project is discountable. Dredging would be conducted by a clamshell dredge, that generally operates on a slow cycle time allowing any green sea turtles present to avoid impact and is also considered less likely to result in injury as compared to hydraulic dredging. Structural improvements to Pier J breakwaters would be evaluated during design as part of the USACE permitting process once a specific design is identified. Green sea turtles, if present, would be expected to avoid the construction area. Monitors and avoidance measures described above for LSFs would be included as special conditions in any permit issued by the USACE Regulatory Division.

<u>General Disturbance</u>

Given the lack of important foraging habitat features near the dredging and construction areas, we do not expect green sea turtles to spend a significant time near the construction operations. Therefore, USACE expects that any effects or disturbance resulting from exposure to project activities will be insignificant, given the very low probability that turtles will be in the project area for extended periods of time and the lack of any expected impact on health and fitness that avoidance of these areas would have on green sea turtles.

<u>Impacts to foraging habitat</u>

Given the lack of important foraging habitat features near the Study area USACE expects that any effects or disturbance resulting from exposure to project activities will be insignificant, given the low probability that turtles will be in the project area and the lack of any expected impact on health and fitness that avoidance of these areas would have on green sea turtles.

Projects that may overlap in the Surfside Borrow Site Nearshore Placement Area are limited to potential impacts associated with the East San Pedro Bay Ecosystem Restoration Project, if approved and funded. That project is currently undergoing study and may utilize a portion of the Surfside Borrow Site Nearshore Placement Area adjacent to, but outside, the placement proposed for use by the Study. In all likelihood, if the two projects overlap, sediments dredged for the Study from the Approach Channel would be used by the East San Pedro Bay Ecosystem Restoration Project in lieu of dredging sediments from the Surfside Borrow Site Nearshore Placement Area. The East San Pedro Bay Ecosystem Restoration Project would then no longer require dredging in the Surfside Borrow Site Nearshore Placement Area and the Study would have reduced volume of sediments for placement in the Surfside Borrow Site Nearshore Placement Area thus reducing the chances for effects of these two actions on the Eastern Pacific DPS of green sea turtle. The Navy no longer plans to use the Surfside Borrow Site Nearshore Placement Area as a placement area for sediments dredged from the nearby Naval Weapons Station, Seal Beach associated with their base realignment project.

There are no reasonably foreseeable projects that could overlap within the POLB.

The USACE has used the best scientific and commercial data available in preparing this request.

A copy of this document is being furnished to Mr. Bryant Chesney (NMFS), Mr. Dan Lawson (NMFS) and Ms. Cynthia Fowler (USACE-SPD).

If you have any questions regarding the project, please contact Mr. Larry Smith, Project Environmental Coordinator, at (213) 452-3846, FAX: (213) 452-4204, and email: lawrence.j.smith@usace.army.mil.

Thank you for your attention to this document.

Sincerely,

DEMESA.EDUARDO.T.[redacted]

Digitally signed by DEMESA.EDUARDO.T.[redacted]
Date: 2021.08.09 16:25:51 -07'00'

Eduardo T. De Mesa
Chief, Planning Division

References

Bredvik, Jessica J.; Graham, Suzanne E.; Saunders, Brendan P. 2019. Green Sea Turtle Satellite Tagging in Support of Naval Weapons Station Ammunition Pier and Turning Basin. Prepared for Naval Facilities Engineering Command (NAVFAC) Southwest. Submitted to National Marine Fisheries Service, California, December 2019.

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NMFS (National Marine Fisheries Service). 2021. Letter Re: Endangered Species Act Section 7(a)(2) Concurrence Letter, Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Response, and Fish and Wildlife Coordination Act Recommendations for the East San Pedro Bay Ecosystem Restoration Study. May 1, 2020. NMFS No.: WCRO-2020-00072

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Figure 1 Location Map

Figure 2 Tentatively Selected Plan

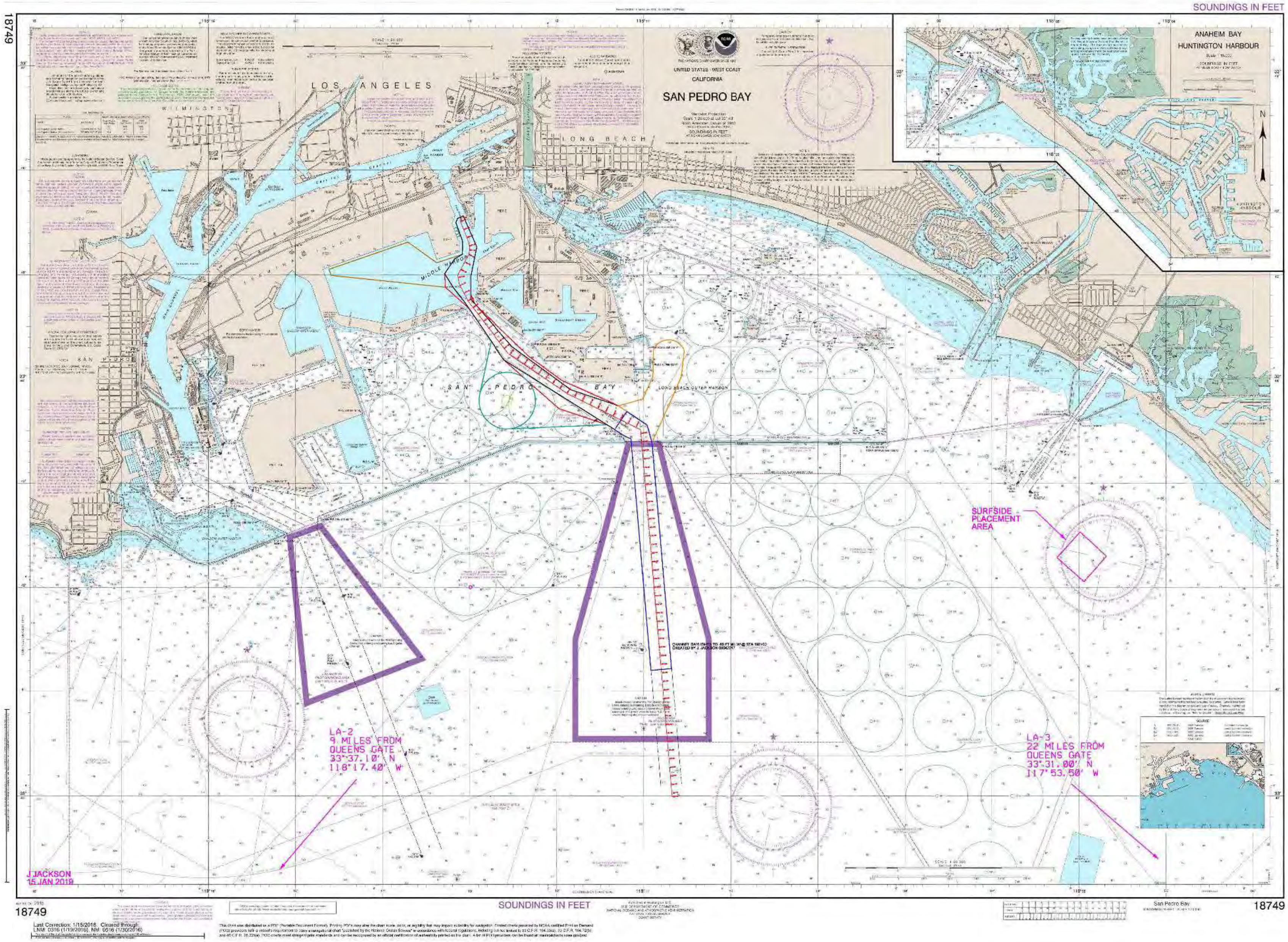

Figure 3 Study Fill Locations

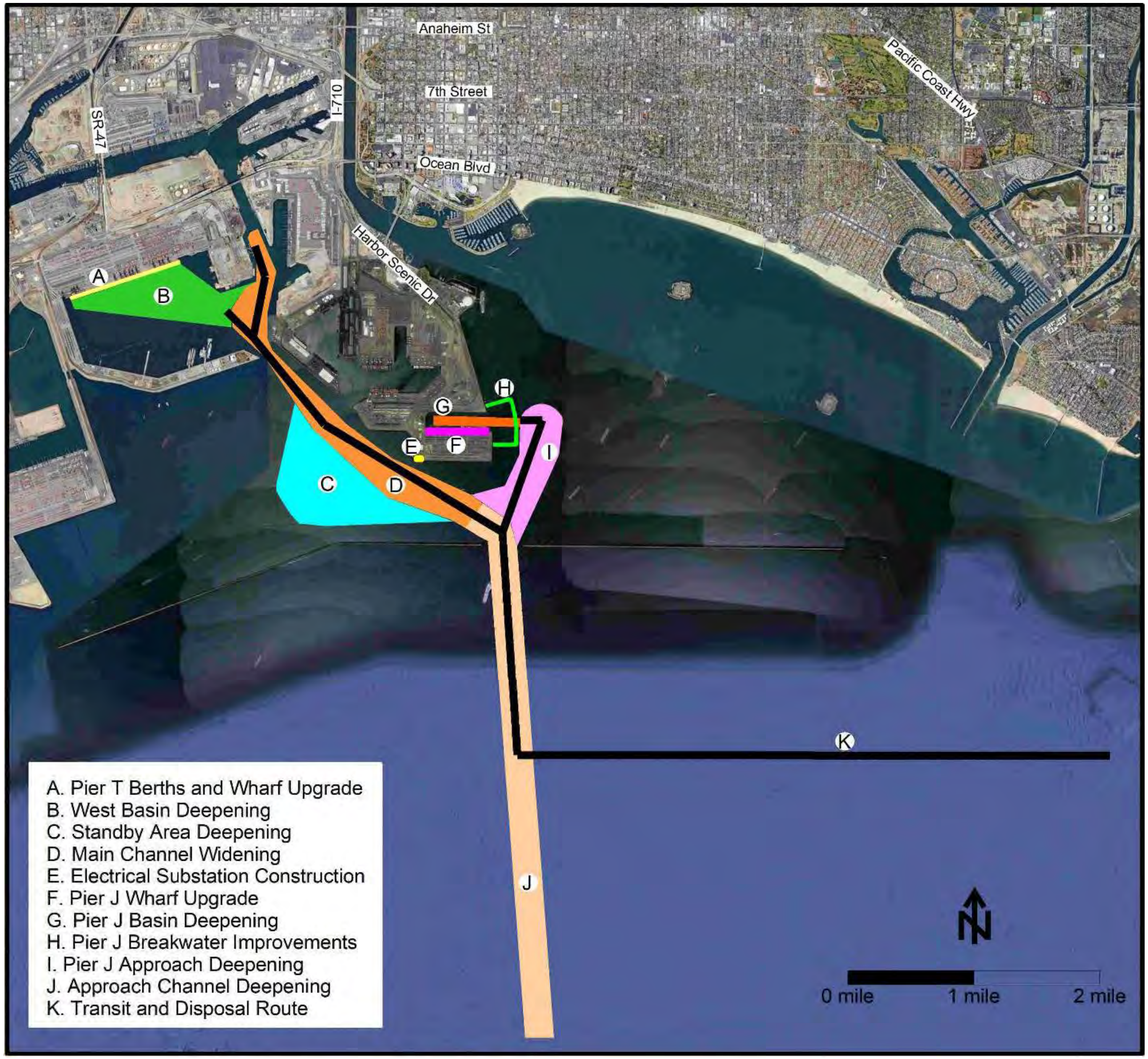

Figure 4 Transit Route to Surfside Borrow Site Nearshore Placement Area (K)
Note: Item C Standby Area Deepening is not a part of the TSP and would not be constructed.

Figure 5. LA-2 and LA-3 ODMDS

From:	Smith, Lawrence J Jr CIV USARMY CESPL (USA)
To:	Dan Lawson - NOAA Federal; Fowler, Cynthia Jo CIV USARMY CESPD (USA)
Cc:	Bryant Chesney - NOAA Federal; Penny Ruvelas - NOAA Federal; Lee, Maricris C (Chris) CIV USARMY CESPL (USA)
Subject:	RE: [Non-DoD Source] Re: Port of Long Beach Deep Draft Navigation Study Request for Informal Consultation
Date:	Wednesday, August 11, 2021 9:08:00 AM

Good morning, Dan. Thank you very much. While it is not specifically called out as such, please consider our request letter to be our Biological Assessment for this project in compliance with 50 CFR 402.12(b).

Please share with us, when you can, your schedule for completing this consultation. We look forward to working with you to complete this consultation.

The Los Angeles District is teleworking. I should be reachable by office phone and/or mobile phone. Intermittent connectivity issues may delay some messages.

Larry Smith Ecologist
Planning Division/Environmental Resources Branch/Environmental Policy Group
Los Angeles District, U.S. Army Corps of Engineers
lawrence.j.smith@usace.army.mil

Office: 213-452-3846
Government Mobile: 213-453-3205

From: Dan Lawson - NOAA Federal <dan.lawson@noaa.gov>
Sent: Wednesday, August 11, 2021 7:24 AM
To: Fowler, Cynthia Jo CIV USARMY CESPD (USA) <Cynthia.J.Fowler@usace.army.mil>
Cc: Bryant Chesney - NOAA Federal <bryant.chesney@noaa.gov>; Penny Ruvelas - NOAA Federal <penny.ruvelas@noaa.gov>; Smith, Lawrence J Jr CIV USARMY CESPL (USA) <Lawrence.J.Smith@usace.army.mil>
Subject: Re: [Non-DoD Source] Re: Port of Long Beach Deep Draft Navigation Study Request for Informal Consultation

Hi Larry and Cynthia

I've reviewed the letter and supporting documentation, and believe that sufficient information has been provided to initiate informal consultation. We'll be in touch with any questions or additional information needs that come up as necessary to conclude consultation.

Dan

On Tue, Aug 10, 2021 at 1:14 PM Fowler, Cynthia Jo CIV USARMY CESPD (USA) <Cynthia.J.Fowler@usace.army.mil> wrote:

> Thanks, Bryant! Appreciate all your assistance! Enjoy your vacation.
>
> Dan – let us know if you need anything else or if informal consultation can be initiated.

v/r,

Cynthia

From: Bryant Chesney - NOAA Federal <bryant.chesney@noaa.gov>
Sent: Tuesday, August 10, 2021 10:07 AM
To: Fowler, Cynthia Jo CIV USARMY CESPD (USA) <Cynthia.J.Fowler@usace.army.mil>
Cc: Dan Lawson - NOAA Federal <dan.lawson@noaa.gov>; Penny Ruvelas - NOAA Federal <penny.ruvelas@noaa.gov>; Smith, Lawrence J Jr CIV USARMY CESPL (USA) <Lawrence.J.Smith@usace.army.mil>
Subject: [Non-DoD Source] Re: Port of Long Beach Deep Draft Navigation Study Request for Informal Consultation

Hi Cynthia,
I'm following up to let you and Larry know that I'm heading out on leave later today, and will be deferring to Dan to review while I'm gone.
Take care,
Bryant

On Mon, Aug 9, 2021 at 4:44 PM Fowler, Cynthia Jo CIV USARMY CESPD (USA) <Cynthia.J.Fowler@usace.army.mil> wrote:

> Hi Dan and Bryant! Thank you again for working so closely with us on this consultation – it really means so much to the region to get this completed in time to keep the study on track. After you've reviewed the informal consultation request and believe that you have all the information to initiate informal consultation, could you respond by letting us know that your agency believes that you have the appropriate information and informal consultation has begun? Our higher headquarters would feel more comfortable knowing that we have begun informal consultation before moving forward for state and agency review.
>
> Thank you again! Much appreciated and I look forward to working with you in the future!
>
> Respectfully,
>
> Cynthia
>
> Cynthia Jo Fowler
> Environmental Program Lead
> South Pacific Division
> U.S. Army Corps of Engineers
>
> 450 Golden Gate Avenue, 6th Floor
> San Francisco, California 94102
>
> o: 415-503-6858
> c: 415-658-1869

p: 415-238-6906

From: Smith, Lawrence J Jr CIV USARMY CESPL (USA) <Lawrence.J.Smith@usace.army.mil>
Sent: Monday, August 9, 2021 4:30 PM
To: Penny.Ruvelas@noaa.gov
Cc: Bryant Chesney (Bryant.Chesney@noaa.gov) <Bryant.Chesney@noaa.gov>; dan.lawson@noaa.gov; Lee, Maricris C (Chris) CIV USARMY CESPL (USA) <Maricris.C.Lee@usace.army.mil>; Fowler, Cynthia Jo CIV USARMY CESPD (USA) <Cynthia.J.Fowler@usace.army.mil>; Demesa, Eduardo T CIV USARMY CESPL (USA) <Eduardo.T.Demesa@usace.army.mil>; Lovan, Hayley J CIV (USA) <Hayley.J.Lovan@usace.army.mil>
Subject: Port of Long Beach Deep Draft Navigation Study Request for Informal Consultation

Good afternoon, Ms. Ruvelas. hope you are well. Attached please find our revised request letter to NMFS to initiate informal consultation on the Port of Long Beach Deep Draft Navigation Study for the Eastern Pacific DPS green sea turtle. We have determined that the project may affect, but is unlikely to adversely green sea turtle. This request is similar to a recently concluded informal consultation for our East San Pedro Bay Restoration Study. We are requesting expedited review and concurrence with our determination to allow this study to remain on schedule. We are facing a very tight time line to get to state and agency review in the next two weeks and would greatly appreciate the efforts of you and your staff to complete this consultation in time. We have spoken with Bryant Chesney and Dan Lawson of your staff regarding this request. I have attached, as a reference, the NMFS concurrence letter for the East San Pedro Bay Restoration Study informal consultation. We look forward to working with your staff to complete this consultation. Please do not hesitate to contact us if you need any additional information of have any questions.

Please acknowledge receipt of this email and its attachments.

The Los Angeles District is teleworking. I should be reachable by office phone and/or mobile phone. Intermittent connectivity issues may delay some messages.

Larry Smith Ecologist
Planning Division/Environmental Resources Branch/Environmental Policy Group
Los Angeles District, U.S. Army Corps of Engineers
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Office: 213-452-3846
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Bryant Chesney
Senior Marine Habitat Resource Specialist, West Coast Region
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Dan Lawson
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206-526-4740

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
West Coast Region
501 West Ocean Boulevard, Suite 4200
Long Beach, California 90802-4213

August 31, 2021

Refer to NMFS No:
WCRO-2021-01950

Eduardo T. De Mesa
Chief, Planning Division
U.S. Army Corps of Engineers
Los Angeles District
915 Wilshire Boulevard, Suite 930
Los Angeles, California 90017-3489

Re: Endangered Species Act Section 7(a)(2) Concurrence Letter for Port of Long Beach Deep Draft Navigation Project

Dear Mr. De Mesa:

On July 29, 2021, NOAA's National Marine Fisheries Service (NMFS) received your request for a written concurrence that the proposed Port of Long Beach Deep Draft Navigation Project by the U.S. Army Corps of Engineers (Corps) is not likely to adversely affect (NLAA) species listed as threatened or endangered or critical habitats designated under the Endangered Species Act (ESA). Following a series of subsequent electronic and verbal communications between the Corps and NMFS, the Corps submitted a revised request for concurrence on August 9, 2021. This response to your request was prepared by NMFS pursuant to section 7(a)(2) of the ESA, implementing regulations at 50 CFR 402, and agency template for preparation of letters of concurrence.

Thank you also for your request for consultation pursuant to the essential fish habitat (EFH) provisions in Section 305(b) of the Magnuson-Stevens Fishery Conservation and Management Act (MSA) (16 U.S.C. 1855(b)) for this action. We acknowledge that the EFH consultation was completed in December 2019, and no further consideration of impacts to EFH will be provided in this response.

Because marine mammals may be present in the action area at any time, we provide comments related to compliance with the Marine Mammal Protection Act (MMPA).

This letter underwent pre-dissemination review using standards for utility, integrity, and objectivity in compliance with applicable guidelines issued under the Data Quality Act (section 515 of the Treasury and General Government Appropriations Act for Fiscal Year 2001, Public Law 106-554). The document will be available within two weeks at NMFS' Environmental Consultation Organizer (ECO) [https://www.fisheries.noaa.gov/resource/tool-app/environmental-consultation-organizer-eco]. A complete record of this consultation is on file at the NMFS West Coast Region Long Beach Office.

Proposed Action and Action Area

The proposed project involves several activities in the Port of Long Beach (POLB) to facilitate operations for container and liquid bulk vessels operating in the POLB, for both the current and future fleet, and to improve conditions for vessel operations and safety in the event of vessel malfunction or weather-related events. The proposed project includes constructing an approach channel to Pier J South and deepening the West Basin Channel to a new depth of -55 feet MLLW, deepening of the Approach Channel to -80 feet MLLW, and widening portions of the Main Channel to match the currently authorized depth in the Main Channel of -76 feet MLLW.

Sediments dredged by a hopper dredge from deepening of the Approach Channel will be placed in the Surfside Borrow Site Nearshore Placement Area, and sediments dredged by an electric clamshell dredge from the remaining dredge areas would be disposed at LA-2 and LA-3. In total, the proposed project includes dredging approximately 7.4 million cubic yards (mcy) of material; with placement of the dredged material in the Surfside Borrow Site Nearshore Placement Area and LA-2 and LA-3 ocean dredge material disposal sites (ODMDS). Overall project duration is estimated at 39 months. To support dredging at the Pier J berth, the Approach Channel, and turning basin, a new dredge electric substation is required to be constructed to mitigate for air quality impacts.

The POLB encompasses the eastern part of the San Pedro Bay, located in the southwestern portion of the city of Long Beach, in southern Los Angeles County, approximately 20 miles south of downtown Los Angeles. The action area includes the waters in the immediate vicinity (and shoreward) of the breakwaters through the entire port and includes the LA-2 and LA-3 ODMDS, the Surfside Borrow Site Nearshore Placement Area, and the transit lanes to and from the disposal/placement sites.

Background and Action Agency's Effects Determination

The Corps determined the proposed project may affect East Pacific Distinct Population Segment (DPS) green sea turtles (*Chelonia mydas*) that occur in the action area surrounding Long Beach, which are currently listed as threatened under the ESA (81 FR 20057). Specifically, the Corps acknowledged that multiple scientific studies (e.g., Crear et al. 2016; Bredvik et al. 2019; Hanna et al. 2020) illustrate that green sea turtles may occur in the action area during the proposed project. The Corps identified potential effects of the proposed action that include risks of injury and/or mortality, general disturbance, and loss/avoidance of habitat, to sea turtles through the use of dredges and construction equipment needed to complete project activities. In order to avoid potential impacts to green sea turtles during the proposed project, the Corps has proposed to implement a suite of measures described in the August 9, 2021 consultation request and Final Integrated Feasibility Report (USACE 2021) for the proposed project that include monitoring of dredging and disposal activities along with mandatory avoidance procedures to be employed if any green sea turtles are present during dredging and sediment disposal to limit the potential for adverse effects activities.

The Corps concludes that adverse effects to ESA-listed green sea turtles as a result from the proposed project are unlikely. The Corps concludes that the monitoring and avoidance measures proposed will ensure that placement activities do not adversely affect green sea turtles. If any green sea turtles are in the project areas, they expect that those turtles will detect the commencement of project activities as they move into the area and will have an opportunity to move away. The Corps concludes the lack of important foraging habitat features near project areas where dredging and disposal will occur minimizes the risk of any effects or disturbance resulting from exposure to project activities, given the low probability that turtles are expected to be within project areas for extended periods of time and the lack of any expected impact on health and fitness that avoidance of these areas would have on green sea turtles.

In total, the Corps concluded that the proposed project may affect, but is not likely to adversely affect, the East Pacific DPS of green sea turtles.

Endangered Species Act

Effects of the Action

Under the ESA, "effects of the action" are all consequences to listed species or critical habitat that are caused by the proposed action, including the consequences of other activities that are caused by the proposed action. A consequence is caused by the proposed action if it would not occur but for the proposed action and it is reasonably certain to occur. Effects of the action may occur later in time and may include consequences occurring outside the immediate area involved in the action (50 CFR 402.02). In our analysis, which describes the effects of the proposed action, we considered 50 CFR 402.17(a) and (b). When evaluating whether the proposed action is not likely to adversely affect listed species or critical habitat, NMFS considers whether the effects are expected to be completely beneficial, insignificant, or discountable. Completely beneficial effects are contemporaneous positive effects without any adverse effects to the species or critical habitat. Insignificant effects relate to the size of the impact and should never reach the scale where take occurs. Effects are considered discountable if they are extremely unlikely to occur.

The Corps accurately described the potential effects of the action, including exposure to direct contact injuries, disturbance, and foraging habitat impacts. In addition to the studies cited by the Corps, the best available information including sightings and strandings of green sea turtles in Southern California (specifically in the Long Beach area), have been increasing, likely representing increasing abundance of these individuals in the area (NMFS 2019). Although studies of green sea turtles in the Long Beach area have been focused on estuarine complexes such as the San Gabriel River and Anaheim Bay, movements of green turtles outside of the estuaries have been recorded during all of the studies. In addition, sightings/strandings of green turtles have become common throughout the coastal area surrounding Long Beach (NMFS unpublished data). Based on the available information, we assume that green turtles are periodically or frequently transiting through the action area, including where dredging and sediment disposal is slated to occur. We also assume they may occur in the action area at any time during the year although they are most likely to be found moving around in the action area from spring through fall, depending in part on coastal water temperatures.

The Corps acknowledges the potential for collisions with green sea turtles and vessels, equipment, and debris that are associated with proposed action activities. We agree with the Corps that implementation of the proposed monitoring and avoidance procedures will be effective at minimizing the risk of direct contact injuries making them extremely unlikely to occur. During research operations, NMFS staff repeatedly have observed the detection and avoidance reactions of sea turtles to slow moving vessels, even upon detecting them at very close proximity while surfacing, and concluded that the risk of a collision with slower moving vessels in project areas that are monitoring for the presence of green turtles is discountable (D. Lawson, NMFS, personal observations 2015). Although turtles may occur anywhere at any time in the project area, project activities including dredging and disposal are not occurring in areas known to be regularly used for foraging by green sea turtles. As such, we agree with the Corps that alterations of these habitats by project activities in these areas will not significantly impact the foraging or movement activities of green sea turtles in the area. We also agree with the Corps that project activities may create general disturbance that is likely to lead to avoidance of project areas when detected. As a result, we agree with the Corps that any disturbance or disruption of green sea turtle presence in this area will not significantly impact the foraging and movement activities of green sea turtles which are typically concentrated in other areas that will not be affected by the proposed action.

The project description includes that the purpose of the project is to support safe and efficient operations of the current and future fleet of container and liquid bulk vessels in the POLB. The main problem identified by the POLB that is addressed by the proposed project is that existing channel depths and widths that create limitations of the harbor, resulting in the inefficient operation of deep draft vessels in the Federal (Main) and secondary channels in the Port of Long Beach complex, which increases the Nation's transportation costs. What the project will do is potentially affect the amount and type of vessel activity that could occur within and near the project area, as efficiency operations of large vessels within the POLB are improved. Within the POLB, vessel speeds are restricted to accommodate the needs for safe navigation within confined waterways with significant other private and commercial traffic. As described before, vessel operations at restricted speeds within the POLB are generally not expected to lead to vessel collisions with green sea turtles. As a result, we would not anticipate any additional risk of interactions between the operations of container and liquid bulk vessels within the POLB and green sea turtles as a result of the proposed project.

Conclusion

Based on our knowledge, expertise, and your action agency's materials, we concur with the Corp's conclusions that the proposed action may affect, but is not likely to adversely affect, the East Pacific DPS of green sea turtles.

Reinitiation of Consultation

Reinitiation of consultation is required and shall be requested by the Corps or by NMFS, where discretionary Federal involvement or control over the action has been retained or is authorized by law and (1) the proposed action causes take because no incidental take is anticipated; (2) new information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not previously considered; (3) the identified action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in the written concurrence; or (4) a new species is listed or critical habitat designated that may be affected by the identified action (50 CFR 402.16). This concludes the ESA portion of this consultation.

Marine Mammal Protection Act Comments

Numerous species of marine mammals may be found in the project area, including areas within the POLB where dredging will occur, as well as coastal areas where disposal will occur. These include species of pinnipeds such as California sea lions (*Zalophus californianus*) and Pacific harbor seals (*Phoca vitulina*), as whale as cetaceans such as common dolphins (*Delphinus spp.*), gray whales (*Eschrichtius robustus*), and blue whales (*Balaenoptera musculus*). Marine mammals are protected under the Marine Mammal Protection Act (MMPA) (16 U.S.C. § 1361 et. seq.). Under the MMPA, it is generally illegal to "take" a marine mammal without prior authorization from NMFS. "Take" is defined as harassing, hunting, capturing, or killing, or attempting to harass, hunt, capture, or kill any marine mammal. Except with respect to military readiness activities and certain scientific research conducted by, or on behalf of, the Federal Government, "harassment" is defined as any act of pursuit, torment, or annoyance, which has the potential to injure a marine mammal in the wild, or has the potential to disturb a marine mammal in the wild by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering.

During the monitoring associated with this proposed project, the Corps should note marine mammal presence and any behaviors indicative of potential harassment under the MMPA. These behaviors could include startled response, irregular diving, or flushing from haul-out positions in the vicinity of the project area. Implementation of the proposed monitoring and avoidance measures for marine mammals should help minimize the potential for marine mammal harassment or injury resulting from this proposed activity. NMFS requests that the Corps carefully record the behavior of any marine mammals that do occur within the proposed project area. If the proposed project disturbs marine mammals, the Corps should cease activity and contact NMFS before proceeding further. If the incidental take of marine mammals is expected to occur as a result of any proposed action, the Corps should apply for an Incidental Harassment Authorization (IHA) or Letter of Authorization (LOA) from NMFS well in advance of the proposed action. Please note that this letter does not provide Incidental Harassment Authorization for any marine mammals; any authorization would have to come from NMFS Office of Protected Resources, in Silver Spring, Maryland.

In the unlikely event of an injury or mortality of a marine mammal or sea turtle due to this project, immediately contact our regional stranding coordinator, Justin Viezbicke, at (562) 980-3230.

Please direct questions regarding this letter to Dan Lawson, Long Beach Protected Resources Division, at 206-526-4740 or Dan.Lawson@noaa.gov.

Sincerely,

Penny Ruvelas
Long Beach Branch Chief
Protected Resources Division

cc: Administrative File: 151422WCR2021PR00151

References

Bredvik, J.J.; S.E. Graham, and B.P. Saunders. 2019. Green Sea Turtle Satellite Tagging in Support of Naval Weapons Station Ammunition Pier and Turning Basin. Prepared for Naval Facilities Engineering Command (NAVFAC) Southwest. Submitted to National Marine Fisheries Service, California, December 2019.

Crear, D.P., D.D. Lawson, J.A. Seminoff, T. Eguchi, R.A. LeRoux, and C.G. Lowe. 2016. Seasonal shifts in the movement and distribution of green sea turtles Chelonia mydas in response to anthropogenically altered water temperatures. Marine Ecology Progress Series 548:219-232.

Hanna, M.E., J. Bredvik, S.E. Graham, B. Saunders, J.A. Seminoff, T. Eguchi and C. Turner Tomaszewicz. 2020. Movements and habitat use of green sea turtles at the Seal Beach National Wildlife Refuge, CA. Prepared for Naval Weapons Station Seal Beach, California, September 2020.

NMFS. 2019. Endangered Species Act Section 7(a)(2) Biological Opinion, Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Response, and Fish and Wildlife Coordination Act Recommendations, for the Ammunition Pier and Turning Basin Construction Project at Naval Weapons Station Seal Beach. NMFS West Coast Region Protected Resources Division, Long Beach CA. April 30, 2019.

USACE. 2021. Port of Long Beach Deep Draft Navigation Feasibility Study. Final Integrated Feasibility Report with Environmental Impact Statement/Environmental Impact Report. U.S. Army Corps of Engineers. August, 2021.

4.2 U.S. Fish and Wildlife Service

DEPARTMENT OF THE ARMY
LOS ANGELES DISTRICT, U.S. ARMY CORPS OF ENGINEERS
915 WILSHIRE BOULEVARD, SUITE 930
LOS ANGELES, CALIFORNIA 90017

July 31, 2014

Office of the Chief
Planning Division

Mr. Jon Avery
Federal Projects Coordinator
U.S. Fish & Wildlife Service
2177 Salk Avenue, Suite 250
Carlsbad, California 92008

Dear Mr. Avery:

The U.S. Army Corps of Engineers (Corps) is initiating the Port of Long Beach Deep Draft Navigation Reconnaissance Study in order to improve navigation efficiencies. The study area is located in the city of Long Beach, Los Angeles County, California. A project vicinity map is enclosed.

To aid the planning process, the Corps requests a current list of any endangered, threatened, proposed or candidate species, pursuant to the Endangered Species Act of 1973, that may be within the vicinity of the study area. Please also include species of concern.

Also enclosed for your review is a draft plan formulation document identifying preliminary problems, opportunities, objectives, and measures. Your review of the draft document and initial comments concerning resource constraints as well as avoidance and minimization measures that could further aid the planning process are also solicited.

Please forward your comments and the species list by September 1, 2014, to:

Josephine R. Axt, Ph.D.
Chief, Planning Division
U.S. Army Corps of Engineers
Los Angeles District
915 Wilshire Boulevard, Suite 930
Attention: Mr. Larry Smith
Los Angeles, California 90017-3401

Should you require additional information or have any questions, please contact Mr. Larry Smith, Project Environmental Coordinator, at (213) 452-3846.

Sincerely,

Josephine R. Axt, Ph.D.
Chief, Planning Division

Enclosure

Port of Long Beach Deep Draft Navigation Reconnaissance Study.

1) Problems: The primary problem is the inefficient operation of deep draft vessels—liquid bulk and container—in the Federal channel and secondary channels, which increases the Nation's transportation costs

a. Existing container vessels cannot draft more than 43 feet, which causes lightering and delays to an increasing number of containerships.

b. Delays and lightering from container vessel draft limits will increase as new, larger vessels are added to the fleet.

c. Existing vessels drafting 55 feet or more with LOA of 900 feet cannot enter the Federal Approach Channel during periods of dynamic (high) wave events causing delays.

iv. The severity of delays from dynamic wave effects will increase as liquid bulk (crude oil) traffic increases.

d. Liquid bulk vessels drafting over 61 feet must enter and exit the 2-mile long Entrance Channel one-at-a-time increasing costs due to delays arriving at berths.

e. Oil tankers in VLCC or ULCC classes (+200,000 DWT) drafting over 61 feet have no anchorage within the Inner Harbor due to the lack of deep anchorages creating safety concerns in the event of propulsion or equipment failure, weather conditions, emergency repairs, or other possible berthing issues.

f. Oil tankers are lightering offshore.

2) Opportunities: A number of opportunities were identified in the initial and subsequent steps and iterations of the planning process.

a. Reduce the transportation cost of import and export trade through the Port of Long Beach and contribute to increases in national net income

b. Provide a more accessible channel and increased opportunities for vessel transit

c. Provide improved conditions for vessel operation

d. Reduce constraints of harbor pilot operating practices

e. Provide beneficial placement of sediment (e.g., beach nourishment)

3) Planning Objectives:

a. Contribute to National Economic Development by reducing the cost of transporting cargo volumes to and from the Port of Long Beach by examining improvements to channel dimensions and vessel operations

b. Reduce expected future vessel re-routings from the Port of Long Beach to alternate facilities by examining improvements to channel dimensions and vessel operations

c. Utilize dredged sediment for beneficial means when possible

4) Measures

a. Deepen the secondary access channel to Pier J

b. Deepen the secondary access channel to Pier T West Basin

c. Construct a turning basin in the secondary access channel to Pier J

d. Construct a turning basin in the secondary access channel to Pier T West Basin

e. Deepen the approach channel

f. Deepen Cerritos Channel

g. Construct a turning basin in Cerritos Channel

h. Deepen the Back Channel

i. Construct an inner harbor waiting area or deepen the anchorage along main channel

5) Preliminary Alternatives

a. Improvement to Container & Liquid Bulk Efficiency: Deepen the secondary access channels and construct turning basins to Pier J, Pier T West Basin, and Cerritos Channel. Deepen the approach channel. Construct an inner harbor waiting area and widen the main channel turning basin.

b. Improvement to Container Efficiency: Deepen the secondary access channels and construct turning basins to Pier J, Pier T West Basin, and Cerritos Channel.

c. Improvement to Container Efficiency at Pier J and Pier T West Basin: Deepen the secondary access channels and construct turning basins to Pier J and Pier T West Basin.


WILMINGTON DISTRICT
LONG BEACH
Cerritos Channel
CERRITOS CHANNEL
TURNING BASIN
PIER B
CHANNEL 2
PIER C
CHANNEL 3
PIER D
PIER E
PIER S
LOS ANGELES RIVER FLOOD CONTRO
QUEENSWAY BAY
WEST BASIN
EAST BASIN
SOUTH TURNING BASIN
MORMON ISLAND
EAST BASIN CHANNEL
Pier T - West Basin
ISLAND GRISSOM
LARE
PORT OF LONG BEACH
ISLAND WHITE
INNER TURNING BASIN
WEST BASIN
TURNING BASIN
PIER F
BASIN SIX
PIER G
BAY
PORT OF LOS ANGELES
TERMINAL ISLANDS
NAVY MOLE
ENTRANCE CHANNEL
SOUTHEAST BASIN
ISLAND FREEMAN
PIER J
Long Beach Outer Harbor
MAIN CHANNEL
FISH HARBOR
PIER 300
NORTH CHANNEL
SAN PEDRO
Pier J
Anchorage
PIER 400
* P400 SMSS
PIER 300 TURNING BASIN
LONG BEACH BREAKWATER
(13, 350 FT)
City of Long Beach
City of Los Angeles
WEST CHANNEL
EAST CHANNEL
MIDDLE BREAKWATER
(18, 500 FT)
QUEEN'S GATE ENTRANCE
SOUTH CHANNEL
ANGEL'S GATE ENTRANCE
SOUTH TURNING BASIN
CSWH
SAN PEDRO BREAKWATER
(11,152 FT)
APPROACH CHANNEL
POLB Navigation Improvements Reconnaissance Study
Approach Channel
Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmap

From: Roberts, Carol
To: Smith, Lawrence J SPL
Subject: [EXTERNAL] Port of Long Beach Deep Draft Navigation Reconnaissance Study
Date: Wednesday, September 03, 2014 1:05:45 PM

14B0006-14EC3007

Hey Larry,
I apologize that the request for a species list has been sitting on my desk for a while. We generally don't provide species lists except through our ECOS portal to reduce the overall workload. You can get a species list (which includes species of concern as well as listed species) by following the step by step instructions at the following link:

http://ecos.fws.gov/ipac/

In regards to the plan formulation document, it provides some helpful organization of concepts for working through the process. Given our concerns for fish and wildlife that may use the larger Port of Long Beach area, I encourage the Corps to take advantage of the expertise within the Southern California Dredged Materials Management Team (SC-DMMT)to assist in providing for the appropriate beneficial use of the dredged materials. Given the volume of material, phasing would be appropriate, and the phases should be scheduled to avoid fish and wildlife impacts to species foraging in the dredge area and/or using potential receiving areas as nesting or wintering sites. I look forward to future discussions with the SC-DMMT on making the most of these materials while concurrently improving the Port facilities without adverse effects to fish and wildlife resources.

-Carol

+

Carol A Roberts, Division Chief
Environmental Contaminants/Federal Projects
Carlsbad Fish and Wildlife Office
2177 Salk Avenue, Suite 250
Carlsbad, CA 92008

(760) 431-9440, ext. 271/ fax (760) 431-5901
24-hr spill phone number is 760-607-9768

carol_a_roberts@fws.gov <mailto:carol_a_roberts@fws.gov>

"The significant problems we have cannot be solved with the same level of thinking with which we created them." -Albert Einstein

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Carlsbad Fish and Wildlife Office
2177 SALK AVENUE - SUITE 250
CARLSBAD, CA 92008
PHONE: (760)431-9440 FAX: (760)431-5901
URL: www.fws.gov/carlsbad/

Consultation Code: 08ECAR00-2015-SLI-0209 February 18, 2015
Event Code: 08ECAR00-2015-E-00451
Project Name: Port of Long Beach Deep Draft Navigation Reconnais

Subject: List of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, and proposed species, designated critical habitat, and candidate species that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (http://www.fws.gov/windenergy/) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm; http://www.towerkill.com; and http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment

Official Species List

Provided by:

Carlsbad Fish and Wildlife Office
2177 SALK AVENUE - SUITE 250
CARLSBAD, CA 92008
(760) 431-9440
http://www.fws.gov/carlsbad/

Consultation Code: 08ECAR00-2015-SLI-0209
Event Code: 08ECAR00-2015-E-00451

Project Type: Dredge / Excavation

Project Name: Port of Long Beach Deep Draft Navigation Reconnais
Project Description: Port of Long Beach Deep Draft Navigation Reconnaissance Study

Please Note: The FWS office may have modified the Project Name and/or Project Description, so it may be different from what was submitted in your previous request. If the Consultation Code matches, the FWS considers this to be the same project. Contact the office in the 'Provided by' section of your previous Official Species list if you have any questions or concerns.

United States Department of Interior
Fish and Wildlife Service

Project name: Port of Long Beach Deep Draft Navigation Reconnais

Project Location Map:

Project Coordinates: MULTIPOLYGON (((-118.2446426 33.7503824, -118.2252448 33.7566624, -118.2230132 33.7520952, -118.2182067 33.7533797, -118.2178634 33.7545215, -118.2199233 33.7575187, -118.2192367 33.7593811, -118.2216399 33.7635127, -118.2252448 33.7679365, -118.2207816 33.7705051, -118.220095 33.7660814, -118.21958 33.7636554, -118.2156318 33.7566624, -118.2151168 33.7566624, -118.2147735 33.7625137, -118.2142585 33.7625137, -118.2137435 33.761372, -118.2134002 33.7563769, -118.2134002 33.7553779, -118.2113402 33.7560915, -118.2103103 33.7566624, -118.208422 33.758375, -118.2087653 33.7596594, -118.2087653 33.762371, -118.2080787 33.7626564, -118.2067054 33.7562342, -118.2149451 33.7519525, -118.2151168 33.7456722, -118.2065337 33.7403907, -118.2051604 33.7419609, -118.2127135 33.7469568, -118.2063621 33.7509534, -118.2060187 33.7442448, -118.1986373 33.7442448, -118.1986373 33.7509534, -118.1974357 33.7508106, -118.1969207 33.7431029, -118.1929725 33.7436738, -118.1921142 33.7431029, -118.1950324 33.7398197, -118.2010406 33.7398197, -118.2034438 33.739106, -118.2031005 33.7381067, -118.2018989 33.7363937, -118.196749 33.7359654, -118.187816 33.732682, -118.1848977 33.7336813, -

118.1850694 33.7361082, -118.1938241 33.7361082, -118.1943391 33.737964, -118.1860994 33.738535, -118.1648477 33.7376785, -118.1617233 33.7156959, -118.2315895 33.7128401, -118.2424041 33.7421077, -118.2305595 33.7395382, -118.2169982 33.7443916, -118.2186805 33.7449625, -118.2310745 33.7411085, -118.2412025 33.7429641, -118.2417175 33.7432496, -118.2446426 33.7503824)))

Project Counties: Los Angeles, CA

Endangered Species Act Species List

There are a total of 6 threatened or endangered species on your species list. Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species. Critical habitats listed under the **Has Critical Habitat** column may or may not lie within your project area. See the **Critical habitats within your project area** section further below for critical habitat that lies within your project. Please contact the designated FWS office if you have questions.

Birds	**Status**	**Has Critical Habitat**	**Condition(s)**
California Least tern *(Sterna antillarum browni)*	Endangered		
Coastal California gnatcatcher *(Polioptila californica californica)* Population: Entire	Threatened	Final designated	
Least Bell's vireo *(Vireo bellii pusillus)* Population: Entire	Endangered	Final designated	
Light-Footed Clapper rail *(Rallus longirostris levipes)* Population: U.S.A. only	Endangered		
western snowy plover *(Charadrius nivosus ssp. nivosus)* Population: Pacific coastal pop.	Threatened	Final designated	
Mammals			
Pacific Pocket mouse *(Perognathus longimembris pacificus)* Population: Entire	Endangered		

Critical habitats that lie within your project area

There are no critical habitats within your project area.

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United States Department of the Interior

FISH AND WILDLIFE SERVICE
Carlsbad Fish and Wildlife Office
2177 SALK AVENUE - SUITE 250
CARLSBAD, CA 92008
PHONE: (760)431-9440 FAX: (760)431-5901
URL: www.fws.gov/carlsbad/

Consultation Code: 08ECAR00-2015-SLI-0253 March 10, 2015
Event Code: 08ECAR00-2015-E-00516
Project Name: POLB Navigation Improvements

Subject: List of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, and proposed species, designated critical habitat, and candidate species that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (http://www.fws.gov/windenergy/) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm; http://www.towerkill.com; and http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment

Official Species List

Provided by:

Carlsbad Fish and Wildlife Office
2177 SALK AVENUE - SUITE 250
CARLSBAD, CA 92008
(760) 431-9440
http://www.fws.gov/carlsbad/

Consultation Code: 08ECAR00-2015-SLI-0253
Event Code: 08ECAR00-2015-E-00516

Project Type: Dredge / Excavation

Project Name: POLB Navigation Improvements
Project Description: Dredge channels and turning basins to improve efficiency at the POLB.

Please Note: The FWS office may have modified the Project Name and/or Project Description, so it may be different from what was submitted in your previous request. If the Consultation Code matches, the FWS considers this to be the same project. Contact the office in the 'Provided by' section of your previous Official Species list if you have any questions or concerns.

Project Location Map:

Project Coordinates: MULTIPOLYGON (((-118.21717 33.7443975, -118.2211096 33.7505351, -118.2168095 33.7533968, -118.2186978 33.7579567, -118.2183545 33.7592412, -118.2204144 33.7630944, -118.2238648 33.7685172, -118.2346795 33.766234, -118.2370741 33.7653778, -118.2374175 33.7670902, -118.2228177 33.7709431, -118.2197278 33.7728053, -118.2211011 33.7705221, -118.2207577 33.768239, -118.2205861 33.7659557, -118.2174962 33.7588202, -118.2166379 33.7572503, -118.2156079 33.7525404, -118.2156079 33.7462602, -118.2054799 33.7388375, -118.1994717 33.7339839, -118.1974118 33.7352687, -118.1965535 33.7322708, -118.1938069 33.7308432, -118.1905453 33.7268457, -118.1826489 33.7307004, -118.181104 33.7361253, -118.1848805 33.736839, -118.1841939 33.7384093, -118.1770013 33.7382594, -118.1754391 33.7312715, -118.1756108 33.7271313, -118.1860821 33.7204208, -118.1852238 33.705856, -118.1908887 33.7054276, -118.21717 33.7443975)))

Project Counties: Los Angeles, CA

Endangered Species Act Species List

There are a total of 6 threatened or endangered species on your species list. Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species. Critical habitats listed under the **Has Critical Habitat** column may or may not lie within your project area. See the **Critical habitats within your project area** section further below for critical habitat that lies within your project. Please contact the designated FWS office if you have questions.

Birds	Status	Has Critical Habitat	Condition(s)
California Least tern *(Sterna antillarum browni)*	Endangered		
Coastal California gnatcatcher *(Polioptila californica californica)* Population: Entire	Threatened	Final designated	
Least Bell's vireo *(Vireo bellii pusillus)* Population: Entire	Endangered	Final designated	
Light-Footed Clapper rail *(Rallus longirostris levipes)* Population: U.S.A. only	Endangered		
western snowy plover *(Charadrius nivosus ssp. nivosus)* Population: Pacific coastal pop.	Threatened	Final designated	
Mammals			
Pacific Pocket mouse *(Perognathus longimembris pacificus)* Population: Entire	Endangered		

Critical habitats that lie within your project area

There are no critical habitats within your project area.

United States Department of the Interior

U.S. FISH AND WILDLIFE SERVICE
Ecological Services
Carlsbad Fish and Wildlife Office
2177 Salk Avenue, Suite 250
Carlsbad, California 92008

In Reply Refer to:
FWS-LA-15B0128-21CPA0060

April 14, 2021
Sent Electronically

Colonel Julie A. Balten
U.S. Army Corps of Engineers – Los Angeles District
915 Wilshire Boulevard, Suite 930
Los Angeles, California 90017-3409

Attention: Larry Smith

Subject: Final Coordination Act Report for the Proposed Long Beach Project, Los Angeles County, California

Dear Colonel Balten:

The U.S. Fish and Wildlife Service (Service) has prepared this Final Coordination Act Report (Final CAR) for the U.S. Army Corps of Engineers (Corps) on the proposed Port of Long Beach Deep Draft Navigation Project (project) to describe ecological components and processes, identify opportunities to protect and improve biological resources, and provide recommendations related to the conservation and enhancement of fish and wildlife species in the project area. The Corps' Los Angeles District and the Port of Long Beach (POLB), have completed a Draft Integrated Feasibility Report and Environmental Impact Statement/Environmental Impact Report (EIS/EIR) for the Port of Long Beach Deep Draft Navigation Feasibility Study (feasibility study) located in the City of Long Beach, Los Angeles County, California. The feasibility study was published in October 2019 and provided to fulfill both federal National Environmental Policy Act (NEPA) and state California Environmental Quality Act (CEQA) environmental documentation requirements as the combined EIS/EIR (Corps 2019a).

The purpose of the proposed project is to evaluate and improve existing navigation channels within the Port of Long Beach to improve conditions for current and future container and liquid bulk vessel operations and safety (Corps 2019c). The proposed project would be located mainly at the Port of Long Beach Federal channels and berths serving Pier J and Pier T/West Basin (see Figures 1 and 2). The proposed project would deepen existing channels and construct a new Federal channel and turning basin by dredging and disposing of sediment. The total proposed dredge area is approximately 880 acres, and the project would expand the size of existing navigation channels and turning basin areas by approximately 345 acres (NOAA 2019). As proposed, dredged sediments would be placed in a nearshore disposal site off the coast of the City of Seal Beach, in Orange County, California (see the "Nearshore" site in Figure 3) and at two Environmental Protection Agency-designated offshore dredged material disposal sites (see sites LA-2 and LA-3 in Figure 3) in Los Angeles and Orange counties. The disturbance area of new dredging (areas that have not been dredged previously) from the proposed project would be approximately 241 acres (NOAA 2019).

The overall project region (the general area including and surrounding all proposed project activities) consists of nearshore and offshore areas of a portion of San Pedro Bay in Los Angeles and Orange counties within 10 miles of the coast. The main project area (the area of all proposed project activities, excluding locations for dredge materials placement and associated transit zones between dredging and dredge materials placement) encompasses portions of the Los Angeles County coast of the eastern Pacific Ocean, predominantly within about 5 miles seaward of the historical coastline near the mouth of the Los Angeles River and the coast of the City of Long Beach in San Pedro Bay. The shoreline, marine, and former estuarine areas of the main project region (Figure 1) and main project area (Figure 2) have been heavily modified over the last century, associated with port development, oil extraction, and coastal commercial/urban development. Before the 20th century, the areas that are now the ports of Los Angeles and Long Beach were predominantly estuaries of the Los Angeles and San Gabriel rivers (Port of Long Beach 2011). The formerly extensive natural mudflats and marshlands of the main project area historically provided expansive habitats for birds, fish, and invertebrates, and the former barrier beaches, river mouths, and sand spits of the area served as nesting and foraging habitats for a variety of seabirds and shorebirds (Arnold 1903; POLB 2011). Very small remnants of these natural communities/habitats remain intact in the main project area.

This Final CAR is provided in accordance with the Fish and Wildlife Coordination Act (FWCA) of 1958, as amended (48 Stat. 401; 16 U.S.C. 661 *et seq.*), and the Endangered Species Act (ESA) of 1973, as amended (87 Stat. 884; 16 U.S.C. 1531 *et seq.*). The Final CAR is a report per section 2(b) of the FWCA; it does not constitute a biological opinion under section 7 of the ESA. The purpose of this Final CAR is to deliver information and recommendations for use by the Corps' design-planning team in developing goals, objectives, and alternatives/modifications to the project.

INTRODUCTION

Nearshore[1] ecosystems include many biological resources that are of high ecological, recreational, subsistence, and economic value. California's nearshore ecosystems are some of the most productive ocean areas in the world (CDFG 2001). These systems are home to a wide variety of fishes, kelp, marine invertebrates, and marine mammals, as well as a large number of sea and shorebird species (CDFG 2001). These systems also are subject to influences from natural and human-caused perturbations, which can originate in terrestrial or oceanic environments. Nearshore marine habitats are productive, while also vulnerable, owing to their connections to pelagic and terrestrial landscapes. About 450 species of fish occupy California's nearshore ecosystem within the limits of the continental shelf (CDFG 2001).

[1] The nearshore is defined as the area from the coastal high tide line offshore to a water depth of 120 feet.

Figure 1. Main Project Region (Corps 2019a).

Figure 2. Main Project Area (Corps 2019a).[2]

[2] The white solid line boundary shown in the Corps' figure above denotes the "Existing Federal Project" main channel and approach channel for the Port of Long Beach – which are both currently dredged to 76 feet below mean lower low water. The "C" represents the proposed project "General Navigation Features" that would be constructed for container ships. The "LB" represents the proposed project "General Navigation Features" that would be constructed for liquid bulk vessels. The hashed and solid light blue areas represent proposed project dredging. The dotted line denotes the Port of Long Beach boundary.

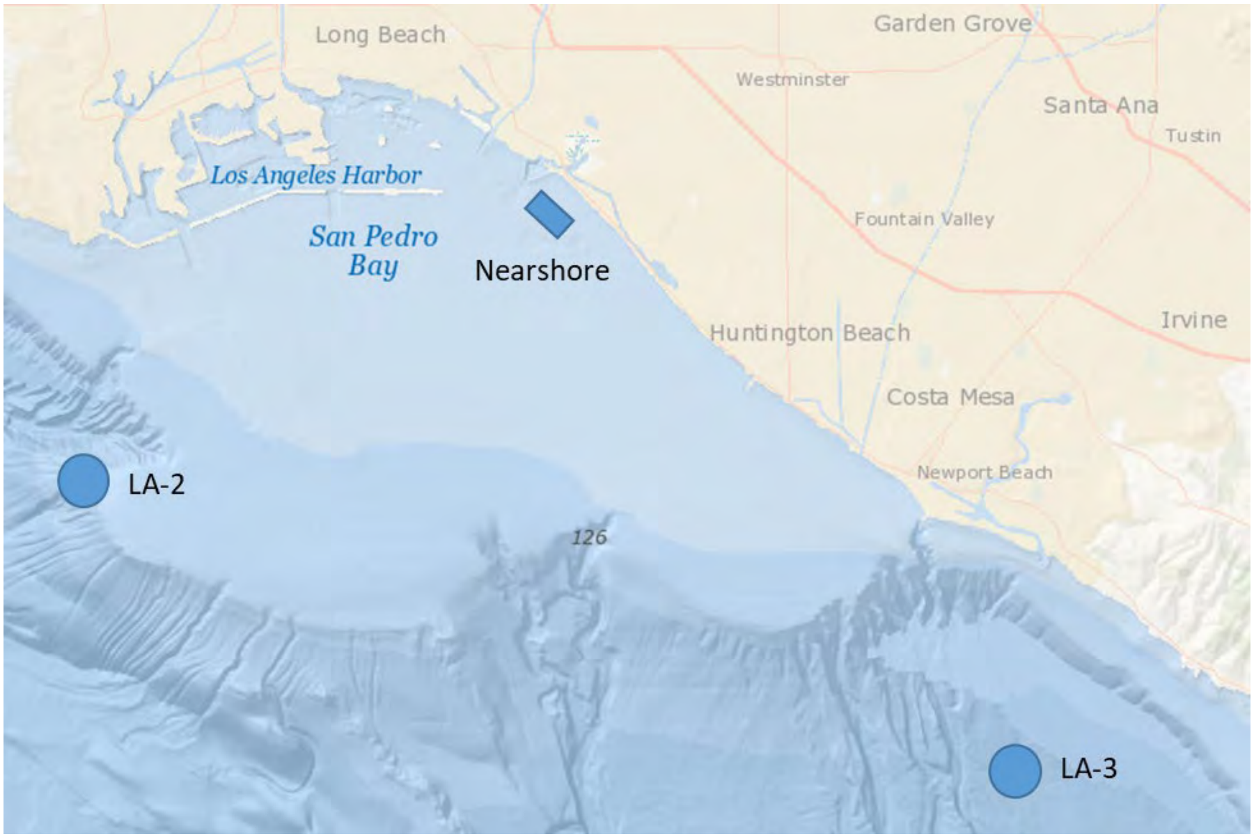

Figure 3. Full Project Region and Dredge Material Placement Portion of Project Area (Corps 2019a).

San Pedro Bay is a large inlet of the eastern Pacific Ocean along the southwestern continental United States coast, within the Southern California Bight. The Southern California Bight encompasses the marine waters from Point Conception at the northwest end of the Santa Barbara Channel, to a point just south of the border between the United States and Mexico. The Southern California Bight is notable for complex bathymetry, offshore islands, and for being adjacent to a highly developed coastal region with substantial anthropogenic inputs into the coastal ocean (Todd *et al*. 2009). More than 22 million people live along southern California's coast (Brothers 2015).

The San Pedro Bay region includes the Port of Los Angeles and the Port of Long Beach, which together form the fifth-busiest port facility in the world and the busiest port in the Americas. San Pedro Bay is bounded by the City of Los Angeles communities of San Pedro on the west, Wilmington on the north, and by the cities of Long Beach and Seal Beach on the north and east.

Coastal development of Long Beach and a century of harbor dredging and filling associated with development of the ports of Los Angeles and Long Beach eliminated thousands of acres of Los Angeles River estuary. In its place, behind manmade breakwaters, remains an open-water marine embayment of relatively high biological diversity and productivity.

Fish and Wildlife Coordination Act

The Fish and Wildlife Coordination Act of 1934 (the predecessor to the FWCA of 1958 noted above) included requirements that were the first formal expressions in U.S. law of a duty to minimize the negative environmental impacts of major water resource development projects and to compensate for those impacts that remained (Bean 2016).

The Fish and Wildlife Coordination Act of 1934 was a response to a U.S. era of big dam building and reflected a concern for the impact of those dams, particularly on anadromous fish (Bean 2016). As originally enacted, it required consultation with the Bureau of Fisheries (as the Service was then known) prior to the construction of any dam to determine if fish ladders or other aids to migration were necessary and economically practical to minimize impacts on fish populations. It required, as well, the opportunity to use the impounded waters for hatcheries to offset impacts that could not otherwise be avoided. The duties imposed by the FWCA were reinforced and expanded by the National Environmental Policy Act (NEPA) of 1969 (Bean 2016). Under NEPA and its implementing regulations, all federal agencies have a duty to assess the impacts of the major actions they propose to undertake and to consider reasonable alternatives to reduce or eliminate those impacts (Bean 2016). The Service, as the federal agency charged by Congress in the Fish and Wildlife Act of 1956 with the responsibility for management, conservation, and protection of fish and wildlife resources, routinely recommends mitigation measures to other federal agencies through the NEPA and FWCA processes (Bean 2016).

The FWCA directs and authorizes consultation, reporting, consideration, and installation/implementation of fish and wildlife conservation features. The authorities of the FWCA are considered to be "supplementary legislation" to the various Federal project authorizations, such as the Corps public works authorizations (Smalley and Mueller 2004). The FWCA conditions or supplements other water development statutes to require consideration of recommendations generated under the FWCA procedures, including portions of the Clean Water Act [*Zabel* v. *Tabb*, 430 F2d 199 (5th Cir. 1970) cert. denied 401 U.S. 910 (1972)]. For Federal water resources development projects, the FWCA requires that fish and wildlife conservation receive equal consideration by Federal agencies with other project purposes, and that such conservation be coordinated with other project features. Notably, the FWCA authorizes the Federal project implementation of these noted means and measures for both mitigating losses of fish and wildlife resources and for enhancing these resources beyond the scope of offsetting of project effects (Smalley and Mueller 2004).

PROJECT REGION HISTORY

The project region history was substantially covered in our Planning Aid Report on the subject project dated June 2016. This document is enclosed and incorporated herein by reference.

PROPOSED PROJECT

Recommended Plan – "Alternative 3"

The proposed project is termed Alternative 3 within the feasibility study. It was also the Corps' Tentatively Selected Plan (TSP) for the feasibility study, from the several project alternatives analyzed (Corps 2019a). Alternative 3 from the feasibility study is now officially the Corps' Recommended Plan (Corps 2021).

The Recommended Plan, which would be undertaken jointly by the Corps and the POLB, would deepen the entrance to the Main Channel (the Approach Channel through Queens Gate) in the POLB to a depth of -80 feet (ft) mean lower low water (MLLW), widen portions of the Main Channel (bend easing) to a depth of -76 ft MLLW, construct an approach channel and turning basin to Pier J South to a depth of -55 ft MLLW, and deepen portions of the West Basin and West Basin Approach to a depth of -55 ft MLLW. The POLB would also deepen two additional locations within the harbor to a depth of -55 ft MLLW: the Pier J Slip, including berths J266-J270, and berth T140 on Pier T. Structural improvements would also be performed on the Pier J breakwaters at the entrance of the Pier J Slip to accommodate deepening of the Pier J Slip and Approach Channel to -55 ft MLLW; these activities are considered "Local Service Facilities" and would be undertaken solely by POLB.

The total proposed dredging volume is approximately 7.4 million cubic yards (mcy) of sediment, and total dredge area is approximately 880 acres (NOAA 2019). The project would expand the size of existing navigation channels and turning basin areas in the POLB area by approximately 345 acres (NOAA 2019). Proposed construction would begin in 2024 and is anticipated to take approximately 39 months to complete (Corps 2019c).

As proposed, only project sediments dredged from the deepening of the POLB Approach Channel would be placed in a nearshore disposal site off the coast of the City of Seal Beach (see the "Nearshore" site in Figure 3). This Nearshore site is also otherwise known as the Sunset/Surfside Borrow Site for other projects in the area (e.g., Corps 2019b), and is herein termed the "Nearshore/Sunset/Surfside site." Sediments dredged from the balance of project dredging areas would be placed at two designated offshore dredged material disposal sites (see sites LA-2 and LA-3 in Figure 3) in Los Angeles and Orange counties.

The Nearshore/Sunset/Surfside placement site, approximately 5 miles from the main project area at the POLB, can accommodate about 2.5 mcy of dredged material in total (NOAA 2019). The dredge material placement sites LA-2 and LA-3 are approximately 9 miles and 22 miles, respectively, from the main project area in the POLB. Sites LA-2 and LA-3 have an allowed annual disposal volume limit of 1.0 and 2.5 mcy, respectively, from all sources (NOAA 2019). It is assumed that 0.9 mcy for LA-2 and 2.2 mcy for LA-3 would be available for use by this project each year (NOAA 2019). Vessel transit routes between the dredging locations and disposal sites are not mapped or identified in the feasibility study but are assumed to involve routes predominantly in direct lines from proposed dredging areas to noted disposal areas.

Dredging would be performed using a hopper dredge as well as an electric clamshell dredge. Disposal of material from the hopper dredge would maximize use of the Nearshore/Sunset/Surfside site, while a clamshell dredge would be utilized for sediment disposal at the disposal sites LA-2 and LA-3. The Approach Channel portion of the project would be completed in about 5 months of project-year one, utilizing the Nearshore/Sunset/Surfside placement site and LA-2 (Corps 2019a). The rest of the project activities, to be completed by the clamshell dredge, would take the remainder of the project's estimated total of 39 months (Corps 2019c). The total proposed dredging volume is approximately 7.4 mcy and total dredge area is approximately 880 acres (NOAA 2019).

The feasibility study indicates that the POLB would implement structural improvements to the Pier J breakwaters to address the need for increased structural stability associated with the deepened adjacent channels resulting from the project. As proposed, the types of structural improvements could consist of a series of project options: placing additional rock at the base of the existing breakwater structures, placing rock on the dredge slope using ground improvement methods, or submerged bulkhead walls of steel sheet pile structures. The most likely ground improvement method to be utilized would be injection of concrete grout at the base of the existing breakwater structures.[3] However, the feasibility study does not specify the location, amount, and/or type of fill associated with these improvements.

Project Dredge Equipment

The proposed project would utilize the following two types of dredges:

1. Hopper Dredge: A hopper dredge is a self-contained vessel that loads sediment from dredge sites then moves to a receiver site for placement. Approximately 17,500 cubic yards of sediment can be removed and transported to the placement site per day using a hopper dredge; although this can vary depending on the transit trip length to the placement/disposal site. The hopper dredge contains two large arms that drag along the ocean floor and collect sediment. The hopper dredge moves along the ocean surface with its arms extended, passing back and forth in the designated dredge site until the hull is fully loaded with sediment. The hopper dredge can generally reach within approximately 0.5 mile of shore to offload to a nearshore site. A single hopper dredge would be used for the project, and it would place all of its dredged material at the Nearshore/Sunset/Surfside placement site; this would involve a total of about 2.5 mcy of sediment to be removed and placed using this equipment.

2. Clamshell Dredge: The clamshell dredge consists of a derrick mounted on a barge outfitted with a clamshell bucket. Dredged materials are placed on a separate barge for transport to the placement site. Approximately 6,000 cubic yards of sediment can be removed and transported to the placement site per day using a clamshell dredge. Additional construction equipment typically required to support dredging activities

[3] The proposed ground improvement option would consist of injecting cement grout at high pressures into the soils behind a proposed sheet pile wall. The intent of the grout is to strengthen the soil behind the wall, relieving pressure on the bulk head. The injection of the grout as proposed would be accomplished by land-based equipment working on the adjacent wharf (Corps 2019a).

using a clamshell dredge include three support boats (two tugboats to move the barge and/or reposition the dredge, and a crew boat). Clamshell dredges are generally diesel-powered; however, all-electric clamshell dredges are available. An electric clamshell would be used for the proposed project as mitigation for air quality impacts. A single clamshell dredge would be used for the project, and a total of about 4.9 mcy of sediments would be removed and transported to the offshore disposal sites LA-2 and/or LA-3 using this equipment (Corps 2019a).

DESCRIPTION OF THE PROJECT REGION, PROJECT FOOTPRINT, AND PROJECT AREA

The project region, project footprint, and project area were substantially analyzed in our Planning Aid Report on the subject project in June 2016 (Enclosure).

DESCRIPTION OF BIOLOGICAL RESOURCES

The fish and wildlife resources of the POLB are reported in detail in a 2016 report entitled: *2013-2014 Biological Surveys of Long Beach and Los Angeles Harbors* (MBC 2016). The biological resources of most of the project region were analyzed within the 2019 feasibility study for the project noted above. Additionally, the biological resources of the main project area were substantially covered in our Planning Aid Report on the subject project dated June 2016 (Enclosure). Please refer to these resources.

The northern portion of San Pedro Bay is dominated by the ports of Los Angeles and Long Beach. These ports are large harbor complexes typified by extensive areas of hardened shoreline (riprap and quay wall) and dredge-maintained channels (SAIC 2010). The benthic hard substrates in the port areas are mostly artificial breakwaters and constructed walls and pilings in shallow water areas in the ports (LA/LBHSC 2016).

The physical habitats of the bottom of San Pedro Bay, with the exception of the artificial structures, is mostly natural soft bottom substrates (Allen 1985; Anchor Environmental 2001). Maximum water depths in the bay typically do not exceed 53 ft (Robbins 2006).

The main project area within POLB where dredging is proposed consists primarily of deep water soft bottom habitats. Specific to zones adjacent to the main project footprint, MBC Applied Environmental Sciences (MBC) observed kelp on both faces of the Long Beach and Middle breakwaters; both faces of Pier F and the Navy Mole; the west-, south-, and east-facing outer faces of Pier J; and both faces of the breakwaters protecting the Pier J slip (MBC 2016).

Harbor seal (*Phoca vitulina*) and California sea lion (*Zalophus californianus californianus*) are commonly observed within the port complex and surrounding areas. Cetaceans known to occur within the POLB complex area include bottlenose dolphin (*Tursiops* spp.) and common dolphin (*Delphinus* spp.). Both pinnipeds and cetaceans utilize the waters of the project region primarily to rest and forage (MBC 2016).

Sea Turtles

Pacific green sea turtles (*Chelonia mydas*; green sea turtles) have been reported from the project region about 2 miles northwest of the proposed Nearshore/Sunset/Surfside placement site since at least 2008, most frequently from the mouth of the San Gabriel River. They are the only sea turtle species likely to occur in the project region. The San Gabriel River and its associated wetland/estuarine areas comprise the northernmost known year-round habitats for the green sea turtle (Aquarium of the Pacific 2019). The green sea turtles using this area and environs are federally-listed as threatened. Green sea turtles are generally found inside reefs, bays, and inlets (except when migrating or transiting). They are attracted to lagoons and shoals with an abundance of marine grass and algae. Nesting of green sea turtles is not considered likely in the project region with the high level of human disturbance on almost all beaches. The green sea turtles observed in the project region over the last decade are reportedly predominantly of the teenage age class, with no reports of small juveniles in the area (Goldman 2016); although, a few reports of breeding-age green sea turtles have come from the San Gabriel River (Propes 2017).

The small and growing population of green sea turtles in the project region mainly persists in and around the San Gabriel River mouth (likely associated with the warm water outfall of the Haynes Generating Station) and within Anaheim Bay/Seal Beach National Wildlife Refuge (SBNWR) estuarine complex (about 1 mile north of the Nearshore/Sunset/Surfside site) (CaliforniaHerps 2018; Crear *et al*. 2016). The available information suggests that while green turtles are present in the estuarine reach of the San Gabriel River year round, their presence may be more seasonal (summer and fall) in other locations in the region when water temperatures are warmer including: Anaheim Bay and other waters in the SBNWR, Sunset/Huntington Harbor, and Alamitos Bay. Crear *et al*. (2016) showed that tagged juvenile sea turtles left SBNWR/Anaheim Bay and moved through the ocean off Seal Beach into the San Gabriel River during winter months, when ocean water temperatures dropped below 59°F/15°C. Conversely, sea turtles moved through Anaheim Bay to get to the 7th Street Basin in the SBNWR during summer and fall months. In the project region, the bay and estuarine habitat areas in which green sea turtles appear to most frequently occur are primarily adjacent and inshore of the project area (NOAA 2020). The expansion or re-expansion of the green sea turtle range and population numbers in southern California in recent years has presented additional conservation challenges for the species, including exposure to marine pollution (Barraza *et al*. 2020), vessel strikes, and potential interactions with marine development (Hanna *et al*. 2020).

Radio tracking data from green sea turtles in the project region indicate that most tagged turtles of the region spent their time in the mouth of the San Gabriel River, with a few turtles swimming into the ocean during the day and returning to the San Gabriel River mouth at night (Goldman 2016), likely crossing portions of the project footprint. The Navy, in collaboration with the National Marine Fisheries Service (NMFS), has been implementing a green sea turtle satellite tagging study to help monitor green sea turtles within the Anaheim Bay region. Preliminary results from this effort indicate that habitat utilization is highest within the SBNWR, but a number of forays have occurred in the adjacent nearshore area of the ocean (Bredvik *et al*. 2019). Of 16 green sea turtles satellite-tagged, two of the turtles went into the ocean after visiting Anaheim Bay (Hanna *et al*. 2020). One individual travelled west from Anaheim Bay along the coast, as far as Rancho Palos Verdes, while another travelled south-east to Dana Point (see Figures 4 and 5; Hanna *et al*. 2020). Both sea turtles then travelled back into Anaheim Bay (Hanna *et al*. 2020). Overall tagging study results indicate use of nearshore habitat in East San Pedro Bay including limited movements in the project footprint, within and adjacent to the Nearshore Surfside/Sunset disposal site (NOAA 2020, 2021) and likely transit zones. We conclude that green sea turtles have considerable potential to occur in the project footprint during the 39 months of proposed project activities.

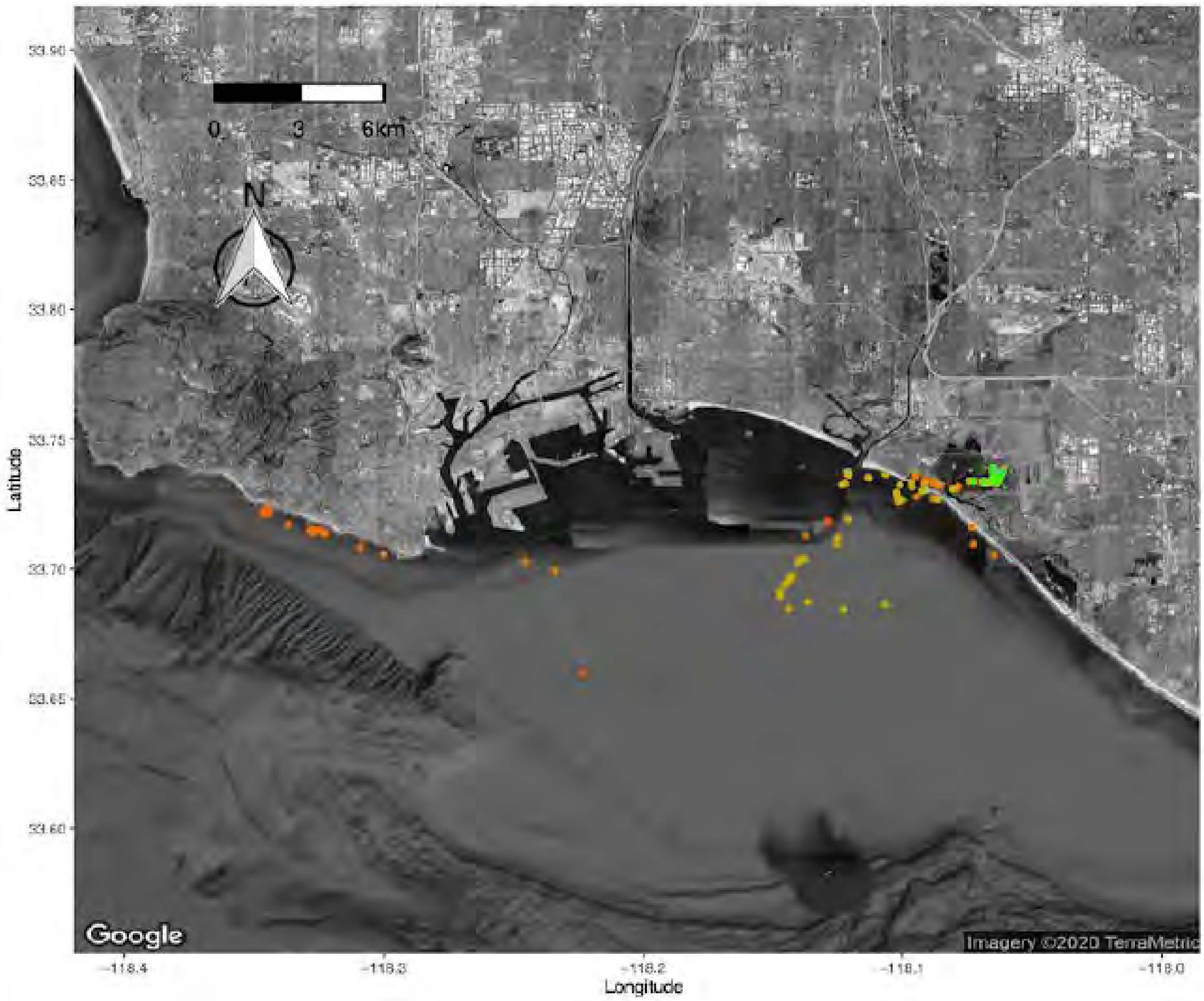

Figure 4. Locations of an individual satellite-tagged green sea turtle (#PTT 152310) in San Pedro Bay and environs during the period of November 2018 to February 2019, from a study of sea turtle use of Anaheim Bay, California (Hanna *et al*. 2020).

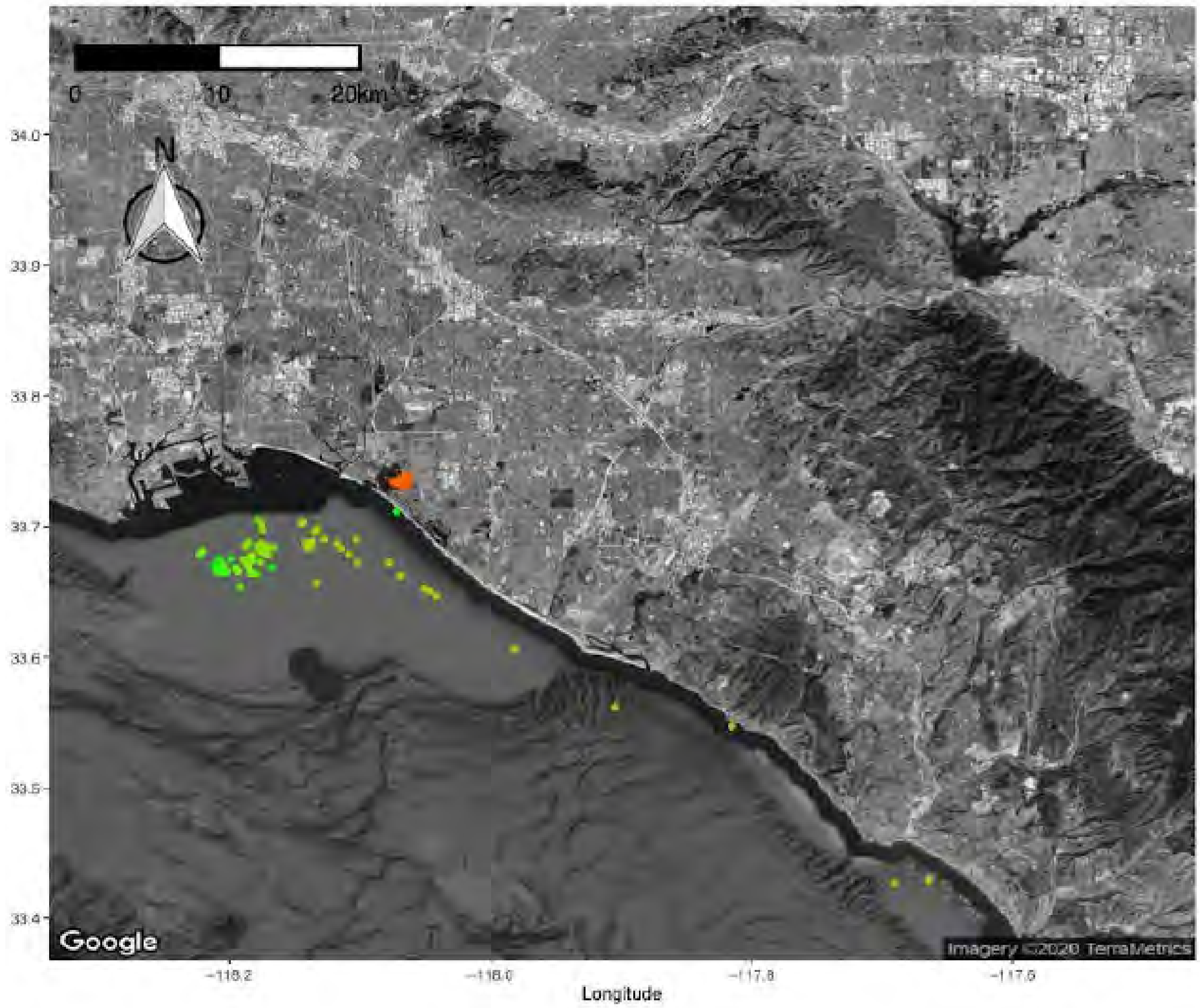

Figure 5. Locations of an individual satellite-tagged green sea turtle (#PTT 182986) in San Pedro Bay and environs during the period of July 2019 to March 2020, from a study of sea turtle use of Anaheim Bay, California (Hanna *et al*. 2020).

Potential Impacts of the Proposed Project on Biological Resources

Many of the potential impacts within the main project area were substantially analyzed in our Planning Aid Report (Enclosure). Please refer to that document.

The proposed project activities would occur predominantly within soft bottom areas within San Pedro Bay. Marine soft-bottom habitats are naturally common within the project area, including proposed dredge placement/disposal areas. The project would likely result in short term increases in turbidity and noise compared to existing levels in the immediate areas around proposed project activities.

The direct footprint of the proposed project activities would occur in areas that are predominantly unvegetated bottom habitats, likely of existing low to moderate biological productivity, depending on the history of past dredging activities at each location and ongoing ship-related propeller turbulence. Adverse impacts to adjacent soft bottom habitats from indirect effects (e.g., turbidity) from project activities would likely be short-term.

According to the feasibility study, some areas within the proposed Pier J approach channel project footprint have not previously been dredged (Corps 2019a; NOAA 2019). This area was naturally deep enough in the past to accommodate container vessels going to Pier J in the POLB without dredging. Proposed dredging of these sediments are expected to result in sediments suitable for open ocean disposal, due to their high sand content. Based upon updated information provided by the Corps subsequent to the feasibility study, the proposed dredging would include 241 acres of new dredging (NOAA 2019); these areas are likely ecologically intact soft-bottom areas of moderate function that are currently partially disturbed by ongoing vessel activities, as noted above.

The feasibility study indicated that the proposed activities related to deepening of project channels would affect some fish species/habitats in the following ways: (1) temporary disturbance and displacement of fish species, (2) increased sediment loads and turbidity in the water column, (3) temporary loss of food items to fisheries (vis-a-vis temporary loss of soft bottom habitats and associated benthic invertebrates), (4) limited sediment transport and re-deposition, and (5) temporary degradation of the water quality due to dredging and construction activities.

The Pacific Fishery Management Council (1998, 2019) has identified broad types of potential adverse effects and recommendations to consider when evaluating coastal marine dredging and disposal projects. In general, the potential adverse effects on fish from dredging and disposal include: (1) loss and alteration of habitat; (2) altered hydrology and geomorphology; (3) sedimentation, siltation, and turbidity; (4) release of contaminants; (5) direct impact to organisms; and (6) noise. Of particular concern are benthic impacts associated with dredging of new areas and potential fill impacts associated with proposed structural work, noted above for Pier J breakwaters (NOAA 2019).

Many fish species of the project area forage on infaunal and bottom-dwelling organisms, such as polychaete worms, crustaceans, and other prey types. Proposed dredging may adversely affect these prey species at the site by directly removing or burying these organisms (Pacific States Marine Fisheries Commission 2005). Recolonization studies suggest that ecological recovery[4] may not be straightforward, and the process can be regulated by physical factors including ocean-bottom matrix particle size distribution, currents, and compaction/stabilization processes following disturbance (Dernie *et al*. 2003; Kaiser *et al*. 2006). Rates of recovery for these areas range from several months to several years for estuarine muds and up to 2 to 3 years for sands

[4] In this context, recovery here generally means the later (or mature) phase of benthic community development following disturbance. Early phases of benthic community development following disturbance often predominantly involve pioneering species different from the original species. Later phases of community development involve initial re-establishment of species that inhabited the area prior to disturbance. The latter phase is what is considered the initial recovery of the community that naturally existed on the site (Rosenberg *et al*. 2002; Dernie *et al*. 2003).

and gravels (Dernie *et al*. 2003; NOAA 2019). Recolonization can take up to 1 to 3 years in areas of strong current, and up to 5 to 10 years in areas of low current (Kenny and Rees 1996; Boyd *et al*. 2005; Pacific States Marine Fisheries Commission 2005; Kaiser *et al*. 2006). Given the large dredging footprint (i.e., 880 acres) and expansion into previously undredged areas (i.e., 241 acres), the adverse effects to benthic foraging habitats (e.g., for some fish species and their predators) from project dredging are likely more than temporary and minimal (NOAA 2019) as concluded by the feasibility study (Corps 2019a).

As a result of southern California's large human population and intense economic and recreational activity, very little coastal space exists that has not been subject to construction, mineral extraction, or other form of habitat alteration. Dredge and fill activities, shoreline armoring, and overwater structures are the primary causes of habitat alteration within southern California coastal marine ecosystems. At the ports of Long Beach and Los Angeles, increasing global economic trade have resulted in the need for larger, deeper draft ships to transport cargo. This has led to a demand for new construction and dredging to widen and deepen channels, turning basins, and slips to accommodate these larger vessels. The Corps' East San Pedro Bay Ecological Restoration Project feasibility study (Corps 2019b) specifically identified habitat loss and declines in abundance and biodiversity of marine populations as the primary problems in the region, which includes the majority of the project area.

The proposed disposal of dredged material offshore may adversely affect some fish habitats by: (1) impacting or destroying benthic communities, (2) affecting adjacent habitats, (3) creating turbidity plumes, and (4) introducing contaminants and/or nutrients (NOAA 2019). Sediment disposal at the ocean disposal sites LA-2 and LA-3 has previously undergone significant environmental review during their designation as offshore disposal sites. In addition, dredged materials proposed for disposal at these areas are evaluated through the Southern California Dredged Material Management Team approval process. We expect that these environmental review processes will adequately address anticipated or potential adverse impacts to marine habitats at these two offshore disposal sites.

Another project concern is the potential project-related spread of the invasive alga *Caulerpa taxifolia*, which has been introduced to the California coastline (NOAA 2019). It is one of two algae on the list of the 100 worst invasive species compiled by the International Union for Conservation of Nature Invasive Species Specialist Group (Lowe *et al*. 2000). Evidence of the harm that can ensue as a result of an uncontrolled spread of the alga has already been seen in the Mediterranean Sea where it has largely destroyed local ecosystems and adversely affected commercial fishing, coastal navigation, and recreational opportunities (NOAA 2019). Although it is not known to be present within the project area, it had been detected in two locations in southern California; one location in Agua Hedionda Lagoon in San Diego County and another (about 7 miles south of the Port of Long Beach) in Huntington Harbour in Orange County (NOAA 2019). If the invasive alga is present within the project area, the proposed dredging-disposal activities could adversely affect local marine ecosystems by promoting its spread and increasing its negative ecosystem impacts. The feasibility study indicates that pre-construction surveys for *Caulerpa taxifolia* would be conducted in the Main Channel, proposed Pier J Channel and Turning Basin, and the Nearshore/Sunset/Surfside disposal site. In addition, project construction would not begin if *Caulerpa taxifolia* is found within the project activity footprint, until cleared to do so by the NMFS (NOAA 2019). The noted proposed environmental commitments, including to survey appropriate locations for *Caulerpa taxifolia*, adequately addresses our concerns.

The feasibility study does not fully describe or analyze the proposed structural improvements to the Pier J breakwater. It does indicate that the placement of a submerged sheet pile structure with associated rock protection to stabilize the Pier J breakwaters, if implemented, would have localized effects on marine biota, including to marine mammals. Sheet pile installation would be by either a hammer or vibratory method, to be determined during design based on sediment characteristics at the site. Likewise, other motile organisms are expected to leave the main project area during such construction activities (NOAA 2019). Proposed rock placement as part of this activity would bury extant soft bottom habitats, likely replacing them over time with rocky reef type of habitats, after eventual colonization by reef species within and on the placed stone.

Riprap supports a unique biological community associated with the rock substrate in the POLB complex (MBC 2016). In addition, it supports canopy kelp habitats (NOAA 2019). If kelp is currently present in the footprint of areas proposed for the noted structural improvements, the use of concrete grouting in such locations would likely adversely affect canopy kelp habitats via direct disturbances to the macroalgal and associated communities and may ultimately reduce habitat complexity in these areas. This riprap and canopy kelp are currently important as settlement substrate, foraging, and refuge, for various living marine resources (NOAA 2019). Given the information provided regarding the type, location, and effects of the proposed Pier J structural improvements in the feasibility study is rather general, additional information would be necessary to fully assess the effects of these proposed structural improvements and identify appropriate specific conservation recommendations. However, we offer a preliminary conservation recommendation addressing these structural improvements below.

The feasibility study and subsequent correspondence from the Corps indicate that sea turtles do not occur in the study area for the project, and thus they would not be affected by the project.[5,6] Various sightings and strandings of green sea turtles have been documented in the POLB surrounding the main project area, and preliminary green sea turtle tagging results also indicate they are present in the project area (Bredvik *et al*. 2019; NOAA 2019; NOAA 2021).[7] Green sea

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[5] This issue may have been partially caused by the Corps' apparent analysis of a study area and project area that do not include project dredge disposal areas and the associated dredge-disposal transit zones.

[6] In a March 30, 2021, letter to the Service on the project, the Corps stated: "The USACE has evaluated information provided to us by the NMFS on green sea turtles in the area. We have also consulted with the POLB, which monitors for green sea turtles during its in-water construction projects. Green sea turtles have been documented in Alamitos and Anaheim Bays. However, no green sea turtles have been documented in the project area, including the Surfside Borrow Site Nearshore Placement Area… We are confident in our position that the project would not effect this species and are maintaining the no effect determination." We note the Corps' conclusion but continue to maintain that there is a high likelihood that green sea turtles are likely to occur in the project area, as described herein.

[7] In a 2014 letter to the Corps identifying the threatened or endangered species that may be found in the project area, NMFS indicated that green sea turtles are known to reside and forage year-round in the Long Beach area, including areas within the vicinity of POLB (main project area), through observations of free-swimming and stranded animals, as well as through directed scientific research (NOAA 2019). In contrast, the Corps subsequently determined that federally-listed marine turtles do not occur in the study area, but are occasionally sighted in warm-water areas of

turtles are also known to occur in and near the Nearshore/Sunset/Surfside site portion of the project footprint, and potentially occur within what are likely the associated transit zones between project dredge locations and the Nearshore/Sunset/Surfside site (NOAA 2021). Sea turtles appear to be at risk of being harmed by the proposed activities. In 2012, a dead green sea turtle was found in Encinitas, California, with injuries reportedly consistent with contact from a hydraulic hopper dredge, similar to the dredge proposed for use in the subject project (Harris 2014; NOAA 2019, 2021). Dredging and sand placement activities for the Regional Beach Sand Project-II (RSBP-II) in 2012 were occurring in the Encinitas area before and at the time the turtle was found (SANDAG 2013).[8] The Corps recently consulted with NMFS on green sea turtles for the proposed East San Pedro Bay Ecosystem Restoration project in a portion of the same project region, including the Nearshore Sunset/Seaside disposal site as a borrow site (NOAA 2020). Based on the above, we conclude that green sea turtles likely occur in the project area/footprint and have substantial potential to be adversely affected by boat, barge, and dredge use and transit associated with the project, including vessel strikes.

Recommendations

The FWCA states that "...wildlife conservation shall receive equal consideration and be coordinated with other features of water-resource development projects through the effectual and harmonious planning, development, maintenance, and coordination of wildlife conservation..." (16 U.S.C. 661). The FWCA establishes a consultation requirement for Federal agencies that undertake any action that proposes to modify any stream or other body of water for any purpose, including navigation and drainage. The FWCA provides for the opportunity for us to offer recommendations for the conservation of species and habitats beyond those currently managed under the ESA.

The proposed project (Recommended Plan) contains a number of standard operating procedures, conservation measures, and mitigation measures to reduce the effects of the project on biological resources. Except where noted in our recommendations below, we expect the noted project mitigation and conservation measures within the feasibility study are integral components of the proposed project action and expect that all proposed activities will be completed consistent with those measures. Consistent with FWCA, should the project be implemented, we suggest incorporation of the following recommendations in order to improve project planning and avoid, minimize, and compensate for potential impacts to fish and wildlife resources; as well, we suggest the incorporation of the project elements outlined below that would improve or enhance fish and wildlife resources beyond the enhancements that could be achieved by offsetting measures alone:

1. As part of the proposed project, the Corps should create a least tern/snowy plover nesting island in the project region with rock and dredged materials. We suggest a location in San

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estuaries and bays in the region (NOAA 2019). In 2021 NMFS indicated that the agency "…disagrees with the USACE's assertion that green sea turtles are not in the project area" (NOAA 2021)."

[8] RBSP-II beach sand replenishment occurred at the Moonlight Beach receiver site from October 20 to 25, 2012, and at the Batiquitos receiver site (3 miles to the north of Moonlight Beach) from October 28 to November 24, 2012. The noted dead sea turtle was found on Moonlight Beach in Encinitas on November 4, 2012.

Pedro Bay shoreward of the existing Middle or Long Beach breakwaters.[9] Some potential sandy island locations in this area were evaluated within the Corps' East San Pedro Bay Ecosystem Restoration project. Other functional locations away from shore likely exist in the project region. This island should be at least 9 acres in size and relatively flat with the main surface of the island constructed of typical least tern nesting soil matrix materials (e.g., light-colored sand). To accommodate snowy plovers and the haul-out of some pinniped marine mammals, a portion of the island should have a zone of low gradient shoreline sloped down to the water within a protected cove, likely adjacent to and facing the existing breakwater for swell/wave energy protection. Other features such as subaquatic reefs constructed of rock are also suggested around the island, to provide shallow rocky reef habitats and to additionally help prevent erosion of the island cove shoreline surface materials (sand and gravel) through dissipation of wave energy. The configuration and slope surface of the noted island cove shore should be constructed of surface sand and gravel (possibly partially cemented or grouted in place for erosion control) or other compatible materials for snowy plover chick foraging; the configuration should be such that the cove areas remain open to tide-borne deposition of natural beach wrack and would otherwise support (e.g., shore slope angle) snowy plover chick and adult foraging. The remainder of the island (outside of the sand/gravel shore portion) would likely need to be edged by riprap or similar materials to avoid erosion of the island by wave and wind energy; similar to the four artificial THUMS islands[10] currently found off Long Beach within the project region. Dredged materials could be used for this purpose, at least in part. It is preferred that the surface/shore of this island not be utilized for human recreation and be protected from unauthorized entry.[11]

2. Consistent with the general recommendations provided by Pacific Fisheries Management Council (2019), the Corps should, to the extent feasible, offset all likely adverse effects to important marine fish habitats from new dredging. Specifically, the dredged material may provide a beneficial re-use opportunity to restore aquatic ecosystem structures and functions in East San Pedro Bay. The Corps should evaluate the feasibility of re-using the dredged material that would be provided by the project (as contaminant levels in the

[9] We suggest these locations to minimize conflict with existing shipping traffic routes in the ports. These Outer Harbor areas would likely provide high ecological function for the fish and wildlife species targeted by this measure.
[10] The THUMS Islands are a set of four artificial islands in San Pedro Bay built in 1965 to tap into the East Wilmington Oil Field. THUMS stands for a consortium named after the parent companies who bid for the island contract: Texaco, Humble (now Exxon), Union Oil, Mobil, and Shell. The outside rim of the islands are made of 640,000 tons of boulders from Catalina Island, and the islands are filled with 3.2 mcy of dredged material from the bay (Sidel 1994).
[11] In a letter to the Service dated March 30, 2021, the Corps (2021) indicated that "Generally, the USACE would not propose to develop such an island for species as part of the navigation project unless it is justified as mitigation or offsets for adverse effects. The USACE has determined that the proposed project would not affect either California least tern or western snowy plover. In addition, there is no feasible location for such an island." We note that the FWCA directs the Service to make appropriate recommendations to action agencies such as the Corps that include measures beyond mitigation or project offsets, and it provides associated authorizations to implement those measures. Past development of the ports of Los Angeles and Long Beach, as well as urban and commercial development of the surrounding coastal communities, has eliminated almost all least tern and snowy plover nesting habitats that formerly occurred in the region. This recommendation is directed at partially replacing those historical losses, consistent with the mandates of the FWCA. The East San Pedro Bay Ecosystem Restoration project evaluated potentially feasible locations for such islands in the project region.

dredge materials allow) to support various restoration measures (e.g., to create: areas of shallow water habitats at depths less than -20 feet MLLW, nearshore wetlands, a sandy island as noted above) that would require fill material, as described in the Corps' East San Pedro Bay Ecological Restoration Project feasibility study.

3. We recommend that the Corps re-consider the risks of potential injury and disturbance impacts to green sea turtles in its determination of whether this species may be adversely affected by proposed project activities (NOAA 2019; NOAA 2021). In particular, we recommend that the Corps consider the risks of injury associated with hopper dredge activities, including transit between dredging and the Nearshore/Sunset/Surfside location outside the entrance to Anaheim Bay. Hopper dredge encounters with sea turtles known to occur in the southeastern U.S. have been formally consulted upon numerous times by Corps and NMFS (NOAA 2019). We recommend that the Corps engage in consultation pursuant to the ESA with NMFS Protected Resources Division in Long Beach, California. Appropriate project monitoring for sea turtles by qualified individuals should be incorporated into the project, including monitoring for avoidance of project vessel strikes, as well as improved understanding of sea turtle use of the project area/region and potential effects associated with temporarily increased turbidity, with guidance developed in consultation with NMFS.

4. The Corps should analyze in greater detail the potential ecological impacts associated with Pier J breakwater structural improvements. Compensatory mitigation should be developed and implemented as appropriate for any permanent loss of fish or reef habitats, such as from fill placement associated with proposed Pier J breakwater structural improvements.

If you have any questions regarding this letter, please contact Jon Avery,[12] Federal Projects Coordinator, at 760-431-9440, extension 309.

Sincerely,

KRISTINE PETERSEN
Digitally signed by KRISTINE PETERSEN
Date: 2021.04.14 12:58:03 -07'00'

for Scott A. Sobiech
Field Supervisor

Enclosure

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ENCLOSURE

United States Department of the Interior

FISH AND WILDLIFE SERVICE
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Carlsbad Fish and Wildlife Office
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In Reply Refer To:
FWS-LA-15B0128-16CPA0091-E00880

June 30, 2016

Colonel Kirk Gibbs
U.S. Army Corps of Engineers, Los Angeles District
915 Wilshire Boulevard, Suite 930
Los Angeles, California 90017-3409

Attention: Lawrence Smith

Subject: Final Planning Aid Report for the Proposed Port of Long Beach Deep Draft Navigation Project, Los Angeles County, California

Dear Colonel Gibbs:

The U.S. Fish and Wildlife Service (Service) has prepared this Final Planning Aid Report (PAR) for the U.S. Army Corps of Engineers (Corps) on the proposed Port of Long Beach Deep Draft Navigation Project (project) to describe issues and opportunities related to the conservation and enhancement of fish and wildlife resources. The project, as proposed, would involve dredging and deepening portions of the Port of Long Beach (Port), Los Angeles County, California. The purpose of the proposed project is to improve transportation efficiency and safety at the Port for large ships.

The proposed project area would involve portions of the Los Angeles County coast of the eastern Pacific Ocean, within about 3 miles seaward of the historic coastline near the mouth of the Los Angeles River. These existing marine and estuarine areas have been heavily modified over the last century associated with development of Long Beach Harbor/Port of Long Beach and nearby civil engineering and commercial/urban development. Most of the direct project footprint would occur within the boundaries of the Port; exceptions include proposed modifications to portions of the Pier J ship approach area (Corps 2016) and potential (currently undetermined) dredge material disposal areas, both of which are outside the Port harbor district area. The project area is located south of the City of Long Beach and east of the community of San Pedro and the Port of Los Angeles. The depths, widths, and volumes of dredge and disposal material associated with the proposed project are currently undetermined.

This PAR is provided in accordance with the Fish and Wildlife Coordination Act (FWCA) of 1958, as amended (48 Stat. 401; 16 U.S.C. 661 *et seq.*), the Endangered Species Act (ESA) of 1973, as amended (87 Stat. 884; 16 U.S.C. 1531 *et seq.*), and the scope of work agreed upon by the Corps and the Service. This PAR does not constitute the report of the Secretary of the Interior as required by section 2(b) of the FWCA, nor does it constitute a biological opinion under section 7 of the ESA.

The purpose of this PAR is to deliver recommendations for use by the Corps design team in developing goals, objectives, and alternatives for the project.

In October 2015, the Council on Environmental Quality released Memorandum M-16-01 for Executive Departments and Agencies entitled Incorporating Ecosystem Services into Federal Decision Making. The memorandum recognizes that nature provides vital contributions to human economic and social well-being that are often not traded in markets or fully considered in decisions. It directs Federal agencies to incorporate ecosystem services into Federal planning and decision making,[1] and to develop, institutionalize, and implement policies to promote consideration of ecosystem services in planning, investments, and regulatory contexts. Additionally, it calls for integration of assessments of ecosystem services into relevant programs and projects, in accordance with the agency's statutory authority.

In November 2015 the White House released a Presidential Memorandum entitled Mitigating Impacts on Natural Resources from Development and Encouraging Related Private Investment. This memorandum underscores the importance of effectively mitigating adverse impacts to land, water, wildlife, and other ecological resources (EPA 2016). It orders five federal agencies, including the Departments of the Interior and Defense, to streamline regulations for offsetting environmental harm and to promote mitigation efforts. The memorandum establishes a national policy "net benefit goal" for natural resource use from projects. The memo seeks to unify natural resource mitigation goals across agencies; at a minimum, the memorandum calls for "no net loss" of land, water, wildlife and other ecological resources from federal actions including permitting; this extends the no-net-loss national policy standard for wetlands established by the President in 1989. The memorandum also directs that compensatory mitigation is now national policy (White House 2015); the memorandum was designed to ensure consistency and transparency as agencies across the Federal government develop mitigation measures (Bean 2016). Concurrent with the release of the November 2015 Presidential Memorandum, the Department of the Interior issued formal policy and guidance to its bureaus and offices to best implement mitigation measures associated with legal and regulatory responsibilities and the management of Federal lands, waters, and other natural and cultural resources under its jurisdiction, using the best available science (Bean 2016). When assessing appropriate mitigation options, the Service relies upon a long established general mitigation hierarchy – first seeking to avoid impacts, then minimizing them, and then compensating for unavoidable impacts that could impair resource functions or values (Bean 2016).

As of March 2016, the Corps is preparing the Port of Long Beach Deep Draft Navigation Project Feasibility Study. The Corps is currently scoping project alternatives and will likely prepare an Environmental Impact Statement/Environmental Impact Report (EIS/EIR) for the project. This feasibility study phase of the project would likely conclude with the distribution of the Draft EIS/EIR for public review, reportedly scheduled by the Corps for 2018 (Corps 2015).

Repeated dredging is often necessary to maintain operations of many marine harbors. The dredging proposed herein would be implemented to increase the design water depths within the Port for ship

[1] Broadly defined, ecosystem services are the benefits that flow from nature to people, e.g., nature's contributions to the production of food and timber; life-support processes, such as water purification and coastal protection; and life-fulfilling benefits, such as places to recreate.

navigation purposes for very large ships (as compared to regular maintenance dredging). Harbor dredging often has effects on the marine environment, and dredged material disposal may affect water quality, mobilize contaminants, and bury or alter habitats, bathymetry, and physical processes (NOAA 2014).

Introduction

Vessels of increasingly larger size and deeper drafts[2] have been entering U.S. ports over the last decade-plus (NOAA 2015). The proposed project would be another increment in a series of dredge-and-fill projects over the last several decades that have modernized and reshaped the Port. This project would deepen water depths for access and navigation of very large ships within the Port. The latest generation of large cargo ships being built is twice the size of those that entered the global fleet only 15 years ago; these ships are now calling at the Port (Port 2016). These larger ships are reportedly more cost effective for ocean carriers and decrease transportation diesel consumption (Port 2016). These massive vessels, some with capacity of 14,000 Twenty-foot Equivalent Units (TEUs),[3] can be up to 1,200 feet long (Port 2016). Long Beach is one of only a handful of ports in North America capable of accommodating these larger ships, per the following features (Port 2016):

1. Deep-water main channel;
2. Deep-water terminals;
3. Berths designed to handle vessels that can exceed 156,000 tons fully loaded; and
4. Cranes that can move containers stacked 180 feet high and 24 boxes wide.

A century of harbor dredging and filling associated with development of the Port of Los Angeles and the Port of Long Beach has eliminated thousands of acres of the historic Wilmington Lagoon/Los Angeles River Estuary. In its place, behind manmade breakwaters, remains an open-water marine embayment of relatively high biological diversity and productivity.

Pacific Rim trade is increasing, along with the size of the some of the associated ships entering U.S. ports. The Port is a major center of international commerce on the west coast of the United States. Development of a permanent industrial base within the Port was gradual and began with increased harbor improvements and transportation in the early 1900s. It is the second-busiest container port in the United States, after the adjacent Port of Los Angeles. The Corps, in conjunction with the Port, are now examining options to provide additional channel depths to allow very large ships (with greater drafts than those that can currently be effectively accommodated) into the Port.

[2] The draft of a ship's hull is the vertical distance between the waterline and the bottom of the hull or keel.
[3] TEU or Twenty-Foot Equivalent Unit can be used to measure a ship's cargo carrying capacity. The dimensions of one TEU are equal to that of a standard 20-foot shipping container (20 feet long, 8.5 feet tall and 8 feet wide).

Fish and Wildlife Coordination Act

The Fish and Wildlife Coordination Act of 1934 included requirements that were the first formal expressions in U.S. law of a duty to minimize the negative environmental impacts of major water resource development projects and to compensate for those impacts that remained (Bean 2016).

The FWCA was a response to a U.S. era of big dam building and reflected a concern for the impact of those dams, particularly on anadromous fish (Bean 2016). As originally enacted in 1934, it required consultation with the Bureau of Fisheries (as the Service was then known) prior to the construction of any dam to determine if fish ladders or other aids to migration were necessary and economically practical to minimize impacts on fish populations. It required, as well, the opportunity to use the impounded waters for hatcheries to offset impacts that could not otherwise be avoided. The duties imposed by the FWCA were reinforced and expanded by the National Environmental Policy Act of 1969 (NEPA) (Bean 2016). Under NEPA and its implementing regulations, all federal agencies have a duty to assess the impacts of the major actions they propose to undertake and to consider reasonable alternatives to reduce or eliminate those impacts (Bean 2016). The Service, as the federal agency charged by Congress in the Fish and Wildlife Act of 1956 with the responsibility for management, conservation, and protection of fish and wildlife resources, routinely recommends mitigation measures to other federal agencies through the NEPA and FWCA processes (Bean 2016).

The FWCA directs and authorizes consultation, reporting, consideration, and installation/implementation of fish and wildlife conservation features. The authorities of the FWCA are considered to be “supplementary legislation” to the various Federal project authorizations, such as the Corps public works authorizations (Smalley and Mueller 2004). The FWCA conditions or supplements other water development statutes to require consideration of recommendations generated under the FWCA procedures, including portions of the Clean Water Act [*Zabel* v. *Tabb*, 430 F2d 199 (5th Cir. 1970) cert. denied 401 U.S. 910 (1972)]. For Federal water resources development projects, the FWCA requires that fish and wildlife conservation receive equal consideration by Federal agencies with other project purposes, and that such conservation be coordinated with other project features. The FWCA authorizes the project implementation of means and measures for both mitigating losses of fish and wildlife resources, and for enhancing these resources beyond the offsetting of project effects (Smalley and Mueller 2004).

Project Area History

In 1542, Juan Rodriquez Cabrillo “discovered” the "Bay of Smokes" that is now called San Pedro Bay, describing it from offshore aboard ship. The smoke he described above the bay may have originated from the several Native American villages that existed near the bay along the Los Angeles River at the time. Much of the south-facing San Pedro Bay along the coast was originally a shallow estuary and mudflat (see Figures 1 – 3).

The area currently occupied by the ports of Los Angeles and Long Beach formerly included several undeveloped islands, and likely included barrier beaches and beach/river-mouth sand spits. These islands and spits likely included unvegetated beach and open areas that historically supported what

are now sensitive species, including California least terns [*Sternula antillarum browni* (*Sterna a. b.*);[4] least tern] and western snowy plovers [*Charadrius alexandrinus nivosus* (*C. alexandrinus n.*); snowy plover].[5] The area of the northern San Pedro Bay was originally largely a marsh, with the Los Angeles River and the Bay sharing a common opening into the ocean.

In 1899 construction of the San Pedro Bay breakwater began near the project area. In 1906, the Los Angeles Dock and Terminal Company started development of Long Beach Harbor by purchasing 800 acres of sloughs and salt marshes associated with the Los Angeles River mouth estuary — an area that later became the inner portion (Inner Harbor) of Long Beach Harbor. In 1907, construction began on the Craig Shipyard in the Inner Harbor; the Craig Shipyard Company was also awarded a contract to dredge a channel from the open ocean to the new Inner Harbor. In 1911, the State of California (State) granted the tidelands areas of what is now the Port of Long Beach to the City of Long Beach (City) for port operations.[6] These tidelands were granted to the City in trust for the people of the State. This tidelands trust not only restricts the use of the tidelands, but the tidelands and tidelands-related revenues of the Port must be used for purposes related to harbor commerce, navigation, marine recreation, and fisheries. The Port currently includes more than 7,600 acres of wharves, cargo terminals, roadways, rail yards, and shipping channels, and is one of the world's busiest seaports (see Figure 3).

An 8.5 mile-long breakwater made of three rock segments stretches across most of San Pedro Bay, with two openings to allow ships to enter the harbor areas of the Ports of Los Angeles and Long Beach behind it. The initial western section of the breakwater, called the San Pedro Breakwater, was constructed between 1899 and 1911 at San Pedro; the Middle Breakwater was completed from 1911 to 1936, and the Long Beach Breakwater was completed after World War II. The San Pedro and Middle Breakwaters protect the Ports of Los Angeles and Long Beach, respectively (Long Beach 2009).

The Los Angeles River is a major river and flood management waterway for the Los Angeles watershed basin. In the 1930s, the Army Corps began channelizing the river for flood damage reduction and by 1954, the entire length of the river was channelized (Long Beach 2009).
The river is now maintained by the Corps and the Los Angeles County Department of Public Works (Long Beach 2009). The Los Angeles River continues to discharge into San Pedro Bay at the northeastern edge of the proposed Project Area.

Considerable changes have occurred in the two ports since the 1970s. Some of these changes included deepening of navigational channels and basins; construction of substantial landfills at Piers 300 and 400 in the Port of Los Angeles; construction of a transportation corridor out to Pier 400; expansion of Pier J in the Port of Long Beach; and construction the west basin of the Cabrillo Marina

[4] The California least tern was originally and remains federally- and California State-listed under the generic name of *Sterna antillarum browni*; this original name is now otherwise invalid. The American Ornithologists Union in 2006 changed the valid generic name of the least tern to *Sternula*, with the California least tern then becoming *Sternula a. b.*) (Service 2016).
[5] California least terns typically nest in colonies on relatively open beach areas that are free of vegetation and are near fish prey (Service 2006). Sand spits, dune-backed beaches, beaches at creek and river mouths, and salt pans at lagoons and estuaries are the main coastal habitats for nesting western snowy plovers (Service 2007).
[6] Tidelands in California are defined as those lands and water areas along the coast of the Pacific Ocean seaward of the ordinary high tide line to a distance of three miles.

complex. As part of mitigation for construction and channel deepening, shallow water habitats were created in formerly deepwater areas near Pier 300, near the San Pedro Breakwater, and on the east side of Pier 400. Thus, several areas that were previously aquatic natural communities are now developed land areas, some former deep water areas are now shallow, and water circulation patterns within the Ports have been substantially altered.

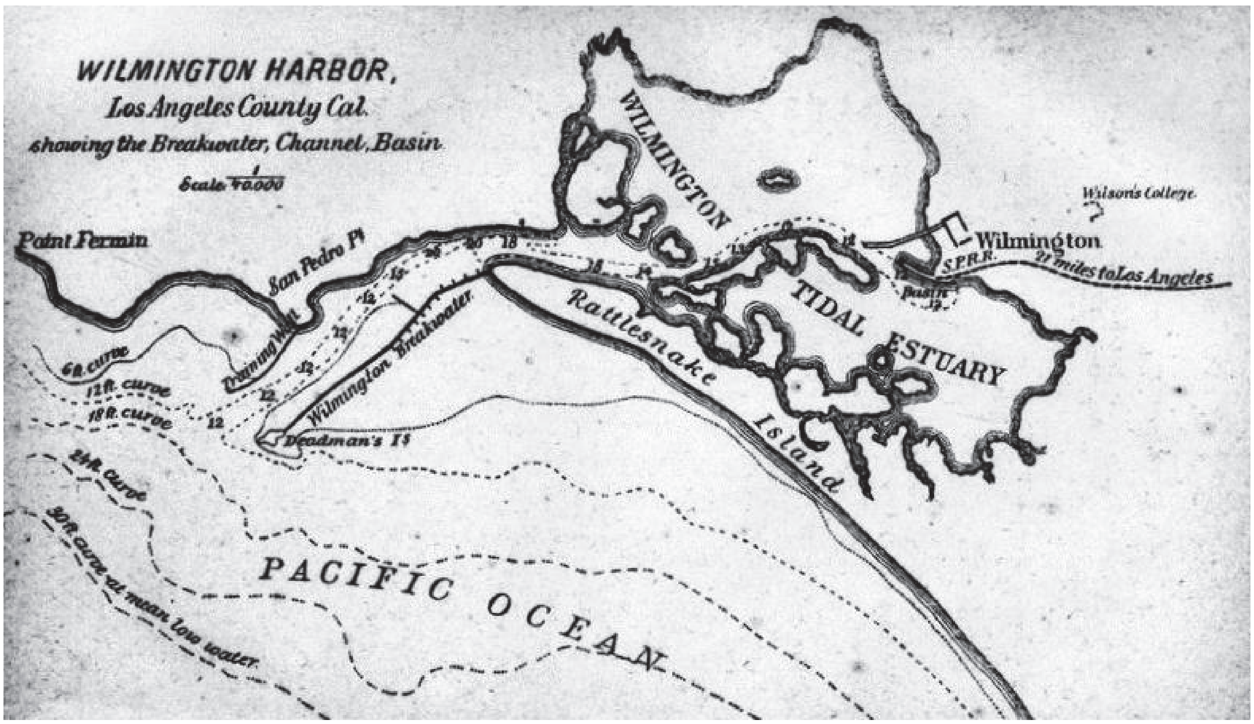

Figure 1. Circa 1880 drawing of Wilmington Harbor. The Future Port of Long Beach is on the east (right) side of the "Wilmington Tidal Estuary." "Rattlesnake Island" would later be expanded to become Terminal Island within the ports of Los Angeles and Long Beach. Wilmington Harbor would later become the Port of Los Angeles. Note the water depths indicated. (Water Power and Associates 2014)

Figure 2. Portion of a circa 1880 drawing by William H. Hall of Los Angeles showing the San Pedro Bay coastline, estuaries, and ocean contours (Hall 1880). The future Port of Long Beach is in the center-left of the drawing.

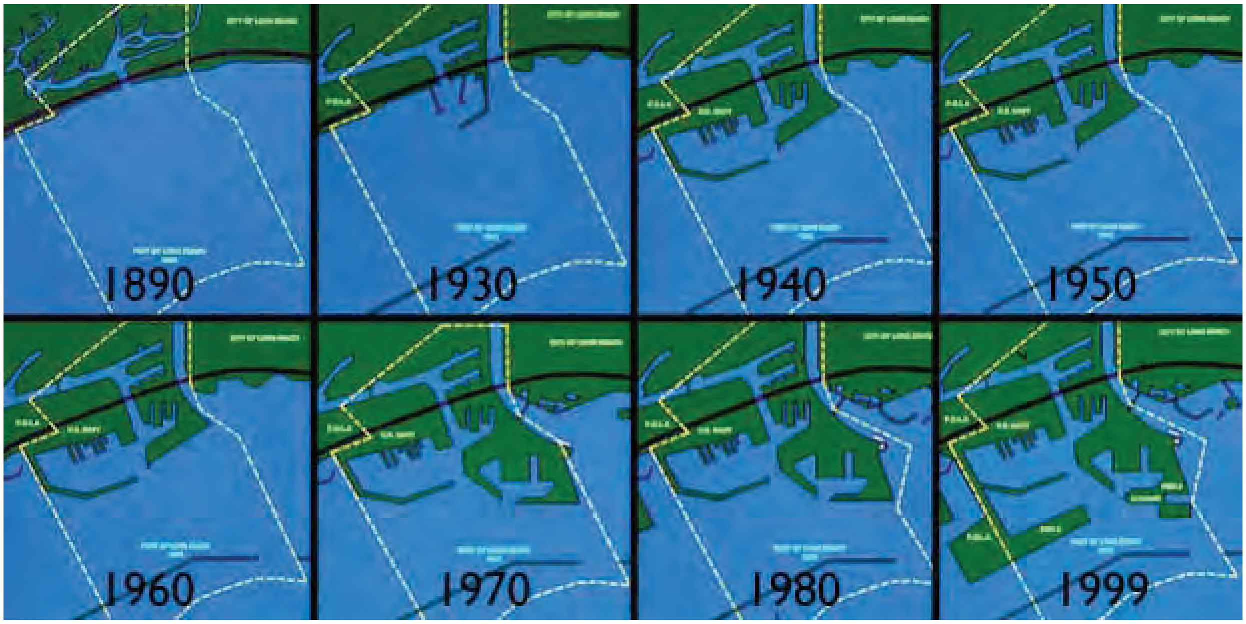

Figure 3. Drawings showing development progression of the Port since 1890 (Port 2014).

Description of the Project Area

The main project site is the Port of Long Beach and is located on the Pacific coast of southern California in western San Pedro Bay, at the southern end of the City, in southern Los Angeles County. The Port is less than 2 miles southwest of downtown Long Beach and about 25 miles south of downtown Los Angeles. To the west and northwest of San Pedro Bay are the communities of San Pedro and Wilmington, respectively, and to the east is the community of Seal Beach. Other areas that could be included in the Project area are local beaches or the open ocean for dredge disposal; the project dredge disposal areas are currently undetermined.

Two competing and independent commercial ports, the Port of Los Angeles and the Port of Long Beach, share the San Pedro Bay marine ecosystem. These man-made harbors have been created through over a century of dredging and filling of the former 3,450-acre Wilmington Lagoon and surrounding areas. The Port of Los Angeles and Port of Long Beach encompass 7,500 acres and 7,600 acres of land and water, respectively. The Port consists of: 3,000 acres of land, 4,600 acres of water, 10 piers, and 80 berths. Uses within both ports are largely industrial, although a variety of other uses (e.g., recreation, commercial fishing) are also supported.

The Port of Los Angeles and Port of Long Beach are both considered deep-water constructed ports, and do not have siltation problems like ports located in natural rivers (natural river ports) (LA/LBHSC 2016). The vast majority of sediments deposited in the ports are carried by the Los Angeles River, Dominguez Channel, and several smaller local creek/storm drains (LA/LBHSC 2016). Due to the region's Mediterranean climate, these channels carry significant quantities of storm water on rare occasions during the winter, and most of the silt settles out near the inlet mouths (LA/LBHSC 2016). As such, the ports need only to be dredged occasionally to maintain berth side design water depths (LA/LBHSC 2016).

The Port has 65 deep-water berths; all of these berths lay within three miles of the open sea, and are reached via the Port's Main Channel which has depths of minus 76 feet at Mean-Lower-Low-Water (MLLW) (LA/LBHSC 2016). The maximum ship draft in the Main Channel is currently limited to 65 feet (LA/LBHSC 2016). Dredging outside the Long Beach Breakwater Entrance Channel has deepened that area to minus 76 feet at MLLW (LA/LBHSC 2016). The Port is currently engaged in a capital development program (CDP) that includes but is not limited to dredging, terminal redevelopment, transportation, and public safety projects (LA/LBHSC 2016). Major components of the CDP include capital dredging in the West Basin and Inner Harbor Turning Basin, and in-water fill within the East Basin (LA/LBHSC 2016). The CDP includes the Middle Harbor Redevelopment Program, the replacement of the Gerald Desmond Bridge spanning the Back Channel, several rail infrastructure projects, and proposed security operations and support facilities (LA/LBHSC 2016). Though not a Port project, Caltrans is currently engaged in the replacement of the Commodore Schuyler Heim Bridge (SR-47) spanning the Cerritos Channel; it will be converted from a lift bridge to a fixed bridge (LA/LBHSC 2016).

Port of Long Beach Water Depths (LA/LBHSC 2016):

Federal Channels in the Port	Current Depth	Current Width
Main Channel	-76 feet	360 – 1500 feet
Back Channel	-52 feet	220 feet
Inner Harbor (Turning Basin)	-52 feet	960 feet
Cerritos Channel	-50 feet	325 feet
Channel 2	-37 to -55 feet	150 – 250 feet
Channel 3	-36 to -45 feet	150 – 200 feet

The outer limit of the Port is defined by breakwaters that were constructed during the early to mid 1900's (MEC 2002). The majority of the harbor waters within the Port currently range in water depth from 30 to 60 feet (MEC 2002) with navigation channels dredged to depths of 45 feet and greater (Service 2000). The adjacent Port of Los Angeles contains several hundred acres of waters currently shallower than 20 feet, primarily constructed by sub-aquatic fill of deeper areas performed to increase marine biological functions. The relative bathymetry[7] of the areas within and around the ports of Long Beach and Los Angeles can be seen in Figure 4.

[7] Bathymetry: the measurement of the depths of oceans, seas, or other large bodies of water, and the data derived from such measurement.

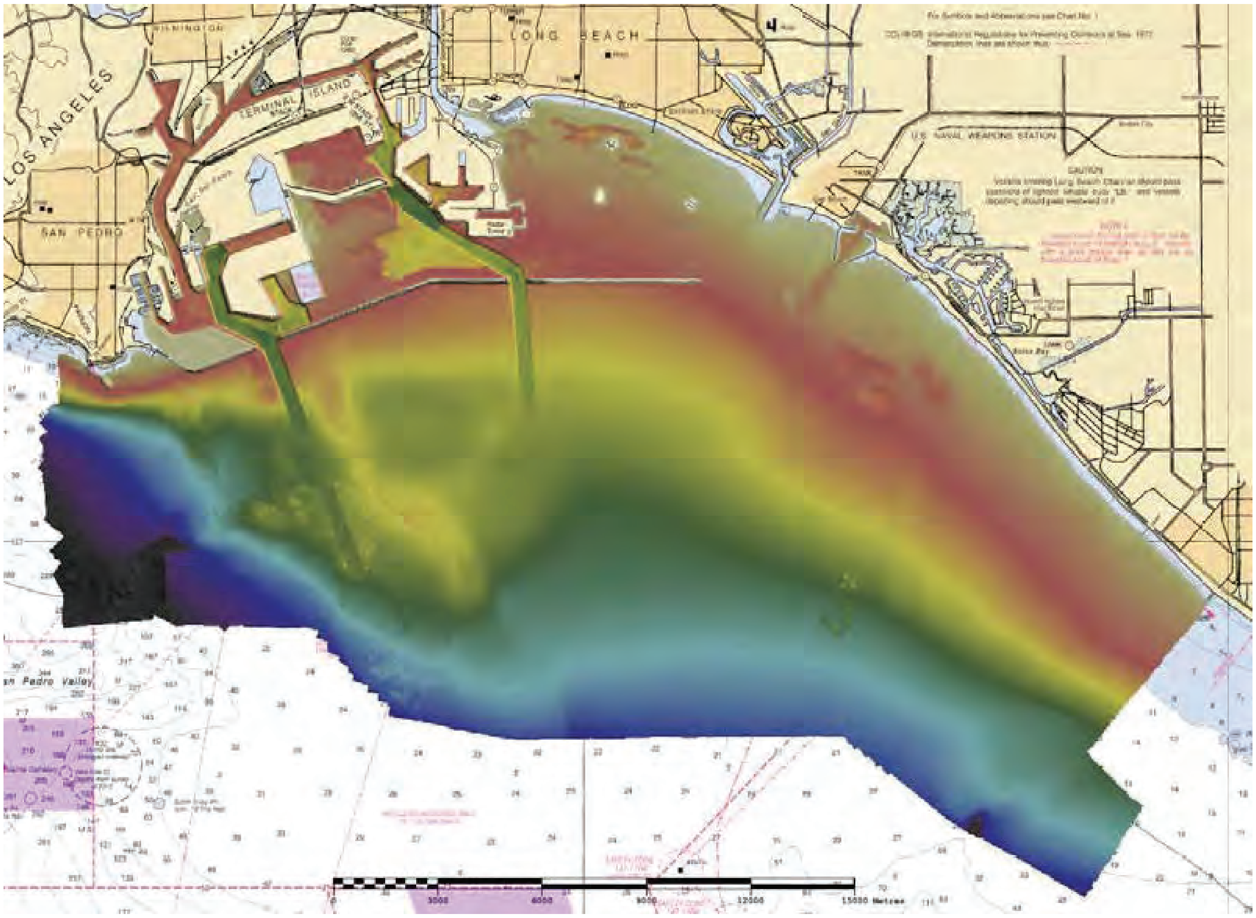

Figure 4. Relative bathymetry of the ports of Long Beach and Los Angeles and environs to highlight the deeper waters in the ports. (NOAA 2015)

Corps Study/Project Area

The Corps' study area for the proposed project includes the waters in the immediate vicinity (and shoreward) of the Port breakwaters throughout most of the Port, and the upstream reaches of the Los Angeles River that have direct impact on the San Pedro Bay, as well as the entire Port facility, including Outer Harbor, Inner Harbor, Cerritos Channel, West Basin, and the Back Channel (Corps 2015). The Corps' current Project Area is shown in Figure 5 (Corps 2016).

Project Description

The Corps, with the Port as the local sponsor, is considering the feasibility of deepening navigation channels within the harbor to increase water depths necessary to accommodate deeper draft ships in the Port. The proposed channel depths and methods to accomplish this are currently undetermined. The proposed project's proposed footprint areas are shown in Figure 5. Additional details regarding work areas have not been provided to the Service. Other project footprint areas could include areas within and/or outside the Port for dredge material disposal.

Figure 5. Corps Draft Project Area and Areas of Interest (Corps 2016)

The proposed project would require disposal site(s) for dredge materials. These sites are currently undetermined, but are expected to potentially include sites within the Port area, open-ocean, and/or nearby beach areas, depending in-part on sediment qualities and contaminant constituents in dredge materials (as determined through the testing requirements in 40 CFR §230). Re-use of dredge materials for sand replenishment on beaches near the Port is often desired by the Corps and locals where sediments are appropriate.

Background

The Port has undergone significant development and expansion in the past century (Corps 2015). In the last three decades, the ports of Los Angeles and Long Beach have undertaken accelerated long-range development efforts to increase the shipping and commercial capacity of the ports; both of the ports have become major transportation and trade centers. International commerce is almost 20 percent of the U.S. gross domestic product, and about 95 percent of these products arrive or leave the country in ships (Gray 2001). The Port provides the shipping terminals for nearly one-third of the waterborne trade moving through the west coast of the United States (Corps 2015).

The Port of Long Beach and the Port of Los Angeles are ranked sixth and eighth in tonnage in the United States respectively, moving a combined 139.2 million metric tons (DOT 2012). Trade currently valued annually at more than $155 billion moves through the Port, making financially it the

second-busiest seaport in the United States (Corps 2015). To handle this high volume of trade, Port facilities include 10 piers, 80 berths, and 66 post-Panamax gantry cranes (Corps 2015). The Port has 22 shipping terminals to process break bulk (e.g., lumber, steel), bulk (e.g., salt, cement, and gypsum), containers, and liquid bulk (e.g., petroleum) (Corps 2015). Each year the Port handles more than 6 million Twenty-foot Equivalent Units (TEUs)[8] and 75 million tons of cargo, and has over 2,000 vessels call (Corps 2015). Items from clothing and shoes to toys, furniture and consumer electronics arrive at the Port before making their way to stores throughout the country (Corps 2015). Specialized terminals also move petroleum, automobiles, cement, lumber, steel and other products (Corps 2015). The Port's top trading partners are China, South Korea, Hong Kong, and Japan. East Asian trade accounts for about 90 percent of the shipments through the Port (Corps 2015). Top imports are crude oil (16 million metric tons annually), electronics, plastics, and furniture (with inbound container tonnage on the order of 22 million tons annually), while top exports are petroleum products, chemicals, and agricultural commodities (Corps 2015). Currently, about one-third of liquid bulk and container cargo by weight is transported on vessels that could potentially experience operating constraints associated with the current channel depths in the Port (Corps 2015).

Under keel clearance for larger ships in the Port is important in terms of the depth of the seafloor and the static draft of the vessel transiting above it (NOAA 2015). This takes into play many elements: water level is the most obvious and important contributor to this equation. The term "tide" captures the astronomic contribution of the rise and fall of the sea's surface, whereas water level takes into account weather effects and riverine runoff contributions (NOAA 2015). In addition to the water levels, the other factors that must be considered include meteorological conditions, the vessel's motion induced by the prevailing sea state, the static draft of the vessel, the variation in this draft due to the vessel's motion through the water (dynamic draft), and the chemical composition of the water the vessel is sailing in, primarily salinity (NOAA 2015).

The large sizes of the many new trade ships are outsizing some of our waterways. Some Ultra Large Crude Carriers (ULCCs) entering the Port of Long Beach are carrying more than a million gallons of crude oil and are loading to drafts of 65 feet (NOAA 2015). Depending on the sea state in the approach channels of the Port, the ship's pitching may bring the hull close to the Port channel floor (NOAA 2015).

The channel leading into the Port of Long Beach currently has an authorized depth of 76 feet and local regulations allow drafts of 69 feet for ships with a displacement of up to 420,000 tons (NOAA 2015). In late 2012, at a Harbor Safety Committee meeting for the ports of Los Angeles and Long Beach, the Jacobsen Pilots[9] noted that during storms and long period swell conditions outside of the breakwater, ULCCs demonstrated significant levels of pitch[10] in high wave situations (NOAA 2015).[11] As a result, the Captain of the Port froze the maximum draft at 65 feet until they understood the effects of the swells on the ULCCs and could better predict their behavior (NOAA 2015). The effect

[8] TEU or Twenty-Foot Equivalent Unit can be used to measure a ship's cargo carrying capacity. The dimensions of one TEU are equal to that of a standard 20-foot shipping container (20 feet long, 8.5 feet tall and 8 feet wide).
[9] Jacobsen Pilots is the sole ship piloting company for the Port of Long Beach.
[10] Pitch is the up/down rotation of a vessel about its lateral/Y (side-to-side or port-starboard) axis.
[11] As a point of reference, a 1,000-foot vessel pitching just 1 degree will experience an increase in draft of more than 10 feet (NOAA 2015).

of reducing the allowed under keel clearance means that ULCCs must wait outside of the sea buoy until conditions are favorable to make the transit into the Port of Long Beach, or lighter to another vessel in order to reduce their draft; both are expensive delays (NOAA 2015).

Presently the largest containerships dock primarily at one of two piers—Pier J or Pier T West Basin (Corps 2015). Access to south berthing area of Pier J is through a secondary channel connected to the Long Beach main access channel; that secondary access channel limits drafts to about 43 feet (Corps 2016). Access to the northern berthing area of Pier J is off the Southeast Basin and does not have this depth limitation (Corps 2016). About 20 years ago a small share of container vessels had to restrict drafts, utilize tides, or both (Corps 2015). However, the impact to operations has increased in the past few years due to the increasing share of larger containerships calling on the port (Corps 2015). Today containerships docking at south berthing area of Pier J have maximum operating drafts of 52 feet and over 7.5 million of the 36.6 million tons of container cargo in 2012 was handled by vessels at or near the 43-foot limit of the secondary access channel (Corps 2016).

Currently, light loading, and tidal delays increase transportation costs for goods transported on containers, and in the future the impact is expected to worsen (Corps 2015; Corps 2016). If sufficiently dredged, containerships with capacities of over 18,000 TEUs (e.g., 1300 feet long, 176 feet beam,[12] drafts approximately 52 feet) would be capable of operating fully loaded in the Port (Corps 2016). Thus, addressing operating constraints to containerships has the potential to significantly lower transportation costs (Corps 2015).

Through agreements with the Service and other resource agencies, the Port has restored some coastal wetlands in southern California in exchange for development approvals of various Port areas. The Port has participated in substantial wetlands restoration projects, including one at the National Wildlife Refuge in Seal Beach. In addition, the Port contributed $39 million toward acquisition of 267 acres of degraded wetlands in Bolsa Chica Lagoon (Bolsa Chica Lowlands Restoration Project) in Huntington Beach (Port 2015).

Project Goals and Objectives

The proposed channel deepening project would allow large, deeper draft ships access to terminals within the Port. The Corps' stated planning goal is to provide safe, reliable, and efficient waterborne transportation improvements to the Port that address problems and opportunities as outlined herein. The Corps' planning objectives are specified as follows:

1. Reduce the cost of transporting cargo to and from the Port by improving channel dimensions, vessel operations, and other navigation features such as turning basins, waiting areas, and anchorages; and

2. Reduce expected future vessel re-routings from the Port to alternate facilities by improving channel dimensions, vessel operations, and other navigation features such as turning basins, waiting areas, and anchorages.

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[12] The beam of a ship is its width at the widest point as measured at the ship's nominal waterline.

Description of Biological Resources

The Port of Long Beach represents a large harbor complex typified by extensive areas of hardened shoreline (riprap and quay wall) and dredge maintained shipping channels (SAIC 2010). The fish and wildlife resources of the Port and San Pedro Bay are reported in substantial detail in a 2000 biological baseline report entitled "Ports of Los Angeles and Long Beach Year 2000 Biological Baseline Study of San Pedro Bay" (MEC 2002). This information was updated with additional survey efforts in 2008 in a report entitled "Final 2008 Biological Surveys of Los Angeles and Long Beach Harbors" (SAIC 2010). A brief summary of the available information is provided herein, based primarily on these two baseline reports. The biological resource groups of San Pedro Bay that are typically considered the most important are the marine fishes and water-associated birds.

The benthic hard substrates in the ports are mostly artificial breakwaters and barriers of riprap (boulders and concrete rubble), and constructed shallow water areas in the ports (LA/LBHSC 2016). Kelp beds typically dominate the hard substrates, with surfgrass natural community potentially existing in waters less than 10 feet deep (LA/LBHSC 2016). Soft bottom substrates comprise the majority of acreage in the two ports (LA/LBHSC 2016). No eelgrass beds were identified within the Port of Long Beach (SAIC 2010). One area just outside the Port's boundary line northeast of Island Grissom[13] was identified as supporting a sizeable eelgrass bed (SAIC 2010). The water column within the ports provides important habitats for many fish, larvae, and plankton, seals, and sea lions (LA/LBHSC 2016).

Fish

Fish populations of San Pedro Bay (including the ports of Los Angeles and Long Beach and environs) are diverse and relatively abundant (SAIC 2010). During surveys conducted in 2000, a total of 74 species were recorded and an estimated 44 million fish occupied the 2 ports. Surveys of the 2 ports in 2008 identified total of 62 fish taxa representing 59 unique species of fish (SAIC 2010). Generally, schooling fishes were the most abundant species recorded.

Northern anchovy (*Engraulis mordax*) and white croaker (*Genyonemus lineatus*) were the most abundant species collected in 2000 surveys; white croaker was top ranked in terms of biomass (MEC 2002). From 2008 surveys in the two ports, pelagic fish from lampara[14] net collections were dominated by four species: northern anchovy, topsmelt (*Atherinops affinis*), California grunion (*Leuresthes tenuis*), and Pacific sardine (*Sardinops sagax*). These species accounted for 98 percent of the total lampara net catch in 2008. All of these species are schooling fishes that spend most of their lives in the harbor environment. From 2008 otter trawl[15] surveys, dominant species included northern anchovy, white croaker (*Genyonemus lineatus*), queenfish (*Seriphus politus*), shiner surfperch (*Cymatogaster aggregata*), and white surfperch (*Phanerodon furcatus*). Other species

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[13] One of a set of four artificial oil production islands in San Pedro Bay off the coast of Long Beach.
[14] A lampara net is a type of fishing net used for capturing certain pelagic fish, those swimming near the water's surface.
[15] In otter trawling, a large net is dragged along the bottom or up in the water column behind a towing vessel. The mouth of the net is held open by two large "doors" which are attached to either side of the net. For the noted surveys performed in 2000 and 2008, trawl surveys were performed to capture bottom-dwelling demersal fish.

caught in high abundance were specklefin midshipman (*Porichthys myriaster*), California tonguefish (*Symphurus atricauda*), and yellowchin sculpin (*Icelinus quadriseriatus*).

The five most abundant species accounted for 92 percent of the total fish populations in the ports (MEC 2002). These included northern anchovy, white croaker, queenfish, Pacific sardine, and topsmelt. Other relatively abundant species included shiner surfperch, salema (*Xenistius californiensis*), and jacksmelt (*Atherinopsis californiensis*). Less numerous but ecologically and/or recreationally important species recorded were California barracuda (*Sphyraena argentea*), California halibut (*Paralichthys californicus*), barred sand bass (*Paralabrax nebulifer*), California corbina (*Menticirrhus undulatus*), white seabass (*Atractoscion nobilis*), California grunion (*Leuresthes tenuis*), and several species of sharks and rays.

In 2000, generally fewer species were caught in the Inner Harbor than Outer Harbor (MEC 2002). Benthic invertebrates, which represent an important food source for demersal fish,[16] also exhibited a trend of decreasing function of habitats from Outer to Inner Harbor areas (MEC 2002). In 2008 surveys, few differences were observed for pelagic fish between Inner and Outer Harbor areas, with Inner Harbor stations having between 4 and 12 species and Outer Harbor stations typified by between 3 and 11 species (SAIC 2010). This likely indicates that pelagic schooling species move throughout the harbor complex (SAIC 2010). In contrast, Outer Harbor areas generally were typified by a greater number, biomass, and variety of trawl-caught (demersal) fish than Inner Harbor areas (SAIC 2010).

More species of fish were collected in the shallow waters of the ports of Los Angeles and Long Beach, including all three of the created shallow water mitigation sites within the Port of Los Angeles, than at deepwater survey stations in open water, channel, basin, and slip habitats (MEC 2002). The greater diversity is likely partially explained by the greater heterogeneity associated with the shallow water habitats, which were adjacent to rock riprap and/or vegetated areas (e.g., eelgrass beds, kelp bed); this likely results in higher fish nursery function, greater production, and generally higher abundance of fish in shallow waters. For instance, the Cabrillo Shallow Water Habitat area is located alongside the San Pedro Breakwater, which supports giant kelp and other macroalgae; the Long Beach Shallow Water Habitat area is located adjacent to the riprap shoreline along Pier 400 that supports giant kelp and other macroalgae, and extensive eelgrass beds occur within the Pier 300 Shallow Water Habitat. Studies conducted in the shallow areas of the Outer Harbor, including the Pier 300 Shallow Water Habitat (MEC 1988, 1999) created in 1984 and the Cabrillo Shallow Water Habitat (MEC 1999) constructed in 1997, have shown that these areas have both higher diversity and greater abundance of fish and invertebrates than the deeper soft bottom portions of the ports of Los Angeles and Long Beach (MEC 2002). A greater abundance of juvenile fish is also present in these shallow areas; they appear to enter these areas relatively soon after hatching/birth. Long Beach fishing experts often fish adjacent to the four manmade oil production islands located within the overall Port boundaries,[17] due to the abundance of recreational fish found there; the abundance of recreational fish in these areas is reportedly due to shallow water combined with high relief from the riprap placed around the created islands (Ballanti 2007).

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[16] Fish dwelling at or near the bottom of a body of water.
[17] The islands are controlled by the City of Long Beach and are not part of the Port's Harbor District.

Forty-four unique species of fish larvae and 13 categories of fish eggs were identified in the ports of Los Angeles and Long Beach during the 2000 surveys (MEC 2002). The most abundant fish larvae were gobies [arrow goby (*Clevelandia ios*), cheekspot goby (*Ilypnus gilberti*), shadow goby (*Acentrogobius nebulosus*), and bay goby (*Lepidogobius lepidus*)], northern anchovy, California clingfish, queenfish, blennies, and white croaker. With the exception of the Pier 300 Shallow Water Habitat (in the Port of Los Angeles) that had high larval abundance and the Long Beach West Basin with low larval abundance, the abundances of larvae were generally higher on the Long Beach side of the two-port complex. This bears some similarity to the abundance pattern indicated for adult fish caught by lampara net surveys, which generally showed higher abundance in the deepwater channel, basins, and slips in the Port of Long Beach (MEC 2002). The larval catch was dominated by benthic associated gobies, which inhabit burrows. The ichthyoplankton surveys provided a good measure of the importance of species inhabiting burrows or associated with rocky and/or vegetated habitats in the Long Beach-Los Angeles port complex (MEC 2002). These species (while poorly represented in the adult fish surveys), are an important part of the overall ecology of the diverse marine habitats in the two ports. The ichthyoplankton results also demonstrate that a wide variety of fish spawn and develop within the ports of Los Angeles and Long Beach. Similar to the previous baseline study (MEC 2002), the only exotic (non-indigenous) fish species collected in the 2008 sampling surveys was the yellowfin goby (*Acanthogobius flavimanus*), collected at three Port of Los Angeles stations and six Port of Long Beach Harbor stations (SAIC 2010).

Benthic Invertebrates

Over 400 species of benthic infauna (small organisms that live on and within the sediment) and larger macroinvertebrates were collected during the Year 2000 Baseline Study; over 250 species of benthic infauna and larger macroinvertebrates were collected during the Year 2008 Baseline Study (MEC 2002; SAIC 2010). Small infaunal organisms (which tend to be less motile than larger macroinvertebrates) and larger macroinvertebrates both exhibited spatial variability in species composition that appeared to be tied to a combination of factors including water depth, years since dredging/disposal in the area, and ecological/habitats functions (MEC 2002). Studies in 2008 found little difference in species composition among deepwater stations located in basins, channels, or slips of the Inner and Outer Harbors (SAIC 2010).

Benthic invertebrate assemblages generally differed between shallow and deepwater habitats (SAIC 2010), and differences were apparent between assemblages from areas that have or have not experienced recent dredging (MEC 2002). Areas of recent dredging had fewer species and lower abundance than non-dredged areas, indicating that the recently dredged areas were still in the colonization phase (MEC 2002). Species assemblages of benthic invertebrates can be indicative of habitat function (SAIC 2010). Certain species are tolerant of adverse environmental conditions, such as low oxygen and high pollutant conditions, and others are found only in more pristine areas (SAIC 2010). In the 2008 study, species assemblages indicated that stations in the Outer Harbor had the highest habitat function as indicated by relatively greater abundance of species that typically characterize areas having background to low organic enrichment (i.e., low pollution) (SAIC 2010). The species assemblages found in the Inner Harbor, basins, and slips were indicative of low to moderate organic enrichment compared to the open-water Outer Harbor stations, suggesting that

benthic invertebrate species composition is influenced by tidal circulation in the harbors, with Outer Harbor areas having greater circulation and higher functional habitats (SAIC 2010).

Non-indigenous invertebrates comprise about 15 percent of the infauna and macroinvertebrate species occurring in the ports, with some of these species representing numerical dominants (SAIC 2010). The relative abundance of these species has increased in the harbors since the 1970s (SAIC 2010). A total of 10 non-indigenous (introduced) and 32 cryptogenic species (of unknown origin) were identified among the 313 species of infauna and macroinvertebrates collected during the 2008 study (SAIC 2010). The overall percentage of introduced and cryptogenic species identified in the present study (14 percent) is similar to the 15 percent reported by MEC (2002) in 2000 (SAIC 2010).

In general, ecological/habitats function was highest for benthic invertebrates at the created Cabrillo, Pier 300, and Long Beach Shallow Water Habitat areas and the deep open waters of both ports (MEC 2002). A gradient of decreasing ecological/habitats function was observed in basin and slip habitats and the back channels of the Inner Harbor. Similar to fish, catch abundance was higher in basin habitats in the Port than in the open waters of the Outer Harbor (SAIC 2010). The lowest catch of benthic invertebrates was obtained in the Inner Harbor (SAIC 2010).

A steady improvement in benthic ecological/habitats function within the ports of Los Angeles and Long Beach over time has occurred, as demonstrated by increased diversity and less dominance by pollution tolerant benthic infauna species over the past half century. Many areas in both ports were severely polluted in the 1950s with depauperate benthic faunal assemblages in these areas during that period (MEC 2002) (please see Contaminants below).

Birds

Southern California's coastal areas, including its shorelines, estuaries, bays, and developed harbors, provide a variety of natural and artificial communities for large numbers of waterfowl, shorebirds, wading birds, and birds that forage from the air. The predominately open water and hardscape/landscape habitats within the ports of Long Beach and Los Angeles provide opportunities for nesting, foraging, and resting by a moderate diversity of bird species, including one species listed as endangered under the ESA, the California least tern.

Birds that occur in and near the ports of Los Angeles and Long Beach are primarily water-associated species; that is, they are dependent on the marine natural communities for food and other essentials. Over 100 avian species use the various habitats within the Ports seasonally, year-round, or during migration (SAIC 2010). The areas within and near the ports provide very limited areas of trees and/or shrubs for feeding, resting, and/or nesting; most of this small area of vegetation is made up of exotic landscaping. As a result of the high numbers of small fish in the shallow water areas of the ports, substantial numbers of fish-eating birds are found foraging in these areas. The ports provide high-function habitats for many foraging, resting, and breeding birds.

During the 2000-2001 monitoring year, a total of 99 bird species, representing 31 families, were observed within San Pedro Bay (MEC 2002). A total of 96 species representing 30 families were observed within the ports during the 2008 study (SAIC 2010). Of these species from both studies,

69 are considered to be dependent on marine habitats. Gulls comprised 44.5 percent of the birds observed in 2000, with aerial foragers (22.4 percent) and waterfowl (21.4 percent) also common. The remaining 21.7 percent of the birds were small and large shorebirds, wading/marsh birds, raptors, and upland birds. The most abundant birds included several gull species [e.g., Western (*Larus occidentalis*), Heermann's (*L. heermanni*), and California (*L. californicus*)], brown pelican (*Pelecanus occidentalis*), elegant tern (*Thalasseus elegans*), western grebe (*Aechmophorus occidentalis*), Brandt's cormorant (*Phalacrocorax penicillatus*), double-crested cormorant (*Phalacrocorax auritus*), surf scoter (*Melanitta perspicillata*), and rock pigeon (*Columba livia*).

The State and Federal endangered California least tern is a piscivorous (fish eating) sea bird that makes significant breeding use of San Pedro Bay (KBC 2005). The least tern has a long history of nesting on Terminal Island and Pier 400 in the Port of Los Angeles (Figure 4). Pier 400 is near the western portion of the proposed project footprint. This least tern nesting site is typical of those used by the species in highly developed coastal California; the site is a relatively flat, open, barren sandy area near the ocean where the least terns lay and incubate their eggs and chicks fledge. The least tern nesting period extends from April through August; along the California coast least terns typically begin to arrive (from wintering grounds) in the southern most colony breeding sites (e.g., San Diego) in early April and they continue to arrive through the later part of May. During the remainder of the year, the birds are gone from the area.

Least terns nest on sparsely vegetated substrates, including sandy beaches, salt flats, and dredge spoil, in colonies of a few to several hundred nesting pairs. This species relies on sight for foraging and usually requires relatively clear water to locate its preferred baitfish food sources, northern anchovy, topsmelt, and jacksmelt (LSA 2009). Although there is some field evidence to suggest that least terns will forage in turbid waters to which fish are attracted, the majority of foraging occurs in clearer waters (LSA 2009).

The location of the tern nesting site(s) in the ports of Los Angeles and Long Beach previously varied from year to year (KBC 1998) depending largely on development activities in the ports, with most nesting on Pier 400. The Los Angeles Harbor Department manages the Pier 400 nesting site pursuant to a Memorandum of Agreement with the Service, Corps, and California Department of Fish and Wildlife (Department) (LA 2006). A 15.7-acre fenced nesting site is located at the southern tip of Pier. 400, although some nesting by least terns also often occurs outside of this designated area.

Least terns have nested within the ports since the late 1800s and have been observed within the harbor almost every year since annual monitoring studies began in the ports in 1973 (SAIC 2010). Since 1973 the least tern has utilized nesting locations on and around Terminal Island, with nesting at Reeves Field and/or Pier 300 and Pier 400 areas (LAHD 2015). Zero least tern nesting pairs were recorded for the Terminal Island area in 1992 (LAHD 2015). The greatest documented nesting activity for the least tern in the area has occurred since the birds began utilizing the then newly-constructed Pier 400 as a nesting site in 1997. The number of recorded nests at Pier 400 peaked at 1,322 in 2005, then declined to 906 in 2006, and further declined to 710 in 2007 (KBC 2007) and 126 in 2014 (State 2015). The principal foraging areas for least tern in the ports and environs vary somewhat from year to year, but during the chick rearing period, the shallow water areas of the ports are used heavily, probably due to the relatively greater abundances of appropriate prey fish (size and

species) found there (see MEC 1988, 1999). Measures to protect the least tern during channel dredging and landfill construction projects have proven successful (Service 1992). Those measures have included nesting area and predator management, shallow water area conservation/creation, and protection of water quality in the shallow water areas during breeding season.

Least tern nest numbers at Pier 400 increased from approximately 565 during the 2000–2001 to 1,332 in 2005, and then declined to 521 in 2008 (SAIC 2010). The decrease in nest numbers is opined to be related to increases both in upland vegetation and predation at the Pier 400 nesting site (KBC 2008). The majority of least tern observations during 2007–2008 surveys were of individuals foraging or flying in the vicinity of the Pier 400 nesting site; least terns also were observed foraging along the outer breakwater and open-water areas of the Outer Harbor and within Inner Harbor basin and channel areas (SAIC 2010). Least terns foraged most frequently just off the Pier 400 nesting site, off Pier 300, and near Cabrillo Beach (SAIC 2010).

The brown pelican, formerly federally listed as endangered, is found in large numbers in San Pedro Bay (MEC 2002). This bird breeds on the offshore Channel Islands, and forages widely along the southern California coast on small fishes. Brown pelicans make heavy use of the Outer Harbor breakwaters for roosting. The brown pelican is present throughout the year. The peregrine falcon (*Falco peregrinus*), also formerly federally listed as endangered, nests on bridges within the area of the ports (SAIC 2010).

Several piscivorous seabirds began nesting in the adjacent Port of Los Angeles following construction of Pier 400. The royal tern (*Thalasseus maximus*), Caspian tern (*Hydroprogne caspia*), elegant tern, and black skimmer (*Rynchops niger*) had each been recorded nesting on Pier 400 up until 2005 (KBC 2005). No nesting by these species was recorded in 2006 or 2007 (KBC 2007). The landfill area of Pier 400 (constructed in 1996) initially provided a large expanse of suitable bare-dirt nesting habitat for terns adjacent to a well-developed forage base (consisting of small fish) in the Outer Harbor. However, development of Pier 400 is now complete and undeveloped areas in the ports of Los Angeles and Long Beach outside of the Pier 400 nesting site currently contain very little suitable seabird nesting habitats.

No snowy plovers were detected within either the ports of Long Beach or Los Angeles during the 2007–2008 surveys (SAIC 2010). Snowy plovers are occasionally observed during migration at the California least tern nesting site on Pier 400 (SAIC 2010). A few snowy plovers have been observed at nearby Point Fermin and Cabrillo Beach (outside of the breakwater), both south and outside of the Port of Los Angeles (SAIC 2010).

Mammals

Most marine mammals are under the jurisdiction of the National Oceanic and Atmospheric Administration (NOAA Fisheries), including all those potentially occurring in or near the ports. All marine mammals are protected under the Marine Mammal Protection Act of 1972 (16 U.S.C. 1361 *et seq*.) and some are also protected by the ESA. Marine mammals that are known to occur sporadically in waters of the ports include pinnipeds [California sea lion (*Zalophus californianus*) and harbor seal (*Phoca vitulina*)] and cetaceans (SAIC 2010). Cetaceans that have been observed in

outer harbor locations in the ports include the gray whale (*Eschrichtius robustus*), Pacific bottlenose dolphin (*Tursiops truncatus*), short-beaked common dolphin (*Delphinus delphis*), and Pacific white-sided dolphin (*Lagenorhynchus obliquidens*) (SAIC 2010). None of these are species are known to breed in the ports (SAIC 2010).

Riprap-Associated Organisms

A total of 334 species of invertebrates were identified from three tidal zones within the riprap community in the ports (SAIC 2010). Distinct tidal zonation was observed with increasing numbers of species with increasing depth. Mean total abundance was highest in the lower intertidal, lowest in the upper intertidal, and intermediate in the subtidal zone (SAIC 2010). Across all tidal zones, crustaceans were numerically dominant, followed by polychaetes, echinoderms, molluscs, and other phyla. Past studies have noted relatively greater community development in Outer Harbor compared to Inner Harbor areas (MEC 1988, 2002). However, the 2008 study noted general similarities in these communities throughout the two ports (SAIC 2010). Exceptions were for diversity, which was somewhat greater at Outer Harbor breakwater stations compared to Inner Harbor locations, but these differences were mainly associated with the upper intertidal zone (SAIC 2010). Community summary measures did not show distinct trends among Inner and Outer Harbor stations for the lower intertidal and subtidal zones, suggesting some improvement in ecological function at Inner Harbor stations since the 2000 study (SAIC 2010).

Kelp and Macroalgae

Within the ports, the majority of kelp and macroalgae surface canopy is closely associated with the outer breakwaters and with riprap structures in the Outer Harbor and in locations facing the port entrances (SAIC 2010). While algal diversity in the ports is considered relatively low, there is a general pattern of decreasing algal diversity from Outer to Inner Harbor locations (SAIC 2010). During the 2008 study, Macrocystis canopy in the two ports totaled 77.8 acres in spring and decreased to 50.4 acres in the fall (35% decrease) (SAIC 2010). Seasonal declines in kelp canopy cover for both studies are likely due to natural die-offs between winter and fall. Dominant macroalgal communities included the genera *Sargassum*, *Ulva*, *Colpomenia*, *Chondracnathus*, and *Halymenia* (SAIC 2010).

Occurrences of invasive exotic algae within the ports include the brown algae *Sargassum muticum* and *Undaria pinnatifida*. While *Sargassum* has become a commonly observed component of the algal flora in southern California, including the ports, *Undaria* was first reported in the United States in spring 2000 during the previous baseline study of the ports (MEC 2002). Notably, *Undaria* was documented during the present study at all eight Inner Harbor sites studied and at 7 of 12 Outer Harbor locations, indicating an expanded distribution since 2000 (SAIC 2010).

Contaminants

The marine biological environment of the ports of Los Angeles and Long Beach has been periodically studied since the 1950s. Early studies documented severe pollution in several of the basins in the harbors. As recently as the late 1960s, dissolved oxygen (DO) levels at some locations

in Los Angeles Harbor were so low that little or no marine life could survive (SAIC 2010). Since that time, regulations have reduced direct waste discharges into the ports, resulting in improved DO levels throughout the port areas (MEC 2002; SAIC 2010). Comprehensive studies in the 1970s reported a dramatic improvement in marine habitats function/quality relative to the 1950s, although areas of pollution are still evident in Inner Harbor and blind-end slip areas (MEC 2002).

Results from studies in 2000 and 2008 indicate a continued trend of water quality improvement since the 1970s, with most DO concentrations in excess of 5 milligrams/liter (MEC 2002; SAIC 2010). Episodic and localized changes in some parameters, such as low DO concentrations coinciding with low transmissivity, suggested minor effects possibly associated with sediment resuspension events (MEC 2002). Water clarity (transmissivity) decreased with increasing depth and was relatively lower in bottom waters at stations with fine sediments and/or in the vicinity of dredging and/or disposal (MEC 2002). Polluted and “semi-healthy” areas still exist in the ports; however, the spatial extent of these areas of relatively poorer ecological/habitats function is not as widespread today. The most polluted area is the Consolidated Slip of the Port of Los Angeles; “semi-healthy” areas exist in the Cerritos Channel of the Inner Harbor and in confined basins and slips in both ports (MEC 2002).

Water quality conditions measured during July 2008 generally were uniform throughout the environments of the ports, with only minor differences that appeared to be unrelated to natural community (SAIC 2010). Further, water quality conditions also were consistent with values reported previously for the ports (MEC 2002), and indicative of well-mixed and well-oxygenated waters (e.g., DO greater than 5 mg/L) for almost all stations (SAIC 2010). Some localized differences, associated with comparatively warmer surface water temperatures, lower surface water salinities, and lower DO concentrations in near-bottom water, were observed, but the magnitude of the differences were considered small (SAIC 2010).

The waters of ports of Los Angeles and Long Beach (including Inner and Outer Harbor, Main Channel, Consolidated Slip, Southwest Slip, Fish Harbor, Cabrillo Marina, Inner Cabrillo Beach), San Pedro Bay, Dominguez Channel, Dominguez Channel estuary, Torrance Lateral Channel (sometimes referred to as Torrance Carson Channel), and Los Angeles River Estuary are impaired by heavy metals and organic pollutants (CRWQCB 2011). More specifically, each of these water bodies are included on the 303(d) list for one or more of the following pollutants: cadmium, chromium, copper, mercury, lead, zinc, chlordane, dieldrin, toxaphene, DDT, PCBs, and certain PAH compounds (CRWQCB 2011). These impairments may exist in one or more environmental media — water, sediments, or tissue (CRWQCB 2011).

Some site specific data are available that suggest varying levels of contamination in the sediments to be dredged. Additional testing will be required to determine what materials from which areas may be re-used for habitat creation or beach replenishment, disposed of at an ocean dumping site, or disposed of at a confined disposal facility or appropriate upland site. The Service will provide additional input on these determinations as information regarding physical and chemical characteristics of the materials to be dredged becomes available.

San Pedro Bay Landfill Mitigation History

The agency consensus mitigation goal for San Pedro Bay (ports of Los Angeles and Long Beach) landfill impacts to date has been no net loss of habitat value for in-kind resources, as near to the site of loss as feasible, and in advance of, but not later than concurrently with, the fill (Corps and LAHD 1992). For the last several years, the Service, Department, the National Marine Fisheries Service, the City of Los Angeles Harbor Department, and the Port have been designing and executing mitigation plans for development projects in the ports. The process employs a modified habitat evaluation procedure and involves evaluation of the habitat value in the affected port area and compares that to predicted habitat value increases at conceptual mitigation areas.

Following implementation of measures for avoiding and minimizing impacts to fish and wildlife resources, on-site mitigation has been conducted in the adjacent Port of Los Angeles consisting of creation of shallow water from deep areas. In 1985, as a condition of the Harbor Deepening Project in the Port of Los Angeles, the Corps created 190 acres of shallow water (i.e., water less than -20 feet MLLW) as mitigation for the filling of 190 acres of shallow water to make the land area now called Pier 300. The created shallow water area, now called the Pier 300 Shallow Water Habitat, has been the subject of several biological investigations (MEC 1988, 1999) and shown to provide highly productive habitats for fish. It is also an important foraging area for the California least tern (KBC and Aspen Environmental Group 2004).

Potential Impacts of the Proposed Project on Biological Resources

The proposed project would involve deepening of portions of the Port to currently undetermined depths with the disposal of dredge material at currently undetermined locations. The project would involve dredging of only relatively deep (i.e., greater than 20 feet) water areas of San Pedro Bay. These deeper water impacts typically do not involve what is considered significant long-term loss of habitats warranting mitigation.[18] Anticipated potential effects associated with dredging and disposal of dredge materials would depend largely on disposal location; these potentially include: 1) the permanent elimination of fish and wildlife habitats associated with any in-bay landfills; 2) a temporary reduction in available foraging habitat for piscivorous bird species, including the least tern, due to dredging or disposal-associated turbidity generated by the project (depending on locations); 3) the reduction of deep water habitats and creation of shallow water fish habitats with any in-bay subaquatic fill of deeper waters; 4) the reduction of deepwater habitats and creation of island (nesting bird) habitats with any in-bay island fill of deeper waters; and 5) temporary impacts of burying of beach- and nearshore-associated invertebrates and nearshore turbidity associated with disposal of dredge materials through local beach/nearshore replenishment.

The dredging of deeper water areas within the project footprint would impact the invertebrate benthic fauna and demersal fish communities found in these areas. These dredging impacts would be largely temporary, although the resultant areas would then be deeper in the long-term. The replacement benthic fauna that would colonize these dredged areas in the years following project

[18] Historically, mitigation has been required for dredging that deepens shallow water areas, 20 feet deep or less, because the deepening reduces or eliminates the fish nursery and bird foraging values. No such impacts to areas less than 20 feet deep are anticipated with this project.

implementation would likely be different; this fauna would include species combinations adapted to these new deeper areas. The vast majority (if not all) of these areas have been subject to dredging in the past century, with varying levels of recovery since the last dredging event. It is undetermined what areas of the project footprint would be subject to future maintenance dredging.

The dredging and disposal of dredge materials creates temporary turbidity impacts to surrounding waters. When dredge materials are used to create shallow water or island habitats this typically creates long-term benefits due to the typically higher functions and values for fish and wildlife attributable to shallow water and sensitive species nesting areas. The size and duration of the turbidity plume generated by dredging and disposal activities is dependent on grain size of the suspended material and current velocities at the time the activity is conducted (Corps and LAHD 2000). Project dredge material qualities, disposal locations, and associated current velocities are unknown; therefore, turbidity is not readily predictable for the project. The amount of turbidity is generally greater in the immediate vicinity of the filling/disposal operations than at the dredge site because the dredge typically operates with suction, while the filling operation is often by discharge from a pipe (Corps and LAHD 2000). However, based on past dredge disposal operations, the extent of the turbidity plume is not expected to be greater than several hundred feet from the discharge point. Because several hundred acres of high-function shallow water foraging habitat are available for piscivorous bird species within the Port region (e.g., 193-acre Pier 300 Shallow Water Habitat and 326-acre Cabrillo Shallow Water Habitat), the area of disturbance from the project would likely represent a small portion of available foraging habitats for such birds.

Recommendations

The Fish and Wildlife Coordination Act states that "...wildlife conservation shall receive equal consideration and be coordinated with other features of water-resource development projects through the effectual and harmonious planning, development, maintenance, and coordination of wildlife conservation...." (16 U.S.C. 661). Consistent with Fish and Wildlife Coordination Act, should the project be implemented, we suggest incorporation of the following planning aid recommendations in order avoid, minimize, and compensate potential impacts to fish and wildlife resources, and suggest the Corps incorporate the project design elements outlined below that would improve fish and wildlife resources:

1. The Corps should use dredge materials, as contaminant levels in the dredge materials allow, to construct areas of shallow water fish habitats (areas of water less than -20 feet MLLW).

2. Within the center of the area of created shallow water fish habitats noted above, the Corps should create a least tern/snowy plover nesting island with dredge materials. We suggest that the Outer Harbor in areas of low shipping traffic would likely be a functional location for this purpose, particularly areas adjacent to (behind) the existing Middle or Long Beach breakwaters.[19] The middle of this island(s) should be at least several acres in size and relatively flat with the surface constructed of typical least tern nesting soil matrix materials.

[19] We suggest these locations so as to minimize conflict with existing shipping traffic routes in the ports. These Outer Harbor areas would likely provide high ecological function for the fish and wildlife species targeted by these measures.

A portion of the island should have a zone of low gradient shoreline slope down to the water within a protected cove(s), likely adjacent to and facing the existing breakwater within the Port for swell protection. Other features such as subaquatic reefs constructed of rock are also suggested, in part to help prevent erosion of the island cove shoreline surface materials from swells. The configuration and slope surface of the noted cove should be constructed of sand and gravel or other compatible materials for snowy plover chick foraging: the configuration should be such that the cove areas remain open to tide-borne deposition of natural beach wrack[20] and would otherwise support snowy plover chick and adult foraging. The remainder of the island (outside of the cove portion) would likely need to be edged by riprap to avoid erosion of the island by swells. Possibly waste rock from other proposed projects in the area (e.g., partial or full removal of the Long Beach Breakwater) could be used/combined for this purpose. It is preferred that the surface of this island not be utilized for human recreation and be protected from unauthorized entry.

3. The Corps should implement a construction schedule for the project that avoids the least tern breeding season, if feasible.

4. Turbidity from dredge and fill activities in the vicinity of the shallow water habitats should not extend over an area greater than 5 acres of shallow waters (i.e., areas less than 20 feet deep) at any one time during the April-to-September breeding season of the California least tern. Monitoring of project-related turbidity, as provided for in measure 5 below, should be based on visually observed differences between ambient surface water conditions and any visible dredging turbidity plume.

5. The Corps should provide a qualified least tern biologist, acceptable to the Service and Department, and approved by the Corps, to help monitor and manage project activities. This program should be carried out during project activities. The biologist should coordinate with the Service and the Department and:

   a. If the areas associated with project activities (such as staging areas) would occur within upland areas of the Port that are capable of supporting sensitive species, the Corps should provide an education program for construction crews, including the identity of the least tern and their nests, restricted areas and activities, and actions to be taken if least tern nesting sites are found outside the designated least tern nesting sites/within project activity areas.

   b. Visually monitor and report to the dredging contractor or Corps contract manager and Service/Department any turbidity from project dredging which extends over an area greater than 5 acres of shallow waters.

6. If least tern or other protected species nests are found within the project's direct footprint in upland areas during construction, then all work in the immediate area should be halted, and the Corps biologist be notified immediately. An appropriate buffer zone around the nest for

[20] Beach wrack consists of organic material such as kelp and sea grass that is cast up onto the beach by surf, tides, and wind. Beach wrack supports a wide variety and large quantity of beach invertebrates.

exclusion of project-related activities should be specified by the biologist in coordination with the Service and the Department.

If you have any questions you have regarding this letter, please contact Jon Avery, Federal Projects Coordinator, at 760-431-9440, extension 309.

Sincerely,

CAROL ROBERTS
Digitally signed by CAROL ROBERTS
Date: 2016.06.30 15:09:09 -07'00'

Scott A. Sobiech
Deputy Field Supervisor

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4.3 South Coast Air Quality Management District

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U.S. ARMY CORPS OF ENGINEERS
LOS ANGELES DISTRICT
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LOS ANGELES, CALIFORNIA 90017-3489

April 9, 2021

Ms. Sang-Mi Lee
Program Supervisor
Air Quality Modeling/Emissions Inventory
South Coast Air Quality Management District
21865 Copley Drive
Diamond Bar, California 91765

Dear Ms. Lee:

This letter concerns the United States Army Corps of Engineers (USACE), Port of Long Beach Deep Draft Navigation Project (proposed project) as it relates to the general conformity rule. Established under the Clean Air Act (CAA) section 176(c) [42 USC 7506(c)], the purpose of the general conformity rule is to ensure that actions taken by Federal agencies do not interfere with a state's plan to attain and maintain National Ambient Air Quality Standards (NAAQS). Under the general conformity rule, federal agencies must work with state and local governments, in nonattainment or maintenance areas, to ensure that federal actions conform to the established, applicable State Implementation Plan (SIP). To do so, the federal agency must either determine that the action is exempt from general conformity regulations or make a conformity determination consistent with the general conformity requirements.

The USACE, in conjunction with the Port of Long Beach (POLB), intends to dredge specific areas in the POLB as discussed in detail in the Integrated Feasibility Report and Draft Environmental Impact Statement and Environmental Impact Report (IFR). Per 40 CFR 93.152, USACE's federal authority would extend only to construction emissions associated with the proposed project. There would be no net changes in operational air emissions expected following completion of project construction activities. The only reasonably foreseeable activities extending beyond the construction period and subject to USACE authority would be maintenance dredging, which is exempt from conformity applicability per 40 CFR 93.153(c)(2)(ix). Hence, the USACE would have no continuing program responsibility for activities beyond construction.

Alternative 3[1] is the USACE's preferred project alternative. The USACE's federal actions include the General Navigation Features and Local Service Facilities within the USACE's regulatory purview. Based on the USACE's applicability analysis in the IFR, the total of direct and indirect emissions caused by the federal actions would exceed the applicability rates specified in 40 CFR 93.153(b) for nitrogen dioxide (NO_2), ozone (nitrogen oxides (NO_x) and volatile organic compounds (VOC) precursors), and carbon monoxide (CO), in construction years 2025, 2026, and 2027. Therefore, the USACE is required to have a general conformity determination for these three criteria pollutants.

The USACE can use one of several methods to show that the federal actions conform to the SIP. For actions where the direct and indirect emissions exceed the rates in 40 CFR 93.153(b), the federal action can include mitigation measures to offset the emission increases from the federal action or can show that the action will conform by meeting any of the following requirements:

- Showing that the net emission increases caused by an action are included in the SIP,
- documenting that the state agrees to include the emission increases in the SIP,
- offsetting the action's emissions in the same or nearby area of equal or greater classification, or
- providing an air quality modeling demonstration in some circumstances.

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[1] Alternative 3 is composed of measures for liquid bulk vessels, container vessels, and the local service facilities, as identified below:

- General Navigation Features for Liquid Bulk Vessels
  - Deepen the entrance to the Main Channel (the Approach Channel through Queens Gate) from a project depth of -76 feet to -80 feet mean lower low water (MLLW)
  - Widen portions of the Main Channel (bend easing) to a depth of -76 feet MLLW

- General Navigation Features for Container Ships
  - Construct an approach channel and turning basin to Pier J South to a depth of -55 feet MLLW.
  - Deepen portions of the West Basin and West Basin Approach to a depth of -55 feet MLLW.

- Local Service Facilities to be constructed by the POLB
  - Deepen two additional locations within the harbor to a depth of -55 feet MLLW – the Pier J Slip, including berths J266-J270, and berth T140 on Pier T
  - Perform structural improvements on Pier J breakwaters at the entrance of the Pier J Slip to accommodate deepening of the Pier J Slip and Approach Channel to -55 feet MLLW.

Approximately 7.4 million cubic yards (mcy) of material would be dredged. Dredged material would be placed either at a nearshore placement site, a USEPA-designated ocean disposal site (LA-2 and/or LA-3), or a combination of the two. The nearshore placement site, approximately five miles from the project site, can accommodate about 2.5 mcy of dredged material. LA-2 and LA-3, approximately nine and 22 miles, respectively, from the project site, have an annual disposal volume limit of 1.0 and 2.5 mcy, respectively, from all sources. It is assumed that 0.9 mcy for LA-2 and 2.2 mcy for LA-3 is available for use by this proposed project each year.

As part of the USACE's analysis in the IFR, the USACE considered the following mitigation measures to reduce construction-related emissions:

- *MM-AQ-1. Electric clamshell dredge.* The use of an electric clamshell dredge shall be required for project clamshell dredging activities during the entire construction period of the project.

- *MM-AQ-2·. Construction-Related Harbor Craft.* Construction-related harbor craft (tugboats, crew boats, and survey boats) with Category 1 or Category 2 marine engines shall meet USEPA Tier 3 emission standards for marine engines. In addition, the construction contractor shall require all construction-related tugboats that home fleet in the San Pedro Bay Ports: 1) to shut down their main engines; and 2) to refrain from using auxiliary engines while at dock and instead use electrical shore power, if feasible.

- *MM-AQ-3: Off-Road Construction Equipment.* Self-propelled, diesel-fueled off-road construction equipment 25 horsepower or greater shall meet United States Environmental Protection Agency (USEPA)/California Air Resources Board (CARB) Tier 4 emission standards for non-road equipment.

Table 1 presents the mitigated annual construction emissions associated with Alternative 3 (this information can be found in Section 5.5.5 and Table 5-19 in the Draft IFR). The table shows that NO_2 and ozone (NOx precursor) emissions would be reduced but would remain above the applicability rates. All other pollutants would be reduced to below the applicability rates. All methods, input/output data and emissions before and after the application of above mitigation measures were made available to public as part of the Draft IFR distributed publicly on October 21, 2019, and still available for download at: https://www.spl.usace.army.mil/Missions/Civil-Works/Projects-Studies/Port-of-Long-Beach-Deep-Draft-Navigation-Study/.

Table 1. Alternative 3 Emissions After Mitigation

Source Category	**PM_{10}**	**$PM_{2.5}$**	**Ozone (NOx precursor)**	**NO_2**	**CO**	**Ozone (VOC precursor)**
2024						
Offroad Construction Equipment	0.0	0.0	0.1	0.1	0.2	0.0
Onroad Construction Vehicles	0.0	0.0	0.0	0.0	0.1	0.0
Fugitive Emissions	0.0	0.0	0.0	0.0	0.0	0.0
Marine Equipment	0.1	0.1	2.7	2.7	2.2	0.2
Total Construction Year 2024	0.2	0.1	2.8	2.8	2.4	0.2
Conformity Determination Applicability Rate	100	100	10	100	100	10
Equal or Exceed Applicability Rate?	No	No	No	No	No	No

Source Category	**PM_{10}**	**$PM_{2.5}$**	**Ozone (NOx precursor)**	**NO_2**	**CO**	**Ozone (VOC precursor)**
2025						
Offroad Construction Equipment	0.0	0.0	0.0	0.0	0.0	0.0
Onroad Construction Vehicles	0.0	0.0	0.0	0.0	0.0	0.0
Fugitive Emissions	0.0	0.0	0.0	0.0	0.0	0.0
Marine Equipment	7.6	6.7	145.5	145.5	86.9	8.1
Total Construction Year 2025	7.6	6.7	145.5	145.5	86.9	8.1
Conformity Determination Applicability Rate	100	100	10	100	100	10
Equal or Exceed Applicability Rate?	No	No	Yes	Yes	No	No
2026						
Offroad Construction Equipment	0.0	0.0	0.0	0.0	0.0	0.0
Onroad Construction Vehicles	0.0	0.0	0.0	0.0	0.0	0.0
Fugitive Emissions	0.0	0.0	0.0	0.0	0.0	0.0
Marine Equipment	1.7	1.5	35.8	35.8	27.4	2.0
Total Construction Year 2026	1.7	1.5	35.8	35.8	27.4	2.0
Conformity Determination Applicability Rate	100	100	10	100	100	10
Equal or Exceed Applicability Rate?	No	No	Yes	No	No	No
2027						
Offroad Construction Equipment	0.0	0.0	0.0	0.0	0.0	0.0
Onroad Construction Vehicles	0.0	0.0	0.0	0.0	0.0	0.0
Fugitive Emissions	0.0	0.0	0.0	0.0	0.0	0.0
Marine Equipment	0.6	0.5	11.9	11.9	9.1	0.7
Total Construction Year 2027	0.6	0.5	11.9	11.9	9.1	0.7
Conformity Determination Applicability Rate	100	100	10	100	100	10
Equal or Exceed Applicability Rate?	No	No	Yes	No	No	No

Notes:
Tons per day for each year are based on the number of construction days in each year of the proposed project (i.e., 365 days in each year 2024 through 2026, and 113 days in year 2027), per Table 5-19 of IFR.

During a December 1, 2020, conference call, the South Coast Air Quality Management District (SCAQMD) raised a concern that the NOx and NO_2 emissions in Table 1 were the same and suggested that the USACE consider recalculating NO_2 emissions to account for the fraction of NO_2 in NOx exhaust. Although the USACE recognizes NOx consists of both NO and NO_2, and that NO_2 emissions are initially low in exhaust at the tailpipe, it is conservative and common industry practice to assume that most NO in NOx exhaust is rapidly converted to NO_2. The SCAQMD's Localized

Significance Threshold methodology assumes that although initially only 5 percent of the emitted NOx is NO_2, within 500 meters downwind all NO is converted to NO_2. During a December 15, 2020, conference call between the SCAQMD and iLanco Environmental, LLC, the POLB's air quality contractor, it is the USACE's understanding that the SCAQMD discussed amongst their groups whether it was appropriate to assume that NOx and NO_2 emissions are equal and decided that this approach is appropriate.

The USACE recognizes that the SCAQMD's NOx set-aside conformity budget was primarily established to streamline determinations for ozone conformity. Notwithstanding, NO_2 is the only component of NOx that directly drives tropospheric ozone formation. If the SCAQMD can find that a certain NOx budget would not interfere with reaching ozone attainment, it seems reasonable to assume that the same NOx budget would also not interfere with maintaining NO_2 attainment.

Additionally, the South Coast Air Basin (SCAB) has been in attainment of the NO_2 standard for many years and has been designated as "maintenance" since 1998. It is possible that the SCAB may be moved to "attainment" since it has been in maintenance status for over ten years. It is our understanding that USEPA's clarification is needed for this determination in which case there would be no need for a NO_2 demonstration of conformity. We respectfully request that the SCAQMD advise us on the SCAB's "maintenance" vs "attainment" designation for purposes of determining conformity.

During the December 1, 2020, conference call, the SCAQMD raised concerns regarding future operational emissions in the POLB and emissions levels associated with Tier 2 hopper dredges. Regarding future operational emissions, alternatives evaluated in the IFR would result only in construction activities (i.e., both land-based construction and dredging) that would affect air quality within the POLB and surrounding region. While the action alternatives may accommodate changes in the vessel fleet calling at the POLB, they would not increase cargo or liquid bulk throughput. Therefore, operational emissions have not been assessed in the IFR.

Reducing inefficiencies would allow current fleet vessels to arrive fully loaded and to avoid delays associated with tide riding, lightering, or traffic conflicts (for liquid bulk vessels). Throughput at the POLB is limited by backland storage areas, which are constrained and at capacity. While the proposed project would not result in larger vessels calling at the POLB beyond those that currently call at the POLB and those that have previously been forecasted, the efficiencies afforded by accommodating these larger vessels fully loaded with no operational restrictions would in turn reduce the total number of vessels calling at the POLB over time. The objective of the proposed project is to improve conditions for vessel operations and safety, and to accommodate the existing large vessels that call at the POLB with fewer restrictions as they come online. Appendix E of the IFR includes projected fleet forecasts for the POLB for all alternatives, including the no action alternative that were used for the economic evaluation of project benefits. Ship sizes and expected numbers calling on the POLB

are discussed in this appendix. Attention is called to Tables 4-8 and 4-9 for details. A summary table (Table 2) is provided here to illustrate the expected decrease in ship calls for the proposed project.

Table 2. Expected Decrease in Ship Calls for the Proposed Project

Year	Alternative	Container Vessel Calls	Tanker Calls
2021	Current	1,278	932
2030	No Action	1,494	916
2030	Proposed Project	1,444	908
2040	No Action	1,724	912
2040	Proposed Project	1,643	903

Container vessel calls are expected to go up for all alternatives from 2021 to 2030 and from 2030 to 2040. Tanker calls are expected to decrease slightly over the same time period, although there is a slight increase from 2030 to 2040. However, fewer container vessel calls are projected for the years 2030 and 2040 with the proposed project for the same years as the no action alternative. There are 50 fewer container vessels and 8 fewer tanker vessels projected to call at the POLB for the proposed project as compared to future without project conditions (no action alternative) for 2030. Furthermore, there are 81 fewer container vessels and 9 fewer tanker vessels projected to call at the POLB for the proposed project as compared to future without project conditions (no action alternative) for 2040.

Regarding hopper dredge emissions, the areas that are proposed for hopper dredges are unsuitable for dredging by the electric clamshell for two reasons. First, is the distance between the on-land transformer and the dredge location. The distance is impracticable for efficient operations and safety as this would require placing the electric power cable through the busy ship traffic lane at Queen's Gate. The tether to the shoreline would need to be at least 1 mile long at the closest point all the way up to 4 plus miles to dredge at the "daylight" location of the entrance channel, and this would be crossing the major thoroughfare through the Queen's Gate. The second reason is the depth of the dredge cut. Dredging from -70 feet MLLW to -80 feet MLLW is inefficient for a clamshell dredge due to the depth of water. A hopper dredge keeps its drag head continuously on the ocean floor while dredging while a clamshell must repeatedly go up and down through the water column leading to extended time for each cycle and increased loss of sediments from the clamshell while transiting the water column. The clamshell would also have a significantly lower production rate to the hopper due to the proposed dredging depths. It is about 1/3 of the hopper daily production rate in optimal conditions, and with the proposed depths, this would decrease even more. This would increase the proposed project timeline by 1-2 years.

Sediments in the Approach Channel (where the hopper dredge would operate) are sandy and thus suitable for nearshore placement. This allows the hopper dredge to

operate more efficiently by using a shortened transit from dredge site to the nearshore placement site, as opposed to a transit from the dredge site to the ocean disposal site. Reduced transit times results in a longer dredging period per day for the hopper dredge.

POLB staff reached out to their contacts in the U.S. dredging industry as well as conducted an on-line search to find information on hopper dredges with Tier 3 or better engines. There are only two USACE-owned dredges stationed on the west coast of the U.S. Both are Tier 2 equipped. The *Yaquina* is unable to reach the depths needed for the proposed project and is unsuitable. The *Essayons* could reach the required depths, if modified. There currently are no privately-owned hopper dredges stationed on the west coast. Regarding the international market, these are not available for operation in the U.S. market. There has not been any indication that changes will be made to the Jones Act, Public Law 66-261, to allow non-U.S. constructed, owned and crewed vessels to operate in U.S. waters.

We appreciate the SCAQMD staff's recommendation during our conference call on December 1, 2020, for the USACE to include a requirement for the hopper dredge to be equipped with Tier 3/4 engines as a mitigation measure for the proposed project. The use of Tier 3/4 engines is not a regulatory requirement in effect for the SCAB now or at the estimated time of construction. We are unable to accommodate such a mitigation measure under our current contracting standards. We may consider it in the future if available, feasible, and consistent with competition in contracting.

According to 40 CFR 93.161, the state or local agency responsible for implementing and enforcing the SIP can develop and adopt an emissions budget to be used for demonstrating conformity under 40 CFR 93.158(a)(1). The SCAQMD's 2016 Air Quality Management Plan (AQMP) addresses general conformity budgets beginning on page VI-D-1 of Appendix VI and on pages 111-2-85 through 11-2-88 of Appendix Ill. To streamline the general conformity process for federal projects and to facilitate general conformity determinations, the 2016 AQMP establishes VOC and NOx general conformity budgets of 2.0 tons per day (tpd) of NOx and 0.5 tpd of VOC on an annual basis from 2017 to 2030, and budgets of 0.5 tpd of NOx and 0.2 tpd VOC in 2031. These general conformity budgets are included in the "set-aside" account added to baseline emissions in tables 9, 10 and 11 in section 111.D.2.c of this document. The general conformity budgets in the 2016 AQMP are not set aside for specific facilities per se but were developed in the anticipation of the construction and operation of certain development projects in the South Coast Air Basin that are expected over the next decade. Under the 2016 AQMP, emissions from general conformity projects are tracked by the SCAQMD's tracking system and debited from this set-aside budget on a first-come-first-served basis until the budget has been exhausted. The USEPA approved the general conformity budgets in the 2016 AQMP on October 1, 2019.

Federal agencies can use these budgets to demonstrate that their federal actions conform to the SIP through a letter from the State and SCAQMD confirming that the federal actions emissions are accounted for in the SIP's general conformity

budgets. The USACE requests the SCAQMD provide written confirmation that the federal actions emissions of 146 tons NOx, 36 tons NOx and 12 tons NOx in years 2025, 2026, and 2027, respectively, are accounted for in the SIPs general conformity budget, which would be used by the USACE to demonstrate conformity under 40 CFR 93.158(a)(1).

If you have questions, please contact Mr. Larry Smith, Project Environmental Coordinator, at (213) 452-3846 or by email at lawrence.j.smith@usace.army.mil.

Sincerely,

DEMESA.EDUARDO.T[redacted]

Digitally signed by DEMESA.EDUARDO.T.1[redacted]
Date: 2021.04.07 14:32:18 -07'00'

Eduardo T. De Mesa
Chief, Planning Division

South Coast
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April 12, 2021

Eduardo T. De Mesa
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Dear Mr. De Mesa,

This letter is in response to your letter dated March 3, 2021 requesting South Coast AQMD to accommodate the anticipated emissions from the Port of Long Beach Deep Draft Navigation Project in the Air Quality Management Plan (AQMP)/State Implementation Plan (SIP) emissions budget for general conformity purposes.

The general conformity determination process is intended to demonstrate that a proposed Federal action will not: (1) cause or contribute to new violations of a national ambient air quality standard (NAAQS); (2) interfere with provisions in the applicable SIP for maintenance of any NAAQS; (3) increase the frequency or severity of existing violations of any standard; or (4) delay the timely attainment of any standard. As such, for general conformity determination, the proposed federal action needs to conform to the latest approved SIP/AQMP.

The South Coast Air Basin (Basin) is designated as an extreme non-attainment area for ozone, serious non-attainment for PM2.5 and maintenance area for Carbon Monoxide. In order to accommodate projects subject to general conformity requirements and to streamline the review process, general conformity budgets for NOx and VOC emissions are established in the AQMP. The 2016 AQMP (https://www.aqmd.gov/home/air-quality/clean-air-plans/air-quality-mgt-plan/final-2016-aqmp), which is the latest plan approved by U.E. EPA, established set aside accounts to accommodate emissions subject to general conformity requirements. The set-aside accounts include 2 tons per day (tpd) or 730 tons per year (tpy) of NOx and 0.5 tpd or 182.5 tpy of VOC each year starting in 2017 through 2030, and 0.5 tpd (182.5 tpy) of NOx and 0.2 tpd (73 tpy) of VOC each year in 2031 and thereafter.

The anticipated emissions from the proposed project exceed the General Conformity de minimis thresholds of NOx in the years 2025, 2026 and 2027 as indicated in Table 1, “Alternative 3 Emissions After Mitigation”, in your letter. These emissions are associated with construction activities of Alternative 3 scenario, which is the preferred alternative scenario by U.S. Corps of Army Engineers. After the completion of project construction activities, no changes in net operational emissions are anticipated. Emissions from potential maintenance dredging in the future, if any, will be exempt from conformity applicability if the action has no emissions increase or the emissions increase is below de minimis threshold per 40 CFR 93.153(c)(2)(ix). Detailed method to calculate emissions included in the general conformity determination can be found at the Port of Long Beach Deep Draft Navigation Project[1].

South Coast AQMD staff has reviewed the proposed project emissions based on the information provided in your letter. Based on our review, we have determined that NOx emissions above de minimis thresholds can be accommodated within the general conformity budgets established in the 2016 AQMP. The emissions accommodated in the general conformity budgets for 2025, 2026 and 2027 are listed in Table 1 below.

Table 1. Proposed Project Emissions Accommodated in 2016 AQMP General Conformity Budgets (tons per year)

Pollutants	Emission Phase	2025	2026	2027
NOx	Construction	145.5	35.8	11.9

In addition to NOx emissions, NO2 emissions exceed the de minimis threshold in 2025. South Coast Air Basin was designated as a maintenance area for the 1971 annual NO2 NAAQS on July 24, 1998. However, twenty years after the effective date of redesignation to attainment, general conformity no longer applies unless a maintenance plan approved under CAA Section 175A specifies that conformity requirements apply for a longer time period. The approved maintenance plan for the Basin did not extend the maintenance plan period beyond 20 years from redesignation. Consequently, conformity requirements for NO2 ceased to apply after September 22, 2018. Therefore, no conformity requirement applies to the NO2 emissions from the proposed project.

In summary, based on our evaluation, the proposed project will conform to the latest EPA approved AQMP as the emissions from the project are accommodated within the AQMP's emissions budgets, and the proposed project is not expected to result in any new or additional violations of the NAAQS or impede the projected attainment of the NAAQS.

[1] Documents are available at https://www.spl.usace.army.mil/Missions/Civil-Works/Projects-Studies/Port-of-Long-Beach-Deep-Draft-Navigation-Study
Refer Table 5-19 for the amount of emissions subject to general conformity determination and Appendix for detailed methodology

If you have any questions, please contact me at (909) 396-2856 or srees@aqmd.gov or Sang-Mi Lee, Program Supervisor at (909)-396-3169 or slee@aqmd.gov.

Sincerely,

Sarah Rees

Sarah L. Rees, Ph.D.
Deputy Executive Officer
Planning, Rule Development & Area Sources
South Coast Air Quality Management District

Attachment:
Letter from U.S. Army Corps of Engineers dated March 3, 2021

cc: Tom Kelly, US EPA Region IX
Barbara Baird, South Coast AQMD
Zorik Pirveysian, South Coast AQMD
Sang-Mi Lee, South Coast AQMD
Jillian Wong, South Coast AQMD
Lijin Sun, South Coast AQMD

ZP:SL

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS
LOS ANGELES DISTRICT
915 WILSHIRE BOULEVARD, SUITE 930
LOS ANGELES, CALIFORNIA 90017-3489

April 9, 2021

Ms. Sang-Mi Lee
Program Supervisor
Air Quality Modeling/Emissions Inventory
South Coast Air Quality Management District
21865 Copley Drive
Diamond Bar, California 91765

Dear Ms. Lee:

This letter concerns the United States Army Corps of Engineers (USACE), Port of Long Beach Deep Draft Navigation Project (proposed project) as it relates to the general conformity rule. Established under the Clean Air Act (CAA) section 176(c) [42 USC 7506(c)], the purpose of the general conformity rule is to ensure that actions taken by Federal agencies do not interfere with a state's plan to attain and maintain National Ambient Air Quality Standards (NAAQS). Under the general conformity rule, federal agencies must work with state and local governments, in nonattainment or maintenance areas, to ensure that federal actions conform to the established, applicable State Implementation Plan (SIP). To do so, the federal agency must either determine that the action is exempt from general conformity regulations or make a conformity determination consistent with the general conformity requirements.

The USACE, in conjunction with the Port of Long Beach (POLB), intends to dredge specific areas in the POLB as discussed in detail in the Integrated Feasibility Report and Draft Environmental Impact Statement and Environmental Impact Report (IFR). Per 40 CFR 93.152, USACE's federal authority would extend only to construction emissions associated with the proposed project. There would be no net changes in operational air emissions expected following completion of project construction activities. The only reasonably foreseeable activities extending beyond the construction period and subject to USACE authority would be maintenance dredging, which is exempt from conformity applicability per 40 CFR 93.153(c)(2)(ix). Hence, the USACE would have no continuing program responsibility for activities beyond construction.

Alternative 3[1] is the USACE's preferred project alternative. The USACE's federal actions include the General Navigation Features and Local Service Facilities within the USACE's regulatory purview. Based on the USACE's applicability analysis in the IFR, the total of direct and indirect emissions caused by the federal actions would exceed the applicability rates specified in 40 CFR 93.153(b) for nitrogen dioxide (NO_2), ozone (nitrogen oxides (NO_x) and volatile organic compounds (VOC) precursors), and carbon monoxide (CO), in construction years 2025, 2026, and 2027. Therefore, the USACE is required to have a general conformity determination for these three criteria pollutants.

The USACE can use one of several methods to show that the federal actions conform to the SIP. For actions where the direct and indirect emissions exceed the rates in 40 CFR 93.153(b), the federal action can include mitigation measures to offset the emission increases from the federal action or can show that the action will conform by meeting any of the following requirements:

- Showing that the net emission increases caused by an action are included in the SIP,
- documenting that the state agrees to include the emission increases in the SIP,
- offsetting the action's emissions in the same or nearby area of equal or greater classification, or
- providing an air quality modeling demonstration in some circumstances.

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[1] Alternative 3 is composed of measures for liquid bulk vessels, container vessels, and the local service facilities, as identified below:

- General Navigation Features for Liquid Bulk Vessels
  - Deepen the entrance to the Main Channel (the Approach Channel through Queens Gate) from a project depth of -76 feet to -80 feet mean lower low water (MLLW)
  - Widen portions of the Main Channel (bend easing) to a depth of -76 feet MLLW

- General Navigation Features for Container Ships
  - Construct an approach channel and turning basin to Pier J South to a depth of -55 feet MLLW.
  - Deepen portions of the West Basin and West Basin Approach to a depth of -55 feet MLLW.

- Local Service Facilities to be constructed by the POLB
  - Deepen two additional locations within the harbor to a depth of -55 feet MLLW – the Pier J Slip, including berths J266-J270, and berth T140 on Pier T
  - Perform structural improvements on Pier J breakwaters at the entrance of the Pier J Slip to accommodate deepening of the Pier J Slip and Approach Channel to -55 feet MLLW.

Approximately 7.4 million cubic yards (mcy) of material would be dredged. Dredged material would be placed either at a nearshore placement site, a USEPA-designated ocean disposal site (LA-2 and/or LA-3), or a combination of the two. The nearshore placement site, approximately five miles from the project site, can accommodate about 2.5 mcy of dredged material. LA-2 and LA-3, approximately nine and 22 miles, respectively, from the project site, have an annual disposal volume limit of 1.0 and 2.5 mcy, respectively, from all sources. It is assumed that 0.9 mcy for LA-2 and 2.2 mcy for LA-3 is available for use by this proposed project each year.

As part of the USACE's analysis in the IFR, the USACE considered the following mitigation measures to reduce construction-related emissions:

- *MM-AQ-1. Electric clamshell dredge.* The use of an electric clamshell dredge shall be required for project clamshell dredging activities during the entire construction period of the project.

- *MM-AQ-2·. Construction-Related Harbor Craft.* Construction-related harbor craft (tugboats, crew boats, and survey boats) with Category 1 or Category 2 marine engines shall meet USEPA Tier 3 emission standards for marine engines. In addition, the construction contractor shall require all construction-related tugboats that home fleet in the San Pedro Bay Ports: 1) to shut down their main engines; and 2) to refrain from using auxiliary engines while at dock and instead use electrical shore power, if feasible.

- *MM-AQ-3: Off-Road Construction Equipment.* Self-propelled, diesel-fueled off-road construction equipment 25 horsepower or greater shall meet United States Environmental Protection Agency (USEPA)/California Air Resources Board (CARB) Tier 4 emission standards for non-road equipment.

Table 1 presents the mitigated annual construction emissions associated with Alternative 3 (this information can be found in Section 5.5.5 and Table 5-19 in the Draft IFR). The table shows that NO_2 and ozone (NOx precursor) emissions would be reduced but would remain above the applicability rates. All other pollutants would be reduced to below the applicability rates. All methods, input/output data and emissions before and after the application of above mitigation measures were made available to public as part of the Draft IFR distributed publicly on October 21, 2019, and still available for download at: https://www.spl.usace.army.mil/Missions/Civil-Works/Projects-Studies/Port-of-Long-Beach-Deep-Draft-Navigation-Study/.

Table 1. Alternative 3 Emissions After Mitigation

Source Category	**PM_{10}**	**$PM_{2.5}$**	**Ozone (NOx precursor)**	**NO_2**	**CO**	**Ozone (VOC precursor)**
2024						
Offroad Construction Equipment	0.0	0.0	0.1	0.1	0.2	0.0
Onroad Construction Vehicles	0.0	0.0	0.0	0.0	0.1	0.0
Fugitive Emissions	0.0	0.0	0.0	0.0	0.0	0.0
Marine Equipment	0.1	0.1	2.7	2.7	2.2	0.2
Total Construction Year 2024	0.2	0.1	2.8	2.8	2.4	0.2
Conformity Determination Applicability Rate	100	100	10	100	100	10
Equal or Exceed Applicability Rate?	No	No	No	No	No	No

Source Category	PM_{10}	$PM_{2.5}$	Ozone (NOx precursor)	NO_2	CO	Ozone (VOC precursor)
2025						
Offroad Construction Equipment	0.0	0.0	0.0	0.0	0.0	0.0
Onroad Construction Vehicles	0.0	0.0	0.0	0.0	0.0	0.0
Fugitive Emissions	0.0	0.0	0.0	0.0	0.0	0.0
Marine Equipment	7.6	6.7	145.5	145.5	86.9	8.1
Total Construction Year 2025	7.6	6.7	145.5	145.5	86.9	8.1
Conformity Determination Applicability Rate	100	100	10	100	100	10
Equal or Exceed Applicability Rate?	No	No	Yes	Yes	No	No
2026						
Offroad Construction Equipment	0.0	0.0	0.0	0.0	0.0	0.0
Onroad Construction Vehicles	0.0	0.0	0.0	0.0	0.0	0.0
Fugitive Emissions	0.0	0.0	0.0	0.0	0.0	0.0
Marine Equipment	1.7	1.5	35.8	35.8	27.4	2.0
Total Construction Year 2026	1.7	1.5	35.8	35.8	27.4	2.0
Conformity Determination Applicability Rate	100	100	10	100	100	10
Equal or Exceed Applicability Rate?	No	No	Yes	No	No	No
2027						
Offroad Construction Equipment	0.0	0.0	0.0	0.0	0.0	0.0
Onroad Construction Vehicles	0.0	0.0	0.0	0.0	0.0	0.0
Fugitive Emissions	0.0	0.0	0.0	0.0	0.0	0.0
Marine Equipment	0.6	0.5	11.9	11.9	9.1	0.7
Total Construction Year 2027	0.6	0.5	11.9	11.9	9.1	0.7
Conformity Determination Applicability Rate	100	100	10	100	100	10
Equal or Exceed Applicability Rate?	No	No	Yes	No	No	No

Notes:
Tons per day for each year are based on the number of construction days in each year of the proposed project (i.e., 365 days in each year 2024 through 2026, and 113 days in year 2027), per Table 5-19 of IFR.

During a December 1, 2020, conference call, the South Coast Air Quality Management District (SCAQMD) raised a concern that the NOx and NO_2 emissions in Table 1 were the same and suggested that the USACE consider recalculating NO_2 emissions to account for the fraction of NO_2 in NOx exhaust. Although the USACE recognizes NOx consists of both NO and NO_2, and that NO_2 emissions are initially low in exhaust at the tailpipe, it is conservative and common industry practice to assume that most NO in NOx exhaust is rapidly converted to NO_2. The SCAQMD's Localized

Significance Threshold methodology assumes that although initially only 5 percent of the emitted NOx is NO_2, within 500 meters downwind all NO is converted to NO_2. During a December 15, 2020, conference call between the SCAQMD and iLanco Environmental, LLC, the POLB's air quality contractor, it is the USACE's understanding that the SCAQMD discussed amongst their groups whether it was appropriate to assume that NOx and NO_2 emissions are equal and decided that this approach is appropriate.

The USACE recognizes that the SCAQMD's NOx set-aside conformity budget was primarily established to streamline determinations for ozone conformity. Notwithstanding, NO_2 is the only component of NOx that directly drives tropospheric ozone formation. If the SCAQMD can find that a certain NOx budget would not interfere with reaching ozone attainment, it seems reasonable to assume that the same NOx budget would also not interfere with maintaining NO_2 attainment.

Additionally, the South Coast Air Basin (SCAB) has been in attainment of the NO_2 standard for many years and has been designated as "maintenance" since 1998. It is possible that the SCAB may be moved to "attainment" since it has been in maintenance status for over ten years. It is our understanding that USEPA's clarification is needed for this determination in which case there would be no need for a NO_2 demonstration of conformity. We respectfully request that the SCAQMD advise us on the SCAB's "maintenance" vs "attainment" designation for purposes of determining conformity.

During the December 1, 2020, conference call, the SCAQMD raised concerns regarding future operational emissions in the POLB and emissions levels associated with Tier 2 hopper dredges. Regarding future operational emissions, alternatives evaluated in the IFR would result only in construction activities (i.e., both land-based construction and dredging) that would affect air quality within the POLB and surrounding region. While the action alternatives may accommodate changes in the vessel fleet calling at the POLB, they would not increase cargo or liquid bulk throughput. Therefore, operational emissions have not been assessed in the IFR.

Reducing inefficiencies would allow current fleet vessels to arrive fully loaded and to avoid delays associated with tide riding, lightering, or traffic conflicts (for liquid bulk vessels). Throughput at the POLB is limited by backland storage areas, which are constrained and at capacity. While the proposed project would not result in larger vessels calling at the POLB beyond those that currently call at the POLB and those that have previously been forecasted, the efficiencies afforded by accommodating these larger vessels fully loaded with no operational restrictions would in turn reduce the total number of vessels calling at the POLB over time. The objective of the proposed project is to improve conditions for vessel operations and safety, and to accommodate the existing large vessels that call at the POLB with fewer restrictions as they come online. Appendix E of the IFR includes projected fleet forecasts for the POLB for all alternatives, including the no action alternative that were used for the economic evaluation of project benefits. Ship sizes and expected numbers calling on the POLB

are discussed in this appendix. Attention is called to Tables 4-8 and 4-9 for details. A summary table (Table 2) is provided here to illustrate the expected decrease in ship calls for the proposed project.

Table 2. Expected Decrease in Ship Calls for the Proposed Project

Year	Alternative	Container Vessel Calls	Tanker Calls
2021	Current	1,278	932
2030	No Action	1,494	916
2030	Proposed Project	1,444	908
2040	No Action	1,724	912
2040	Proposed Project	1,643	903

Container vessel calls are expected to go up for all alternatives from 2021 to 2030 and from 2030 to 2040. Tanker calls are expected to decrease slightly over the same time period, although there is a slight increase from 2030 to 2040. However, fewer container vessel calls are projected for the years 2030 and 2040 with the proposed project for the same years as the no action alternative. There are 50 fewer container vessels and 8 fewer tanker vessels projected to call at the POLB for the proposed project as compared to future without project conditions (no action alternative) for 2030. Furthermore, there are 81 fewer container vessels and 9 fewer tanker vessels projected to call at the POLB for the proposed project as compared to future without project conditions (no action alternative) for 2040.

Regarding hopper dredge emissions, the areas that are proposed for hopper dredges are unsuitable for dredging by the electric clamshell for two reasons. First, is the distance between the on-land transformer and the dredge location. The distance is impracticable for efficient operations and safety as this would require placing the electric power cable through the busy ship traffic lane at Queen’s Gate. The tether to the shoreline would need to be at least 1 mile long at the closest point all the way up to 4 plus miles to dredge at the “daylight” location of the entrance channel, and this would be crossing the major thoroughfare through the Queen’s Gate. The second reason is the depth of the dredge cut. Dredging from -70 feet MLLW to -80 feet MLLW is inefficient for a clamshell dredge due to the depth of water. A hopper dredge keeps its drag head continuously on the ocean floor while dredging while a clamshell must repeatedly go up and down through the water column leading to extended time for each cycle and increased loss of sediments from the clamshell while transiting the water column. The clamshell would also have a significantly lower production rate to the hopper due to the proposed dredging depths. It is about 1/3 of the hopper daily production rate in optimal conditions, and with the proposed depths, this would decrease even more. This would increase the proposed project timeline by 1-2 years.

Sediments in the Approach Channel (where the hopper dredge would operate) are sandy and thus suitable for nearshore placement. This allows the hopper dredge to

operate more efficiently by using a shortened transit from dredge site to the nearshore placement site, as opposed to a transit from the dredge site to the ocean disposal site. Reduced transit times results in a longer dredging period per day for the hopper dredge.

POLB staff reached out to their contacts in the U.S. dredging industry as well as conducted an on-line search to find information on hopper dredges with Tier 3 or better engines. There are only two USACE-owned dredges stationed on the west coast of the U.S. Both are Tier 2 equipped. The *Yaquina* is unable to reach the depths needed for the proposed project and is unsuitable. The *Essayons* could reach the required depths, if modified. There currently are no privately-owned hopper dredges stationed on the west coast. Regarding the international market, these are not available for operation in the U.S. market. There has not been any indication that changes will be made to the Jones Act, Public Law 66-261, to allow non-U.S. constructed, owned and crewed vessels to operate in U.S. waters.

We appreciate the SCAQMD staff's recommendation during our conference call on December 1, 2020, for the USACE to include a requirement for the hopper dredge to be equipped with Tier 3/4 engines as a mitigation measure for the proposed project. The use of Tier 3/4 engines is not a regulatory requirement in effect for the SCAB now or at the estimated time of construction. We are unable to accommodate such a mitigation measure under our current contracting standards. We may consider it in the future if available, feasible, and consistent with competition in contracting.

According to 40 CFR 93.161, the state or local agency responsible for implementing and enforcing the SIP can develop and adopt an emissions budget to be used for demonstrating conformity under 40 CFR 93.158(a)(1). The SCAQMD's 2016 Air Quality Management Plan (AQMP) addresses general conformity budgets beginning on page VI-D-1 of Appendix VI and on pages 111-2-85 through 11-2-88 of Appendix Ill. To streamline the general conformity process for federal projects and to facilitate general conformity determinations, the 2016 AQMP establishes VOC and NOx general conformity budgets of 2.0 tons per day (tpd) of NOx and 0.5 tpd of VOC on an annual basis from 2017 to 2030, and budgets of 0.5 tpd of NOx and 0.2 tpd VOC in 2031. These general conformity budgets are included in the "set-aside" account added to baseline emissions in tables 9, 10 and 11 in section 111.D.2.c of this document. The general conformity budgets in the 2016 AQMP are not set aside for specific facilities per se but were developed in the anticipation of the construction and operation of certain development projects in the South Coast Air Basin that are expected over the next decade. Under the 2016 AQMP, emissions from general conformity projects are tracked by the SCAQMD's tracking system and debited from this set-aside budget on a first-come-first-served basis until the budget has been exhausted. The USEPA approved the general conformity budgets in the 2016 AQMP on October 1, 2019.

Federal agencies can use these budgets to demonstrate that their federal actions conform to the SIP through a letter from the State and SCAQMD confirming that the federal actions emissions are accounted for in the SIP's general conformity

budgets. The USACE requests the SCAQMD provide written confirmation that the federal actions emissions of 146 tons NOx, 36 tons NOx and 12 tons NOx in years 2025, 2026, and 2027, respectively, are accounted for in the SIPs general conformity budget, which would be used by the USACE to demonstrate conformity under 40 CFR 93.158(a)(1).

If you have questions, please contact Mr. Larry Smith, Project Environmental Coordinator, at (213) 452-3846 or by email at lawrence.j.smith@usace.army.mil.

Sincerely,

DEMESA.EDUARDO.T.[redacted] Digitally signed by DEMESA.EDUARDO.T.[redacted] Date: 2021.04.07 14:32:18 -07'00'

Eduardo T. De Mesa
Chief, Planning Division

4.4 California Coastal Commission

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, LOS ANGELES DISTRICT
915 WILSHIRE BOULEVARD, SUITE 930
LOS ANGELES, CALIFORNIA 90017-3489

October 21, 2019

Jack Ainsworth
Executive Director
California Coastal Commission
45 Fremont, Suite 2000
Attention: Mr. Larry Simon
San Francisco, California 94105-2219

Dear Mr. Ainsworth:

A copy of the Draft Integrated Feasibility Report (IFR) for the Port of Long Beach Deep Draft Navigation Feasibility Study located in Los Angeles County, California, is available for your review at:

https://www.spl.usace.army.mil/Missions/Civil-Works/Projects-Studies/Port-of-Long-Beach-Deep-Draft-Navigation-Study/

The purpose of the proposed project is to increase transportation efficiencies for both the current and future fleet of container and liquid bulk vessels operating in the Port of Long Beach, and to improve overall conditions for vessel operations and safety, in the event of vessel malfunction or weather-related events. The proposed project deepens existing and constructs new Federal channels and turning basins by dredging and disposing approximately 7.4 million cubic yards of sediment. Construction would begin in 2024 and take approximately three years to complete.

Please review the Draft IFR. This letter and the Draft IFR constitute the US Army Corps of Engineers' (USACE) Coastal Consistency Determination (CCD) for this project. The Los Angeles District has determined that the proposed project is consistent, to the maximum extent practicable with the Coastal Zone Management Act of 1972 and with enforceable policies of the California Coastal Management Plan. We are requesting concurrence with this CCD. Project construction is not anticipated to begin until approximately 2024, subsequent to authorization by Congress. Prior to construction, USACE will conduct a sediment sampling and analysis program to confirm the suitability of dredged material for nearshore placement/ocean disposal. Results of the program will be shared with the California Coastal Commission staff. If USACE determines that the project has changed or has new or different effects on coastal resources, USACE will, as provided for the consistency regulations, develop and submit a supplemental CCD to the Coastal Commission. This includes any changes to the preliminary suitability determination that all sediments are suitable for the proposed placement/disposal sites.

Public meetings will be held on Wednesday, November 13, 2019, in the Port of Long Beach Offices located at 415 W. Ocean Blvd, Long Beach, CA 90802 in their first floor multipurpose room. The first meeting will be 3:00 – 4:00 pm.. A second meeting will be from 6:00 – 7:00 pm..

Please respond with comments on the Draft IFR by December 9, 2019. Correspondence may be sent to:

Eduardo T. De Mesa
Chief, Planning Division
U.S. Army Corps of Engineers
Los Angeles District
ATTN: Mr. Larry Smith, CESPL-PDR-Q
915 Wilshire Boulevard, Suite 930
Los Angeles, California 90017-3849
EMAIL: POLB@usace.army.mil

If you have any questions regarding the project, please contact Mr. Larry Smith, Project Environmental Coordinator, at (213) 452-3846, FAX: (213) 452-4204, and EMAIL: POLB@usace.army.mil.

Thank you for your attention to this document.

Sincerely,

Eduardo T. De Mesa
Chief, Planning Division

CALIFORNIA COASTAL COMMISSION
455 MARKET STREET, SUITE 228
SAN FRANCISCO, CA 94105-2219
VOICE (415) 904-5200
FAX (415) 904-5400

October 22, 2020

Eduardo De Mesa
Chief of Planning
U.S. Army Corps of Engineers
Los Angeles District
915 Wilshire Boulevard
Suite 930
Los Angeles, CA 90017-3401

SUBJECT: California Coastal Commission Support for the Port of Long Beach Deep Draft Navigation Project

Dear Mr. De Mesa:

Thank you for the Los Angeles District of the U.S. Army Corps of Engineers' (USACE) request that the California Coastal Commission (Commission) support the navigation project proposed by the USACE's Port of Long Beach Deep Draft Navigation Study (DDN). The project is described in the draft Integrated Feasibility Report (IFR) sent to us on October 22, 2019, which has been the center of detailed discussions between the project proponents, USACE, and our staff. For a number of reasons, primarily because the Port of Long Beach is currently working to obtain from the Commission certification of a port master plan amendment (PMPA), which addresses future development in the Port of Long Beach, including the DDN project, the USACE extended the statutory time limit for Commission action on consistency determination CD-0005-19 (CD) for the DDN project several times. The current deadline is now January 12, 2021.

This delay in bringing the CD for the DDN project to the Commission is not based on substantive inconsistencies with Coastal Act policies but rather the need to ensure that the Commission can make the required findings with the resource protection policies of the Coastal Act, and including the applicable Chapter 8 port policies. The port policies will be included in the PMPA, hence, the need for certification of the PMPA before Commission action on the CD. The USACE has acknowledged that its CD needs to be acted on by the Commission only after the Commission certifies the PMPA.

As the proposed project would be constructed by the federal government, with some local funding, the USACE is required to submit a CD to the Commission for review and concurrence under the federal Coastal Zone Management Act (CZMA) prior to commencing any work. Based on decades of past practice and experience, the staff and

Commission believe that it would be most prudent for the USACE to submit its CD during the project's Pre-Construction Engineering & Design (PED) phase.

Although a draft CD was included with the draft IFR, the Commissioners look forward to Commission staff's formal review and action under the CZMA during the PED phase, during which more information will be available for the Commission to review as the USACE demonstrates compliance to the maximum extent practicable with the CZMA. The Commission staff supports the USACE's efforts to delay Commission action on a CD for the DDN project until the PED phase of the project. Based on our review of the materials submitted with CD-0005-19, the staff does not anticipate any difficulties in recommending the Commission concur with the CD for the DDN project. The Commission staff believes that withdrawal of CD-0005-19 prior to the current January 12, 2021, deadline and resubmittal of a CD during the PED phase for the project is the most appropriate and efficient pathway forward to eventually scheduling Commission action on the CD. If you have any further questions, please contact me by email at Larry.Simon@coastal.ca.gov.

Sincerely,

LARRY SIMON

Larry Simon
Manager, Federal Consistency Unit

4.5 Regional Water Quality Control Board

Los Angeles Regional Water Quality Control Board

April 23, 2021

Eduardo T. De Mesa
Chief, Planning Division
U.S. Army Corps of Engineers, Los Angeles District
915 Wilshire Boulevard, Suite 930
Los Angeles, CA 90017-3489

REQUEST FOR CLEAN WATER ACT SECTION 401 PRE-APPLICATION REVIEW OF PROPOSED PORT OF LONG BEACH DEEP DRAFT NAVIGATION PROJECT

Dear Mr. De Mesa:

The Los Angeles Regional Water Quality Control Board (Los Angeles Water Board) is in receipt of your letter dated October 21, 2019 concerning the Draft Integrated Feasibility Report (IFR) for the Port of Long Beach Deep Draft Project (Project) located in Los Angeles County, California.

Relevant sediment testing in the Approach Channel, Main Channel and West Basin of the Port of Long Beach has been conducted for previous projects from 1994 and 2018. In the previous sampling efforts, all chemicals, including DDT and metals, have been detected at concentrations low enough to be approved for ocean disposal. Sediments in the proposed Pier J Approach Channel have not yet been dredged or tested. However, the Army Corps of Engineers anticipates that the material in the Pier J Approach will also be suitable for ocean disposal.

Based on review of the October 21, 2019 letter and the Draft Integrated Feasibility Report and Environmental Impact Statement/Environmental Impact Report (Draft Feasibility and EIS/EIR) for the Project, and contingent on a complete application for Water Quality Certification for the Project under the Clean Water Act Section 401 (Water Quality Certification), I anticipate that the Los Angeles Water Board will issue a Water Quality Certification for the Project.

Any Water Quality Certification issued will require Best Management Practices (BMPs) for the protection of water quality. However, I anticipate that because this Project's proposed impacts to Waters of the State or United States will not significantly alter habitat, and because the Project will include the mitigation measures included in the

Draft Feasibility and EIS/EIR, the Water Quality Certification will not include requirements beyond the water quality BMPs usually required of such projects.

The Los Angeles Water Board looks forward to receiving an application for Water Quality Certification for the Project and to working with you to determine the appropriate and effective BMPs to protect water quality during the Project. We also look forward to receiving the additional sediment testing results after the planning and design phase of the project has been completed.

Sincerely,

Hugh Marley Digitally signed by Hugh Marley Date: 2021.04.23 15:06:19 -07'00' for

Water Boards

Renee Purdy
Executive Officer

4.6 Assistant Secretary of the Army (Civil Works)

DEPARTMENT OF THE ARMY
OFFICE OF THE ASSISTANT SECRETARY
CIVIL WORKS
108 ARMY PENTAGON
WASHINGTON DC 20310-0108

SACW 4 JUNE 2021

MEMORANDUM FOR COMMANDING GENERAL, U.S. ARMY CORPS OF ENGINEERS

SUBJECT: Port of Long Beach Deep Draft Navigation Study, Los Angeles County, California, Request for Policy Exception for Coastal Zone Management Compliance

1. References:

a. HQ USACE, CECW-SPD memorandum (Port of Long Beach Deep Draft Navigation Study, Los Angeles County, California, Request for Policy Exception for Coastal Zone Management Compliance) 02 March 2021.

b. USACE, CESPD-PD memorandum (CESPD Endorsement of the Port of Long Beach Deep Draft Navigation Study, Los Angeles County, California, Policy Waiver to Defer Formal Consultation with the California Coastal Commission to the Preconstruction Engineering and Design (PED) Phase) 17 December 2020.

c. USACE, CESPL-ZA memorandum (Port of Long Beach Deep Draft Navigation Study, Los Angeles County, California, Request for Policy Waiver to Defer Formal Consultation with the California Coastal Commission to the Preconstruction Engineering and Design Phase) 9 November 2020.

d. 22 October 2020 California Coastal Commission (CCC) support letter.

2. I am responding to your memorandum requesting an exception to the policy requirement to complete Coastal Zone Management Act (CZMA) compliance prior to completion of the feasibility study for the Port of Long Beach, California deep draft navigation project.

3. The CMA requires that actions are consistent with the State's Coastal Zone Plan prepared under the CZMA as overseen by Department of Commerce and NOAA has issued regulations implementing the CZMA requirement for Federal agencies. In accordance with these requirements, Corps policy requires that the Corps complete CZMA compliance prior to completion of a feasibility study. However, CZMA regulations allow both the Federal agency and the state agency to agree to an alternative schedule. The California Coastal Commission (CCC) supports the Corps request in their letter dated 22 October 2020, (Reference d). The Corps documents that the legal and policy risks are minimal since the Corps is proposing no new coastal navigation structures, the

CCC staff does not anticipate any difficulties in recommending the Commission concur with the CD for the DDN project, and the Corps does not anticipate that new information between now and PED would be significant or would substantially affect CCC concurrence.

4. I approve the requested policy exception for the Port of Long Beach navigation project. Completing the Port of Long Beach CZMA compliance in PED will allow the Corps to develop the necessary information to attain CZMA concurrence from the California Coastal Commission, without delay of the completion of the feasibility study. The NEPA document should clearly commit to this future completion of the CZMA process.

5. If there are any questions, your staff may contact Mr. Jeffrey L. Trulick, Project Planning and Review at 703-915-8995.

JAIME A. PINKHAM
Acting Assistant Secretary of the Army
(Civil Works)

CF:
DCG-CEO, USACE
DCW, USACE
CECW-SPD

4.7 Clean Air Act General Conformity Determination

CLASSIFIEDS

PHONE:
562-435-1161
ONLINE @:
marketplace.socaladsonline.com/lang

HOW TO PLACE AN AD

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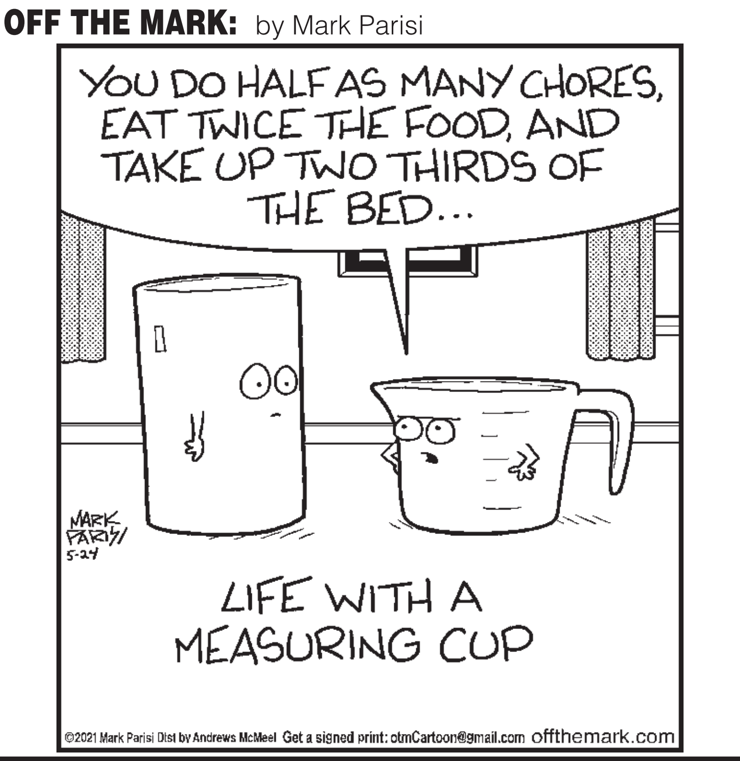
Tuesday	1:00pm Monday
Wednesday	11:30am Tuesday
Thursday-Saturday	1:00pm Prior Day

MARK TRAIL: by Jules Rivera

OFF THE MARK: by Mark Parisi



THE ACES ON BRIDGE®

Bobby Wolff

"The best of men cannot suspend their fate:
The good die early and the bad die late."
— Daniel Defoe

05-24-A

NORTH
♠ A J 3
♥ J 10 9 8 5
♦ 7 5 2
♣ 9 5

WEST
♠ Q 10 8 2
♥ 6 3
♦ Q 10 6 4
♣ J 7 6

EAST
♠ 6 5 4
♥ A K 7 4
♦ 9 8
♣ Q 10 8 2

SOUTH
♠ K 9 7
♥ Q 2
♦ A K J 3
♣ A K 4 3

Vulnerable: Both
Dealer: South

The bidding:

South	West	North	East
2 NT	Pass	3 ♦	Pass
3 ♥	Pass	3 NT	All pass

Opening Lead: Spade two

The fate of many a contract is decided at trick one. Today's deal is no different — but once you have been forewarned, you will not fall into declarer's error ... will you?

South's two-no-trump opening was greeted by a transfer to hearts, followed by three no-trump, offering a choice of games. South naturally preferred no-trump, despite the fact that his controls might have been better-suited to a trump contract. The only time you might feel differently when holding a doubleton heart would be with a doubleton double-honor.

West's fourth-highest spade two lead tipped declarer off to the probable location of the spade queen. He could therefore count seven top tricks. Hearts was the place to look for more, and declarer could establish three tricks there by force.

Declarer played low from dummy as East contributed the four, showing count. Declarer won cheaply with the seven, then advanced the heart queen. East smartly held off, then won the next heart and shifted to the club 10. Declarer took the ace and, nothing his earlier error, tried to sneak an extra entry to dummy via a finesse of the spade jack, but West was wide awake. He inserted the spade queen, forcing dummy's ace, and declarer had no way back to dummy to score the long hearts.

South was careless here. He should have anticipated his entry problems and won trick one with the spade king, clearing the way to enter dummy twice more in the suit. East's holdup would then prove ineffective.

LEAD WITH THE ACES

05-24-B

South holds:
♠ 6
♥ Q 5 2
♦ 9 6 5 2
♣ A K 10 8 2

South	West	North	East
			1 NT
Pass	3 NT	All pass	

ANSWER: Lead the club eight. You should look no further than your five-card suit, and while it could be necessary to lead a top card in order to drop a doubleton queen, that is not terribly likely after Stayman has been eschewed. More likely, partner has the doubleton or three small, in which case a low card will unblock the suit, or at least retain a link with partner.

For details of Bobby Wolff's autobiography, "The Lone Wolff," contact shewolff5757@aol.com. If you would like to contact Bobby Wolff, e-mail him at bobbywolff@mindspring.com.

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ORDER TO SHOW CAUSE FOR CHANGE OF NAME
PETITION OF
Maria Martinez
FOR CHANGE OF NAME
CASE NUMBER:
21LBCP00137
Superior Court of California, County of Los Angeles
275 Magnolia Ave
Long Beach CA 90802
Governor George Deukmejian Courthouse
TO ALL INTERESTED PERSONS:
1. Petitioner filed a petition with this court for a decree changing names as follows:
Present name
a. **Maria Martinez**
to Proposed name
Nikole Martinez
2. THE COURT ORDERS that all persons interested in this matter shall appear before this court at the hearing indicated below to show cause, if any, why the petition for change of name should not be granted.
NOTICE OF HEARING
a. Date: **07-2-21** Time: **8:30 AM**
Dept: **27** Room: **51**
b. The address of the court is same as noted above.
3. a. A copy of this Order to Show Cause shall be published at least once each week for four successive weeks prior to the day set for hearing on the petition in the following newspaper of general circulation, printed in this county:
PRESS TELEGRAM
DATED: May 17, 2021
Mark C. Kim
JUDGE OF THE SUPERIOR COURT
Pub. May 24, 31; June 7, 14, 2021 (4t) PT (11464467)

Legal Notice

ORDER TO SHOW CAUSE FOR CHANGE OF NAME
PETITION OF
Staci Denise Pineda and Antonio Pineda
FOR CHANGE OF NAME
CASE NUMBER:
21PSCP00209
Superior Court of California, County of Los Angeles
400 Civic Center Plaza
Pomona CA 91766
Pomona Courthouse South
TO ALL INTERESTED PERSONS:
1. Petitioner filed a petition with this court for a decree changing names as follows:
Present name
a. **Patrick William Pineda Dabney**
to Proposed name
Patrick William Pineda
2. THE COURT ORDERS that all persons interested in this matter shall appear before this court at the hearing indicated below to show cause, if any, why the petition for change of name should not be granted.
NOTICE OF HEARING
a. Date: **06-24-21** Time: **8:30 AM**
Dept: **J** Room: **4th Floor**
b. The address of the court is same as noted above.
3. a. A copy of this Order to Show Cause shall be published at least once each week for four successive weeks prior to the day set for hearing on the petition in the following newspaper of general circulation, printed in this county:
PRESS TELEGRAM
DATED: 4/28/21
Gloria WHite-Brown
JUDGE OF THE SUPERIOR COURT
Pub May 10, 17, 24, 31, 2021 (4t) PT (11460799)

NOTICE OF AVAILABILITY OF THE PORT OF LONG BEACH DEEP DRAFT NAVIGATION PROJECT

DRAFT GENERAL CONFORMITY DETERMINATION

Interested parties are hereby notified of and provided an opportunity to comment on the Draft General Conformity Determination (DGCD). In accordance with Title 40 of the Code of Federal Regulations, Chapter I, Subchapter C, Part 93, Section 93.156(b), notice is hereby provided that the DGCD contains a description of the proposed Federal action and the Federal agency's draft conformity determination.

The DGCD is available for download at https://www.spl.usace.army.mil/Missions/Civil-Works/Projects-Studies/Port-of-Long-Beach-Deep-Draft-Navigation-Study/ or at Port of Long Beach Administration Building (Lobby Security Desk), 415 West Ocean Boulevard, Long Beach, CA 90802.

Written comments on the DGCD must be received by June 22, 2021. Comments by mail or email will be accepted. Comments may be sent to:

U.S. Army Corps of Engineers, Los Angeles District
ATTN: Mr. Larry Smith (CESPL-PDR-Q)
915 Wilshire Boulevard
Los Angeles, CALIFORNIA 90017
Email: POLB@usace.army.mil

Pub May 24, 2021 (1t) PT (11464040)

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U.S. ARMY CORPS OF ENGINEERS
LOS ANGELES DISTRICT
915 WILSHIRE BOULEVARD, SUITE 930
LOS ANGELES, CALIFORNIA 90017-3489

May 24, 2021

TO INTERESTED PARTIES:

The U.S. Army Corps of Engineers, Los Angeles District, has determined that the proposed Port of Long Beach Deep Draft Navigation Project (Project) is consistent with the State Implementation Plan (SIP) and conforms with the requirements of Section 176(c) of the Clean Air Act. A copy of the Draft General Conformity Determination for the proposed Project is available for your review at:

https://www.spl.usace.army.mil/Missions/Civil-Works/Projects-Studies/Port-of-Long-Beach-Deep-Draft-Navigation-Study/

The purpose of the proposed Project is to increase transportation efficiencies for both the current and future fleet of container and liquid bulk vessels operating in the Port of Long Beach, and to improve overall conditions for vessel operations and safety, in the event of vessel malfunction or weather-related events. The proposed Project deepens Federal channels by dredging and disposing approximately 7.4 million cubic yards of sediment as well as accommodating the construction of local service facilities to fully implement the federal project by the Port of Long Beach. Construction would begin in 2025 and take approximately two years to complete.

The comment period will close June 22, 2021. Comments must be received by that date to be included in the Final Conformity Determination. Comments by mail or email will be accepted. Comments may be sent to:

U.S. Army Corps of Engineers, Los Angeles District
ATTN: Mr. Larry Smith (CESPL-PDR-Q)
915 Wilshire Boulevard
Los Angeles, California 90017
Email: POLB@usace.army.mil

If you have any questions regarding the project, please contact Mr. Larry Smith, Project Environmental Coordinator, at (213) 452-3846, and email: POLB@usace.army.mil. Thank you for your attention to this document.

Sincerely,

TABIJE.ROLAN
D.RAMIREZ.[redacted]

Digitally signed by
TABIJE.ROLAND.RAMIREZ.
[redacted]
Date: 2021.05.21 13:41:51
-07'00'

Eduardo T. Demesa
Chief, Planning Division

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS
LOS ANGELES DISTRICT
915 WILSHIRE BOULEVARD, SUITE 930
LOS ANGELES, CALIFORNIA 90017-3489

May 24, 2021

Terry Allen
CA Air Resources Board
9480 Telstar Avenue, No. 4
El Monte, CA 91731
Terry.allen@arb.ca.gov

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Los Angeles, California 90017
Email: POLB@usace.army.mil

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Sincerely,

TABIJE.ROLAND.RAMIREZ.[redacted]
Digitally signed by TABIJE.ROLAND.RAMIREZ.[redacted]
Date: 2021.05.21 13:29:03 -07'00'

Eduardo T. Demesa
Chief, Planning Division

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS
LOS ANGELES DISTRICT
915 WILSHIRE BOULEVARD, SUITE 930
LOS ANGELES, CALIFORNIA 90017-3489

May 24, 2021

Mr. Michael Benjamin
CA Air Resources Board
1001 "I" Street
Sacramento, CA 95814
michael.benjamin@arb.ca.gov

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Email: POLB@usace.army.mil

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Sincerely,

DEMESA.EDUARDO.T[redacted] Digitally signed by DEMESA.EDUARDO.T[redacted] Date: 2021.05.21 13:19:41 -07'00'

Eduardo T. Demesa
Chief, Planning Division

DEPARTMENT OF THE ARMY
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LOS ANGELES, CALIFORNIA 90017-3489

May 24, 2021

Morgan Capilla
U.S. Environmental Protection Agency, Region IX
75 Hawthorne Street
San Francisco, CA 94105-3901
capilla.morgan@epa.gov

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Email: POLB@usace.army.mil

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Sincerely,

TABIJE.ROLAND.RAMIREZ.[redacted]
Digitally signed by TABIJE.ROLAND.RAMIREZ[redacted]
Date: 2021.05.21 13:34:33 -07'00'

Eduardo T. Demesa
Chief, Planning Division

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U.S. ARMY CORPS OF ENGINEERS
LOS ANGELES DISTRICT
915 WILSHIRE BOULEVARD, SUITE 930
LOS ANGELES, CALIFORNIA 90017-3489

May 24, 2021

Sang-Mi Lee
Program Supervisor
South Coast Air Quality Management District
21865 Copley Drive
Diamond Bar, CA 91765-4178
slee@aqmd.gov

The U.S. Army Corps of Engineers, Los Angeles District, has determined that the proposed Port of Long Beach Deep Draft Navigation Project (Project) is consistent with the State Implementation Plan (SIP) and conforms with the requirements of Section 176(c) of the Clean Air Act. A copy of the Draft General Conformity Determination for the proposed Project is available for your review at:

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Email: POLB@usace.army.mil

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Sincerely,

TABIJE.ROLAND.
RAMIREZ.[redacted]

Digitally signed by
TABIJE.ROLAND.RAMIREZ.[redacted]
Date: 2021.05.21 13:40:15
-07'00'

Eduardo T. Demesa
Chief, Planning Division

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U.S. ARMY CORPS OF ENGINEERS
LOS ANGELES DISTRICT
915 WILSHIRE BOULEVARD, SUITE 930
LOS ANGELES, CALIFORNIA 90017-3489

May 24, 2021

Mr. Fred Collins
Tribal Spokesperson
Northern Chumash Tribal Counsel
P.O. Box 6533
Los Osos, CA 93412
fcollins@northernchumash.org

The U.S. Army Corps of Engineers, Los Angeles District, has determined that the proposed Port of Long Beach Deep Draft Navigation Project (Project) is consistent with the State Implementation Plan (SIP) and conforms with the requirements of Section 176(c) of the Clean Air Act. A copy of the Draft General Conformity Determination for the proposed Project is available for your review at:

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ATTN: Mr. Larry Smith (CESPL-PDR-Q)
915 Wilshire Boulevard
Los Angeles, California 90017
Email: POLB@usace.army.mil

If you have any questions regarding the project, please contact Mr. Larry Smith, Project Environmental Coordinator, at (213) 452-3846, and email: POLB@usace.army.mil. Thank you for your attention to this document.

Sincerely,

TABIJE.ROLAND.RAMIREZ [redacted]
Digitally signed by TABIJE.ROLAND.RAMIREZ [redacted]
Date: 2021.05.21 13:35:51 -07'00'

Eduardo T. Demesa
Chief, Planning Division

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS
LOS ANGELES DISTRICT
915 WILSHIRE BOULEVARD, SUITE 930
LOS ANGELES, CALIFORNIA 90017-3489

May 24, 2021

Ms. Donna Haro
Tribal Headwoman
Xolon-Salinan Tribe
P.O. Box 7045
Spreckles, CA 93962
dhxolonaakletse@gmail.com

The U.S. Army Corps of Engineers, Los Angeles District, has determined that the proposed Port of Long Beach Deep Draft Navigation Project (Project) is consistent with the State Implementation Plan (SIP) and conforms with the requirements of Section 176(c) of the Clean Air Act. A copy of the Draft General Conformity Determination for the proposed Project is available for your review at:

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915 Wilshire Boulevard
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Sincerely,

TABIJE.ROLAND.R AMIREZ [redacted]

Digitally signed by TABIJE.ROLAND.RAMIREZ.[redacted]
Date: 2021.05.21 13:22:23 -07'00'

Eduardo T. Demesa
Chief, Planning Division

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS
LOS ANGELES DISTRICT
915 WILSHIRE BOULEVARD, SUITE 930
LOS ANGELES, CALIFORNIA 90017-3489

May 24, 2021

Mr. Kenneth Kahn
Chairman
Santa Ynez Band of Chumash
P.O. Box 517
Santa Ynez, CA 93460
kkahn@santaynezchumash.org

The U.S. Army Corps of Engineers, Los Angeles District, has determined that the proposed Port of Long Beach Deep Draft Navigation Project (Project) is consistent with the State Implementation Plan (SIP) and conforms with the requirements of Section 176(c) of the Clean Air Act. A copy of the Draft General Conformity Determination for the proposed Project is available for your review at:

https://www.spl.usace.army.mil/Missions/Civil-Works/Projects-Studies/Port-of-Long-Beach-Deep-Draft-Navigation-Study/

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The comment period will close June 22, 2021. Comments must be received by that date to be included in the Final Conformity Determination. Comments by mail or email will be accepted. Comments may be sent to:

U.S. Army Corps of Engineers, Los Angeles District
ATTN: Mr. Larry Smith (CESPL-PDR-Q)
915 Wilshire Boulevard
Los Angeles, California 90017
Email: POLB@usace.army.mil

If you have any questions regarding the project, please contact Mr. Larry Smith, Project Environmental Coordinator, at (213) 452-3846, and email: POLB@usace.army.mil. Thank you for your attention to this document.

Sincerely,

TABIJE.ROLAND.R
AMIREZ.1[redacted]
[redacted]

Digitally signed by TABIJE.ROLAND.RAMIREZ.[redacted]
[redacted]
Date: 2021.05.21 13:45:03 -07'00'

Eduardo T. Demesa
Chief, Planning Division

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS
LOS ANGELES DISTRICT
915 WILSHIRE BOULEVARD, SUITE 930
LOS ANGELES, CALIFORNIA 90017-3489

May 24, 2021

Mr. Gary Pierce
Contemporary Council Lead and Public Law Lead
Salinan Tribe of Monterey and San Luis Obispo Counties
7070 Morro Road, Suite A
Atascadero, CA 93422
Morrorock40@gmail.com

The U.S. Army Corps of Engineers, Los Angeles District, has determined that the proposed Port of Long Beach Deep Draft Navigation Project (Project) is consistent with the State Implementation Plan (SIP) and conforms with the requirements of Section 176(c) of the Clean Air Act. A copy of the Draft General Conformity Determination for the proposed Project is available for your review at:

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Sincerely,

TABIJE.ROLAND.RAMIREZ[redacted]
Digitally signed by TABIJE.ROLAND.RAMIREZ[redacted]
[redacted]021.05.21 13:47:28 -07'00'

Eduardo T. Demesa
Chief, Planning Division

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS
LOS ANGELES DISTRICT
915 WILSHIRE BOULEVARD, SUITE 930
LOS ANGELES, CALIFORNIA 90017-3489

May 24, 2021

Mr. Freddie Romero
Santa Ynez Band of Chumash
Cultural Resources Coordinator
Santa Ynez Tribal Elders Council
fromero@santaynezchumash.org

The U.S. Army Corps of Engineers, Los Angeles District, has determined that the proposed Port of Long Beach Deep Draft Navigation Project (Project) is consistent with the State Implementation Plan (SIP) and conforms with the requirements of Section 176(c) of the Clean Air Act. A copy of the Draft General Conformity Determination for the proposed Project is available for your review at:

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Sincerely,

TABIJE.ROLAND.RAMIREZ.[redacted]
Digitally signed by TABIJE.ROLAND.RAMIREZ.[redacted]
[redacted] 2021.05.21 13:49:28 -07'00'

Eduardo T. Demesa
Chief, Planning Division

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS
LOS ANGELES DISTRICT
915 WILSHIRE BOULEVARD, SUITE 930
LOS ANGELES, CALIFORNIA 90017-3489

May 24, 2021

Ms. Mariza Sullivan
Chair
Coastal Band of the Chumash Nation
P.O. Box 4464
Santa Barbara, CA 93140
cbcntribalchair@gmail.com

The U.S. Army Corps of Engineers, Los Angeles District, has determined that the proposed Port of Long Beach Deep Draft Navigation Project (Project) is consistent with the State Implementation Plan (SIP) and conforms with the requirements of Section 176(c) of the Clean Air Act. A copy of the Draft General Conformity Determination for the proposed Project is available for your review at:

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915 Wilshire Boulevard
Los Angeles, California 90017
Email: POLB@usace.army.mil

If you have any questions regarding the project, please contact Mr. Larry Smith, Project Environmental Coordinator, at (213) 452-3846, and email: POLB@usace.army.mil. Thank you for your attention to this document.

Sincerely,

TABIJE.ROLAND.
RAMIREZ.[redacted]

Digitally signed by
TABIJE.ROLAND.RAMIREZ.[redacted]
Date: 2021.05.21 13:53:08
-07'00'

Eduardo T. Demesa
Chief, Planning Division

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS
LOS ANGELES DISTRICT
915 WILSHIRE BOULEVARD, SUITE 930
LOS ANGELES, CALIFORNIA 90017-3489

May 24, 2021

Ms. Mona Olivas Tucker
Chairwoman
yak tityu tityu yak tithini - Northern Chumash Tribe
660 Camino Del Rey
Orroyo Grande, CA 93420
Olivas.mona@gmail.com

The U.S. Army Corps of Engineers, Los Angeles District, has determined that the proposed Port of Long Beach Deep Draft Navigation Project (Project) is consistent with the State Implementation Plan (SIP) and conforms with the requirements of Section 176(c) of the Clean Air Act. A copy of the Draft General Conformity Determination for the proposed Project is available for your review at:

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915 Wilshire Boulevard
Los Angeles, California 90017
Email: POLB@usace.army.mil

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Sincerely,

TABIJE.ROLAND.RAMIREZ[redacted]
Digitally signed by TABIJE.ROLAND.RAMIREZ[redacted]
[redacted]021.05.21 14:15:49 -07'00'

Eduardo T. Demesa
Chief, Planning Division

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS
LOS ANGELES DISTRICT
915 WILSHIRE BOULEVARD, SUITE 930
LOS ANGELES, CALIFORNIA 90017-3489

May 24, 2021

Ms. Julie Tumamait-Stenslie
Chair
Barbareno/Ventura Band of Mission Indians
365 North Poli Avenue
Ojai, California 93023
Jtumamait@hotmail.com

The U.S. Army Corps of Engineers, Los Angeles District, has determined that the proposed Port of Long Beach Deep Draft Navigation Project (Project) is consistent with the State Implementation Plan (SIP) and conforms with the requirements of Section 176(c) of the Clean Air Act. A copy of the Draft General Conformity Determination for the proposed Project is available for your review at:

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915 Wilshire Boulevard
Los Angeles, California 90017
Email: POLB@usace.army.mil

If you have any questions regarding the project, please contact Mr. Larry Smith, Project Environmental Coordinator, at (213) 452-3846, and email: POLB@usace.army.mil. Thank you for your attention to this document.

Sincerely,

TABIJE.ROLAND.RAMIREZ.[redacted]
Digitally signed by TABIJE.ROLAND.RAMIREZ.[redacted]
Date: 2021.05.21 14:18:55 -07'00'

Eduardo T. Demesa
Chief, Planning Division

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, LOS ANGELES DISTRICT
915 WILSHIRE BOULEVARD, SUITE 930
LOS ANGELES, CALIFORNIA 90017-3489

May 24, 2021

Ms. Karen R. White
Council Chair/Tribal Roll Administrator
Xolon Salinan Tribe
P.O. Box 7046
Spreckles, CA 93962
Xolon.salinan.heritage@gmail.com

The U.S. Army Corps of Engineers, Los Angeles District, has determined that the proposed Port of Long Beach Deep Draft Navigation Project (Project) is consistent with the State Implementation Plan (SIP) and conforms with the requirements of Section 176(c) of the Clean Air Act. A copy of the Draft General Conformity Determination for the proposed Project is available for your review at:

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U.S. Army Corps of Engineers, Los Angeles District
ATTN: Mr. Larry Smith (CESPL-PDR-Q)
915 Wilshire Boulevard
Los Angeles, California 90017
Email: POLB@usace.army.mil

If you have any questions regarding the project, please contact Mr. Larry Smith, Project Environmental Coordinator, at (213) 452-3846, and email: POLB@usace.army.mil. Thank you for your attention to this document.

Sincerely,

TABIJE.ROLAND.RA
MIREZ[redacted]
Digitally signed by
TABIJE.ROLAND.RAMIREZ[redacted]
Date: 2021.05.21 14:21:30 -07'00'

Eduardo Demesa
Chief, Planning Division

Legal L

NOTICE OF AVAILABILITY OF THE

PORT OF LONG BEACH DEEP DRAFT NAVIGATION PROJECT

FINAL GENERAL CONFORMITY DETERMINATION

The U.S. Army Corps of Engineers, Los Angeles District (USACE) announces issuance of the Final General Conformity Determination (FGCD) for the Port of Long Beach Deep Draft Navigation Project on June 24, 2021.

The USACE prepared a Draft General Conformity Determination (DGCD) pursuant to 40 CFR part 93, subpart B, which establishes the process for complying with the general conformity requirements of the Clean Air Act. Consistent with those regulations, on May 24, 2021, the USACE published a notice in the Long Beach Press Telegram newspaper announcing availability of the DGCD for a 30-day public review and comment period. Copies of the DGCD were made available at the Port of Long Beach Administrative Building and were also posted on the USACE's website. The comment period on the DGCD closed June 22, 2021. The USACE considered and responded to all comments received in making the FGCD.

The public can request copies of the FGCD from the USACE at the address listed below, or can view or download the FGCD from the USACE's website at https://www.spl.usace.army.mil/Missions/Civil-Works/Projects-Studies/Port-of-Long-Beach-Deep-Draft-Navigation-Study/. In addition, copies of the FGCD are available at Port of Long Beach Administration Building (Lobby Security Desk), 415 West Ocean Boulevard, Long Beach, CA 90802.

Questions concerning the FGCD should be directed to:

U.S. Army Corps of Engineers, Los Angeles District
ATTN: Mr. Larry Smith (CESPL-PDR-Q)
915 Wilshire Boulevard
Los Angeles, CALIFORNIA 90017
Email: POLB@usace.army.mil

Pub June 24, 2021 (1t) PT (11470614)

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS
LOS ANGELES DISTRICT
915 WILSHIRE BOULEVARD, SUITE 930
LOS ANGELES, CALIFORNIA 90017-3489

June 24, 2021

TO INTRESTED PARTIES:

In accordance with 40 CFR part 93, subpart B, the U.S. Army Corps of Engineers, Los Angeles District (USACE) has prepared a Final General Conformity Determination for the proposed Port of Long Beach Deep Draft Navigation Project. A copy is available for viewing or download from the USACE's website at:

https://www.spl.usace.army.mil/Missions/Civil-Works/Projects-Studies/Port-of-Long-Beach-Deep-Draft-Navigation-Study/

If you have any questions regarding the Final General Conformity Determination, please contact Mr. Larry Smith, Project Environmental Coordinator, at (213) 452-3846, or via email at POLB@usace.army.mil.

Sincerely,

DEMESA.EDUARDO.T.[redacted] Digitally signed by DEMESA.EDUARDO.T.[redacted] Date: 2021.06.22 11:11:29 -07'00'

Eduardo T. De Mesa
Chief, Planning Division

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS
LOS ANGELES DISTRICT
915 WILSHIRE BOULEVARD, SUITE 930
LOS ANGELES, CALIFORNIA 90017-3489

June 24, 2021

Mr. Terry Allen
California Air Resources Board
9480 Telstar Avenue, No. 4
El Monte, California 91731
Email: Terry.Allen@arb.ca.gov

Dear Mr. Allen:

In accordance with 40 CFR part 93, subpart B, the U.S. Army Corps of Engineers, Los Angeles District (USACE) has prepared a Final General Conformity Determination for the proposed Port of Long Beach Deep Draft Navigation Project. A copy is available for viewing or download from the USACE's website at:

https://www.spl.usace.army.mil/Missions/Civil-Works/Projects-Studies/Port-of-Long-Beach-Deep-Draft-Navigation-Study/

If you have any questions regarding the Final General Conformity Determination, please contact Mr. Larry Smith, Project Environmental Coordinator, at (213) 452-3846 or via email at POLB@usace.army.mil.

Sincerely,

DEMESA.EDUARDO.T[redacted] Digitally signed by DEMESA.EDUARDO.T[redacted] Date: 2021.06.22 11:23:14 -07'00'

Eduardo T. De Mesa
Chief, Planning Division

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS
LOS ANGELES DISTRICT
915 WILSHIRE BOULEVARD, SUITE 930
LOS ANGELES, CALIFORNIA 90017-3489

June 24, 2021

Mr. Michael Benjamin
CA Air Resources Board
1001 "I" Street
Sacramento, California 95814
Email: Michael.Benjamin@arb.ca.gov

Dear Mr. Benjamin:

In accordance with 40 CFR part 93, subpart B, the U.S. Army Corps of Engineers, Los Angeles District (USACE) has prepared a Final General Conformity Determination for the proposed Port of Long Beach Deep Draft Navigation Project. A copy is available for viewing or download from the USACE's website at:

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If you have any questions regarding the Final General Conformity Determination, please contact Mr. Larry Smith, Project Environmental Coordinator, at (213) 452-3846, or via email at POLB@usace.army.mil.

Sincerely,

DEMESA.EDUARDO.T[redacted] Digitally signed by DEMESA.EDUARDO.T[redacted] Date: 2021.06.22 11:21:47 -07'00'

Eduardo T. De Mesa
Chief, Planning Division

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS
LOS ANGELES DISTRICT
915 WILSHIRE BOULEVARD, SUITE 930
LOS ANGELES, CALIFORNIA 90017-3489

June 24, 2021

Mr. Morgan Capilla
U.S. Environmental Protection Agency, Region IX
75 Hawthorne Street
San Francisco, California 94105-3901
Email: Capilla.Morgan@epa.gov

Dear Mr. Capilla:

In accordance with 40 CFR part 93, subpart B, the U.S. Army Corps of Engineers, Los Angeles District (USACE) has prepared a Final General Conformity Determination for the proposed Port of Long Beach Deep Draft Navigation Project. A copy is available for viewing or download from the USACE's website at:

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If you have any questions regarding the Final General Conformity Determination, please contact Mr. Larry Smith, Project Environmental Coordinator, at (213) 452-3846, or via email at POLB@usace.army.mil.

Sincerely,

DEMESA.EDUARDO.T.[redacted]

Digitally signed by DEMESA.EDUARDO.T.[redacted]
Date: 2021.06.22 11:19:17 -07'00'

Eduardo T. De Mesa
Chief, Planning Division

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS
LOS ANGELES DISTRICT
915 WILSHIRE BOULEVARD, SUITE 930
LOS ANGELES, CALIFORNIA 90017-3489

June 24, 2021

Ms. Sang-Mi Lee
Program Supervisor
South Coast Air Quality Management District
21865 Copley Drive
Diamond Bar, California 91765-4178
Email: Slee@aqmd.gov

Dear Ms. Lee:

In accordance with 40 CFR part 93, subpart B, the U.S. Army Corps of Engineers, Los Angeles District (USACE) has prepared a Final General Conformity Determination for the proposed Port of Long Beach Deep Draft Navigation Project. A copy is available for viewing or download from the USACE's website at:

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If you have any questions regarding the Final General Conformity Determination, please contact Mr. Larry Smith, Project Environmental Coordinator, at (213) 452-3846, or via email at POLB@usace.army.mil.

Sincerely,

DEMESA.EDUARDO.T[redacted]

Digitally signed by DEMESA.EDUARDO.T[redacted]
Date: 2021.06.22 11:44:25 -07'00'

Eduardo T. De Mesa
Chief, Planning Division

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS
LOS ANGELES DISTRICT
915 WILSHIRE BOULEVARD, SUITE 930
LOS ANGELES, CALIFORNIA 90017-3489

June 24, 2021

Mr. Sam Cohen
Government Affairs and Legal Officer
Santa Ynez Band of Chumash Indians
P.O. Box 517
Santa Ynez, California 93460
Email: Scohen@santaynezchumash.org

Dear Mr. Cohen:

In accordance with 40 CFR part 93, subpart B, the U.S. Army Corps of Engineers, Los Angeles District (USACE) has prepared a Final General Conformity Determination for the proposed Port of Long Beach Deep Draft Navigation Project. A copy is available for viewing or download from the USACE's website at:

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Sincerely,

DEMESA.EDUARDO.T.[redacted] Digitally signed by DEMESA.EDUARDO.T.[redacted] Date: 2021.06.22 11:16:59 -07'00'

Eduardo T. De Mesa
Chief, Planning Division

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS
LOS ANGELES DISTRICT
915 WILSHIRE BOULEVARD, SUITE 930
LOS ANGELES, CALIFORNIA 90017-3489

June 24, 2021

Mr. Fred Collins
Tribal Spokesperson
Northern Chumash Tribal Counsel
P.O. Box 6533
Los Osos, California 93412
Email: Fcollins@northernchumash.org

Dear Mr. Collins:

In accordance with 40 CFR part 93, subpart B, the U.S. Army Corps of Engineers, Los Angeles District (USACE) has prepared a Final General Conformity Determination for the proposed Port of Long Beach Deep Draft Navigation Project. A copy is available for viewing or download from the USACE's website at:

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If you have any questions regarding the Final General Conformity Determination, please contact Mr. Larry Smith, Project Environmental Coordinator, at (213) 452-3846, or via email at POLB@usace.army.mil.

Sincerely,

DEMESA.EDUARDO.T[redacted]

Digitally signed by DEMESA.EDUARDO.T[redacted]
Date: 2021.06.22 11:15:17 -07'00'

Eduardo T. De Mesa
Chief, Planning Division

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS
LOS ANGELES DISTRICT
915 WILSHIRE BOULEVARD, SUITE 930
LOS ANGELES, CALIFORNIA 90017-3489

June 24, 2021

Ms. Donna Haro
Tribal Headwoman
Xolon-Salinan Tribe
P.O. Box 7045
Spreckles, California 93962
Email: dhxolonaakletse@gmail.com

Dear Ms. Haro:

In accordance with 40 CFR part 93, subpart B, the U.S. Army Corps of Engineers, Los Angeles District (USACE) has prepared a Final General Conformity Determination for the proposed Port of Long Beach Deep Draft Navigation Project. A copy is available for viewing or download from the USACE's website at:

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Sincerely,

DEMESA.EDUARDO.T[redacted]

Digitally signed by DEMESA.EDUARDO.T[redacted]
Date: 2021.06.22 11:48:46 -07'00'

Eduardo T. De Mesa
Chief, Planning Division

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS
LOS ANGELES DISTRICT
915 WILSHIRE BOULEVARD, SUITE 930
LOS ANGELES, CALIFORNIA 90017-3489

June 24, 2021

Mr. Kenneth Kahn
Chairman
Santa Ynez Band of Chumash
P.O. Box 517
Santa Ynez, California 93460
Email: Kkahn@santaynezchumash.org

Dear Mr. Kahn:

In accordance with 40 CFR part 93, subpart B, the U.S. Army Corps of Engineers, Los Angeles District (USACE) has prepared a Final General Conformity Determination for the proposed Port of Long Beach Deep Draft Navigation Project. A copy is available for viewing or download from the USACE's website at:

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Sincerely,

DEMESA.EDUARDO.T[redacted]
Digitally signed by DEMESA.EDUARDO.T[redacted]
Date: 2021.06.22 11:12:48 -07'00'

Eduardo T. De Mesa
Chief, Planning Division

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS
LOS ANGELES DISTRICT
915 WILSHIRE BOULEVARD, SUITE 930
LOS ANGELES, CALIFORNIA 90017-3489

June 24, 2021

Mr. Gary Pierce
Contemporary Council Lead and Public Law Lead
Salinan Tribe of Monterey and San Luis Obispo Counties
7070 Morro Road, Suite A
Atascadero, California 93422
Email: Morrorock40@gmail.com

Dear Mr. Pierce:

In accordance with 40 CFR part 93, subpart B, the U.S. Army Corps of Engineers, Los Angeles District (USACE) has prepared a Final General Conformity Determination for the proposed Port of Long Beach Deep Draft Navigation Project. A copy is available for viewing or download from the USACE's website at:

https://www.spl.usace.army.mil/Missions/Civil-Works/Projects-Studies/Port-of-Long-Beach-Deep-Draft-Navigation-Study/

If you have any questions regarding the Final General Conformity Determination, please contact Mr. Larry Smith, Project Environmental Coordinator, at (213) 452-3846, or via email at POLB@usace.army.mil.

Sincerely,

DEMESA.EDUARDO.T[redacted] Digitally signed by DEMESA.EDUARDO.T[redacted] Date: 2021.06.22 11:42:16 -07'00'

Eduardo T. De Mesa
Chief, Planning Division

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS
LOS ANGELES DISTRICT
915 WILSHIRE BOULEVARD, SUITE 930
LOS ANGELES, CALIFORNIA 90017-3489

June 24, 2021

Ms. Mariza Sullivan
Chair
Coastal Band of the Chumash Nation
P.O. Box 4464
Santa Barbara, California 93140
Email: cbcntribalchair@gmail.com

Dear Ms. Sullivan:

In accordance with 40 CFR part 93, subpart B, the U.S. Army Corps of Engineers, Los Angeles District (USACE) has prepared a Final General Conformity Determination for the proposed Port of Long Beach Deep Draft Navigation Project. A copy is available for viewing or download from the USACE's website at:

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If you have any questions regarding the Final General Conformity Determination, please contact Mr. Larry Smith, Project Environmental Coordinator, at (213) 452-3846, or via email at POLB@usace.army.mil.

Sincerely,

DEMESA.EDUARDO.T.[redacted] Digitally signed by DEMESA.EDUARDO.T.[redacted] Date: 2021.06.22 11:37:41 -07'00'

Eduardo T. De Mesa
Chief, Planning Division

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS
LOS ANGELES DISTRICT
915 WILSHIRE BOULEVARD, SUITE 930
LOS ANGELES, CALIFORNIA 90017-3489

June 24, 2021

Ms. Mona Olivas Tucker
Chairwoman
Yak tityu tityu yak tithini - Northern Chumash Tribe
660 Camino Del Rey
Arroyo Grande, California 93420
Email: Olivas.Mona@gmail.com

Dear Ms. Tucker:

In accordance with 40 CFR part 93, subpart B, the U.S. Army Corps of Engineers, Los Angeles District (USACE) has prepared a Final General Conformity Determination for the proposed Port of Long Beach Deep Draft Navigation Project. A copy is available for viewing or download from the USACE's website at:

https://www.spl.usace.army.mil/Missions/Civil-Works/Projects-Studies/Port-of-Long-Beach-Deep-Draft-Navigation-Study/

If you have any questions regarding the Final General Conformity Determination, please contact Mr. Larry Smith, Project Environmental Coordinator, at (213) 452-3846, or via email at POLB@usace.army.mil.

Sincerely,

DEMESA.EDUARD
O.T[redacted]

Digitally signed by
DEMESA.EDUARDO.T.[redacted]
Date: 2021.06.22 11:32:31 -07'00'

Eduardo T. De Mesa
Chief, Planning Division

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS
LOS ANGELES DISTRICT
915 WILSHIRE BOULEVARD, SUITE 930
LOS ANGELES, CALIFORNIA 90017-3489

June 24, 2021

Ms. Julie Tumamait-Stenslie
Chair
Barbareño/Ventureño Band of Mission Indians
P.O. Box 364
Ojai, California 93023
Email: Jtumamait@hotmail.com

Dear Ms. Tumamait-Stenslie:

In accordance with 40 CFR part 93, subpart B, the U.S. Army Corps of Engineers, Los Angeles District (USACE) has prepared a Final General Conformity Determination for the proposed Port of Long Beach Deep Draft Navigation Project. A copy is available for viewing or download from the USACE's website at:

https://www.spl.usace.army.mil/Missions/Civil-Works/Projects-Studies/Port-of-Long-Beach-Deep-Draft-Navigation-Study/

If you have any questions regarding the Final General Conformity Determination, please contact Mr. Larry Smith, Project Environmental Coordinator, at (213) 452-3846, or via email at POLB@usace.army.mil.

Sincerely,

DEMESA.EDUARDO.T[redacted] Digitally signed by DEMESA.EDUARDO.T[redacted]
Date: 2021.06.22 11:29:50 -07'00'

Eduardo T. De Mesa
Chief, Planning Division

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS
LOS ANGELES DISTRICT
915 WILSHIRE BOULEVARD, SUITE 930
LOS ANGELES, CALIFORNIA 90017-3489

June 24, 2021

Ms. Karen R. White
Council Chair/Tribal Roll Administrator
Xolon Salinan Tribe
P.O. Box 7045
Spreckles, California 93962
Email: Xolon.Salinan.heritage@gmail.com

Dear Ms. White:

In accordance with 40 CFR part 93, subpart B, the U.S. Army Corps of Engineers, Los Angeles District (USACE) has prepared a Final General Conformity Determination for the proposed Port of Long Beach Deep Draft Navigation Project. A copy is available for viewing or download from the USACE's website at:

https://www.spl.usace.army.mil/Missions/Civil-Works/Projects-Studies/Port-of-Long-Beach-Deep-Draft-Navigation-Study/

If you have any questions regarding the Final General Conformity Determination, please contact Mr. Larry Smith, Project Environmental Coordinator, at (213) 452-3846, or via email at POLB@usace.army.mil.

Sincerely,

DEMESA.EDUARDO.T.[redacted] Digitally signed by DEMESA.EDUARDO.T.[redacted] Date: 2021.06.22 11:26:42 -07'00'

Eduardo T. De Mesa
Chief, Planning Division

Lee, Maricris C (Chris) CIV USARMY CESPL (USA)

From:	Kelly, ThomasP <Kelly.ThomasP@epa.gov>
Sent:	Thursday, June 3, 2021 12:22 PM
To:	Smith, Lawrence J Jr CIV USARMY CESPL (USA)
Cc:	Lee, Maricris C (Chris) CIV USARMY CESPL (USA); Capilla, Morgan; SPL, POLB
Subject:	[Non-DoD Source] POLB Deep Draft Navigation Project - Draft General Conformity Determination

I have no comments on the Draft General Conformity Determination for the Port of Long Beach Deep Draft Navigation Project.

____

Tom Kelly | U.S. EPA Region IX | Air Planning Office (AIR-2) | San Francisco, CA 94105 | (415) 972-3856

Lee, Maricris C (Chris) CIV USARMY CESPL (USA)

From:	Fred Collins <fcollins@northernchumash.org>
Sent:	Tuesday, May 25, 2021 7:52 AM
To:	Lee, Maricris C (Chris) CIV USARMY CESPL (USA)
Cc:	SPL, POLB
Subject:	[Non-DoD Source] RE: POLB Deep Draft Navigation Project - Draft General Conformity Determination

Hello Larry,

NCTC supports the local Tribal Governments recommendations for this proposed project, thank you.

Fred Collins
NCTC Chair
San Luis Obispo County

From: Lee, Maricris C (Chris) CIV USARMY CESPL (USA) <Maricris.C.Lee@usace.army.mil>
Sent: Monday, May 24, 2021 1:28 PM
To: fcollins@northernchumash.org
Cc: SPL, POLB <POLB@usace.army.mil>
Subject: POLB Deep Draft Navigation Project - Draft General Conformity Determination

Dear Sir:

The U.S. Army Corps of Engineers, Los Angeles District, has determined that the proposed Port of Long Beach Deep Draft Navigation Project (Project) is consistent with the State Implementation Plan (SIP) and conforms with the requirements of Section 176(c) of the Clean
Air Act.

A copy of the Draft General Conformity Determination for the proposed Project is attached for your review. It is also available at:

https://www.spl.usace.army.mil/Missions/Civil-Works/Projects-Studies/Port-of-Long-Beach-Deep-Draft-Navigation-Study/

Kindly confirm receipt of this email.

****
U.S. Army Corps of Engineers, Los Angeles District
ATTN: Larry Smith (CESPL-PDR-Q)
915 Wilshire Boulevard
Los Angeles, CA 90017
Email: POLB@usace.army.mil

Lee, Maricris C (Chris) CIV USARMY CESPL (USA)

From:	Sam Cohen <scohen@santaynezchumash.org>
Sent:	Wednesday, May 26, 2021 10:01 AM
To:	Lee, Maricris C (Chris) CIV USARMY CESPL (USA); SPL, POLB
Cc:	Sam Cohen; Nakia Zavalla; Kelsie Merrick; Allison McAdams; Teresa Romero
Subject:	[Non-DoD Source] RE: POLB Deep Draft Navigation Project - Draft General Conformity Determination

Dear Mr. Maricris (Lee):

The Santa Ynez Band of Chumash is in receipt of the POLB Deep Navigation Project documents and has no comments at this time.

Fred Romero no longer works with us so please contact me or Nakia Zavala, Culture Director and her assistant Kelsie Merrick for all future inquiries.

Best regards,
Sam Cohen

Sam Cohen
Government Affairs and Legal Officer
Santa Ynez Band of Chumash Indians
Office (805) 688-7997
Mobile (805) 245-9083

From: Teresa Romero <tromero@santaynezchumash.org>
Sent: Wednesday, May 26, 2021 9:28 AM
To: Sam Cohen <scohen@santaynezchumash.org>
Subject: FW: POLB Deep Draft Navigation Project - Draft General Conformity Determination

Sam,

FYI-

kaq^{h}inaš (Thank you)

Teresa Romero
Environmental Director
Santa Ynez Band of Chumash Indians
Environmental Department
805.303.7485 (Direct)
805.206.0560 (Cell)

Lee, Maricris C (Chris) CIV USARMY CESPL (USA)

From: Karen White <xolon.salinan.heritage@gmail.com>
Sent: Wednesday, May 26, 2021 9:13 PM
To: SPL, POLB
Subject: [Non-DoD Source] Re: POLB Deep Draft Navigation Project - Draft General Conformity Determination

Good Evening,
This area is not apart of the Xolon Salinan Tribes ancient territory.
Therefore we have no comments at this time.
Thank you,
Karen White
Xolon Salinan Tribe

On Mon, May 24, 2021 at 1:52 PM Lee, Maricris C (Chris) CIV USARMY CESPL (USA) <Maricris.C.Lee@usace.army.mil> wrote:

> Dear Ms. White:
>
> The U.S. Army Corps of Engineers, Los Angeles District, has determined that the proposed Port of Long Beach Deep Draft Navigation Project (Project) is consistent with the State Implementation Plan (SIP) and conforms with the requirements of Section 176(c) of the Clean Air Act.
>
> A copy of the Draft General Conformity Determination for the proposed Project is attached for your review. It is also available at:
>
> https://www.spl.usace.army.mil/Missions/Civil-Works/Projects-Studies/Port-of-Long-Beach-Deep-Draft-Navigation-Study/
>
> Kindly confirm receipt of this email.
>
> ********************
>
> U.S. Army Corps of Engineers, Los Angeles District
>
> ATTN: Larry Smith (CESPL-PDR-Q)
>
> 915 Wilshire Boulevard

FINAL INTEGRATED FEASIBILITY REPORT AND ENVIRONMENTAL IMPACT STATEMENT / ENVIRONMENTAL IMPACT REPORT (EIS/EIR)

APPENDIX B: COASTAL ENGINEERING

PORT OF LONG BEACH
DEEP DRAFT NAVIGATION STUDY
Los Angeles County, California

October 2021

US Army Corps of Engineers®

Port of LONG BEACH
THE PORT OF CHOICE

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TABLE OF CONTENTS

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1 Introduction

Presented herein is the Coastal Engineering Report of the Port of Long Beach (POLB) Deep Draft Navigation Study. The purpose of this appendix is to summarize existing physical conditions and present the results of the engineering investigations and analyses conducted to assist in development of the recommended project improvements for the Approach Channel, Main Channel, West Basin, and Pier J Basin Approach of the study.

1.1 Project Area Description

The POLB is located within San Pedro Bay, Los Angeles County, California approximately 20 miles south of downtown Los Angeles. It lies between the Port of Los Angeles to the West, the Los Angeles River mouth and city of Long Beach to the East, and is protected by the Middle Breakwater (18,500 feet) and Long Beach Breakwater (13,350 feet). A map of the Los Angeles region and POLB location is shown in Figure 1-1. The current federal channel includes the entrance at Queens Gate, extending northward along the west of Pier J and east of Pier F, the Navy Mole, and Pier T, shown in Figure 1-2. Further descriptions of the various POLB improvements evaluated as part of this study are provided in the following paragraphs.

Figure 1-1 Study Area Location Map

Figure 1-2 Port of Long Beach Current Federal Channel

1.1.1 Approach Channel

The Approach Channel (teal, Figure 1-3) is currently authorized to -76 feet mean lower low water (MLLW) by 1200 feet wide, and spans from station 192+00 offshore to inside the breakwaters at station 350+00. The channel is predominantly straight, except for a single bend which occurs to the northwest at station 337+00, shortly after passing through the breakwater. The channel then widens to 1300 feet. The gap between the Middle and Long Beach Breakwaters (Queen's Gate) is 1800 feet wide and serves as the main entrance into the Long Beach Outer Harbor of San Pedro Bay. Construction to the current depth was completed by the US Army Corps of Engineers (USACE) in 2001 (USACE 1998). The Approach Channel is utilized by both container and liquid bulk vessels

1.1.2 Main Channel

The Main Channel (Figure 1-3) is the continuation of the Approach Channel from the Long Beach Outer Harbor to the Middle Harbor. It begins at station 350+00, ends at 517+50, and the channel width varies from a minimum of 400 feet at the Navy Mole/Pier F channel bender to a maximum of 1400 feet at the Pier T Turning Basin. The channel is currently authorized to a depth of -76 feet MLLW. This depth was completed by the Port of Long Beach from the start of the Main Channel to the Navy Mole/Pier F channel bender, and most recently had maintenance dredging performed by USACE in 2014. The authorized depth for the Pier T Turning Basin and Berthing area were completed in 2011 by USACE (USACE 2009). The main channel is utilized by both container and liquid bulk vessels, with liquid bulk vessels docking at Pier T.

1.1.3 West Basin

The West Basin (yellow, Figure 1-3) encompasses the approach from the Main Channel Pier T Turning Basin to the Pier T berthing area. It is bounded on the north by Pier T and the west/south by the Navy Mole. Depths currently vary from -43 feet to -80 feet MLLW. The region is not currently a federal area, and is maintained by the POLB. The deeper portions of the basin are located at a sediment borrow pit utilized by the Port of Long Beach in 2016 for slip fill and land reclamation. The West Basin is utilized by only container vessels.

1.1.4 Pier J Basin Approach

The Pier J Approach (orange, Figure 1-3) will construct a route to the northeast off of the Main and Approach Channels, north of the Queen's Gate, and provides access to the Pier J Basin. Small portions of the area have previously been dredged, near the entrance to the Pier J slip and basin, and natural water depths range from -76 feet at the Main Channel to -49 feet MLLW near the Pier J Basin entrance. The Pier J Approach will be utilized by container vessels only.

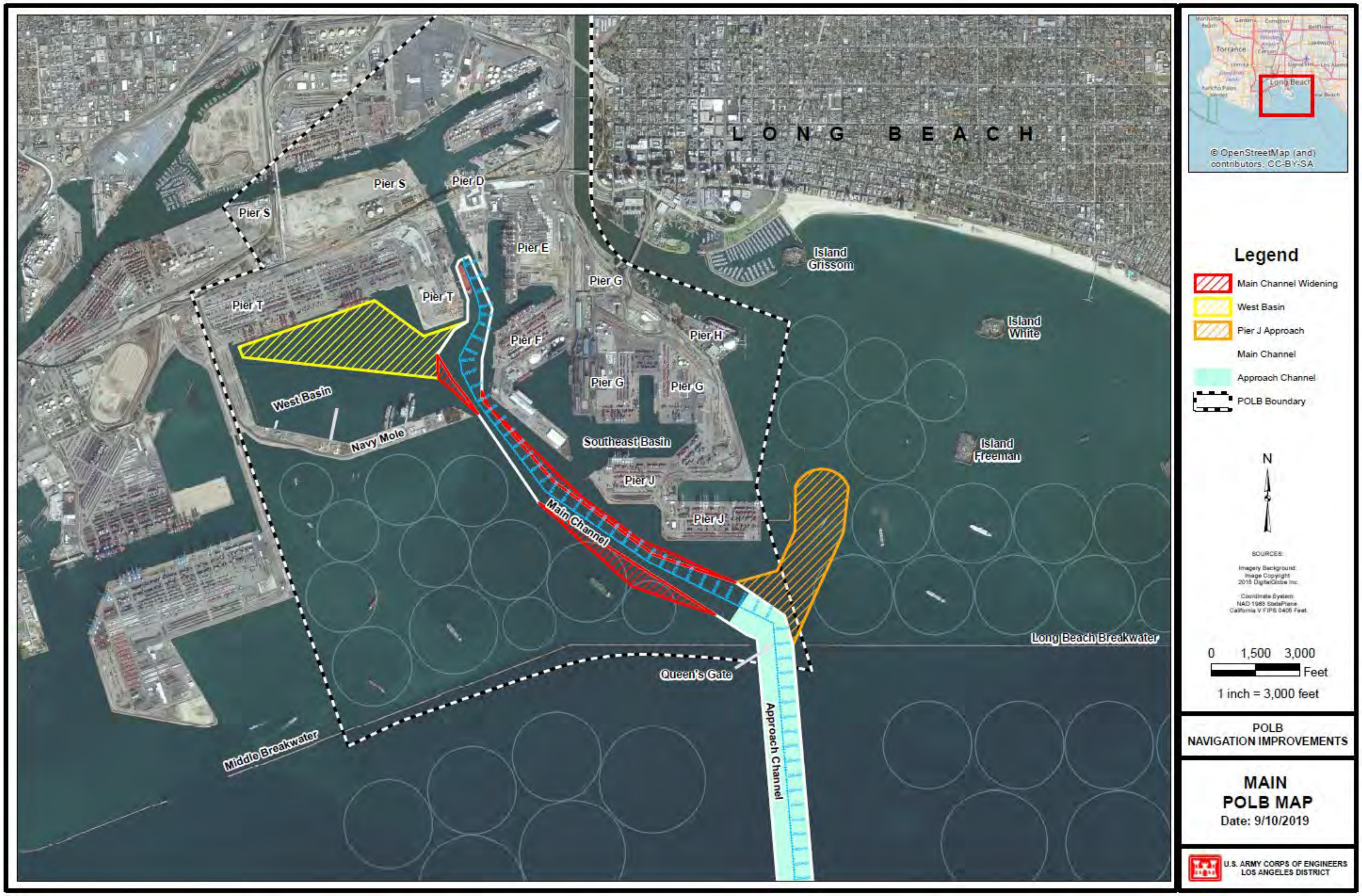

Figure 1-3 Study and Project Area

2 Physical Environment

2.1 Climate

The San Pedro Bay climate is characterized by warm, dry summers and mild winters. Due to Long Beach and San Pedro bays location directly east of the Palos Verdes Peninsula, the area experiences different weather patterns than other nearby coastal communities. Average annual high and low temperatures are 74 degrees and 55 degrees Fahrenheit, with an average temperature of 65 degrees Fahrenheit. Water temperatures in the Port range from 55 – 70 degrees Fahrenheit. Annual precipitation over the port area is 12 inches, the majority of which comes within the winter and early spring months (November to April).

2.2 Winds

The prevailing winds in San Pedro Bay are from the south or west. These are primarily caused by differential heating of water and land, and though the shore faces southward, the onshore (prevailing) wind direction occurs due to the Pacific Ocean being oriented to the west. The most common (50% occurrence) wind speeds in the area are around 6-10 miles per hour, and during the summer onshore winds can peak at 20-25 miles per hour. Occasional strong hot winds from the Great Basin area create an offshore wind condition (Santa Ana Winds) out of the north in the fall and winter months. Winds can reach extremes during this time, especially when occurring in tandem with winter storms. Variations in wind speeds can also occur due to a funneling of winds caused by the nearby Palos Verdes peninsula, intensifying winds in the port area. A wind rose from nearby Long Beach Airport is shown in Figure 2-1.

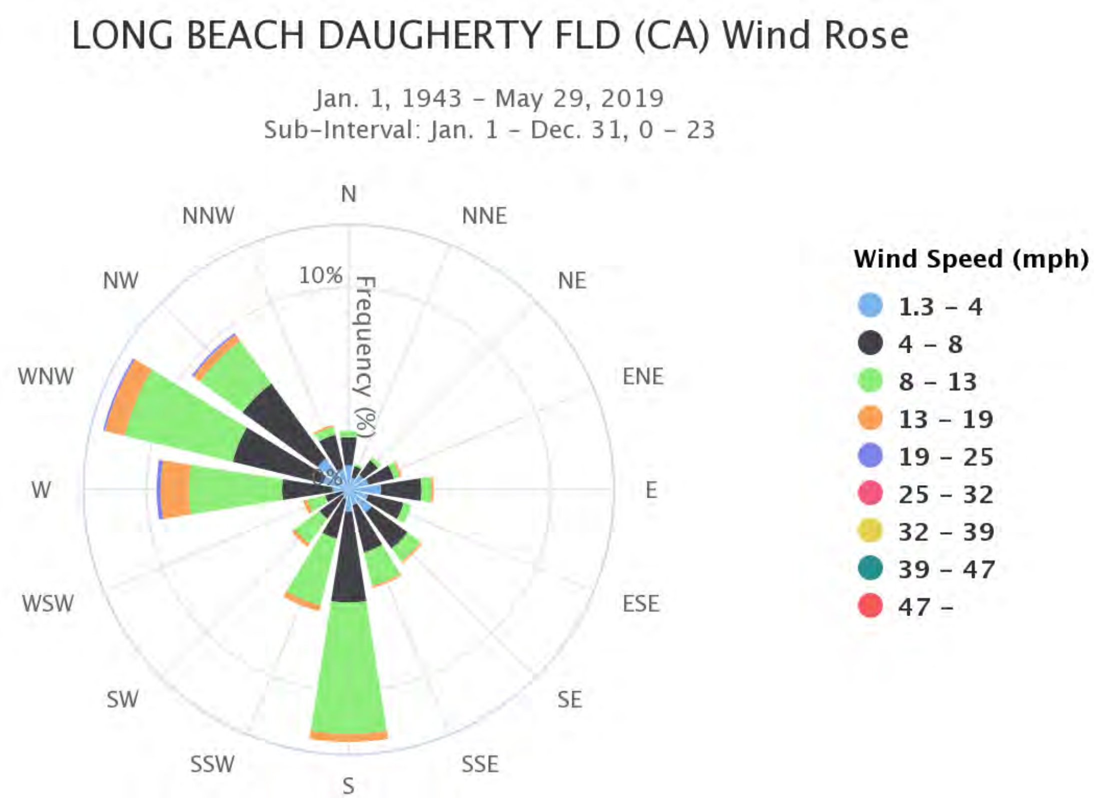

Figure 2-1 Wind Conditions, Long Beach Airport (1943-2019)

2.3 Waves

Due to the sheltering effect of Palos Verdes peninsula, Santa Catalina Island, and San Clemente Island, deepwater waves predominantly approach San Pedro Bay from the west and south. Extratropical storm waves approach from the west, while tropical and pre-frontal sea waves approach from the south. More frequent storm waves from the south occur primarily in the summer, while larger, more threatening storm waves occur less frequently in the winter and originate from the west. The Middle and Long Beach breakwaters provide protection for the port from approaching waves. Outside the breakwaters, waves of 10-12 feet can occur. The typical swell that penetrates into the port has a period upwards of 10 seconds. When wind generated waves occur within the breakwaters they are typically small (< 1 foot wave height), but can reach up to 4 feet with 4 second periods during extreme Santa Ana Winds conditions.

2.4 Tides

Tides along the southern California coastline are of the mixed, semi-diurnal type. Typically, a lunar day (about 25 hours) consists of two unequal high and two unequal low tides. A lower low tide normally follows the higher high tide by approximately seven to eight hours while the time to return to the next higher high tide (through higher low and lower high water levels) is usually approximately 17 hours. Annual tidal peaks typically occur during the summer and winter seasons following a solstice. The increased tidal elevations during the winter season can exacerbate the coastal impacts of winter storms. Tidal datum for the San Pedro Bay are listed in Table 2-1. The mean range of the tide is 3.81 feet, while the great diurnal range is 5.49 feet.

Table 2-1 Tidal Datum at Los Angeles, CA, NOAA Station 9410660

Datum Plane	Elevation, feet, MLLW
Highest Observed Water Level	7.92
Mean Higher High Water (MHHW)	5.49
Mean High Water (MHW)	4.75
Mean Tide Level (MTL)	2.84
Mean Sea Level (MSL)	2.82
Mean Low Water (MLW)	0.94
North American Vertical Datum 1988 (NAVD88)	0.20
Mean Lower Low Water (MLLW)	0.00
Lowest Observed Water Level	-2.73

Source: https://tidesandcurrents.noaa.gov/datums.html?id=9410660

2.5 Currents

Offshore currents, including the California Current, the California Undercurrent, the Davidson Current, and the Southern California Countercurrent (also known as the Southern California Eddy), consist of major large-scale coastal currents, constituting the mean seasonal oceanic circulation with induced tidal and event specific fluctuations on a temporal scale of 3 to 10 days (Hickey 1979).

The California Current is the equator-ward flow of water off the coast of California and is characterized as a wide, sluggish body of water that has relatively low levels of temperature and salinity. Peak currents with a mean speed of approximately 25 to 49 feet per minute occur in summer following several months of persistent northwesterly winds (Schwartzlose and Reid 1972).

The California Undercurrent is a subsurface northward flow that occurs below the main pycnocline and seaward of the continental shelf. The mean speeds are low, on the order of 10 to 20 feet per minute (Schwartzlose and Reid 1972).

The Davidson Current is a northward flowing nearshore current that is associated with winter wind patterns north of Point Conception. The current, which has average velocities between 30 and 60 feet per minute, is typically found off the California coast from mid-November to mid-February, when southerly winds occur along the coast (Schwartzlose and Reid 1972).

The Southern California Countercurrent is the inshore part of a large semi-permanent eddy rotating cyclonically in the Southern California Bight south of Point Conception. Maximum velocities during the winter months have been observed to be as high as 69 to 79 feet per minute (Maloney and Chan 1974).

Maximum flood and ebb tidal velocities occur at Queen's Gate, with surface velocities reaching up to 1.1 feet per second. Tidal circulation is generally clockwise within the port, with flows of 0.2 - 0.3 feet per second in inner channels and 0.3 – 1.1 feet per second at the entrance channel near Queen's Gate. Tidal flushing is the primary influence on water quality in the inner port areas.

2.6 Climate Change

2.6.1 Sea Level Change

Sea level change is an uncertainty, potentially increasing the frequency of extreme water levels. Planning guidance in the form of an USACE Engineering Regulation (ER), USACE ER 1100-2-8162 (USACE 2019), incorporates new information, including projections by the Intergovernmental Panel on Climate Change and National Research Council (IPCC 2007, NRC 2012) , and USACE Engineering Pamphlet (EP) 1100-2-1. Planning studies and engineering designs are to evaluate the entire range of possible future rates of sea-level change (SLC), represented by three scenarios of "low," "intermediate," and "high" sea-level change. ER 1100-2-8162 also recommends that a National Oceanic and Atmospheric Administration (NOAA) water level station should be used with a period of record of at least 40 years. The use of sea level change scenarios as opposed to individual scenario probabilities underscores the uncertainty in how local relative sea levels will actually play out into the future. At any location, changes in local relative sea level (LRSL) reflect the integrated effects of global mean sea level (GMSL) change plus local or regional changes of geologic, oceanographic, or atmospheric origin.

- "Low" rate of sea-level change is equal to the historic rate of SLC.
- "Intermediate" rate of sea-level (ISL) change is based on the modified NRC curve I and using the current estimate of 1.7 mm/year for GMSL change, the following equation

$$E(t) = 0.0017t + bt^2$$

in which t represents years, starting in 1986, b is a constant, and $E(t)$ is the eustatic sea level change, in meters, as a function of t.

Manipulating the above equation to account for the fact that it was developed for eustatic sea level change starting in 1992, while projects will actually be constructed at some date after 1992, results in equation

$$E(t_2) - E(t_1) = 0.0017(t_2 - t_1) + b(t_2^2 - t_1^2)$$

Where t_1 is the time between the project's construction date and 1992 and t_2 is the time between a future date at which one wants an estimate for sea level change and 1992 (t_2 = t_1 + number of years after construction)

- "High" rate of sea-level change (HSL) is based on the modified NRC curve III and the above equations.

Using the USACE Institute of Water Resources (IWR) Sea Level Change calculator (based on the above equations) and data from Los Angeles, CA NOAA gage 9410660, provides an estimated sea level change of 0.00272 feet per year. Figure 2-2 shows the relative sea level change projections for the three SLC scenarios. As shown in Table 2-2, projecting the three rates of change to the year 2077, which corresponds to a 50 year period of analysis, provides us with predicted low level rise of 0.14 feet, intermediate of 0.67 feet, and high level rise of 2.36 feet. Any rises in sea level are a net positive for deep draft navigation due to a reduction in future dredging needs.

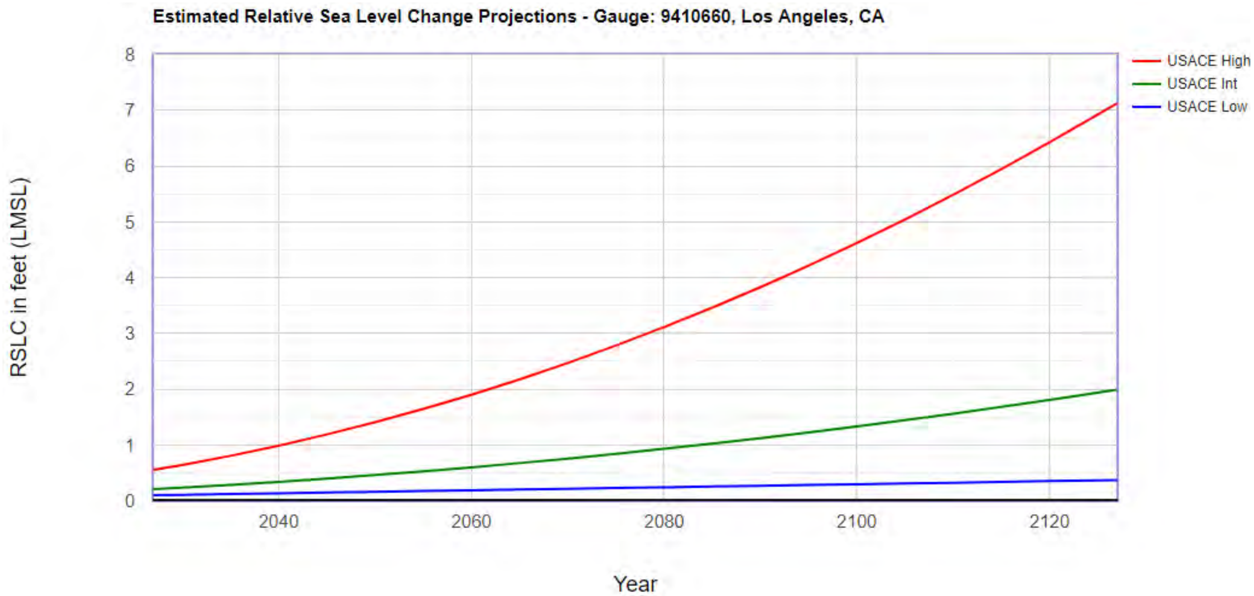

Figure 2-2 Relative Sea Level Rise Projections, Los Angeles, CA, NOAA gage 9410660

Table 2-2 Predicted Relative Sea Level Change, Los Angeles, CA, NOAA gage 9410660

9410660, Los Angeles, CA
NOAA's 2006 Published Rate: 0.00272 feet/yr
All values are expressed in feet relative to LMSL

Year	USACE Low	USACE Int	USACE High
2027	0.10	0.20	0.55
2030	0.10	0.23	0.64
2035	0.12	0.28	0.80
2040	0.13	0.34	0.99
2045	0.14	0.39	1.19
2050	0.16	0.46	1.41
2055	0.17	0.52	1.64
2060	0.19	0.60	1.90
2065	0.20	0.67	2.17
2070	0.21	0.75	2.47
2075	0.23	0.84	2.78

Year	USACE Low	USACE Int	USACE High
2080	0.24	0.93	3.11
2085	0.25	1.02	3.46
2090	0.27	1.12	3.83
2095	0.28	1.22	4.21
2100	0.29	1.33	4.62
2105	0.31	1.44	5.04
2110	0.32	1.56	5.48
2115	0.34	1.68	5.94
2120	0.35	1.81	6.42
2125	0.36	1.94	6.92
2127	0.37	1.99	7.12

2.6.2 Impact on Local Service Facilities

The POLB has an extensive Climate Adaptation and Coastal Resiliency Plan (CACRP) (POLB 2016) in accordance with California Assembly Bill 691 (2014) to manage the direct and indirect risks associated with climate change and coastal hazards. This plan identifies strategies for adaptation to climate change impacts throughout the Port's Harbor District. Port guidelines and policies for future planning studies are influenced by adding sea level rise analysis to all future harbor development permits. The POLB CACRP has analyzed the impact from SLR to all Local Service Facilities (LSF) through the year 2100, which includes inundation modeling for a sea level rise of 55" (4.6') in conjunction with a 100-year storm event. Presently, there are no POLB facilities that will be impacted within the planning horizon of this project (50 years) for any of the USACE SLR curves. LSFs are similarly not at risk through the adaptation horizon of the project (2077-2127) for the low or intermediate SLR curves, however the risk is uncertain beyond 2100 for the high SLR curve.

The POLB CACRP addresses the port's plans to address future sea level rise through:

- Governance: By adding language to overarching policies/plans and in technical guidelines, both planners and designers will start thinking about climate change from the start of a project
- Initiatives: By introducing initiatives, stakeholders and Port staff can continue to evaluate impacts on operations and physical damage that are associated specifically with climate change
- Infrastructure: By modifying existing infrastructure, such as strengthening sea walls or raising electrical equipment, the Port can be more prepared for future climate-related events.

2.7 Sediment

Sediments in the study area comprise sand, silt, and clay of varying proportions. Gravel, cobble, and debris may be encountered in limited quantities, within project depths. A thin layer of semi-floating silt and mud (clay) exists atop the ocean bottom surface, in areas of less disturbance or where recent man-made activities (e.g., dredging and harbor modifications) have not altered the surrounding natural subsurface conditions. This layer is approximately 2 to 6 inches thick and overlies a very loose unconsolidated layer of sand or silt. Underlying this shallow surface sediment are thick alternating layers of silty sand and sand with some silt, with some occasional thin layers of clay. Sandy portions of the sediment are predominantly fine grained, rounded and composed of quartz and mica minerals. Minor thin layers and localized lenses of gravel and clays are present within the sandy sediment and are found mostly within the upper 50 feet; some cobble and boulder size stone (up to 3 feet in maximum dimensions) may be present seaward of the breakwater and may be encountered in the Approach Channel. The sediment is unconsolidated and increases in density with increasing depth. A deepening project ending in 2001 encountered material harder to dredge (consolidated material) than anticipated in the approach channel; Cone Penetration Testing (CPT) will be performed during PED to ensure the dredgeability of material in the project area. For more information on sediment characteristics see Appendix C.

2.8 Sediment Transport

The San Pedro Bay has a stable bathymetry, with very little sedimentation and sediment transport. The area is located at the beginning of the San Pedro Littoral Cell (Patsch and Griggs 2006), where sediment transport is blocked from the north and west by the Palos Verdes peninsula, and the stability created by the breakwaters limits accretion or loss of sediment. Since the Los Angeles River was diverted in 1923 to its present course, the sediment load carried by the river is diverted to areas away from the port facilities. The main sources of sedimentation within the inner port and berths is prop wash from the large propellers of commercial vessels along with the small amounts of sediment inflow from the channel through Queen's Gate. Recent surveys by USACE show that even the exterior of the breakwater is very stable, as since the deepening of the Approach Channel by USACE in 2001 there has been only a small 40,000 cubic yard shoal of sedimentation in the channel, which currently does not impact navigability. Maintenance dredging within the port harbor and berths is performed occasionally by the POLB under a Waste Discharge Requirements Authorization from the State of California Regional Water Quality Control Board for maintenance dredging, which is renewed every five years (most recently in 2018).

3 Design Considerations

3.1 Vessel Inventory and Forecast

Vessels calling port in the POLB include container ships and liquid bulk tankers. The port currently handles more than 7 million twenty-foot equivalent units (TEUs) in container traffic, more than 75 million tons of cargo, and has over 2,000 vessel calls. As shown on Figure 3-1, from 1995 through 2017, total container throughput at the Port increased from about 2.84 million TEUs to about 7.54 million TEUs, representing an increase of 165%, or an annual compound growth rate of 4.54%. Strong growth in throughput is projected to continue until the Port's facilities reach a capacity of about 15 million TEUs, which is anticipated in 2035. Future land-based operations capacity will be added as part of the POLB "Port Master Plan," a long-range plan to establish policies and guidelines for future development within the POLB. Liquid forms of bulk cargo include gasoline, miscellaneous chemicals, and the primary liquid bulk commodity of crude oil imports. Crude oil imports have varied with no discernable trend from 2006 through 2016, and projected imports are not anticipated to be significantly different from historical volumes.

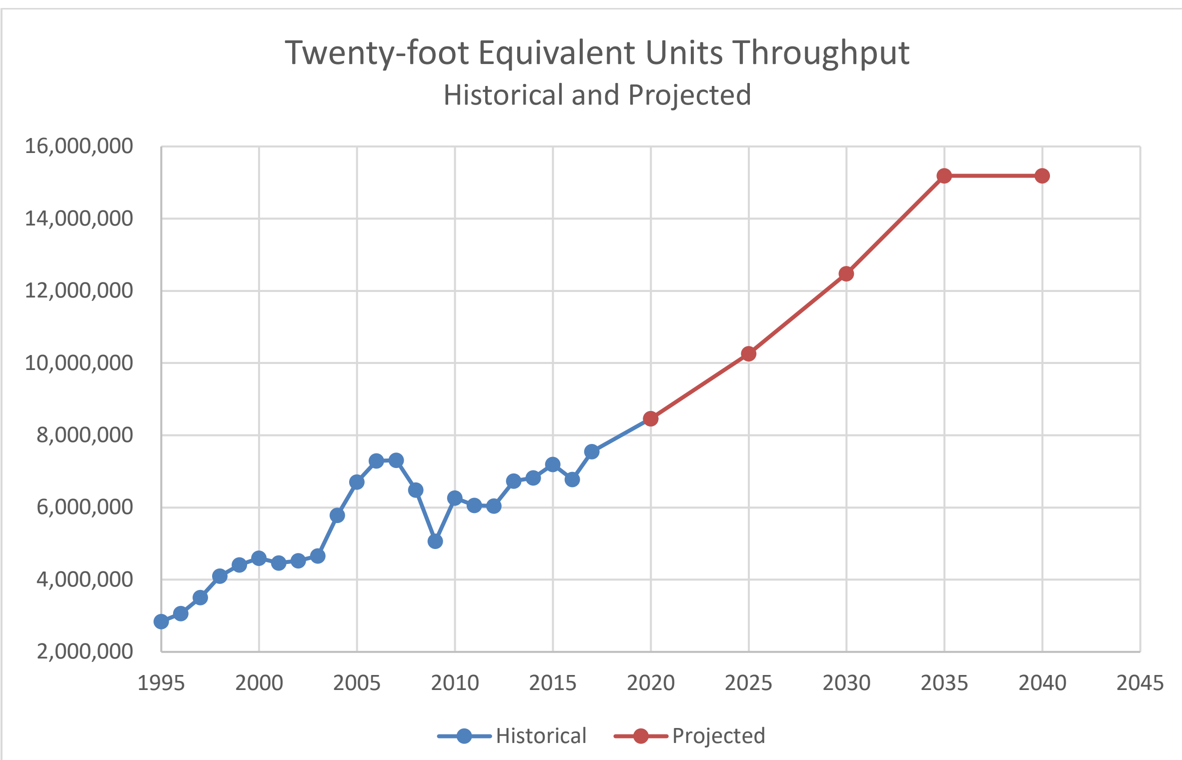

Figure 3-1 Port of Long Beach Container Unit Throughput, Historical and Projected

Vessel speeds in the approach channel are typically 10 knots, with a maximum allowable speed of 12 knots. As vessels approach the Queen's Gate they slow to 8 knots in preparation for the turn after passing through the breakwater. After, their speed exiting the turn is typically around 3 knots, which they maintain through the rest of the Main Channel area. Upon entering the Pier T Turning Basin, the West Basin, or the Pier J Approach, tugboats take over speed and maneuvering for the vessel.

3.2 Design Vessel

Vessels are progressively getting larger and future vessel fleet forecasts continue to show this trend. The container and liquid bulk design vessels were determined based on input and forecasts from the Port of Long Beach, professional judgment of Harbor Pilots, and data collection and analysis by the Planning Center of Expertise for Deep Draft Navigation supported by the Institute for Water Resources. The container design vessel characteristics are 1,300 feet long overall, summer load line of 52 feet, 193-foot beam, 188,000 deadweight tonnage (DWT), and 18,000-19,000 twenty-foot equivalent units (TEU). This is roughly the equivalent to a “Triple E” or “Post-Panamax Generation IV” containerized carrier. The liquid bulk design vessel characteristic are 1,100 feet long overall, 200-foot beam, 325,000 DWT, and 70 feet summer load line draft. This vessel is within the Very/Ultra Large Crude Carrier class also known as VLCC and ULCC.

3.3 Ship Simulation Study

A ship simulation was performed in accordance with ER 1110-2-1403 to evaluate channel navigability of the approach and main channels. A site visit to the port was performed to observe navigation conditions and take photographs for the model’s visual scenes. The ship simulations were conducted in Vicksburg, Mississippi at the Coastal and Hydraulics Laboratory of the Engineer Research and Development Center (ERDC). Two POLB pilots, experienced in navigating the Port of Long Beach channels, participated in the effort. Various conditions of ship size, wave, and current conditions were tested. Model vessels readily available in the ERDC library were chosen for the feasibility level testing, including the containership *Superium Maersk* (length 1,300 feet, beam 191 feet, draft 53 feet)and the VLCC *Elizabeth I. Angelicoussi* (length 1089 feet, beam 190 feet, draft 70 feet). Both of these model vessels are similar to the design vessels, and were good approximations for the simulation testing. As a result of the study, based on feedback from the harbor pilots using the larger design vessels, bend easing of portions of the Main Channel was added to the scope of the project. The pilots also concurred, based on their experience in the simulator, that the recommended design depths (as seen in the following section) were acceptable for the new design vessel sizes.

3.4 Recommended Design

The current POLB standard of operation is to allow only one-way traffic in and out of the port. The USACE Engineering Manual on deep draft navigation (EM 1110-2-1613) recommends a design channel width for one-way ship traffic of a dredged trench type channel of 3.25 times the design beam width for current speeds between 0.5 and 1.5 knots (at Queen’s Gate) and 2.75 for current speeds between 0.0 and 0.5 knots (inner channels). Thus, the navigation channel will require a width of 650 feet at Queen’s Gate and 550 feet for inner channels for liquid bulk design vessels moving under their own power, with container vessels requiring less. These widths are reached for all channel designs.

Channel depth design, as directed by EM 1110-2-1613, "is determined … by an economic analysis of the expected project benefits compared with project costs. Once the design ship and channel depth are determined [by economic analysis], the safety and adequacy of the channel depth for operational design ship transits will be determined". An adequate design channel depth is determined by the design vessel draft and a set of underkeel safety allowances, as well as needs of the local harbor pilots. A summary of the underkeel safety allowances follows, and can be seen in Figure 3-2:

- Minimum safe clearance. A minimum of two additional feet in depth is required under the keel after all other requirements for depth have been met. This is needed to avoid damage to ships propellers from sunken timbers and debris, to avoid fouling of pumps and condensers by bottom material, reduce propeller wash effects, provide allowance for spot shoals, and offset poor steerage effects caused by under keel clearance close to the seabed.
- Freshwater sinkage. Passing from seawater into a freshwater system will increase vessel displacement. However, due to high salinity in the port, fresh water sinkage is anticipated to have a negligible effect on vessel displacement.
- Trim. The difference between the vessel draft at midship and the bow or stern is termed trim. It is often complex and expensive to keep a ship at even keel and a nose down vessel does not maneuver well, so a vessel is often loaded to keep the stern lower than the bow. For the Port of Long Beach, this provision is not necessary, due to the needs and requirements of local pilots.
- Squat. A moving ship causes a drawdown of the water surface causing the vessel to ride lower relative to a fixed datum. Squat is dependent upon many variables including vessel speed through the water, water depth, and vessel to channel blockage ratio. Vessel speed controls this design value, and calculation is provided in EM 1110-2-1613.
- Tidal and wave effects. In order to eliminate tidal delays in the waterways an allowance is included for transits during low tides and effects from wave motion.

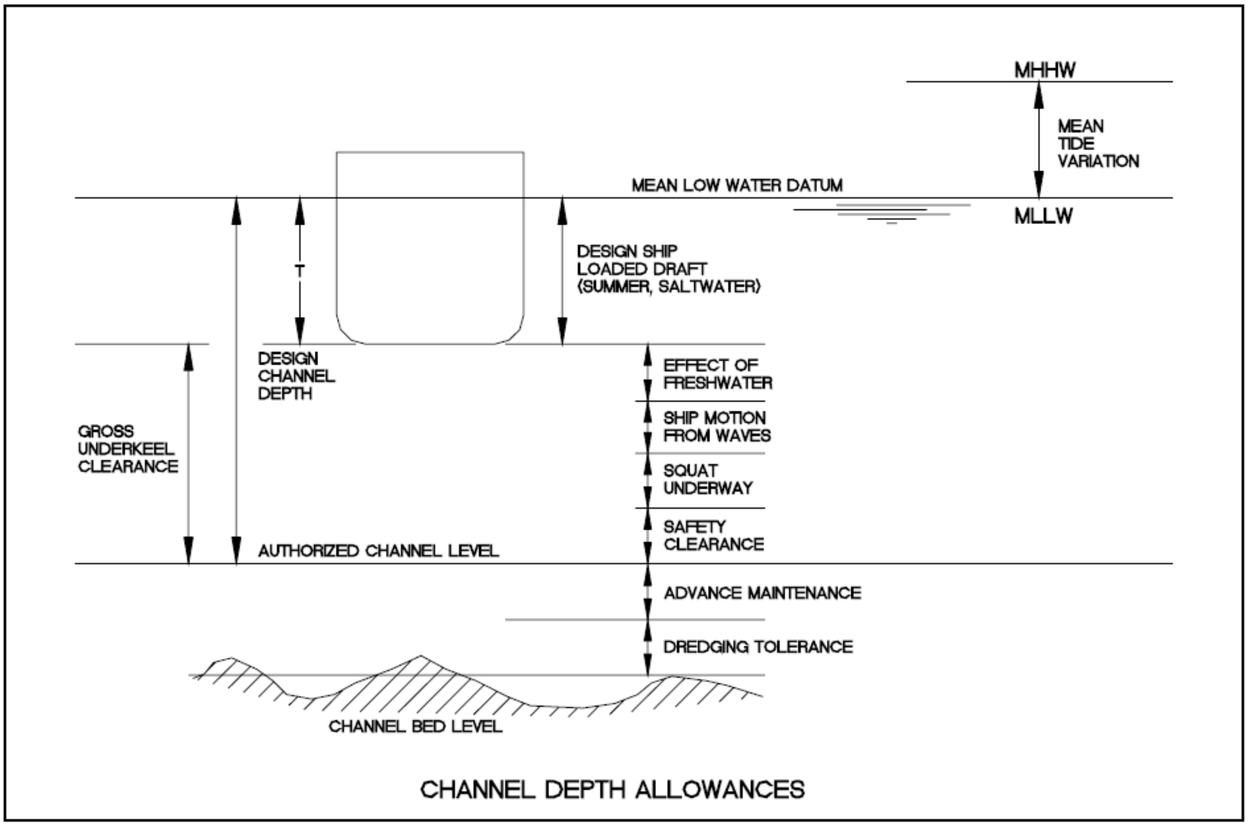

Figure 3-2 Design Channel Depth Allowances and Underkeel Clearance

3.4.1 Approach Channel

For the approach channel, depths are driven by the draft of the design liquid bulk vessel. The total underkeel clearance required by EM 1110-2-1613 is the liquid bulk vessel draft of 70 feet, plus the 2 feet of safe clearance, 2.5 feet of squat effects, and 4 feet from local tidal and wave effects, for a total of 78.5 feet. The economic analysis justifies a design depth of -80 feet MLLW, which meets minimum operational safety for navigability of both design ships in the channel.

3.4.2 Main Channel

In the main channel, the liquid bulk vessel slows down, decreasing the squat effects to 0.5 feet. Wave and tidal effects are also reduced to 2 feet due to the sheltering of the Middle and Long Beach Breakwaters. These effects, plus 2 feet of safe clearance, produce a total underkeel clearance required of 74.5 feet. The current depth of the main channel is -76 feet MLLW. Based on pilot feedback from the ship simulation study, bend easing will be done to several areas of the main channel, to accommodate the increased turning radius of the larger design liquid bulk and container vessels. EM 1110-2-1613 guidance for channel turns and bends recommends a turn width increase ranging from 0-2 times the ship beam, depending on the angle of the turn/bend in the channel. The proposed bend easing would comply with the worst case scenario of 2 times the ship beam throughout the main channel, even though that multiplier is not required for the turn angles present (note: the Navy Mole channel bender is classified as an ‘angle turn’, not requiring an increase in channel width). The regions where bend easing will occur are shown in Figure 1-3, which includes west and east sides of the Pier F/Navy Mole channel bender, western portion of the main channel from station 355+00 to 425+00, and the east edge of the main channel from station 350+00 to 460+00. The current design depth of -76 feet MLLW will be maintained, as justified by the economic analysis.

3.4.3 West Basin

Container vessels enter the west basin under control of tugboats at slow speeds. Due to this, squat effects can be assumed small, and the underkeel depth only needs to account for an addition of 2 feet of clearance and tidal/wave effects. The economic analysis justifies a federally authorized design depth of -55 feet MLLW in the area, which is larger than the required underkeel clearance for safe navigability. Currently, much of the west basin is already at or deeper than this design depth, and approximately 30% of the area will require dredging, located at the north and south ends of the area shown in Figure 1-3.

3.4.4 Pier J Basin Approach

The channel alignment design of this area was chiefly driven by feedback from local port pilots prior to and during the ship simulation study and was justified by the economic analysis. Container vessels will enter the Pier J Basin Approach under control of tugboats at slow speeds. Due to this, squat effects can be assumed small, and the underkeel depth only needs to account for an addition of 2 feet of clearance and tidal/wave effects. The economic analysis justifies a design depth of -55 feet MLLW in the area, which surpasses underkeel safety considerations. A transitional depth from the Approach and Main Channel design depths to the Pier J Basin Approach design depth will also be created.

Since this will be a new federal channel, design considerations from EM 1110-2-1613 need to be taken into account to ensure this locally and economically driven design meets safe navigation criteria. Pier J will only need to accommodate the design container vessel, with a beam of 193 feet, and will allow one-way ship traffic. As previously mentioned, the channel widths throughout the entire project area meet minimum safe navigability requirements for one-way traffic. The angle of the turn moving from the Approach Channel to the Pier J Approach requires an increase width factor of 1 times the ship beam, resulting in a needed width in the turn of 820 feet, which the current design meets. The turning basin at the head of the Pier J Approach needs to be 1.2 times the length of the design vessel, or 1560 feet for the project design container vessel, which the turning basin diameter surpasses. The depth for the turning basin has the same safety requirements as the channel.

3.5 Utilities

There are not any utility relocations anticipated for this project. The only utility line crossing a portion of the channel is at the border between the middle and inner port areas. This is past the liquid bulk terminal at Pier T, and outside the project area.

3.6 Slope Stability

The recommended side slope for the federal channel is 1 vertical on 3 horizontal. This has been historically used for projects within the POLB and have proven stable for the sediment characteristics in the region. The currently proposed channel configuration for all regions of the project will not present any concerns for undercutting of structures. However, at the Queen's Gate entrance hydraulic dredging will be minimized for two reasons: most of the channel is currently at the design depth except locations away from the side slopes of the structure, as seen in Figure 3-3; and to minimize any risk of undercutting nearby structures, the Middle and Long Beach Breakwaters. Additionally, maintenance dredging is contracted for FY21 in the area, which may result in minimal to no dredging required in the area when project improvements are to be completed. Please see further analysis on slope stability in Appendix C.

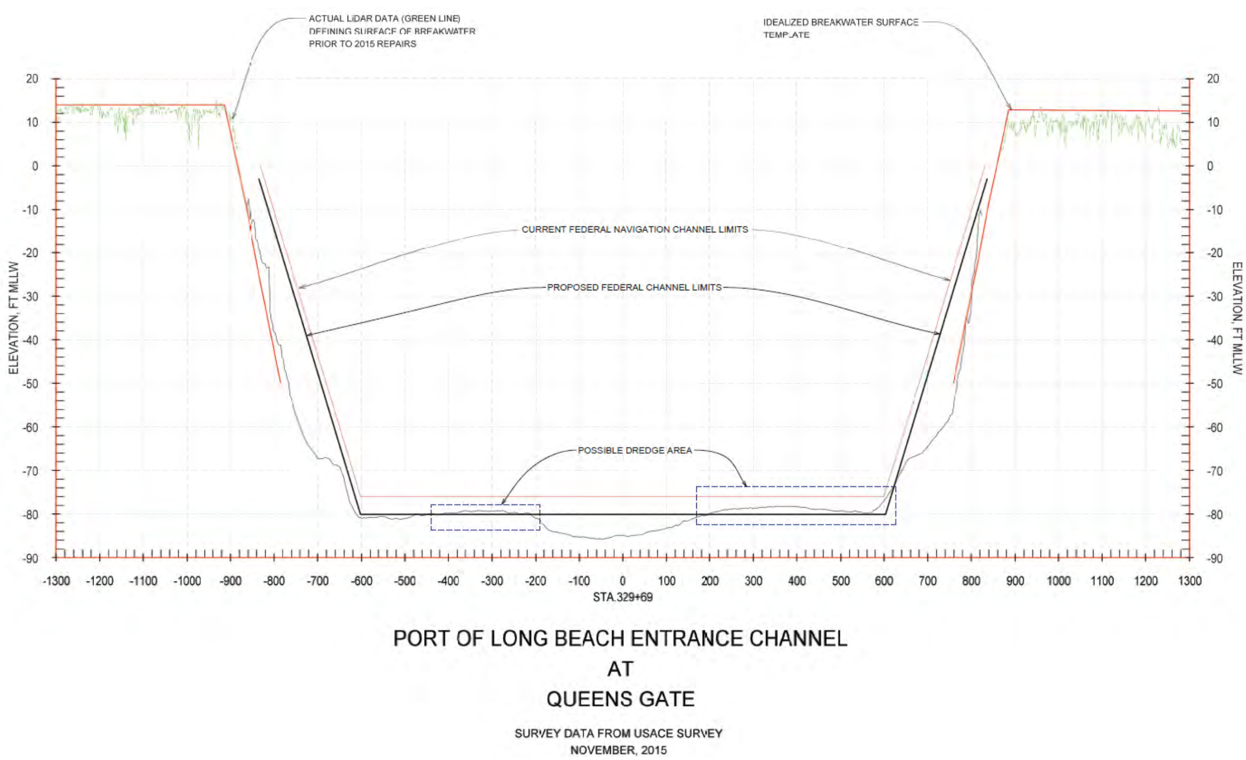

Figure 3-3 Cross-section of POLB Approach Channel and Breakwaters at Queen's Gate, with current and proposed federal navigation channel limits

3.7 Dredging

3.7.1 Dredged Material Quantities

The maximum allowable dredging depth for each alternative will include 2 feet of over dredging tolerance beyond the project design depth to account for inaccuracies during dredging operations. Table 3-1 lists the design depth, area, and dredged volume in each project area (with a reference to their footprint color from Figure 1-3). The total volume including over-depth is calculated using survey data, and is not expected to increase between current date and project construction (due to previously discussed low sedimentation of the area).

Table 3-1 Required Dredging Volumes for Recommended Design Depths

Project Area	Design Depth (feet, MLLW)	Area (square feet)	Average Cut Thickness (feet, approx.)	Total Volume Including Over-depth (cubic yards)
Approach Channel (Teal)	-80	18,780,550	3.8	2,600,000
Main Channel (Red)	-76	4,532,405	6.3	1,065,000
West Basin* (Yellow)	-55	3,010,000*	6.4	717,000
Pier J Approach (Orange)	-55	8,938,890	5.7	1,873,000
Pier J Approach, Transition (Orange)	-68	1,563,000	13.8	800,000
Total				7,055,000

*West Basin Area is approximately 30% of yellow footprint from Figure 1-3, as the majority of the area is to design depth.

3.7.2 Dredged Material Management

The USACE maintains a Dredged Material Management Plan for the Los Angeles Region which outlines strategies for management of dredged sediments from local harbors. Three locations are available for dredged material placement. A nearshore placement site near Sunset beach will be utilized. This area is a borrow pit created during USACE projects nourishing Surfside and Sunset beaches, and can contain approximately 2.5 million cubic yards of material. The U.S. Environmental Protection Agency designated Ocean Dredged Material Disposal Sites LA-2 and LA-3 will also be utilized. LA-2 is located 10 miles southwest of the project site, and has an annual maximum disposal volume of 1.0 million cubic yards. LA-3 is located 25 miles southeast and has an annual maximum of 2.5 million cubic yards (EPA SMMP 2011). These are standard, non-beneficial reuse sites. It is assumed the project will have access to place 0.9 million cubic yards and 2.2 million cubic yards at the locations per year. Relative placement site locations are shown in Figure 3-4. Dredged material from the Approach Channel will be placed at the nearshore site, with an extra 0.1 million cubic yards going to LA-2 after the nearshore site is full. All other dredging operations will place material at LA-2 and LA-3.

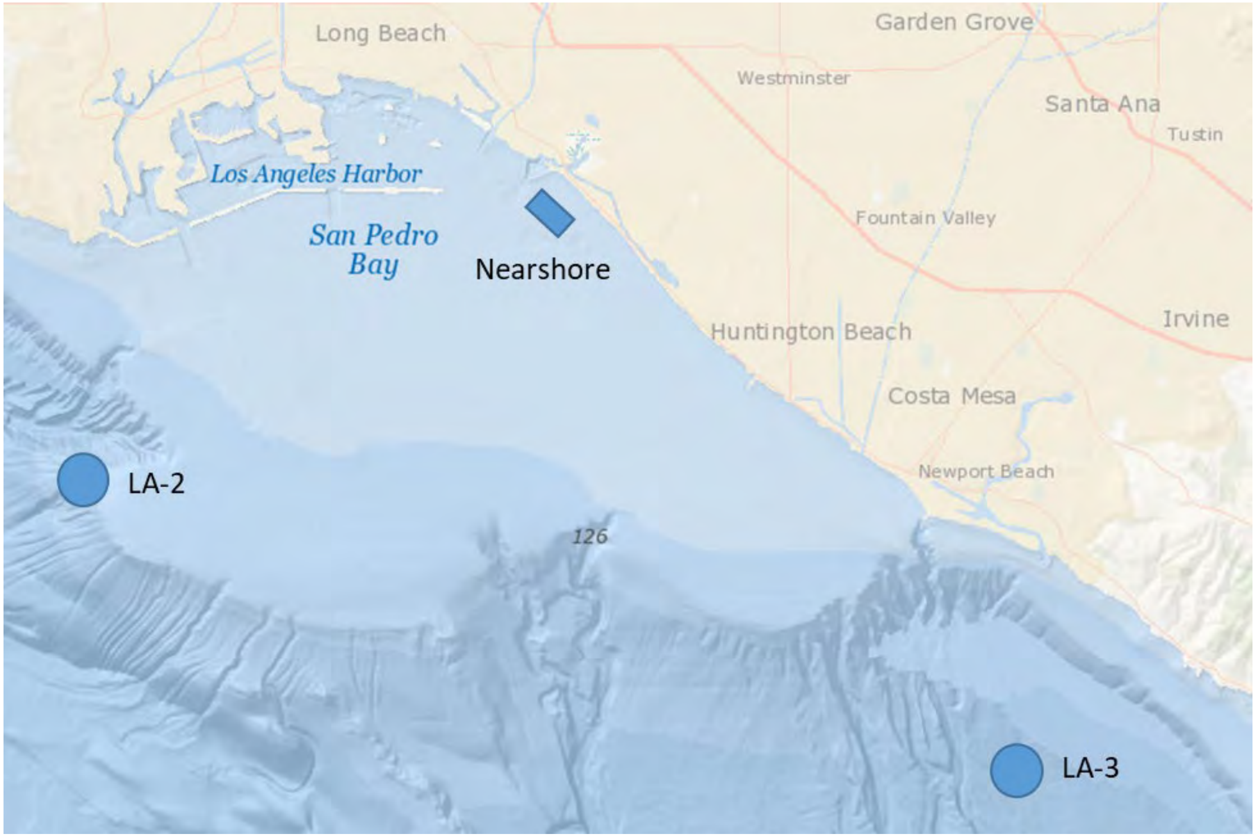

Figure 3-4 Dredging Placement Sites, Surfside/Sunset Nearshore and EPA LA-2/LA-3

3.8 Effects of Recommended Plan

The recommended design is not expected to cause a change in wave energy transmission from the exterior to inner harbor regions, as there is expected to be no decrease in wave attenuation or protection provided by the Middle and Long Beach Breakwaters. This is due to the future with project (FWP) depth increase in the entrance channel being small relative to the channel dimensions through Queen's Gate, which is also small relative to the overall size of the harbor complex. Additionally, the ship simulation study did not indicate any added wave motion due to channel modifications. Following recent repairs by USACE in 2019 the breakwaters are currently fully performing as designed, with crest elevation of 14 feet MLLW; this is expected to continue in FWP conditions. If the most aggressive sea level change ('USACE High' of Table 2-2) of 2.3 feet at 50 years occurs, the structures would maintain their designed performance in wave attenuation and protection for the life of the project, with no impact to project area function. The recommended design will have little to no impact on water circulation and current flow in the harbor and will not affect tidal flushing and water quality.

4 Construction

4.1 Equipment and Production

4.1.1 Approach Channel

The Approach Channel will be dredged using a large hopper dredge. In selecting this dredging equipment, vessel traffic, disposal site restrictions, hauling distance, and cost are considered. The hopper dredge is the equipment of choice in heavy traffic and is capable of high productions resulting in a cost effective choice. The hopper dredge maneuverability is excellent and is therefore more mobile in traffic. The hopper dredge does not need scows, thus equipment footprint in the area near Queen's Gate is reduced and vessel traffic impacts are reduced. Reduction of traffic impacts near Queen's Gate is encouraged by the project requirements. The production rate of a hopper will vary between 15,000 and 17,500 cubic yards per day, depending on distance traveled to placement site, LA-2 and nearshore respectively.

4.1.2 Other Locations

All other work within the port will be performed by an electric clamshell as a mitigation measure for air quality. The clamshell dredge is economical and suitable for site conditions: selected dredge must run on electric power, a large part of the required deepening of the sea floor runs along the wharf face, and dredging depths are -55 feet and greater. There is an existing electric substation near Pier T that can serve as a power supply to the electric clamshell dredge when working on the West Basin and Main Channel Bend Easing. A new electrical substation will be built at Pier J for work in the Pier J Approach. The clamshell production rate is expected to be 6,000 cubic yards per day.

4.2 Dredging Schedule

Project construction is expected to last two and a half years, and the expected construction sequence is shown in Figure 4-1. The Approach Channel will be completed in year one, utilizing the Nearshore placement site and LA-2. The rest of the project areas, completed by the clamshell dredge, will take approximately 2.5 years. One limiting factor on production is the disposal sites LA-2 and LA-3, due to their yearly disposal capacity. Another is the production rate that the clamshell dredge can achieve.

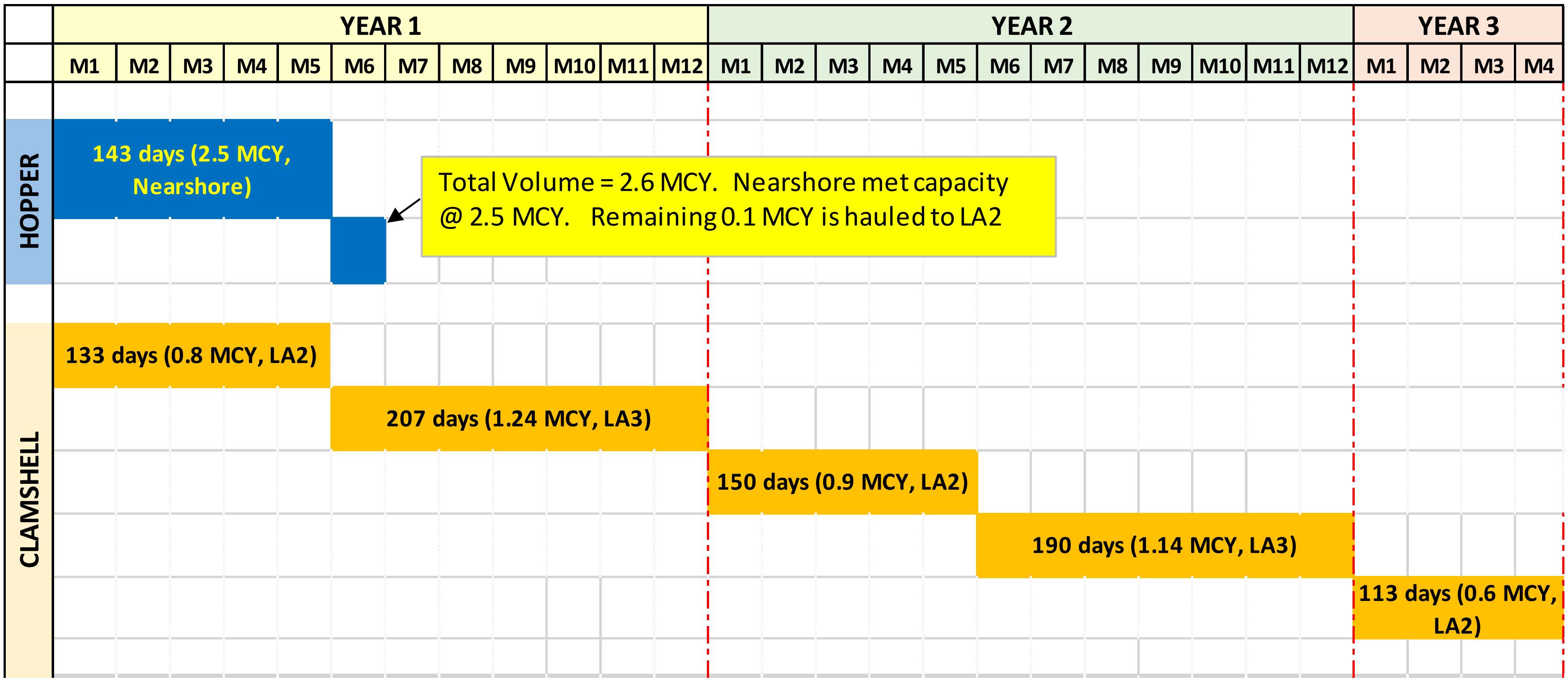

Figure 4-1 Construction Sequence, Port of Long Beach Deep Draft Navigation Study

5 Operations and Maintenance

Historically, channel deepening projects result in a net increase in operation and maintenance (O&M) dredging requirements. This has been well documented over multiple historic deepening and widening projects (Rosati 2005; Vincente and Uva 1984). Sedimentation will result in the need for O&M dredging at the recommended depth over the project life. The main sources of sedimentation within the inner port and berths is prop wash from the large propellers of commercial vessels along with the small amounts of sediment inflow from the channel through Queen's Gate.

O&M within the harbor and berth areas of the port are maintained by the Port of Long Beach Authority under a Waste Discharge Requirements Authorization from the State of California Regional Water Quality Control Board for maintenance dredging, which is renewed every five years (most recently in 2018). From 2014-2018 POLB authority maintenance dredging amounted to only 170,000 cubic yards, the majority of which was placed in LA-2. O&M for the Approach Channel is performed by the USACE, while the Main Channel has been maintained through collaboration of POLB and USACE. The USACE maintains a Dredged Material Management Plan for the Los Angeles region, which outlines strategies for management of dredged sediments, which includes offshore disposal (LA-2). Since navigation improvement dredging of the Main Channel in 2014 (as of writing of this report, a 7-year period), there has been no sedimentation within the channel requiring maintenance. For the Approach Channel, since navigation improvements completed in 2001 (as of writing of this report, a 20 year timeframe), there is presently a 40,000 cubic yard shoal within authorized channel limits, which does not impact navigability, and is scheduled for removal in a FY21 contract. Currently, O&M dredging of the federal channels at the POLB is anticipated to occur every 25 years. An increase in the frequency of O&M dredging is not anticipated within the harbor and berths, current federal channels, or the new Pier J Approach due to the implementation of the Recommended Plan.

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FINAL INTEGRATED FEASIBILITY REPORT AND ENVIRONMENTAL IMPACT STATEMENT / ENVIRONMENTAL IMPACT REPORT (EIS/EIR)

APPENDIX C: GEOTECHNICAL ENGINEERING

PORT OF LONG BEACH
DEEP DRAFT NAVIGATION STUDY
Los Angeles County, California

October 2021

US Army Corps of Engineers®

Port of LONG BEACH
THE PORT OF CHOICE

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LIST OF ACRONYMS/ABBREVIATIONS

ACRONYMS/ABBREVIATIONS	MEANING
ANSS	Advanced National Seismic System
CCC	Criterion Continuous Concentration (chronic)
CISN	California Integrated Seismic Network
CLE	Contingency Level Earthquake
CMC	Criterion Maximum Concentration (acute)
4,4"-DDT	Dichlorodiphenyltrichloroethane DDT (pesticide)
DE	Code-Level Design Earthquake
ERL	Effect Range Low
ERM	Effects Range Medium
EMI	Earth Mechanics, Inc.
H:V	horizontal on vertical
MLLW	mean lower low water
NOAA	National Oceanic and Atmospheric Administration
OLE	Operational Level Earthquake
PED	Pre-Construction Engineering Design
PGA	peak ground acceleration
POLB	Port of Long Beach
S_1	1-second spectral acceleration
SAP	Sampling and Analysis Plan
SAPR	Sampling and Analysis Plan Report
SC-DMMT	Southern California Dredge Material Mgmt Team
USACE	United States Army Corps of Engineers
USEPA	United Sates Environmental Protection Agency
USGS	United States Geological Survey

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1 INTRODUCTION

Presented herein is the Geotechnical Study Report prepared in support of the Port of Long Beach (POLB) Deep Draft Navigation Feasibility Study. The overall objective of this report is to summarize existing geotechnical conditions, considerations, and constraints, as well as present recommendations and conclusions for the proposed dredging activities within the POLB and associated federal waterway channels.

1.1 Study Area

The Study Area is located on the coast of southern California in San Pedro Bay at the POLB, which is approximately 20 miles south of downtown Los Angeles, California. To the west and northwest of San Pedro Bay are the communities of San Pedro and Wilmington, respectively, to the north is the City of Long Beach, and to the east is the community of Seal Beach. The study area includes the waters in the immediate vicinity (and shoreward) of the breakwaters in the POLB including the main channel, west basin, southeast basin, and other areas. The federal channel includes the entrance at Queens Gate (the gap between the Long Beach Breakwater and the Middle Breakwater) extending northward along the west of Pier J and east of Pier F, the Navy Mole, and Pier T. This study does not include any land areas within the harbor. The study area is shown as Plate C1 in Attachment 1.

1.2 Port Operations

The POLB handles domestic and international shipping trade that utilizes the San Pedro Bay water ways for berthing of shipping containers and liquid bulk vessels. The port handles 2,000 vessel calls and 82.3 million metric tons of cargo annually. Presently, access to the main channel, Pier J, West Basin, and the Southeast Basin is limited by depth. The proposed improvements will provide increased transportation efficiency and safety for port navigation. The design vessels for this project are cargo ships with 52-foot draft and oil tankers with 70-foot draft.

1.3 Proposed Improvements

The scope of this feasibility study is dredging to widen portions of the Main Channel (bend easing) to a depth of -76 feet MLLW, deepen the Approach Channel from -76 feet MLLW to depths ranging from -78 feet to -83 feet MLLW, deepen portions of the West Basin with depths ranging from -53 feet to -57 feet MLLW, create a Pier J approach channel and basin, and a standby area.

1.4 Geotechnical Scope of Work

The objective of this geotechnical report is to evaluate the proposed dredging elevations and lateral limits based on available data and provide conclusions and recommendations to meet the safety, cost, and navigational requirements of the project. There are two geotechnical aspects of the project:

A. The effects of dredging on the stability of adjacent structures
B. Dredgeability of the sediments and the suitability of the dredged materials for disposal

The USACE portion of the geotechnical evaluation for this feasibility study was:

A. The stability effects of dredging within the federal channel at the Queens Gate entry through the Long Beach Breakwater.
B. The dredgeability of the sediments and compatibility of the dredged material with proposed beach disposal sites. This will be addressed under a separate cover.

Within the POLB harbor, stability analysis of the proposed dredge locations was performed by POLB's consultant, AECOM, and geotechnical sub consultant Earth Mechanics Inc. (EMI). The results of POLB's geotechnical analysis are included in this report as Attachment 2.

USACE geotechnical tasks for this report included:

A. Review and summarize existing geotechnical data.
B. Peer review the geotechnical analyses completed by POLB's consultants and evaluate how they impact the federal channel.
C. Conduct slope stability analyses of the Long Beach Breakwater and Middle Breakwater with the proposed dredge cuts.

2 AVAILABLE INFORMATION

Characterization of baseline geotechnical and geologic conditions for the study area included acquisition, compilation, and review of existing, available data sources. The present conditions and design parameters are based primarily on the existing data the POLB provided, which includes previous geotechnical studies and investigations dating back to 1942. As-built plans and design manuals available in United States Army Corps of Engineers (USACE) Los Angeles District files were also reviewed. Available information is listed in Section 2.1.1 of this report and cited in Section 8.

2.1 Summary of Existing Reports and Studies

This section presents existing reports and studies prepared for previous projects at the POLB, design guidance, and criteria. These documents assisted in providing an understanding of the site-geotechnical conditions that existed prior to port development and the configuration of port channels, slopes and other facilities as a consequence of development. References for the reports and studies are provided in Section 8.

2.1.1 Existing Reports and Studies

- Report of Foundation Investigation Proposed Wharf, Berths 245, 246, and 247 Pier J (Dames and Moore 1967)
- Report – Foundation Investigation Berths 243 and 244, Pier J (Dames and Moore 1970)
- Report of Soil and Foundation Investigation: Proposed Sea-Land Container Terminal Pier G expansion, Berths 226 – 230 (Dames and Moore 1972)
- Comprehensive Condition Survey Los Angeles – Long Beach Breakwaters: Geotechnical Appendix, (USACE 1987)
- Queens Gate Dredging – Geotechnical and Chemical Investigation (Sea Surveyor 1994)
- USACE Memoranda regarding rock encountered during dredging (USACE 1999a-d, USACE 2001).
- Final Report of Geotechnical Investigation Volume 1 – Soil Data Report: Pier G Terminal Development Project (Kleinfelder 2000)
- Final Report of Geotechnical Investigation: Proposed New Container Wharf Pier J, Berths 235 and 236 (Kleinfelder 1996)
- Comprehensive Condition Assessment of the Middle Breakwaters (USACE 2014)
- Port Wide Ground Motion Study: Final Addendum No. 3 (Earth Mechanics 2015)
- Wharf Design Criteria, Version 4.0 (POLB 2015)
- Port-Wide Dredge Plan and Federal Channel Expansion Study (AECOM 2016)
- Geotechnical Input for Berth and Channel Deepening (Earth Mechanics 2017)

2.2 Summary of Existing Drawings and As-built Plans

From the design and record drawings database, POLB provided available drawings and details of various port structures along the channels and waterways. These drawings included critical data such as the design water depths of existing port structures, current water depths and distances to the proposed/existing channels and waterways from the toe of the existing port structures. POLB's consultants (AECOM and EMI) used the data and drawings to develop potential wharf improvement solutions and to assess setback distances; the results of this analysis are presented in Attachment 2.

2.2.1 Existing Drawings and As-built Plans

The POLB supplied the design team with cross-sections and as-built plans that were the basis of evaluation for the constructed conditions used in the analysis. Plans are itemized below and referenced in Section 8.

- General Plan of Breakwater & Dredging, West Arm
- Pier A Berth 201, Quay Wall
- Pier E Berths 122-124, Wharf
- Pier F and Pier G, Diking, Dredging and Filling
- Pier E Berths 125-127, Cast-In-Place Wharf
- Pier F Berths 204-205, Wharf
- Pier J and Pier F Extension, Rock Dike – Hydraulic Fill
- Pier E Berth 121, Tanker Terminal Offshore facilities
- Pier J Expansion, Rock Dike and Hydraulic Fill
- Pier J Berths 245-247, Wharf Modification
- Pier J Breakwater
- Pier J Expansion, Berths 266-270, Wharf
- Pier T Marine Terminal, Dredging and Wharf Construction
- Pier T Marine Terminal, Berths 134-136, Dredging and Wharf Extension
- Pier S Berths 102-110, Dike Realignment
- Pier T Marine Terminal, Berths 132-134, Dredging and Wharf Extension, Volume 2
- Pier G Berths 232-236, Terminal Redevelopment, Berth 236 Wharf, Landfill and Back Area
- Pier G Berths 232-236, Terminal Redevelopment, Berth 232 Wharf and Backlands

3 BACKGROUND AND EXISTING CONDITIONS

The development of the San Pedro Bay began at the end of the 19th century with the initial construction of the breakwater. After approximately 12 years of construction and dredging the POLB was officially dedicated on June 24, 1911. Over the past 100 years the POLB has undergone several expansion and redevelopment projects since the original development. Construction and composition of the port structures presented below are based upon design cross-sections and as-built plans referenced in Section 2.

While the geology of the port remains relatively unchanged, the POLB has had an impact on surficial sedimentation due to port activities and dredging operations. Present conditions of the basin floor are based upon bathymetry data recently collected in the port as well as the National Oceanic and Atmospheric Administration (NOAA) Nautical Chart of the Los Angeles and Long Beach Harbors (Chart No. 18751) which provide sounding depths from the MLLW datum. The bathymetry map and Chart No. 18751 are included in Attachment 3, Plates C6 and C7.

The following sections provide a summary of the project's basins' sedimentation and existing conditions of the adjacent piers and wharfs.

3.1 West Basin

The West Basin is located within the north-central region of the port and is bounded on the north by Pier T, to the west and south by the Navy Base Mole, and the Middle Harbor/Long Beach Channel to the east. Basin elevations are generally around -50 feet MLLW with shallower regions within the prohibited anchorage region of the Navy Base Mole. Dredging in winter 2016 was performed along the majority of Pier T and widening of the channel at the east end of the mole. Based on previous explorations in the West Basin, soils there generally consist of soft or loose sediments grading to medium stiff and medium dense sands to stiff silts in the surficial 20 feet before transitioning into dense to very dense sands and silty sands.

3.1.1 Pier T (Pier Echo/ US Naval Shipyard)

Located at the north end of the West Basin, at Pier T (formerly part of the U.S. Naval Shipyard) the depth immediately adjacent to the wharf structures varies from -36 to -54 feet MLLW, with an average depth of -50 feet MLLW in the vicinity of Berths 130 to 140, and an average depth of -40 feet MLLW for Berths 122 to 126. In winter 2016 this area was dredged to a depth of -55 feet MLLW to facilitate docking of larger vessels at Pier T. The wharf is supported by timber piles, sheet piles, and tiebacks with deadman anchors (POLB 1956; POLB 2002_A; POLB 2002_B).

3.1.2 Navy Base Mole (Pier W/ US Naval Shipyard)

Bordering the south perimeter of the West Basin is the 17-acre Navy Base Mole which was constructed in the 1940's as part of a new naval station and included 100 acres of Terminal Island. The design cross sections indicate the mole is comprised of hydraulic fill with quarry rock dikes and rock armoring (Naval Operating Base 1944).

3.2 Southeast Basin

Subsurface soils in the Southeast Basin are similar in composition to those in the West Basin. The basin ranges in depth from -35 to -64 feet MLLW with an original design depth of -55 MLLW. Previous explorations indicate soils in the Southeast Basin, including the foundation of the structures referenced below, generally consist of soft clay grading to stiff clay around a depth of 10 feet below bottom of basin before transitioning into the underlying dense to very dense sands and silty sands.

3.2.1 Pier F (Pier A)

The westward expansion of the Southeast Basin included the construction of Pier F, designated Pier A prior to 1993. In the 1960s, wharfs were expanded to accommodate Berths 203 through 208 with repairs to the rock dike being performed in the 1970s. The pier consists of typical hydraulic fill, rock dikes and 18-inch diameter precast concrete piles. The region adjacent to Pier F has the greatest depths to the mudline with elevations in the Southeast Basin averaging at approximately -65 feet MLLW (POLB 1952; POLB 1961; POLB 1966; POLB 1967).

3.2.2 Pier G

Providing berthing access to the north central region of the Southeast Basin, Pier G was originally constructed with hydraulic fill and a series of rock dikes with stone armoring. Recent redevelopment of the region included the installation of 18- and 24-inch-diameter prestressed concrete piles in the 1990s, creating Berths 227 through 230. The depth immediately adjacent to the wharf structures at Pier G varies from -45 to -59 feet MLLW, with an average depth of -54 feet MLLW (POLB 1966; POLB 1967).

3.2.3 Pier J

The southernmost expansion of the Port of Long Beach, Pier J, provides access to the northeastern, east, and southern regions of the Southeast Basin. Similar to the construction sequence at Pier G, Pier J construction and development of the wharfs and pier included hydraulic fill and a series of rock dikes with stone armoring as well as 18- and 24-inch-diameter concrete piles. The east portion of Pier J has a shallow mudline elevation of nearly -55 feet MLLW that transitions to -65 feet MLLW at the west end near the entrance to the Southeast Basin (POLB 1967; POLB 1991; POLB 1994; POLB 1995).

3.3 Pier J East Approach and Pier J Breakwaters

For cargo and shipping vessels that will berth along the eastern region of Pier J, ships are conveyed through the Middle and Long Beach Breakwater at the Queens Gate Entry before entering the Pier J east approach. Several expansion projects were completed during the last three decades of the 20th century. The southernmost expansion created an inlet for Berths 260 through 270 which are now protected by two breakwaters comprised of quarry run cores with armoring focused upon the seaward side. The southernmost sections of the breakwaters are constructed at 1.75 horizontal on 1 vertical (1.75H:1V) along the seaward side with an armored reinforced toe and 1.5H:1V along the landward side. The top of the breakwaters was designed with a top elevation of 12 to 18 feet MLLW that extends to the harbor seabed at -35 to -48 feet MLLW (POLB 1991; POLB 1994; POLB 1995).

3.4 Queens Gate Entrance and Main Breakwaters

The Queens Gate is the main entrance through the Middle and Long Beach Breakwaters into the Long Beach Outer Harbor of San Pedro Bay. The approach and main channel are, on average, at an elevation of -78 to -80 MLLW as indicated by bathymetry data and sounding depths (see Attachment 3, Plates C6 and C7). In 2001, the channel through Queens Gate was dredged to a maximum over-depth elevation of -78 feet MLLW with dredged side slopes in soil constructed at 3H:1V (Sea Surveyor 1994).

As shown in Figure 3-1, the composition of both the Middle and Long Beach Breakwaters is comparable in the design cross-section (Coastal 1986). At the crest of the breakwaters, the stone class is significantly larger, Class A, than the underlying course, Class B, with clay cores and sand cores chiefly constructed from locally dredged sediments in San Pedro Bay. Based on condition surveys of the Middle and Long Beach Breakwaters, the thickness of the layers may vary by a few feet (USACE 1987, 2014).

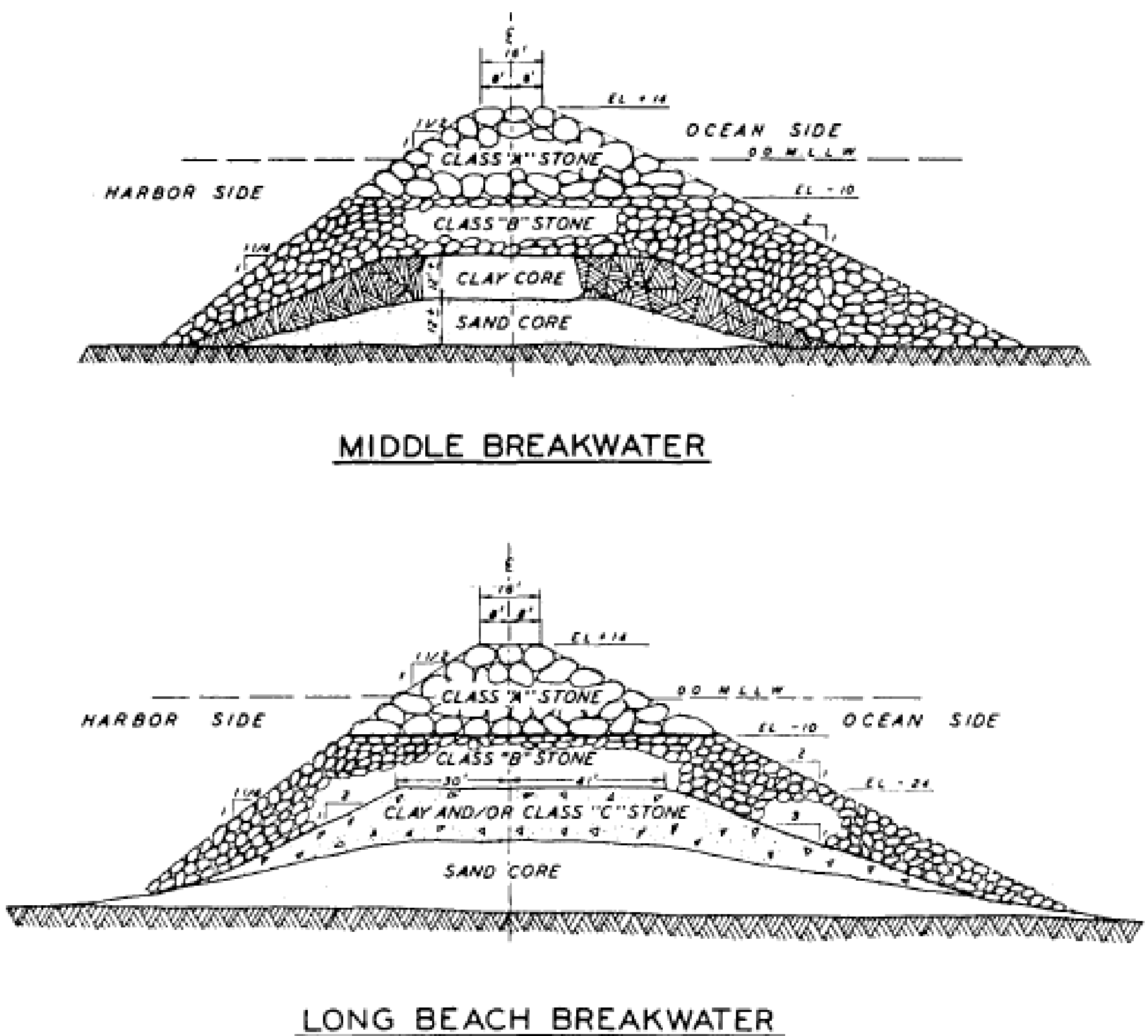

Figure 3-1 Middle and Long Beach Breakwater Cross Sections

3.5 Approach Channel

The approach channel is the deepened area on the ocean side of the breakwaters south of Queens Gate. The channel is approximately 1,200-1,300 feet wide and currently is dredged to an elevation of approximately -76 to -80 feet MLLW according to a 2015 bathymetric survey. The approach channel was deepened from -60 MLLW to -76 MLLW from November 1998 to December 2000. Rock and debris were unexpectedly encountered during late 1998 to about March 1999 dredging operation, with the largest size stone recorded during that period approximately 3 feet in largest dimension; while the rock excavated in each load made up less than 1% of the volume, the amount of rock not picked up by the dredge and left scattered at the bottom was not possible to estimate. This rock would cause the suction heads to be raised and lose suction power, affecting the hopper dredge's performance. The debris consisted predominantly of metal bars and was encountered with less frequency than the rock. All the stone encountered was located seaward of Queen's Gate and there is no record of any stone being encountered landward of Queen's gate. The assessment provided by the USACE project Geologist at that time indicated that stone or rock will be encountered throughout the Long Beach Entrance Channel in sparse quantities, since most of this rock has been transported to the project area via natural processes (e.g. stream or storm deposited). Only a minor fraction was apparently accidentally spilled from the barges carrying quarry rock for other projects in the area or knocked off the nearby breakwaters by storms. Detailed subsurface explorations are recommended during PED phase to better characterize the materials, estimate the size and amount of rock and debris and to better determine the dredging methods for this channel.

3.6 Local Marine Geology

The POLB study area is located entirely within the San Pedro Shelf, which is a relatively flat, isolated and narrow projection of the continental shelf. The bathymetry of the ocean surface at the shelf mimics this flat surface and slopes to the south at a rate of 10 feet per mile. The natural water depth of the Bay ranges from 20 to 50 feet. These depths have been increased from 50 to 70 feet locally due to dredging along the man-made channels and harbors and basins, as part of the creation of the marine infrastructure in the study area.

Based on previous USACE (and other entities) studies in the Port of Long Beach, referenced in section 2.1.1, it was found that the uppermost 20 to 100 feet of material beneath the bay is unconsolidated Quaternary-aged marine sediments. These sediments consist primarily of alternating layers of sand and silt, with very minor amounts of clay, gravel and seashells. However, as discussed above, cobble and boulder sized stone present seaward of the breakwaters was encountered during previous dredging of the approach channel. The shelf sediment is consistently found across the study area and all the man-made features in the study area are founded upon it. The thickness of the sand and silt layer vary between 5 and 50 feet and increases in density with depth. Clay, gravel and seashells are relegated to the uppermost 50 feet of the sediment and are found as thin localized lenses mixed within the thicker layers of sand and silt. The very top of the sea floor sediment, primarily landward of the breakwaters, consists of a suspended, light layer of mud (suspended clay and silt) atop a very loose layer of sand to silt. The thickness of the floating layer is approximately 2 to 6 inches.

The Long Beach harbor and marina infrastructure in the Bay is composed of Anthropogenic (man-made) fill (map symbol af). The fill consists of loose sand, silty sand and silt that was placed as a result of sediments dredged from the Bay since the 1930s. The marine sediment geology is shown on the Attachment 1, Plate C5 Local Marine Geology.

3.6.1 Liquefaction

Soil liquefaction is the partial loss of strength in sandy soils beneath the water table that occurs due to temporary increases in pore water pressure during intense earthquake shaking. As previously mentioned, much of the unconsolidated natural marine sediments in the study area are composed of coarse sand to silt that become denser with depth. Because of the increasing density with depth, the liquefaction potential of such sediments is low, except for shallower deposits of small natural isolated lenses of loose coarse sand and silty sand sediment. The liquefaction potential is higher for loose to medium dense sand and silty sand sediments that have been recently disturbed by anthropogenic activity (man-made fill). Sediments with high potential for liquefaction are found in the various man-made fill marina infrastructure in the study area that are composed of loose, dredged fill. Examples of such structures are Long Beach harbors and its ancillary jetties, slips and wharfs, and Long Beach and San Pedro breakwaters.

Past geotechnical engineering investigations in the Ports of Long Beach and Los Angeles indicate varying degrees of potential for soil liquefaction in the project area. An investigation at Pier J (Kleinfelder, 1996) indicated potential for liquefaction in soils as deep as elevation -57 ft MLLW with earthquake-related ground settlement of 8 to 12 inches. Additional geotechnical reports for Pier J (Geofon 1986) and for Pier T (Diaz-Yourman 2002) suggested that liquefaction of artificial fill is likely but liquefaction of the underlying native marine sediments is not likely.

The leftover deepening footprint after dredging is composed of the same sandy native sediment before dredging. Therefore, liquefaction potential of native sediments after dredging activities remains unchanged as not very likely.

3.7 Faulting and Seismicity

All of southern California including the study area is seismically active. The project study is in the San Pedro Bay shelf, whose seismicity is characteristic of recurring small earthquakes with moment magnitudes less than 4.5. The Bay is located within the inner margin of the southern California Continental Borderland, and north of the Newport submarine canyon and south of the Palos Verdes peninsula. This margin trends from southeast to northwest with a system of marine basins and ridges which are bound by several active faults.

Three major active faults in the vicinity of the study area are the San Andreas, Palos Verdes and Newport-Inglewood. They are all capable of producing a moment magnitude 7 earthquake. The San Andreas is the largest principal active fault in Southern California and is located approximately 65 miles north-northeast of the study area. The Newport-Inglewood and Palos Verdes are located approximately 2 miles northeast and 2 miles southeast of the study area, respectively. Historically, the study area has been subjected to seismic events with a Magnitude 6 (1933 Long Beach earthquake – Magnitude 6.3). A study by EMI (2015), presents the geography, source, and probabilistic seismic hazard parameters for the local faults.

Of the local faults discussed in EMI (2015), the THUMS-Huntington Beach fault and the Compton blind-thrust fault are considered the most significant tectonic features from the San Pedro margin because they both pass directly through the port of Long Beach. Both faults are potentially active and capable of producing a moment magnitude 7 earthquake (BSSA 2019); these two faults, and the Palos Verdes fault, are shown in Attachment 1, Plate C5, Local Marine Geology.

3.7.1 Historic Earthquakes

The Advanced National Seismic System (ANSS) provides a national network comprised of 15 regional seismic networks which are operated by the United States Geological Survey (USGS), among which include the California Integrated Seismic Network (CISN). This network is capable of providing detection and data of seismic events which are available for public records as the ANSS Comprehensive Earthquake Catalog. Table 3-1 provides a summary of the seismic history within a given radius from the study area.

Table 3-1 Seismic History

Magnitude	Number of Events within Radius			
Richter Scale	1 mile	10 miles	25 miles	100 miles
<4	10	1429	8439	208473
4<M<6	1	35	101	669
>6	0	0	1	9

Recorded or documented events extend from 1933 to the present. Within 100 miles, the greatest earthquake event was a magnitude of 7.5 on July 21, 1952 in Grapevine, California approximately 95 miles north of the POLB. Closer to the study area, 15 miles southeast at Newport Beach, on March 11, 1933 a magnitude 6.4 event was recorded; this event likely led to an aftershock earthquake the same day in Signal Hill, less than 1 mile away, with a magnitude of 4.4. The region is well characterized by earthquake events Magnitude 4 and less.

3.7.2 Design Earthquake Levels

The POLB's Wharf Design Criteria (POLB 2015) refers to an Operational Level Earthquake (OLE), Contingency Level Earthquake (CLE) and Code-Level Design Earthquake (DE) as the three levels to be modeled as the earthquake shaking motion for the various harbor improvements. The OLE corresponds to a 72-year return period ground motion having a 50 percent probability of being exceeded in 50 years; the CLE has 475-year return period with 10 percent chance of exceedance in 50 years. During an OLE, a structure is anticipated to experience minimal non-structural damage such that operations may resume promptly after the event. The CLE, however, considers an event where public safety is not impacted though there may be significant structural damage including total loss or failure of the structure. The design earthquake is determined in accordance with the California Building Code and ASCE 7-10 with 2 percent chance of exceedance in 50 years for a return period of 2,475 years.

For stability analysis of the breakwaters, the USGS online design maps tool was used to obtain the necessary seismic shaking information at the Queens Gate location. Based on site class D: the peak ground acceleration (PGA) modified for site class (PGA_M) is 0.627g; the short period design spectral acceleration (SDS) is 1.055g; and the design 1-second spectral acceleration (SD1) is 0.6g.

3.8 Physical Character of Sediment

Sediments in the study area comprise sand, silt, and clay of varying proportions. The physical character of the native (undisturbed) sediments is described in section 3.6 of this appendix. Based on the USCS soil classifications, the sediments are predominantly composed of thick alternating beds of silty sand (SM) and sand with silt (SP-SM). The sediments also contain some occasional thin layers of clay (CH). Sandy portions of the sediment are predominantly fine grained, rounded and composed of quartz and mica minerals.

Minor thin layers and localized lenses of gravel and clays are present within the sandy sediment and are found mostly within the upper 50 feet. As discussed above, cobble and boulder sized stone is also present seaward of the breakwaters and was encountered during previous dredging of the approach channel. The marine sediments are generally unconsolidated and increase in density with increasing depth.

A thin layer of suspended silt and clay (mud) is present atop the sea floor surface in areas of less disturbance or where recent man-made activities (e.g., dredging and harbor modifications) have not altered the surrounding natural subsurface conditions. This mud layer is approximately 2 to 6 inches thick and overlies a very loose unconsolidated layer of sand or silt. Underlying this shallow surface sediment are the thicker alternating layers of silty sand to sand, as mentioned above.

Gravel, cobble, and debris may be encountered in limited quantities, within project depths. As discussed above (Section 3.5), significant quantities of rock and debris, including particles up to three feet, were encountered in the Approach Channel during a 1998-2000 dredging contract.

3.9 Chemistry and Biotoxicity Character of Sediment

Bulk sediment chemistry and bio toxicity (bio-assay) testing has been performed on the sediments in the project site limits as part of past dredge investigations. The testing was done to evaluate the suitability of dredged sediments for disposal and/or placement in the vicinity of the project area and at the USEPA offshore disposal area of LA-2. The testing areas are shown on Inventory Map of Environmental Testing Events (Attachment 1, Plate C3). Four testing events are described as follows:

1994 Queens Gate Approach Channel - Bulk sediment chemistry tests were run on sediment collected by the Los Angeles District Corps of Engineers via vibracores for the Approach Channel. Chemistry results showed low detections of phthalate compounds and tributyltin and metals that were all below Effects Range Low criteria. Test conclusions indicated that all sediments were acceptable for placement at nearby beach nourishment areas and as fill at North Energy Island ocean borrow pit.

2012 Pier J Entrance Channel and Pier T - Bulk sediment chemistry tests were run by POLB on sediment collected from vibracores from areas on east entrance area of Pier J and at the Pier T and its West Basin entrance channel. Chemistry results indicated that all sediments were below ERL, except for Copper and Nickel that were above ERL for Pier J DU-COMP sample; and 4.4”-DDE and Total DDT above ERL for Pier T DU1-COMP and Pier T DU2-COMP. Pier T and J sediments were considered suitable for placement at Long Beach Middle Harbor fill site.

2013 Pier J Turning Basin, Pier J Berths 245-247, Pier T Berths 132-134 - Bulk sediment chemistry and effluent elutriate tests were run by POLB on sediment collected from these areas by vibracores and surface grab samples. Chemistry results for Pier J Turning Basin showed 4,4’-DDE and Total DDT above ERL but below ERM and elutriate results were below criterion continuous concentration (acute). All Pier J elutriate chemical results were below all criterion continuous concentration (CCC and CMC). Pier T chemical elutriate results were all below criterion continuous concentration, except for Copper which was above criterion maximum concentration (CMC). Pier J and T sediments were considered suitable for placement at Long Beach Middle Harbor fill site.

2014 Pier T and Pier Echo - Bulk sediment chemistry, bio-toxicity and effluent elutriate tests were run on sediment collected by POLB via vibracores and ponar samplers from Pier T and Pier Echo. Biotoxicity results indicated that samples Pier T-DU08, 10 and 11 did not meet limiting permissible concentration requirements for ocean disposal due to amphipod toxicity. Marine organism tissue samples were analyzed further for mercury, dichlorodiphenyltrichloroethanes (DDT) and polychlorinated biphenyls (PCB). Tissue results indicated low bioaccumulation potential, with concentrations less than Food and Drug Administration (FDA) action levels and those shown to have toxic effects. Elutriate test results were below Criterion Continuous Concentrations and Criterion Maximum Concentrations criteria. Chemistry results were all below ERL except for detections of silver and 4,4'-DDT above ERM for Pier T-DU06-COMP surface sample. Suspended particulate phase testing results indicated that sediments did not pose a toxicity risk to water column organisms during placement activities. Sediment from Pier Echo showed elutriate test results less than CMC and CCC criteria and indicated that placement activities would also not result in water quality impacts. Pier T and Echo sediments were considered suitable for placement at Long Beach Middle Harbor fill site.

<u>2018 Queens Gate Approach Channel</u> - Bulk sediment chemistry tests were run by Los Angeles District Corps of Engineers on sediment collected from vibracores from a small shoaled area near the entrance to the Long Middle Breakwater at the Approach Channel. Chemistry results indicated that all sediments were below ERM except for DDT and 4.4'-DDE, which were elevated above ERL. Biotoxicity tests were run on clams and worms mixed with the Approach Channel sediment. Chemistry and biotoxicity results indicated no adverse ecological effects were predicted based on these results. The sediment was considered suitable for placement at the offshore USEPA LA-2 open ocean disposal site.

3.10 Dredgeability of Sediment

All sediment at the project site is considered to be dredgeable by either hydraulic (cutterhead or hopper dredge) or mechanical (clamshell) dredging methods. Sediment to be dredged near marine terminals, piers and revetments is not expected to be difficult to dredge but should be removed by mechanical dredging methods to reduce potential sloughing or slope failures near those structures. Dredging near Queens Gate and in the Approach Channel will be harder due to greater density and presence of rock and debris. Dredging in that area may be better accomplished by clamshell methods rather than hydraulic methods because of harder dredging and to mitigate the risk of slope failure. The deeper, oceanward portions of the Queens Gate and Approach Channel alternative dredge footprints may need to consider more robust hydraulic cutterhead or mechanical clamshell dredge methods, because the sediment there is denser and contains more rock, up to 39 inches in size, than sediment to be dredged from all of the alternative footprints that lie inside (harborside) of Queens Gate. The rest of the proposed areas to be deepened could likely be dredged by hydraulic methods.

3.11 Physical and Chemical Compatibility of Sediment for Placement

The sediment chemistry and biotoxicity testing areas between the years 1994 and 2014, and the sampling locations for geotechnical and environmental purposes for the period between 1961 and 2014 are shown in Attachment 1, Plates C3 and C4 respectively.

Test results from gradation testing between 1994 and 2014 show that much of the sediment previously dredged from the project study final alternative footprints is composed of approximately 30 to 60% silty sediment. This sediment was too fine, therefore not compatible for use as nourishment material for nearshore and/or onshore beach placement areas. Chemical and biotoxicity testing results of the same timeframe show that much of the sediment previously dredged was also too contaminated to be placed as beach material. Because of this, the Southern California Dredge Material Management Team (SC-DMMT) and the U.S. Environmental Protection Agency approved of its use as disposal material at the

USEPA offshore LA-2 disposal site and for use as artificial fill (engineered fill) at POLB middle harbor slip (confined disposal site).

3.12 Geotechnical and Environmental Sampling and Analysis

Additional physical, chemistry and biotoxicity sampling and testing and sediment suitability analysis will be required as part of pre-dredge investigations prior to deepening any one of the project study final alternative array footprints. The physical testing and sampling should involve offshore cone penetrometer testing (CPT) to evaluate density and dredgeability. Vibracore or other off-shore sampling methods should be conducted after the CPT evaluation to evaluate grain-size distribution, presence of rock and foreign material, and to collect samples for chemical/environmental testing.

A sampling and analysis plan (SAP) and sampling and analysis report (SAPR) will also need to be prepared prior to dredging and dredge disposal activities according to the latest SC-DMMT guidelines. The SC-DMMT and USEPA will need to review and approve the SAP and SAPR and will also need to approve the suitability for final placement of dredged sediment. All of these activities will need to occur as part of the Pre-Construction Engineering Design (PED) phase.

3.13 Instability Due to Dredging

Sediment to be dredged for Federal Channel deepening near marine terminals, piers and revetments should be removed carefully to reduce potential sloughing or slope failures near those structures. Dredging in “box cut” configurations should not be permitted and increased, real time monitoring of the area between the structure and the dredging should be implemented in those areas. The deepening of the channel near Queens Gate within the east portion of the Federal Channel Limits at the east side Long Beach breakwater and its junction with the Pier J Approach Basin could be subject to slope failures. These locations have been identified because the bottom toe of the east breakwater is less than 100 feet from the Federal Channel and increases the risk for slope failure there.

During the dredging of Pier 400, east of Terminal Island, the contractor experienced slope stability issues due to running sands likely caused by east-sloping bedding planes. It is recommended to assess the bedding orientations in the Project area during the PED phase to ensure slope stability is maintained.

4 SLOPE STABILITY OF PROPOSED DREDGING

As part of the feasibility study, slope stability for the basins, wharfs and piers in the study area of the POLB was evaluated by POLB's consultant (See Attachment 2, Earth Mechanics 2017 memo). Stability was expressed as allowable standoff distances from structures. Within the federal waters of the approach channel at the Queens Gate Entry through the Long Beach Breakwater, USACE performed an evaluation of the slope stability based upon the parameters and configurations of previously performed investigations, studies, and as-built plans.

As stated in section 3.13 above, bedding orientations in the Project area need to be assessed during PED to determine if standoff distances recommended by EMI need to be reevaluated, or other mitigation measures need to be implemented.

4.1 Queens Gate Entry

Cross-sections of the main breakwaters, shown in Plate C2 of Attachment 1, were obtained from historical design documents as well as repairs associated with the Middle Breakwater to the west of Queens Gate Entry and the Long Beach Breakwater to the east. These documents also provide subsurface data collected from two borings, M2 in the Middle Breakwater, and L1 in the Long Beach Breakwater (USACE 1987). USACE analysis for the current feasibility study is based upon the information presented in those documents in conjunction with the NOAA Nautical Chart of the Los Angeles and Long Beach Harbors (Chart No. 18751) which provides sounding depths based upon the MLLW (see Attachment 3, Plates C6 and C7).

4.1.1 Design Parameters and Assumptions

The unit weights and strength parameters for stability analysis of the soil and breakwater materials were based partly on the limited data available near the Queens Gate Entry and partly on assumptions and engineering judgment. Values used for the analysis are provided in Attachment 4, Slope Stability Modeling.

Middle and Long Beach Breakwater

Construction and parameters for the breakwater are typical of the material types as described by the previous comprehensive condition assessments performed for the Long Beach and Middle Breakwaters (USACE 1987, 2014). The breakwater cross-sections were modeled as their idealized construction formation as shown in Figure 3-1 absent any deformations or significant void space.

Foundation Soils

The soil deposition and strength parameters are based on the data collected from 1986-1987 and presented in the Comprehensive Condition Survey of the Los Angeles-Long Beach Breakwaters (USACE 1987) from borings M2 (Middle Breakwater) and L1 explorations (Long Beach Breakwater). The soil (sediments) underlying the breakwaters and within the Queens Gate Entry vary from sands and silty sands to sandy silts and silts, and although there were minor amounts of clay, a "simplified" single layer of silty sand was assumed for modeling purposes. Soft sediments, such as loose surface mud or compressible clays, were not included as part of the stability model, since there has been no appreciable decrease in channel depth to indicate accumulating sediments since dredging activities in the late 1990s (USACE

1998). As indicated by the chart and map in Attachment 3, the channel depth is actually deeper than the plans from 2001; the current channel depth is at the same depth or deeper than the depth dredged indicated in the chart and plans (see Attachment 2, EMI 2017 memo for further details).

Stability Modeling

The analyses address global stability concerns presented by the proposed dredging and do not address the internal stability of the breakwaters. Slope stability analysis was performed using Geostudio software with the 2016 Slope/W extension and may be considered conservative as it only evaluated the condition in two dimensions. Pseudostatic modeling for seismic conditions considered the DE for the study area. A reduction was applied to the PGA to arrive at a seismic coefficient for psuedostatic analysis consistent with the method presented by FHWA/NCHRP 12-70. The seismic coefficient for limit-equilibrium pseudostatic slope stability analysis was estimated to be 0.23 for the design earthquake, using a slope height of 97 feet, site class D, PGA_M = 0.627, S_1 = 0.6, F_{pga} = 1.0. and F_v = 1.5.

4.1.2 Results

In accordance with USACE standards, the minimum required factor of safety is 1.5 for slope stability. By increasing the standoff distance to 100 feet, the factor of safety increases by 5 to 10 percent for the Middle and Long Beach Breakwater; there were no appreciable changes in the factor of safety by increasing beyond 100 feet as the stand-off distance for dredging activities.

For seismic conditions, USACE minimum required factor of safety is 1.1. Increasing the standoff distance, beyond the toe of the breakwater, yielded no appreciable change in the factor of safety for a series of seismic conditions.

Table 4-1 presents the factors of safety computed based upon particular static and seismic conditions.

Table 4-1 Queens Gate Entry – Factor of Safety

Middle Breakwater				Long Beach Breakwater			
No Standoff	50'	100'	200'	No Standoff	50’	100’	200'
Static Conditions							
1.80	1.93	1.97	1.97	1.67	1.74	1.74	1.76
Seismic Conditions (DE)							
0.74	0.74	0.74	0.74	0.67	0.68	0.68	0.68

Standoff distances are measured from the toe of slopes and were determined utilizing the parameters and assumptions presented above in USACE analysis of the federal channel located at the Queens Gate Entry.

Based on this analysis, any dredging activities that remain contained to within the limits of the main channel to a depth of -81 ft MLLW, with 2 feet of over-dredge, will not further impact the stability of the breakwaters. All dredging should be performed in accordance with port practices of slopes being maintained no steeper than 3H:1V. Setback distances to structures should be measured from the base of the slope at the toe. The models for stability analysis of the federal channel are included in Attachment 4.

Since the seismic (pseudostatic) slope stability analyses computed safety factors are less than 1.0, those slopes are expected to fail during the design earthquake. A slope displacement calculation was conducted to evaluate whether such earthquake-related failures of the breakwater slopes would involve significant loss of material from the breakwaters or minor displacements of stones. Using the method presented in FHWA/NCHRP 12-70, the yield acceleration (expressed in terms of gravity) for Middle Breakwater ranged between 0.14 and 0.15 with a computed lateral displacement of 3 to 4 inches. Long Beach Breakwater had a marginally lower yield acceleration of 0.12 to 0.13 and displacement of 5 to 6 inches.

See Table 4-2 for the calculated yield accelerations and lateral displacements for corresponding standoff distances.

Table 4-2 Queens Gate Entry – Computed Lateral Displacement

Middle Breakwater				Long Beach Breakwater			
No Standoff	50'	100'	200'	No Standoff	50’	100’	200'
Estimated Yield Acceleration (g)							
0.145	0.148	0.149	0.149	0.125	0.125	0.126	0.128
Estimated Lateral Displacement (inches) at Design Earthquake							
3.8	3.6	3.5	3.5	5.2	5.2	5.1	5.0

4.2 Port of Long Beach Harbor Slope Stability Analyses

POLB’s consultant, AECOM, tasked their sub-consultant, EMI, to perform a Berth and Channel Deepening study within the POLB harbor. The study considered three different dredging elevations of -53 ft, -55 ft, and -57 ft MLLW within the basins and as deep as -81 ft MLLW within the main channel. Those elevations include 2 feet of over dredging as well as standoff boundaries from the existing port structures to prevent potential damage or undermining due to the proposed dredging activities within the waterways of the port harbor. The study also included recommendations for wharf improvements where necessary to facilitate the scope of dredging.

Five loading conditions were analyzed:

- Static
- Static and Operational Level Earthquake
- Static and Modified Operational Level Earthquake
- Static and Contingency Level Earthquake
- Static and Design Level Earthquake

Wharf improvements include a few scenarios: a continuous Z-section bulkhead, combination of soldier piles and Z-sheets, and double soldier piles with Z-sheets. The methodology for ground improvement is assumed to be various configurations of jet grouting. A summary of the proposed improvements for dredging configurations is presented in Table 4-3.

Table 4-3 Improvements

Pier	Depth*	Static	Static + Modified OLE	Static + OLE	Static + CLE	Static + DE
F	-53	WI	WI	WI & GI	WI & GI	WI & GI
	-55	WI	WI	WI & GI	WI & GI	WI & GI
	-57	WI	WI	WI & GI	WI & GI	WI & GI
G	-53	None	None	None	None	WI
	-55	None	None	None	None	WI
	-57	WI	WI	WI	WI	WI
J	-53	WI	WI	WI & GI	WI & GI	WI & GI
	-55	WI	WI	WI & GI	WI & GI	WI & GI
	-57	WI	WI	WI & GI	WI & GI	WI & GI
T	-53	None	None	None	None	WI
	-55	None	None	None	None	WI
	-57	None	None	None	WI	WI

WI Wharf Improvement   *OLE Operating Level Earthquake*
GI Ground Improvement   *CLE Contingency Level Earthquake*
**feet below MLLW, includes 2 feet of over-dredge*   *DE Design Earthquake*

AECOM provides a discussion and summary of the improvements and associated costs in the document Wharf Structure Improvements and Berth Dredging Evaluation. A memo summarizing the geotechnical analysis within the POLB is included as Attachment 2**.** The recommended standoff distances are provided in Section 5.0.

5 CONCLUSIONS AND RECOMMENDATIONS

Geotechnical conclusions are presented herein regarding the proposed dredging for the POLB Deep Draft Navigation Project. This Feasibility-Level geotechnical study includes a summary of the geotechnical constraints and recommendations for dredging based on the existing conditions as presented by the previous studies, reports and existing design cross-sections and As-built plans.

The geotechnical evaluation of conditions within the port and recommendations for harbor structures were performed by the POLB's consultants and sub consultants. Those studies are summarized within this report as Attachment 2; further assessment of the bedding orientations is recommended during PED to anticipate for potential impact of running sands on slope stability.

In order to maintain the USACE minimum factors of safety, "stand-off" distances have been proposed based upon stability analysis performed by the USACE and POLB, as shown in Table 5-1:

Table 5-1 Port of Long Beach Dredging Standoff (Feet)

Pier T	Pier F	Southeast Basin	Pier J	Pier J Breakwater	Queens Gate Entry
150	100	100	100	50	100

Although the slope stability analysis of Queens Gate Entry satisfies USACE static factors of safety with no standoff, the distance was recommended for constructability to reduce potential for undermining slopes of the breakwaters. The standoff distance would allow for dredging to extend outside of the main channel's current boundaries and allow space for future ground improvement if desired for the project.

Seismic stability analysis of the Middle and Long Beach Breakwaters at Queens Gate Entry indicate ground improvement may be required to meet the USACE standards for factors of safety. Engineering Manual 1110-2-2904: Design of Breakwaters and Jetties states,

> *Since failure of most breakwater and jetty projects that are a result of an earthquake will not result in catastrophic consequences, these structures are generally not designed with seismic considerations. For projects located in high seismic risk zones, however, the geotechnical evaluation for these projects should at least consider the potential impact of seismic damage. If the cost to repair the seismic damage is considerable, as compared with the replacement cost, a detailed seismic evaluation may be warranted. The decision to design for seismic considerations should be made on a case-by-case basis.*

A cost analysis should be performed to assess the level of impact if Queens Gate Entry was no longer accessible due to slope failure of either of the main breakwaters and if structural or seismic upgrades are prudent/desirable. It should be noted that since the construction of the breakwaters, there have been several seismic events ranging up to a magnitude of 6 and any sustained damage did not impede port activities.

Although the majority of the sediment at the project site is considered to be dredgeable by either hydraulic (cutterhead or hopper) or mechanical (clamshell) methods, it is recommended that for dredging near the port structures (marine terminals, piers, revetments, breakwaters, wharfs), a clamshell dredge be used to reduce potential for sloughing or failure of the slopes.

At the Queens Gate and Approach Channel, a clamshell dredge is recommended due to the potential presence of oversize rock and debris, as well as to mitigate the risk of slope failure of nearby breakwaters; if a hopper dredge is chosen for this area, contractor would need to assess the impact that large rocks and debris can have on the dredge’s performance. A hopper dredge can be used for the rest of the proposed areas to be dredged.

6 RECOMMENDED ADDITIONAL STUDIES

If the project progresses beyond the feasibility level, the following geotechnical studies should be conducted during PED:

- Exploration and laboratory testing of foundation soils within the Queens Gate Entry Channel and Long Beach Breakwater (nearer to the project area). This should include a phase of off-shore Cone Penetrometer Testing (CPT) first to evaluate material density and consistency. The CPT investigation should be followed by a phase of vibracore drilling to collect samples for laboratory testing and evaluate grain-size distributions for beach placement or disposal, as well as chemical constituents and potential contamination. To estimate rock quantities, "potholing" with a clam shell large enough for a 3-foot rock is suggested.
- A detailed geotechnical investigation of the subsurface conditions in the project study area, including drilling, sampling, and testing, would be necessary to draw firm conclusions regarding the potential for soil liquefaction in the study area and its impact on the proposed project features.
- Assess bedding orientations in the Project area; running sand issues likely due to east-sloping bedding planes have been observed in previous projects in the area.
- Perform 3D stability analysis at breakwaters for further refinement of slope stability if lesser standoff distances are needed.
- Conduct cost analysis for seismic stability of the main breakwaters.
- Conduct chemical/environmental testing of sediment samples and evaluate suitability for placement in the designated disposal sites; prepare a SAP and a SAPR for SC-DMMT and USEPA approval.

7 LIMITATIONS AND RISK

This report is intended only for use by USACE, the POLB, and its designers for the proposed Berth and Channel Dredging Study. The recommendations contained in this report are based on available drawings, assumptions made due to incomplete information, and engineering judgement.

Specific to the federal channel at Queens Gate Entry, the current design assumptions and analysis indicate there are underlying stability issues that may pose issues in the future; these have been previously studied and documented elsewhere in the port. Lacking more detailed explorations and testing immediately within the channel and breakwaters, design assumptions may not appropriately characterize the subsurface conditions which could lead to construction or design challenges leading to costly changes in the future as the project progresses.

Discussion of the limitations and risk within the Port of Long Beach can be found in the analysis memorandum, Attachment 2.

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APPENDIX C: GEOTECHNICAL ENGINEERING - ATTACHMENT 1

PLATES

Plate C1 – Study Area

Plate C2 – Cross Section A-A' Through Queens Gate

Plate C3 – Inventory Map of Environmental Testing Events for Sediment

Plate C4 – Borehole Sediment Sample Locations for Geotechnical and Environmental Sampling Purposes (1961 to 2014)

Plate C5 – Local Marine Geology

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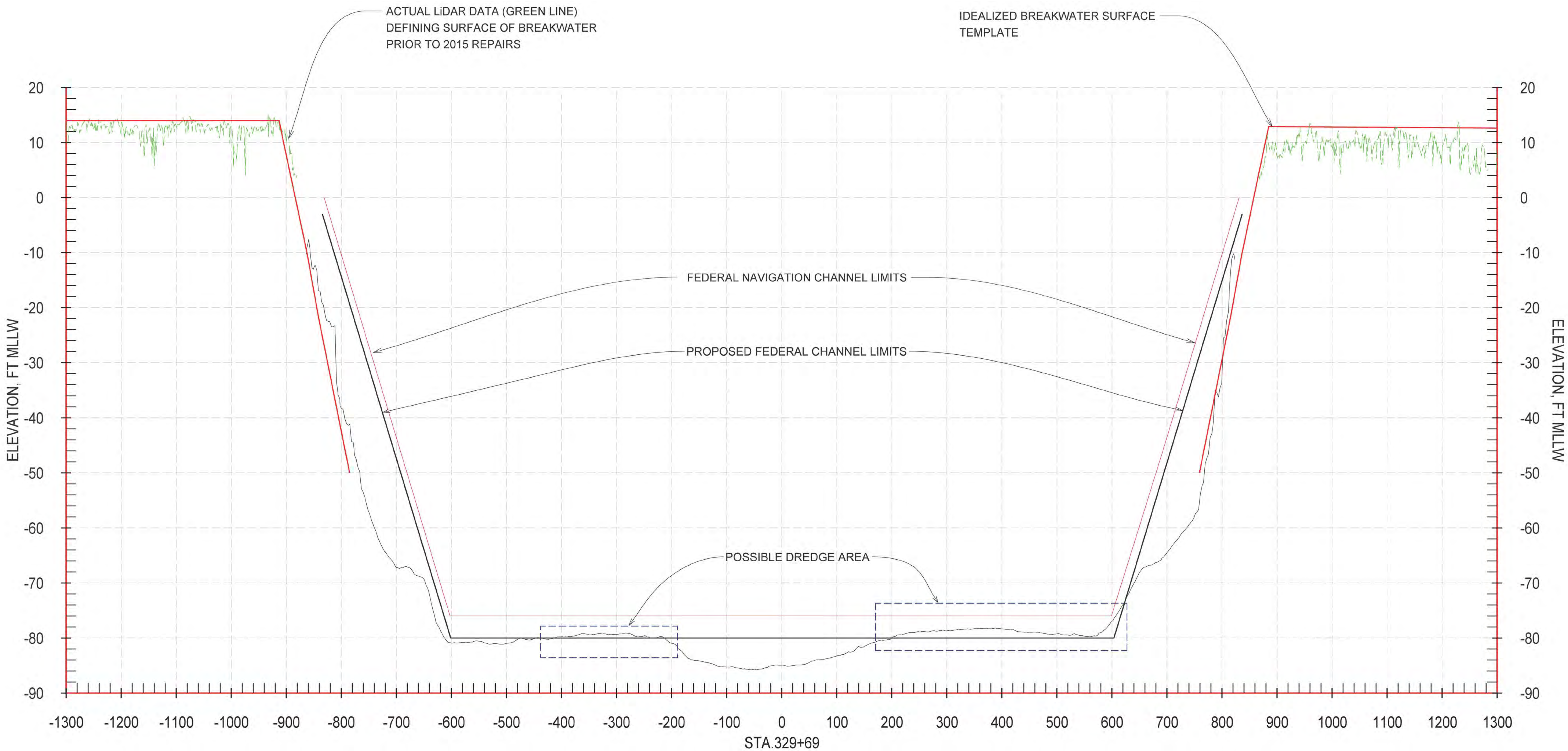
L O N G B E A C H
Pier S
Pier D
Pier S
Pier E
Pier G
Pier T
Pier T
Pier F
Pier H
Pier G
Pier G
West Basin
Navy Mole
Southeast Basin
Pier J
Pier J
Main Channel
Island Grissom
Island White
Island Freeman
Long Beach Breakwater
Queen's Gate
Middle Breakwater
Approach Channel
A
A'
© OpenStreetMap (and) contributors, CC-BY-SA
Legend
Main Channel Widening
Pier T West Basin
Pier J Approach/Basin
Southeast Basin
Standby Area
Main Channel
Standby Area Circle
Standby Area Center
Approach Channel
POLB Boundary
Cross Section SEE PLATE C2
N
SOURCES:
Imagery Background: Image Copyright 2015 DigitalGlobe Inc
Coordinate System: NAD 1983 StatePlane California V FIPS 0405 Feet
0 1,500 3,000 Feet
1 inch = 3,000 feet
POLB NAVIGATION IMPROVEMENTS
STUDY AREA
DATE: NOVEMBER 2017
PLATE C1
U.S. ARMY CORPS OF ENGINEERS LOS ANGELES DISTRICT

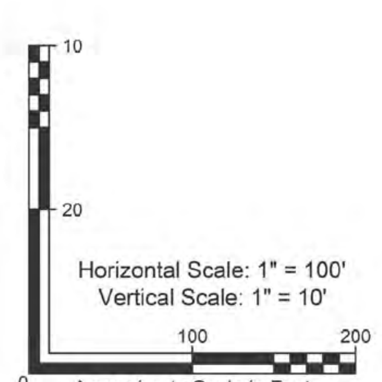


PORT OF LONG BEACH ENTRANCE CHANNEL
AT
QUEENS GATE

CROSS SECTION LOOKING NORTH

SURVEY DATA FROM USACE SURVEY

NOVEMBER, 2015

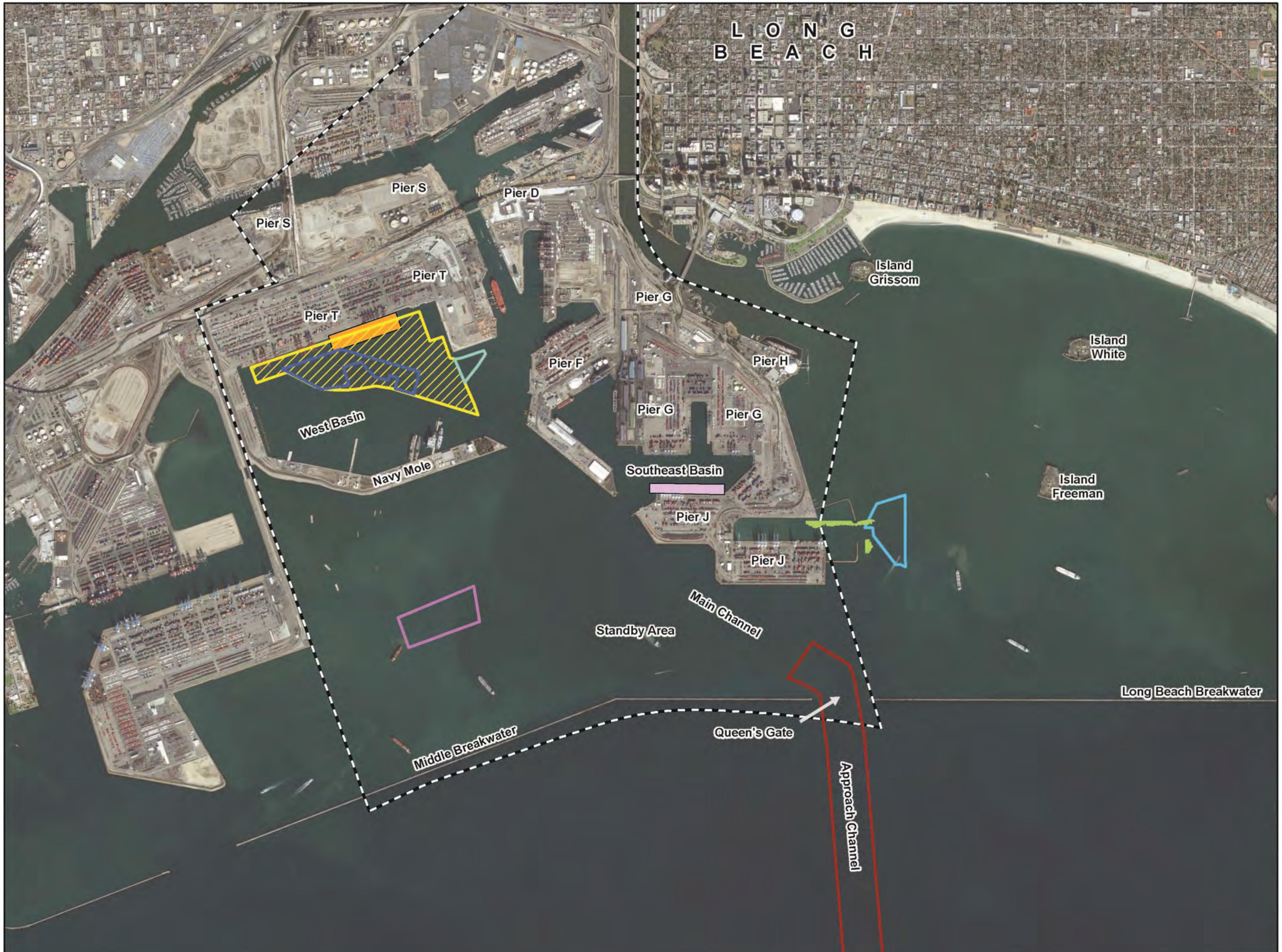


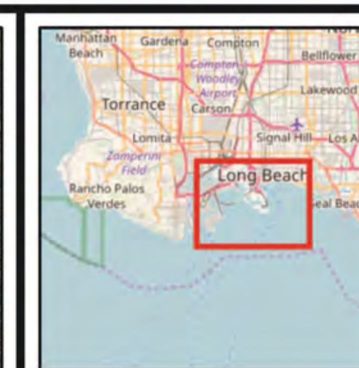
ALL LOCATIONS ARE APPROXIMATE

LOS ANGELES AND LONG BEACH HARBOR, CALIFORNIA
NAVIGATION IMPROVEMENTS
PORT OF LONG BEACH
PORT OF LONGBEACH ENTRANCE CHANNEL
AT QUEENS GATE

US Army Corps of Engineers
Los Angeles District

CKD BY: JY/MLR		PLATE
DWN BY: jbd / eh		C-2
DATE: February 2021		





Legend

Sediment Chemistry and Biotoxicity Testing Areas

- 1994 Queen's Gate Approach Channel Sediment Chemistry Testing Area
- 2012 Bulk Sediment Chemistry & Effluent Ellutriate Testing Boundary
- 2012 Pier J Environmental Testing Area
- 2013 Pier T Berths 132 to 134 Environmental Testing Area
- 2013 Pier J Berths 245 to 247 Environmental Testing Area
- 2013 Pier J Turning Basin Environmental Testing Area
- 2013 Pier T West Basin Access Channel Environmental Testing Area
- 2014 Pier Echo Sediment & Biotoxicity Testing Boundary
- 2014 Pier T Bulk Environmental Testing Area
- POLB Boundary

SOURCES:
Imagery Background:
Image Copyright
2015 DigitalGlobe Inc

Reference Map:
© OpenStreetMap (and) contributors, CC-BY-SA

Coordinate System:
NAD 1983 StatePlane
California V FIPS 0405 Feet
Datum: NAD 1983

N

0 1,500 3,000 Feet

1 inch = 3,000 feet

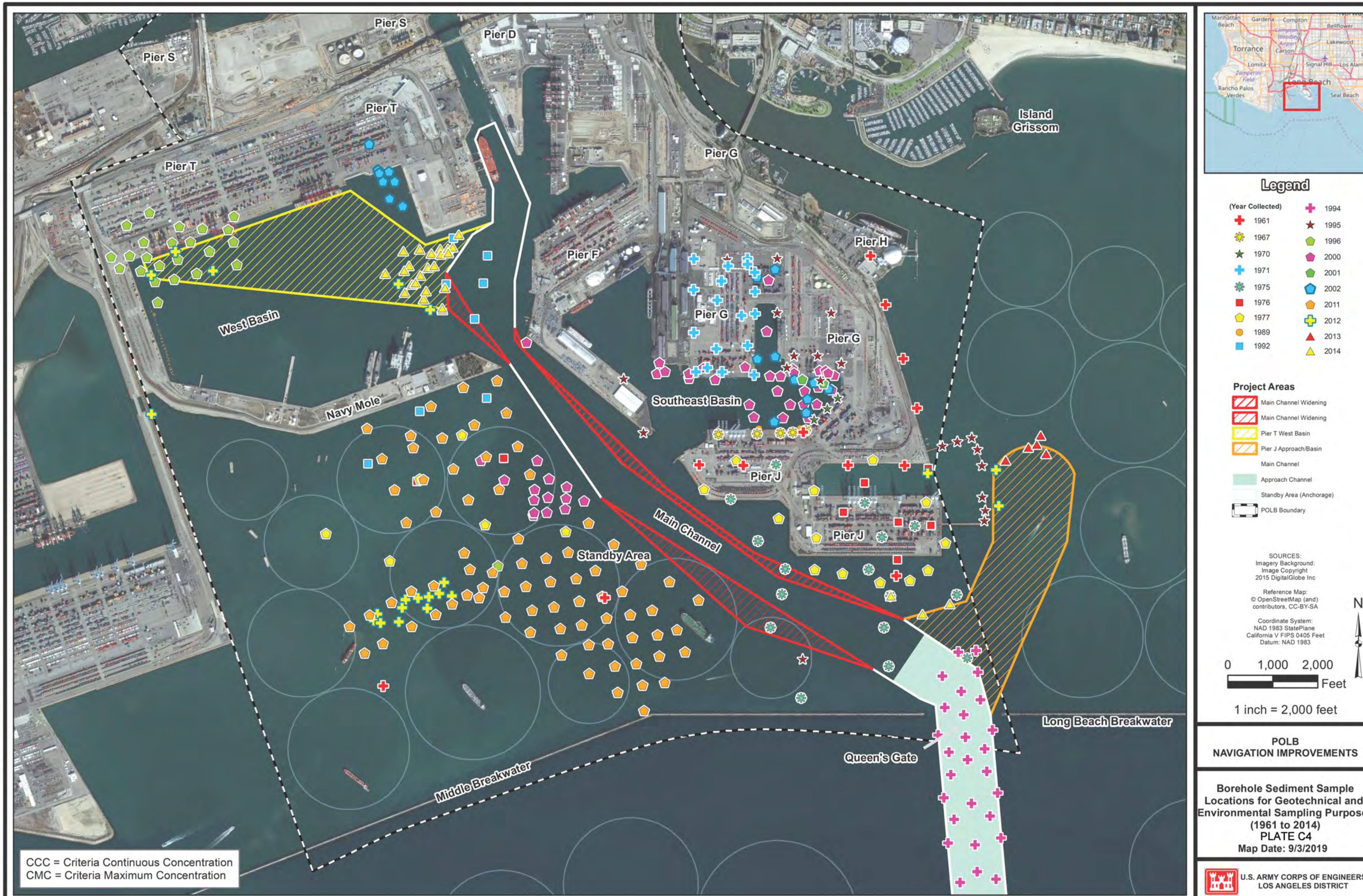
POLB NAVIGATION IMPROVEMENTS

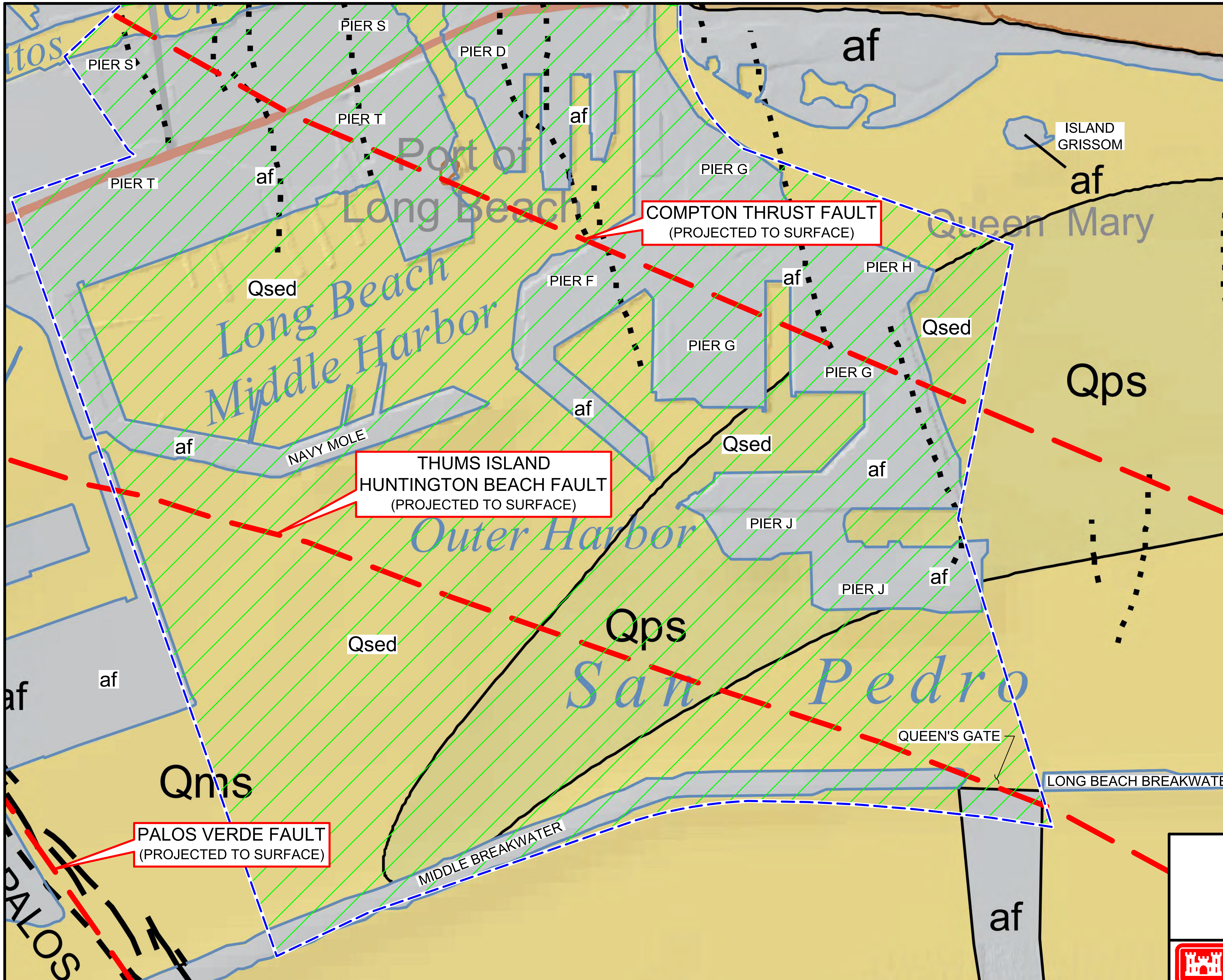
INVENTORY MAP OF ENVIRONMENTAL TESTING EVENTS FOR SEDIMENT

PLATE C3

Map Date: 9/3/2019

U.S. ARMY CORPS OF ENGINEERS
LOS ANGELES DISTRICT


Pier S
Pier D
Pier S
Pier T
Pier T
Island Grissom
Pier G
Pier H
Pier F
Pier G
Pier G
West Basin
Navy Mole
Southeast Basin
Pier J
Pier J
Main Channel
Standby Area
Long Beach Breakwater
Queen's Gate
Middle Breakwater
CCC = Criteria Continuous Concentration
CMC = Criteria Maximum Concentration
Legend
(Year Collected)
1961
1967
1970
1971
1975
1976
1977
1989
1992
1994
1995
1996
2000
2001
2002
2011
2012
2013
2014
Project Areas
Main Channel Widening
Main Channel Widening
Pier T West Basin
Pier J Approach/Basin
Main Channel
Approach Channel
Standby Area (Anchorage)
POLB Boundary
SOURCES:
Imagery Background:
Image Copyright
2015 DigitalGlobe Inc
Reference Map:
© OpenStreetMap (and) contributors, CC-BY-SA
Coordinate System:
NAD 1983 StatePlane
California V FIPS 0405 Feet
Datum: NAD 1983
N
0 1,000 2,000
Feet
1 inch = 2,000 feet
POLB
NAVIGATION IMPROVEMENTS
Borehole Sediment Sample Locations for Geotechnical and Environmental Sampling Purposes (1961 to 2014)
PLATE C4
Map Date: 9/3/2019
U.S. ARMY CORPS OF ENGINEERS
LOS ANGELES DISTRICT



EXPLANATION

SYMBOLS

POLB BOUNDARY

Qsed BOUNDARY

POTENTIALLY ACTIVE EARTHQUAKE FAULTS (USGS, U.S. Quaternary Faults website accessed on 2/12/2021, https://usgs.maps.arcgis.com

UNITS

af	ARTIFICIAL FILL - ALL LAND AREAS WITHIN POLB BOUNDARY ARE ARTIFICIAL FILL
Qsed	QUATERNARY SEDIMENT: LOOSE TO SUSPENDED 4 INCH LAYER OF MUD AND SILT UNDERLAIN BY ALTERNATING LAYERS OF SEDIMENT COMPOSED OF SAND, SILTY SAND AND SILT
Qms	UNCONSOLIDATED SHELF SEDIMENT
Qps	PLEISTOCENE SEDIMENTARY DEPOSITS, UNDIVIDED

Sources: Excerpt of "GEOLOGIC MAP OF THE LONG BEACH 30' x 60' QUADRANGLE, CALIFORNIA", Version 2.0, BY California Geologic Survey. Dated: 2016

ALL LOCATIONS ARE APPROXIMATE

N

0 2000' 4000'
Approximate Scale in Feet

PORT OF LONG BEACH
NAVIGATION IMPROVEMENTS
LOS ANGELES COUNTY, CALIFORNIA
STUDY AREA
LOCAL MARINE GEOLOGY

US Army Corps of Engineers
Los Angeles District

CKD BY: LS/JPY
DWN BY: jbd
DATE: March 2021

PLATE
C5

Plot Date: 3/03/2021 10:33:09 AM, Plotted by: l1ed9jbd, File Name: POLB_B01-PLATE C5_MARINE GEOLOGY.DWG, Plate C5_Project Features Map

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APPENDIX C: GEOTECHNICAL ENGINEERING - ATTACHMENT 2

FEDERAL CHANNEL EXPANSION STUDY GEOTECHNICAL INPUT FOR BERTH AND CHANNEL DEEPENING

(Earth Mechanics, Inc. 1-19-2017)

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Earth Mechanics, Inc.

Geotechnical & Earthquake Engineering

DATE: January 19, 2017 **EMI PROJECT NO:** 15-152

TO: Jeff Khouri, P.E. / AECOM
Richard Mast, P.E. / AECOM

FROM: Pratheep K. Pratheepan, P.E. / Earth Mechanics, Inc. (EMI)
Arul K. Arulmoli, G.E. / EMI

SUBJECT: ***Geotechnical Input for Berth and Channel Deepening***
Port-Wide Dredge Plan and Federal Channel Expansion Study
Port of Long Beach, California

Introduction

Port of Long Beach (POLB) retained AECOM team to provide engineering consultancy services for the Port-Wide Dredge Plan and Federal Channel Expansion Study Project. As a part of this project, a Berth and Channel Deepening study (Sub-Task 1.8) was performed in support of the Federal Expansion Study. The objective of this study is to provide cost input to the US Army Corps of Engineers for the work associated with deepening the berths, as well as provide input on required "stand-off" distances for the deepened channel from critical infrastructure. Three potential dredge depths (-53 ft MLLW, -55 ft MLLW and -57 ft MLLW) with a 2-ft over dredge allowance were considered for the dredging in this study. This study also includes widening of the main channel at some locations (to -76 ft MLLW). Attachment 1 shows the proposed Navigation Improvements. To facilitate this study, potential wharf improvement solutions and associated costs for each berth dredge depth were developed by the AECOM team. In addition to the wharf improvement solutions, Earth Mechanics, Inc (EMI) also provided "stand-off" distances from the existing port structures (dikes, bulkhead walls, breakwaters, etc.) to protect the port structures from any potential undermining/damage due to the dredging and operations within the Federal Channels and waterways.

This memorandum provides the summary of preliminary geotechnical input provided by EMI for the Berth and Channel Deepening study. EMI provided the geotechnical input as a subconsultant to AECOM.

Review of Available Drawings

From the design/record drawings database, POLB provided available drawings and details of various port structures along the channels and waterways. These drawings included critical data such as, the design water depths of existing port structures, current water depths and distances to the proposed/existing channels and waterways from the toe of the existing port structures. The list of reports provided by POLB and reviewed by EMI are included in the References section.

The information from these drawings was used to develop potential wharf improvement solutions and to determine the "stand-off" distances.

Proposed "Stand-Off" Distances

Portions of the proposed channel dredging are within the vicinity of existing port structures such as bulkhead walls, breakwaters and rock dikes. "Stand-off" distances from the toe of these structures are recommended to minimize any potential damages/undermining of these existing structures. Recommended "stand-off" distances are summarized in Table 1 and a schematic diagram shown in Figure 1. Assumptions involved in developing these "stand-off" distances are listed below.

1. No dredging will be performed within the standoff distance.
2. The dredge slopes beyond the standoff distances will be designed to be stable during dredging and long term operational conditions.

Proposed Wharf Improvements

The proposed berth dredging depths, are deeper than the design/existing water depths at many of the berths. Therefore, wharf improvement solutions need to be implemented before dredging near the existing wharves to avoid any damages to the existing wharf structures due to failure of the existing slopes during dredging. Based on past experience with similar projects, an underwater bulkhead wall at the toe of the existing slope is considered to be an effective and practical wharf improvement solution.

However, since the underwater bulkhead walls are cantilever type structures, under high loading conditions, such as very tall dredge cuts or seismic loadings, additional backland or mid slope ground improvements may be required. Due the rock protections on slopes and buried utilities in the backland, jet grouting is considered to be most suitable ground improvement option.

The below listed assumptions were used to develop the wharf improvement solutions.

1. Bulkhead and other improvements are based on engineering judgement and limited high level evaluations. Further geotechnical and structural analyses are needed to finalize these configurations.
2. Under Static and all seismic conditions [i.e., Operating Level Earthquake (OLE), Contingency Level Earthquake (CLE) and Design Earthquake (DE)], bulkheads should generally not reduce stability of the existing slope. Maximum lateral displacements at the top of the bulkhead: 3", 12", and 36", under OLE, CLE and DE, respectively, to meet the POLB Wharf Design Criteria (WDC) screening criteria for 24" octagonal precast, prestressed concrete piles. Moment demand on the bulkhead section under OLE was kept within the elastic moment capacity of the bulkhead section (F_y = 50 ksi).
3. Maximum lateral displacement at the top of the bulkhead under Modified OLE was assumed to be about 12 inches. Moment demand on the bulkhead section was kept below approximately 1.5 times the elastic moment capacity of the bulkhead section (F_y = 50 ksi).
4. "Berth Pocket" in front of the proposed bulkhead (i.e. waterside filled with rock) was assumed for scour protection.
5. An over dredge allowance of 2 feet was assumed.

Based on past experience with similar berth deepening projects and engineering judgement, potential wharf improvement solutions were developed for each berth area. Recommended wharf improvement solutions are summarized in Tables 2, 3 and 4, respectively for dredge depths, -53 ft, -55 ft and -57 ft MLLW water depths.

Limitations

This memorandum is intended only for the use of AECOM, its designers, and the Port of Long Beach for proposed Berth and Channel Dredging Study. This memorandum is based on the project as described and the information provided by AECOM and obtained from available drawings. The recommendations contained in this memorandum are based on available drawings, assumptions made due to incomplete information, and engineering judgement. EMI has no responsibility for errors and incompleteness of available design drawings and assumptions made by EMI due to these errors and incomplete information.

EMI should be notified of any pertinent changes or new information in the as-built and proposed plans. Such changes or variations may require a re-evaluation of the recommendations contained in this report.

The data, opinions, and recommendations contained in this study memorandum are applicable to the specific project element(s) and location(s) which is (are) the subject of this memorandum. They are not intended for design and have no applicability to any other design elements or to any other locations and any and all subsequent users accept any and all liability resulting from any use or reuse of the data, opinions, and recommendations without the prior written consent of EMI.

Services performed by EMI have been conducted in a manner consistent with that level of care and skill ordinarily exercised by members of the profession currently practicing in the same locality under similar conditions. No other representation, expressed or implied, and no warranty or guarantee is included or intended.

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Table 1: Recommended "Stand-Off" Distances from Port Structures

Existing Structures		Recommended "Stand-Off" Distance[(1)] (ft)
Structure Type	**Structure Location**	
Bulkhead Wall	Berths D32 and D33	150
Steel Cells	Berths T122, T124 and T126	
Rock Dike	Future potential Pier J South triangular fill	100
	West face of Pier F from the tip of the Pier F Mole to the Pilot Station and around the corner to F202.	
	Berths F202 and F203	
	Berths G230	
	Berths J260, J262, J264 and J265	
	Tip of the Navy Mole	
Breakwater	Pier J South Breakwaters	50

[1)] Please note the "stand-off" distances are measured from the toe of the existing dikes or bulkhead walls (See Figure 1).

Table 2: Berth Deepening to EL. -53 ft MLLW plus 2 FT Over Dredge (i.e. Lowest El. -55 ft MLLW)

Pier / Berth	Mudline Elevation at Pierhead Line[1] (ft, MLLW)		Bulkhead and Additional Improvements				
	Designed	**Existing**	**Static Only[2]**	**Static + Modified OLE[3]**	**Static + OLE**	**Static + CLE**	**Static + DE**
Pier F/ F204 & F205	-36	-38.2 to -39.5	Solution 12 HZ1180MA & AZ36-700N Combination HZ1180MA from -32' to -100' AZ36-700N from -32' to -65'	Solution 24 Double HZ1080MD & AZ36-700N Combination HZ1080MD from -32' to -125' AZ36-700N from -32' to -65'	Solution 12 HZ1180MD & AZ36-700N Combination HZ1180MD from -32' to -110' AZ36-700N from -32' to -65' + Top GI - 30 ft Wide From +10' to -60' + Mid Slope GI - 15 ft Wide From -20 to -65	Solution 24 Double HZ1080MD & AZ36-700N Combination HZ1080MD from -32' to -115' AZ36-700N from -32' to -65' + Top GI - 30 ft Wide From +10' to -60' + Mid Slope GI - 30 ft Wide From -20 to -65	Solution C23 Continuous HZ880MA HZ880MA from -32' to -120' + Top GI - 30 ft Wide From +10' to -60' + Mid Slope GI - 30 ft Wide From -20 to -65
Pier G/ G232 & G236	-55	-52 to -53	No improvements needed	No improvements needed	No improvements needed	No improvements needed	AZ36-700N Sheet Pile From -51 to -70
Pier J North/ J245 Thru J247	-48	48.6 to -49.6	AZ36-700N Sheet Pile From -44' to -80'	Solution 12 HZ1180MA & AZ36-700N Combination HZ1180MA from -44' to -100' AZ36-700N from -44' to -65'	Solution 12 HZ1080MA & AZ36-700N Combination HZ1080MA from -44' to -85' AZ36-700N from -44' to -65' + Top GI 30 ft Wide From +10' to -60'	Solution 12 HZ880MC & AZ36-700N Combination HZ880MC from -44' to -85' AZ36-700N from -44' to -65' + Top GI - 30 ft Wide From +10' to -60' + Mid Slope GI - 30 ft Wide From -35 to -65	Solution 12 HZ1080MD & AZ36-700N Combination HZ1080MD from -44' to -90' AZ36-700N from -44' to -65' + Top GI - 30 ft Wide From +10' to -60' + Mid Slope GI - 30 ft Wide From -35 to -65
Pier J South/ J266 Thru J270	-55	-47.5 to -47.9	No improvements needed	AZ50 Sheet Pile From -51 to -90	AZ36-700N Sheet Pile From -51 to -70 + Top GI 30 ft Wide From +10' to -60'	AZ36-700N Sheet Pile From -51 to -75 + Top GI - 30 ft Wide From +10' to -60' + Mid Slope GI - 30 ft Wide From -30 to -65	AZ50 Sheet Pile From -51 to -80 + Top GI - 30 ft Wide From +10' to -60' + Mid Slope GI - 30 ft Wide From -30 to -65
Pier T/ T132 Thru T140	-55	-48 to -51	No improvements needed	No improvements needed	No improvements needed	No improvements needed	AZ40-700N Sheet Pile From -51 to -70

NOTES:
[1] Information provided by POLB
[2] Static condition is expected to accommodate PGA of approximately 0.1g
[3] Maximum lateral displacement at the top of the bulkhead under Modified OLE is assumed to be about 12 inches. Moment demand on the bulkhead section was kept below approximately 1.5 times the elastic moment capacity of the bulkhead section (Fy = 50 ksi).

PGA – Horizontal Peak Ground Acceleration
OLE – Operational Level Earthquake; PGA = 0.21g (WDC, 2015 & EMI, 2006); CLE – Contingency Level Earthquake; PGA = 0.51g (WDC, 2015 & EMI, 2006); DE – Design Earthquake; PGE = 0.54g (WDC, 2015 & EMI, 2015)
WDC – POLB Wharf Design Criteria
Sheet piles and King piles used are by Skyline Steel (NUCOR Company). Equivalent sections by other manufacturers are also acceptable.

See Assumptions and References listed respectively, in Page 2 and 3 of the memorandum.

Table 3: Berth Deepening to EL. -55 ft MLLW plus 2 FT Over Dredge (i.e. Lowest El. -57 ft MLLW)

Pier / Berth	Mudline Elevation at Pierhead Line[1] (ft, MLLW)		Bulkhead and Additional Improvements				
	Designed	Existing	Static Only[2]	Static + Modified OLE[3]	Static + OLE	Static + CLE	Static + DE
Pier F/ F204 & F205	-36	-38.2 to -39.5	Solution 12 HZ1180MD & AZ36-700N Combination HZ1180MD from -32' to -105' AZ36-700N from -32' to -67'	Solution 24 Double HZ1180MD & AZ36-700N Combination HZ1180MD from -32' to -130' AZ36-700N from -32' to -67'	Solution 12 Double HZ1080MD & AZ36-700N Combination HZ1080MD from -32' to -115' AZ36-700N from -32' to -67' + Top GI - 30 ft Wide From +10' to -60' + Mid Slope GI - 15 ft Wide From -20 to -65	Solution C23 Continuous HZ880MC HZ880MC from -32' to -120' + Top GI - 30 ft Wide From +10' to -60' + Mid Slope GI - 30 ft Wide From -20 to -65	Solution C23 Continuous HZ1080MD HZ1080MD from -32' to -125' + Top GI - 30 ft Wide From +10' to -60' + Mid Slope GI - 30 ft Wide From -20 to -65
Pier G/ G232 & G236	-55	-52 to -53	No improvements needed	No improvements needed	No improvements needed	No improvements needed	AZ40-700N Sheet Pile From -51 to -80
Pier J North/ J245 Thru J247	-48	48.6 to -49.6	AZ40-700N Sheet Pile From -44' to -85'	Solution 24 Double HZ1080MA & AZ36-700N Combination HZ1080MA from -44' to -105' AZ36-700N from -44' to -67'	Solution 12 HZ1180MA & AZ36-700N Combination HZ1180MA from -44' to -90' AZ36-700N from -44' to -67' + Top GI 30 ft Wide From +10' to -60'	Solution 12 HZ1080MA & AZ36-700N Combination HZ1080MA from -44' to -90' AZ36-700N from -44' to -67' + Top GI - 30 ft Wide From +10' to -60' + Mid Slope GI - 30 ft Wide From -35 to -65	Solution 12 HZ1180MD & AZ36-700N Combination HZ1180MD from -44' to -95' AZ36-700N from -44' to -67' + Top GI - 30 ft Wide From +10' to -60' + Mid Slope GI - 30 ft Wide From -35 to -65
Pier J South/ J266 Thru J270	-55	-47.5 to -47.9	No improvements needed	Solution 12 HZ880MC & AZ36-700N Combination HZ880MC from -51' to -95' AZ36-700N from -51' to -67'	AZ50 Sheet Pile From -51 to -75 + Top GI 30 ft Wide From +10' to -60'	AZ46-700N Sheet Pile From -51 to -80 + Top GI - 30 ft Wide From +10' to -60' + Mid Slope GI - 30 ft Wide From -30 to -65	Solution 12 HZ880MC & AZ36-700N Combination HZ880MC from -51' to -85' AZ36-700N from -51' to -67' + Top GI - 30 ft Wide From +10' to -60' + Mid Slope GI - 30 ft Wide From -30 to -65
Pier T/ T132 Thru T140	-55	-48 to -51	No improvements needed	No improvements needed	No improvements needed	No improvements needed	AZ50 Sheet Pile From -51 to -80

NOTES:
[1] Information provided by POLB
[2] Static condition is expected to accommodate PGA of approximately 0.1g
[3] Maximum lateral displacement at the top of the bulkhead under Modified OLE is assumed to be about 12 inches. Moment demand on the bulkhead section was kept below approximately 1.5 times the elastic moment capacity of the bulkhead section (Fy = 50 ksi).
PGA – Horizontal Peak Ground Acceleration
OLE – Operational Level Earthquake; PGA = 0.21g (WDC, 2015 & EMI, 2006); CLE – Contingency Level Earthquake; PGA = 0.51g (WDC, 2015 & EMI, 2006); DE – Design Earthquake; PGE = 0.54g (WDC, 2015 & EMI, 2015)
WDC – POLB Wharf Design Criteria
Sheet piles and King piles used are by Skyline Steel (NUCOR Company). Equivalent sections by other manufacturers are also acceptable.

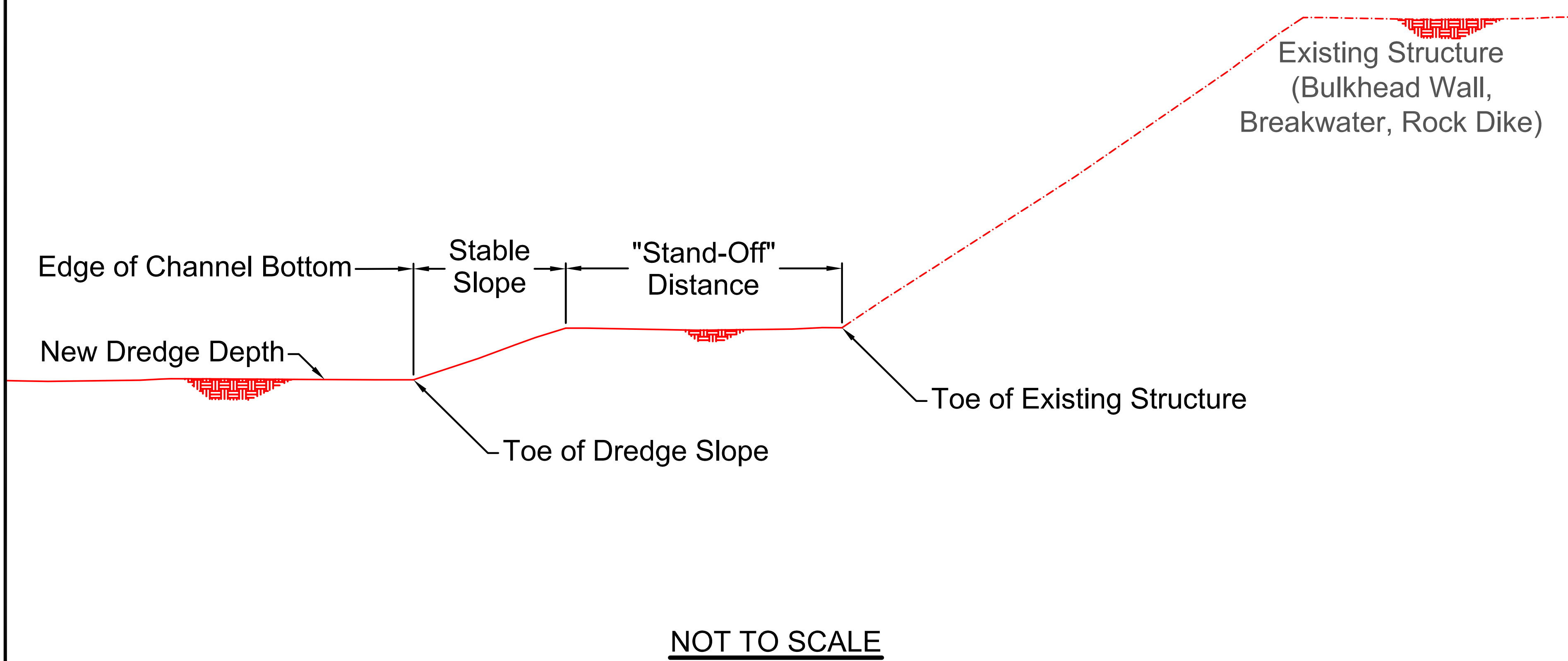
See Assumptions and References listed respectively, in Page 2 and 3 of the memorandum.

Table 4: Berth Deepening to EL. -57 ft MLLW plus 2 FT Over Dredge (i.e. Lowest El. -59 ft MLLW)

Pier / Berth	Mudline Elevation at Pierhead Line[1] (ft, MLLW)		Bulkhead and Additional Improvements				
	Designed	Existing	Static Only[2]	Static + Modified OLE[3]	Static + OLE	Static + CLE	Static + DE
Pier F/ F204 & F205	-36	-38.2 to -39.5	Solution 24 Double HZ1080MD & AZ36-700N Combination HZ1080MD from -32' to -110' AZ36-700N from -32' to -69'	Solution C23 Continuous HZ1080MA HZ1080MA from -32' to -135'	Solution 12 Double HZ1180MD & AZ36-700N Combination HZ1080MD from -32' to -120' AZ36-700N from -32' to -69' + Top GI - 30 ft Wide From +10' to -60' + Mid Slope GI - 15 ft Wide From -20 to -65	Solution C23 Continuous HZ1080MD HZ1080MA from -32' to -125' + Top GI - 30 ft Wide From +10' to -60' + Mid Slope GI - 30 ft Wide From -20 to -65	Solution C23 Continuous HZ1180MD HZ1180MD from -32' to -130' + Top GI - 30 ft Wide From +10' to -60' + Mid Slope GI - 30 ft Wide From -20 to -65
Pier G/ G232 & G236	-55	-52 to -53	AZ36-700N Sheet Pile From -51' to -80'	AZ36-700N Sheet Pile From -51' to -80'	AZ36-700N Sheet Pile From -51' to -80'	AZ40-700N Sheet Pile From -51 to -80	Solution 12 HZ880MC & AZ36-700N Combination HZ880MC from -51' to -85' AZ36-700N from -51' to -69'
Pier J North/ J245 Thru J247	-48	48.6 to -49.6	AZ48-700N Sheet Pile From -44' to -90'	Solution 24 Double HZ1180MD & AZ36-700N Combination HZ1180MD from -44' to -110' AZ36-700N from -44' to -69'	Solution 24 Double HZ1080MA & AZ36-700N Combination HZ1080MA from -44' to -95' AZ36-700N from -44' to -69' + Top GI 30 ft Wide From +10' to -60'	Solution 12 HZ1180MD & AZ36-700N Combination HZ1180MD from -44' to -95' AZ36-700N from -44' to -69' + Top GI - 30 ft Wide From +10' to -60' + Mid Slope GI - 30 ft Wide From -35 to -65	Solution 24 Double HZ1080MD & AZ36-700N Combination HZ1080MD from -44' to -100' AZ36-700N from -44' to -69' + Top GI - 30 ft Wide From +10' to -60' + Mid Slope GI - 30 ft Wide From -35 to -65
Pier J South/ J266 Thru J270	-55	-47.5 to -47.9	AZ36-700N Sheet Pile From -51' to -80'	Solution 12 HZ1080MD & AZ36-700N Combination HZ1080MD from -51' to -100' AZ36-700N from -51 to -69'	Solution 12 HZ880MC & AZ36-700N Combination HZ880MC from -51' to -85' AZ36-700N from -44' to -69' + Top GI 30 ft Wide From +10' to -60'	AZ50 Sheet Pile From -51 to -90 + Top GI - 30 ft Wide From +10' to -60' + Mid Slope GI - 30 ft Wide From -30 to -65	Solution 12 HZ1080MA & AZ36-700N Combination HZ1080MA from -51' to -95' AZ36-700N from -51' to -69' + Top GI - 30 ft Wide From +10' to -60' + Mid Slope GI - 30 ft Wide From -30 to -65
Pier T/ T132 Thru T140	-55	-48 to -51	No improvements needed	No improvements needed	No improvements needed	AZ50 Sheet Pile From -51 to -80	Solution 12 HZ1180MA & AZ36-700N Combination HZ1180MA from -51' to -85' AZ36-700N from -51' to -69'

NOTES:
[1] Information provided by POLB
[2] Static condition is expected to accommodate PGA of approximately 0.1g
[3] Maximum lateral displacement at the top of the bulkhead under Modified OLE is assumed to be about 12 inches. Moment demand on the bulkhead section was kept below approximately 1.5 times the elastic moment capacity of the bulkhead section (Fy = 50 ksi).
PGA – Horizontal Peak Ground Acceleration
OLE – Operational Level Earthquake; PGA = 0.21g (WDC, 2015 & EMI, 2006); CLE – Contingency Level Earthquake; PGA = 0.51g (WDC, 2015 & EMI, 2006); DE – Design Earthquake; PGE = 0.54g (WDC, 2015 & EMI, 2015)
WDC – POLB Wharf Design Criteria
Sheet piles and King piles used are by Skyline Steel (NUCOR Company). Equivalent sections by other manufacturers are also acceptable.

See Assumptions and References listed respectively, in Page 2 and 3 of the memorandum.



Earth Mechanics, Inc.
Geotechnical and Earthquake Engineering

BERTH AND CHANNEL DEEPENING
PORT WIDE DREDGE PLAN AND FEDERAL CHANNEL EXPANSION STUDY
PORT OF LONG BEACH, CALIFORNIA

Project No: 15-152 | Date: 01-19-2017

Schematic Diagram of "Stand-Off" Distance

Figure 1

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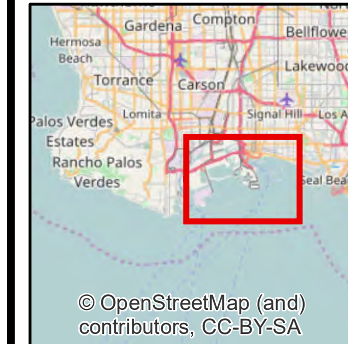
ATTACHMENT 1: POLB NAVIGATION IMPROVEMENT PLAN



Legend

- Main Channel Widening
- Pier T West Basin
- Pier J Approach/Basin
- Southeast Basin
- Standby Area
- Main Channel
- Standby Area Circle
- Standby Area Center
- Approach Channel
- POLB Boundary

N

SOURCES:

Imagery Background:
Image Copyright
2015 DigitalGlobe Inc

Coordinate System:
NAD 1983 StatePlane
California V FIPS 0405 Feet

0 1,500 3,000 Feet

1 inch = 3,000 feet

POLB NAVIGATION IMPROVEMENTS

MAIN POLB MAP

Date: 10/25/2016

U.S. ARMY CORPS OF ENGINEERS
LOS ANGELES DISTRICT

APPENDIX C: GEOTECHNICAL ENGINEERING - ATTACHMENT 3

Plate C6 – BATHYMETRY MAP
&
Plate C7 – NOAA CHART NO 18751

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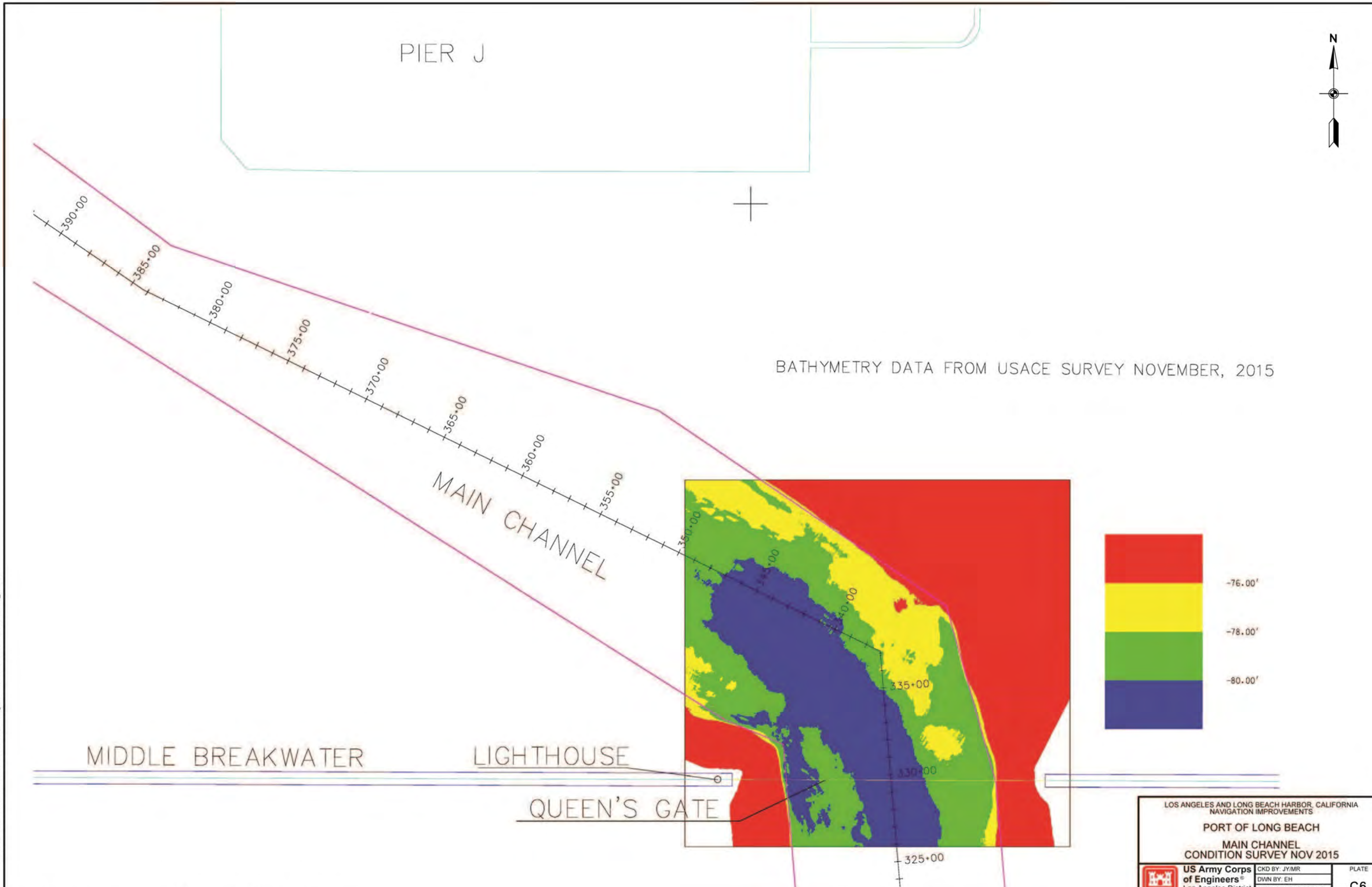
PIER J
BATHYMETRY DATA FROM USACE SURVEY NOVEMBER, 2015
390+00
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365+00
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355+00
350+00
335+00
330+00
325+00
MAIN CHANNEL
-76.00'
-78.00'
-80.00'
MIDDLE BREAKWATER
LIGHTHOUSE
QUEEN'S GATE
N
LOS ANGELES AND LONG BEACH HARBOR, CALIFORNIA
NAVIGATION IMPROVEMENTS
PORT OF LONG BEACH
MAIN CHANNEL
CONDITION SURVEY NOV 2015
US Army Corps of Engineers®
Los Angeles District
CKD BY: JY/MR
DWN BY: EH
DATE: NOVEMBER 2017
PLATE
C6
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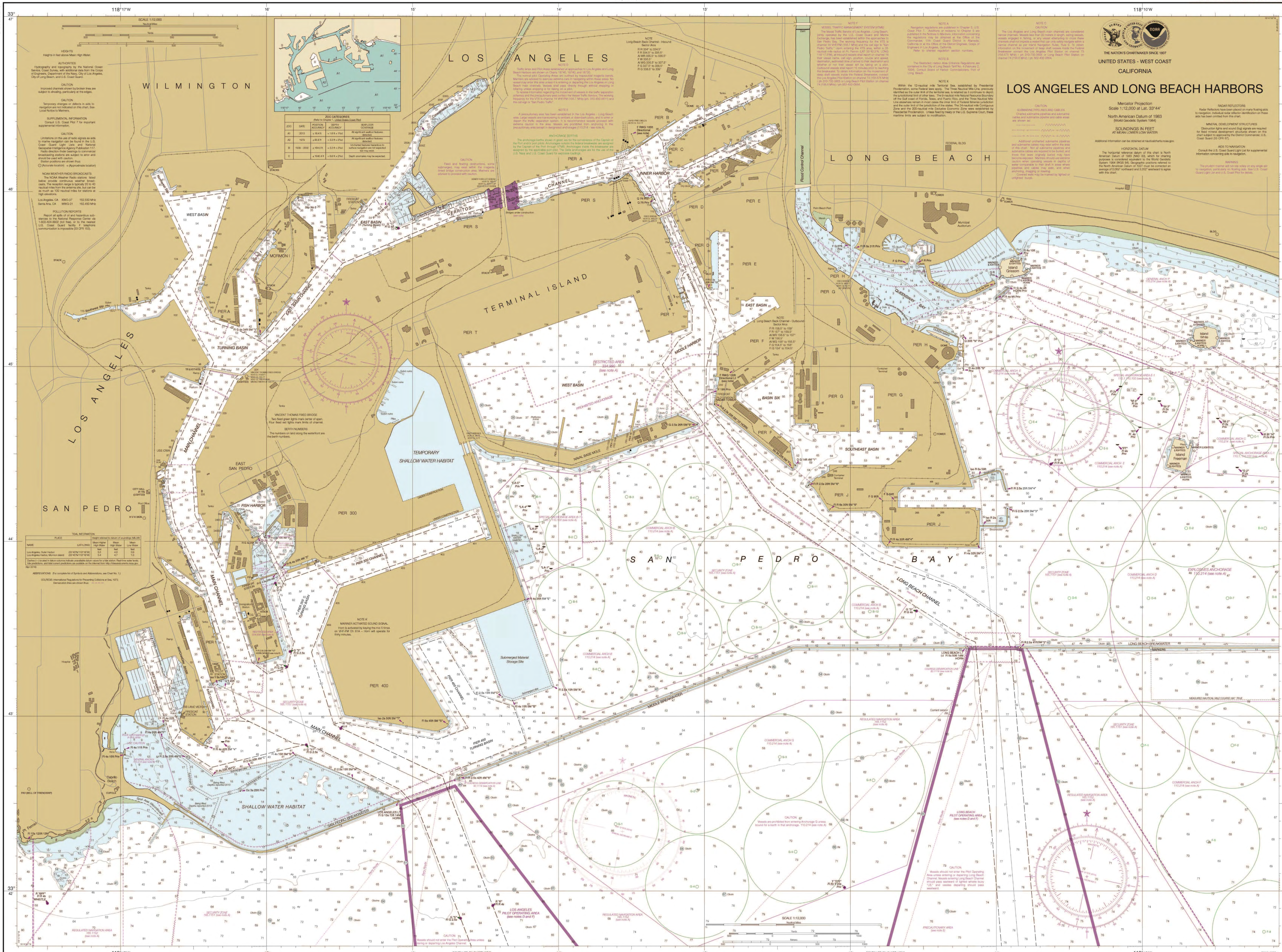

18751

48th Ed., Jul. 2016. Last Correction: 2/28/2017. Cleared through: LNM: 0817 (2/21/2017), NM: 0917 (3/4/2017)

CAUTION

This chart has been corrected from the Notice to Mariners (NM) published weekly by the National Geospatial-Intelligence Agency and the Local Notice to Mariners (LNM) issued periodically by each U.S. Coast Guard district to the dates shown in the lower left hand corner. Chart updates corrected from Notice to Mariners published after the dates shown in the lower left hand corner are available at nauticalcharts.noaa.gov.

NOAA encourages users to submit inquiries, discrepancies or comments about this chart at http://www.nauticalcharts.noaa.gov/staff/contact.htm.

SOUNDINGS IN FEET

Published at Washington, D.C.
U.S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL OCEAN SERVICE
COAST SURVEY

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Los Angeles and Long Beach Harbors
SOUNDINGS IN FEET - SCALE 1:12,000

18751

US Army Corps of Engineers® Los Angeles District	CHECKED BY: JY/MR
	DRAWN BY: eh
	DATE: NOVEMBER 2017

PLATE C7

APPENDIX C: GEOTECHNICAL ENGINEERING - ATTACHMENT 4

USACE SLOPE STABILITY MODELS

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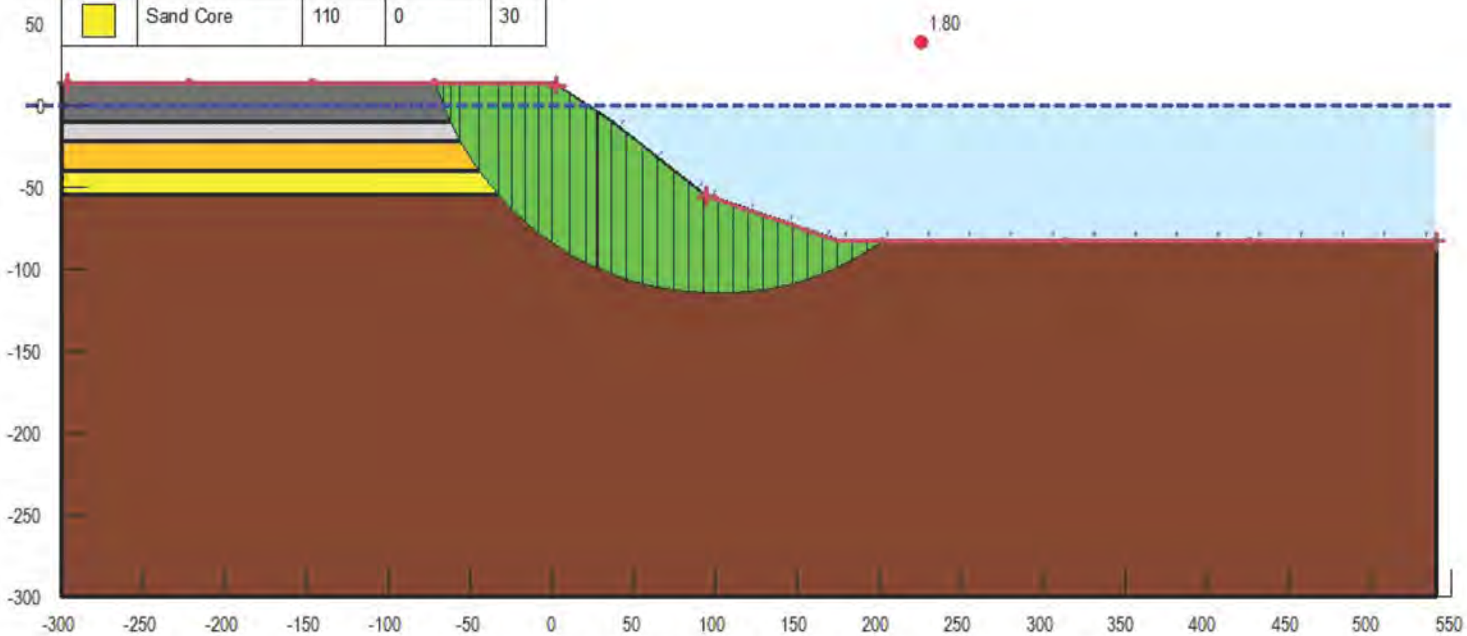
Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Class A Stone	111	0	45
	Class B Stone	120	0	45
	Clay Core	110	1,000	0
	Foundations Soils	119	1,200	11
	Sand Core	110	0	30



MIDDLE BREAKWATER - NO STANDOFF

STATIC

LOS ANGELES AND LONG BEACH HARBOR, CALIFORNIA
NAVIGATION IMPROVEMENTS

PORT OF LONG BEACH

DREDGING SLOPE STABILITY
MIDDLE BREAKWATER
NO STANDOFF STATIC

US Army Corps of Engineers ® Los Angeles District	CKD BY: JY/MR	PLATE
	DWN BY: EH	D1
	DATE: JANUARY 2021	

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Class A Stone	111	0	45
	Class B Stone	120	0	45
	Clay Core	110	1,000	0
	Foundations Soils	119	1,200	11
	Sand Core	110	0	30

MIDDLE BREAKWATER - NO STANDOFF

SEISMIC

LOS ANGELES AND LONG BEACH HARBOR, CALIFORNIA
NAVIGATION IMPROVEMENTS

PORT OF LONG BEACH

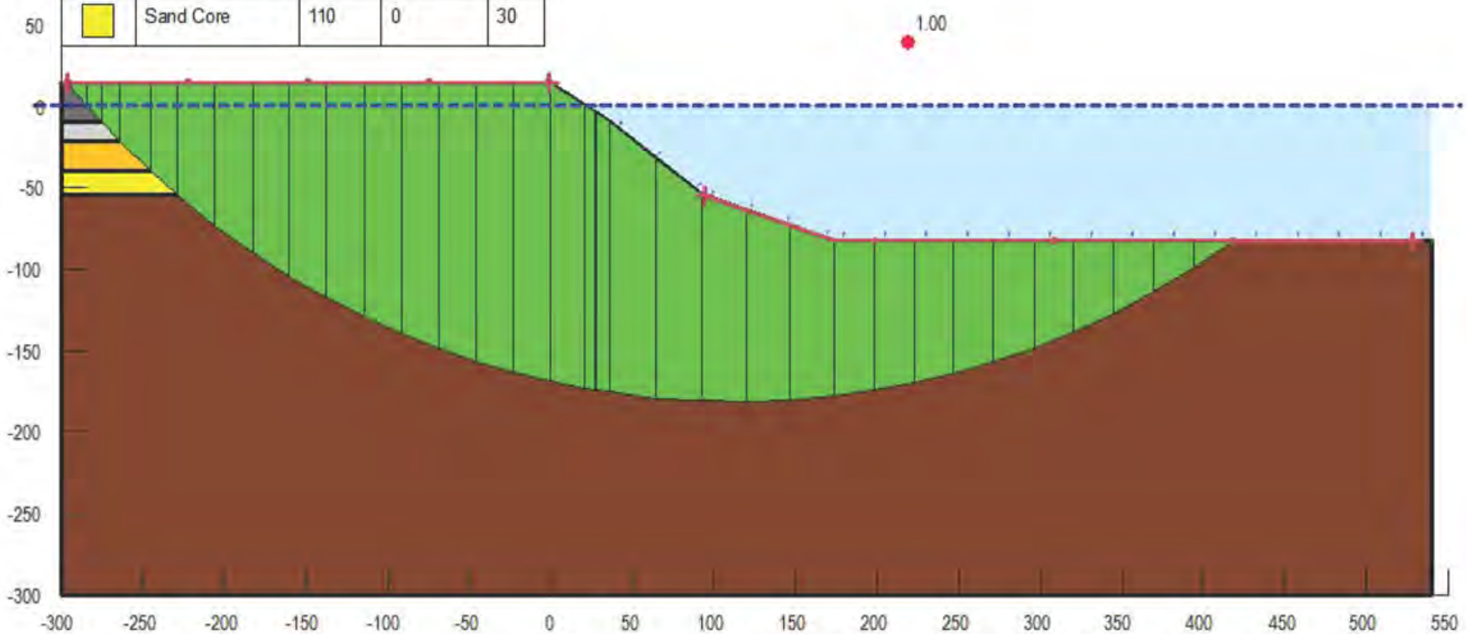
DREDGING SLOPE STABILITY
MIDDLE BREAKWATER
NO STANDOFF SEISMIC

US Army Corps of Engineers ®
Los Angeles District

CKD BY: JY/MR
DWN BY: EH
DATE: JANUARY 2021

PLATE
D2

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Class A Stone	111	0	45
	Class B Stone	120	0	45
	Clay Core	110	1,000	0
	Foundations Soils	119	1,200	11
	Sand Core	110	0	30



MIDDLE BREAKWATER - NO STANDOFF
YIELD ACCELERATION

LOS ANGELES AND LONG BEACH HARBOR, CALIFORNIA
NAVIGATION IMPROVEMENTS
PORT OF LONG BEACH
DREDGING SLOPE STABILITY
MIDDLE BREAKWATER
NO STANDOFF YIELD ACCELERATION

US Army Corps of Engineers ®
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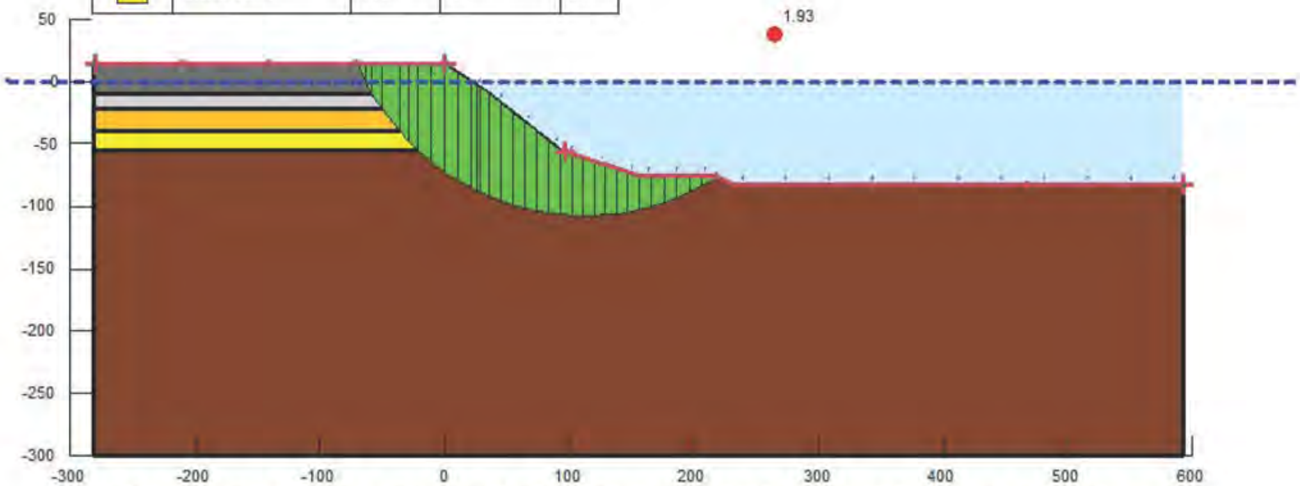
CKD BY: JY/MR	PLATE
DWN BY: EH	D3
DATE: JANUARY 2021	

HERNANDEZ F: \\SPL\DOCUMENTS\GEOTECH\YANG\PORT OF LB\REPORT\FIGURES_PLATES\C-4 GPOLC_D03.DGN

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Class A Stone	111	0	45
	Class B Stone	120	0	45
	Clay Core	110	1,000	0
	Foundations Soils	119	1,200	11
	Sand Core	110	0	30



MIDDLE BREAKWATER - STANDOFF 50 FEET
STATIC

LOS ANGELES AND LONG BEACH HARBOR, CALIFORNIA
NAVIGATION IMPROVEMENTS
PORT OF LONG BEACH
DREDGING SLOPE STABILITY
MIDDLE BREAKWATER
STANDOFF 50FT STATIC

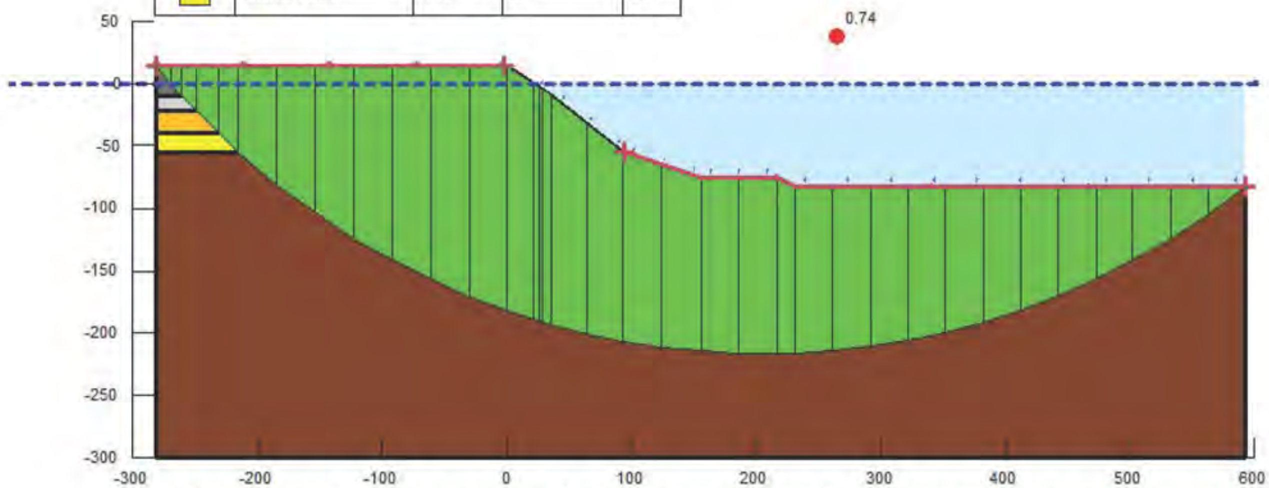
US Army Corps of Engineers ®
Los Angeles District

CKD BY: JY/MR
DWN BY: EH
DATE: JANUARY 2021

PLATE
D4

HERNANDEZ F: \\SPL\DOCUMENTS\GEOTECH\YANG\PORT OF LB\REPORT\FIGURES_PLATES\C-4 GPOLC_D04.DGN

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Class A Stone	111	0	45
	Class B Stone	120	0	45
	Clay Core	110	1,000	0
	Foundations Soils	119	1,200	11
	Sand Core	110	0	30

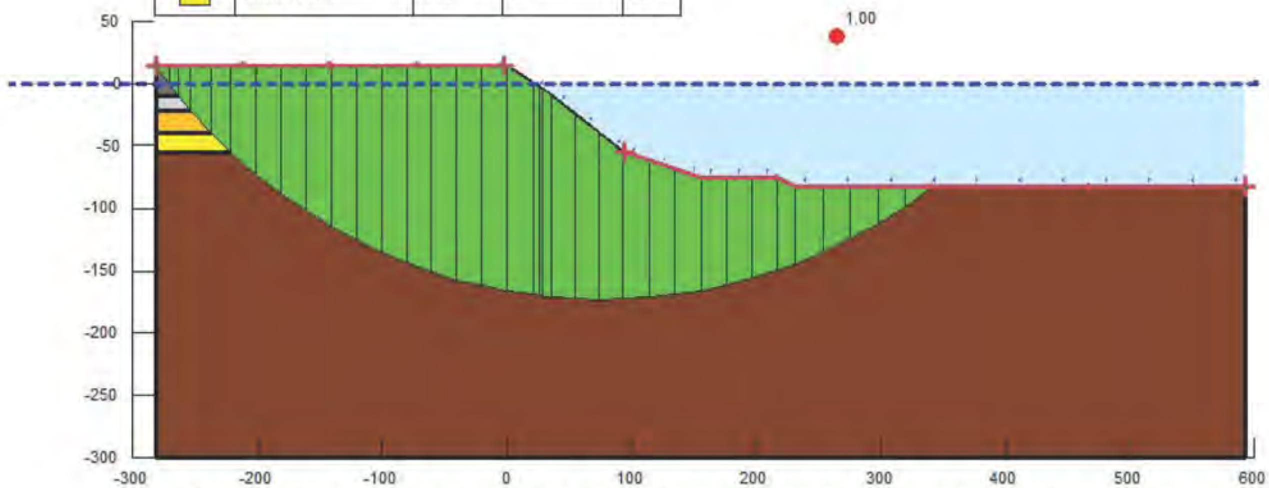


MIDDLE BREAKWATER - STANDOFF 50 FEET
SEISMIC

LOS ANGELES AND LONG BEACH HARBOR, CALIFORNIA
NAVIGATION IMPROVEMENTS
PORT OF LONG BEACH
DREDGING SLOPE STABILITY
MIDDLE BREAKWATER
STANDOFF 50FT SEISMIC

US Army Corps of Engineers ® Los Angeles District	CKD BY: JY/MR	PLATE
	DWN BY: EH	D5
	DATE: JANUARY 2021	

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Class A Stone	111	0	45
	Class B Stone	120	0	45
	Clay Core	110	1,000	0
	Foundations Soils	119	1,200	11
	Sand Core	110	0	30

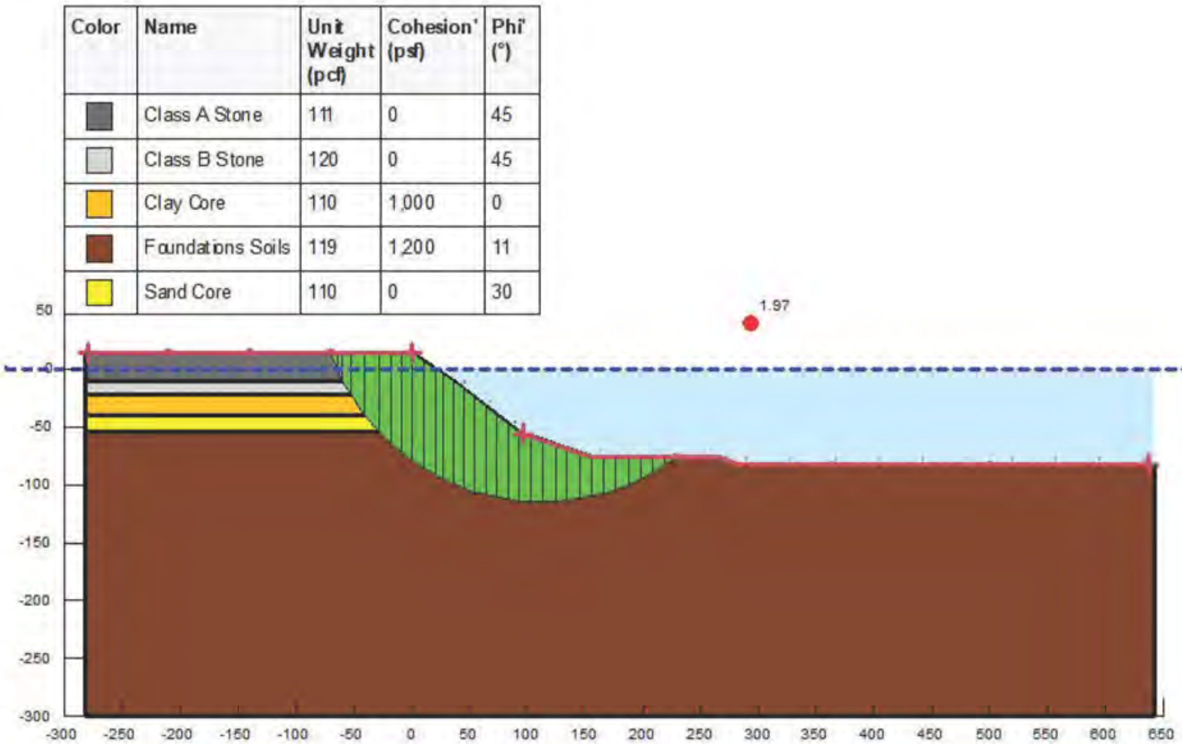


MIDDLE BREAKWATER - STANDOFF 50 FEET
YIELD ACCELERATION

LOS ANGELES AND LONG BEACH HARBOR, CALIFORNIA
NAVIGATION IMPROVEMENTS
PORT OF LONG BEACH
DREDGING SLOPE STABILITY
MIDDLE BREAKWATER
STANDOFF 50FT YIELD ACCELERATION

US Army Corps of Engineers ® Los Angeles District	CKD BY: JY/MR	PLATE
	DWN BY: EH	D6
	DATE: JANUARY 2021	

HERNANDEZ F: \\SPL\DOCUMENTS\GEOTECH\YANG\PORT OF LB\REPORT\FIGURES_PLATES\C-4 GPOLC_D06.DGN



MIDDLE BREAKWATER - STANDOFF 100 FEET
STATIC

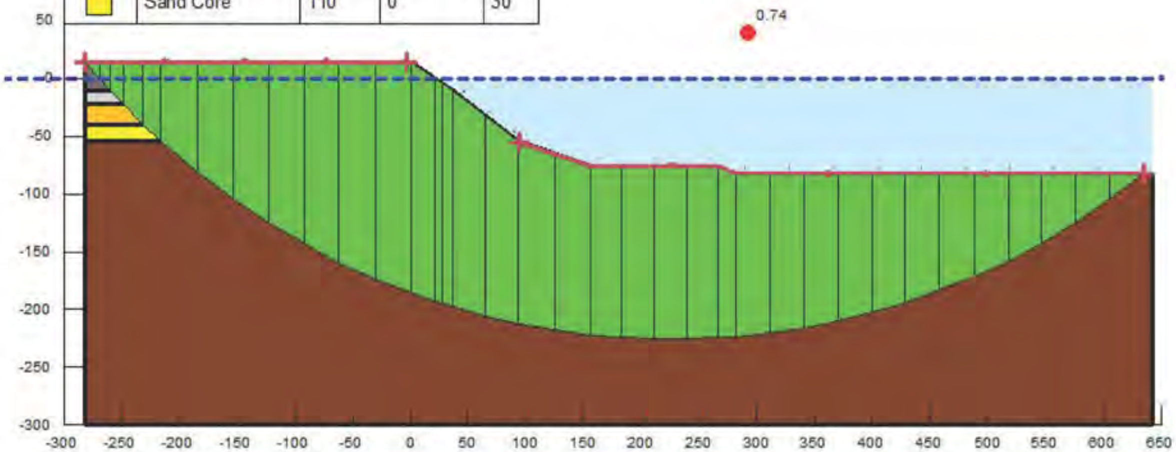
LOS ANGELES AND LONG BEACH HARBOR, CALIFORNIA
NAVIGATION IMPROVEMENTS
PORT OF LONG BEACH
DREDGING SLOPE STABILITY
MIDDLE BREAKWATER
STANDOFF 100FT STATIC

US Army Corps of Engineers ®
Los Angeles District

CKD BY: JY/MR	PLATE
DWN BY: EH	D7
DATE: JANUARY 2021	

HERNANDEZ F: \\SPL\DOCUMENTS\GEOTECH\YANG\PORT OF LB\REPORT\FIGURES_PLATES\C-4 GPOLC_D07.DGN

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Class A Stone	111	0	45
	Class B Stone	120	0	45
	Clay Core	110	1,000	0
	Foundations Soils	119	1,200	11
	Sand Core	110	0	30

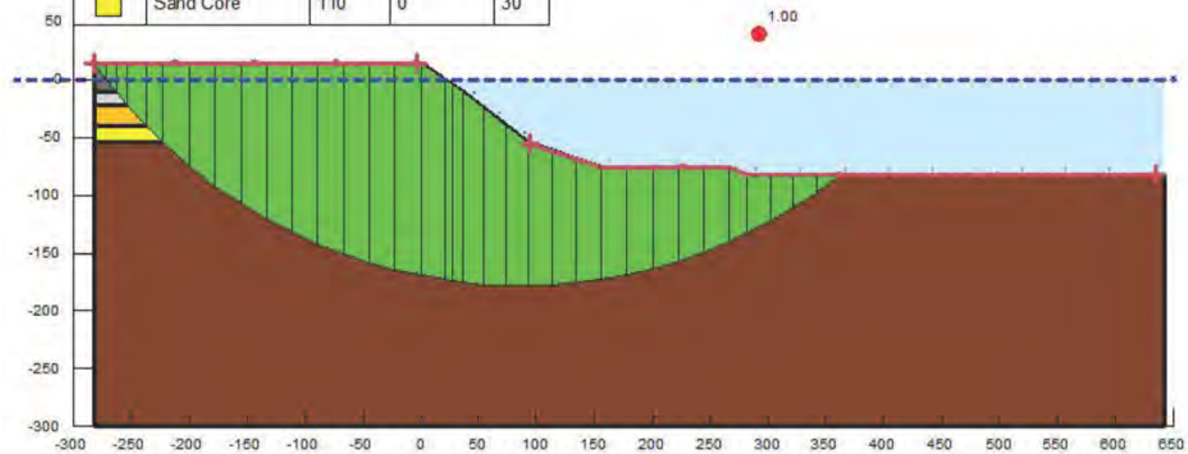


MIDDLE BREAKWATER - STANDOFF 100 FEET
SEISMIC

LOS ANGELES AND LONG BEACH HARBOR, CALIFORNIA NAVIGATION IMPROVEMENTS PORT OF LONG BEACH DREDGING SLOPE STABILITY MIDDLE BREAKWATER STANDOFF 100FT SEISMIC		
US Army Corps of Engineers ® Los Angeles District	CKD BY: JY/MR DWN BY: EH DATE: JANUARY 2021	PLATE D8

HERNANDEZ F: \\SPL\DOCUMENTS\GEOTECH\YANG\PORT OF LB\REPORT\FIGURES_PLATES\C-4 GPOLC_D08.DGN

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Class A Stone	111	0	45
	Class B Stone	120	0	45
	Clay Core	110	1,000	0
	Foundations Soils	119	1,200	11
	Sand Core	110	0	30



MIDDLE BREAKWATER - STANDOFF 100 FEET
YIELD ACCELERATION

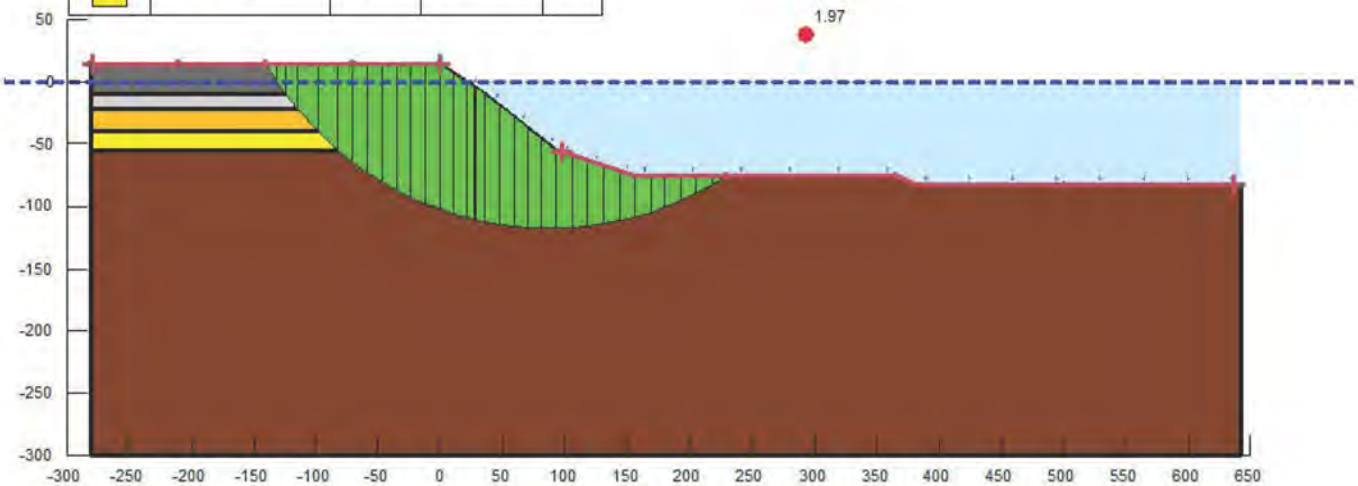
LOS ANGELES AND LONG BEACH HARBOR, CALIFORNIA
NAVIGATION IMPROVEMENTS
PORT OF LONG BEACH
DREDGING SLOPE STABILITY
MIDDLE BREAKWATER
STANDOFF 100FT YIELD ACCELERATION

US Army Corps of Engineers ®
Los Angeles District

CKD BY: JY/MR	PLATE
DWN BY: EH	D9
DATE: JANUARY 2021	

HERNANDEZ F: \\SPL\DOCUMENTS\GEOTECH\YANG\PORT OF LB\REPORT\FIGURES_PLATES\C-4 GPOLC_D09.DGN

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Class A Stone	111	0	45
	Class B Stone	120	0	45
	Clay Core	110	1,000	0
	Foundations Soils	119	1,200	11
	Sand Core	110	0	30



MIDDLE BREAKWATER - STANDOFF 200 FEET

STATIC

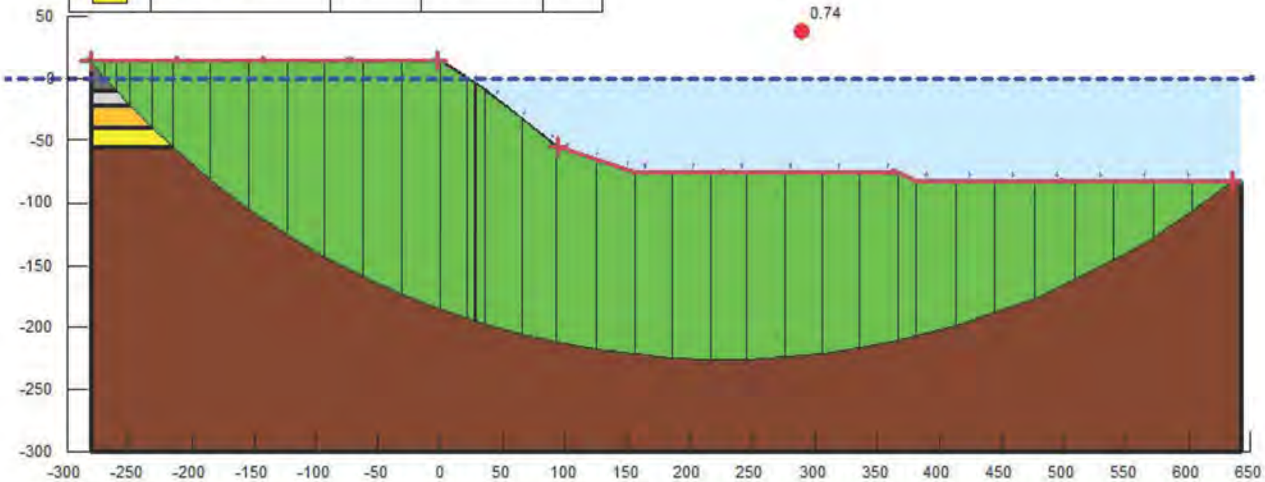
LOS ANGELES AND LONG BEACH HARBOR, CALIFORNIA
NAVIGATION IMPROVEMENTS
PORT OF LONG BEACH
DREDGING SLOPE STABILITY
MIDDLE BREAKWATER
STANDOFF 200FT STATIC

US Army Corps of Engineers ®
Los Angeles District

CKD BY: JY/MR	PLATE
DWN BY: EH	D10
DATE: JANUARY 2021	

HERNANDEZ F: \\SPL\DOCUMENTS\GEOTECH\YANG\PORT OF LB\REPORT\FIGURES_PLATES\C-4 GPOLC_D10.DGN

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Class A Stone	111	0	45
	Class B Stone	120	0	45
	Clay Core	110	1,000	0
	Foundations Soils	119	1,200	11
	Sand Core	110	0	30



MIDDLE BREAKWATER - STANDOFF 200 FEET
SEISMIC

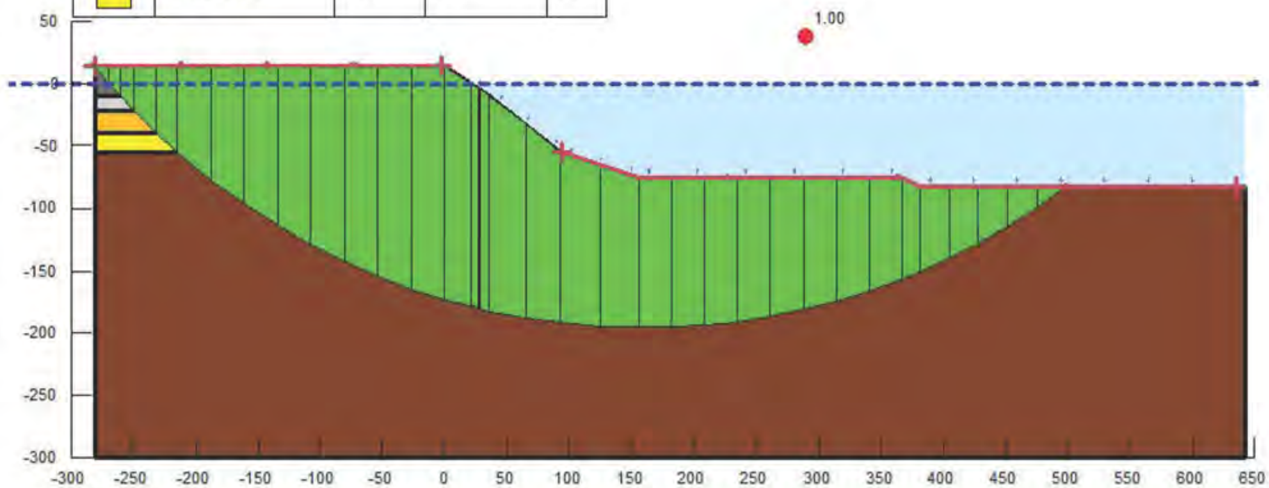
LOS ANGELES AND LONG BEACH HARBOR, CALIFORNIA
NAVIGATION IMPROVEMENTS
PORT OF LONG BEACH
DREDGING SLOPE STABILITY
MIDDLE BREAKWATER
STANDOFF 200FT SEISMIC

US Army Corps of Engineers ® Los Angeles District

CKD BY: JY/MR	PLATE
DWN BY: EH	D11
DATE: JANUARY 2021	

HERNANDEZ F: \\SPL\DOCUMENTS\GEOTECH\YANG\PORT OF LB\REPORT\FIGURES_PLATES\C-4 GPOLC_D11.DGN

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Class A Stone	111	0	45
	Class B Stone	120	0	45
	Clay Core	110	1,000	0
	Foundations Soils	119	1,200	11
	Sand Core	110	0	30



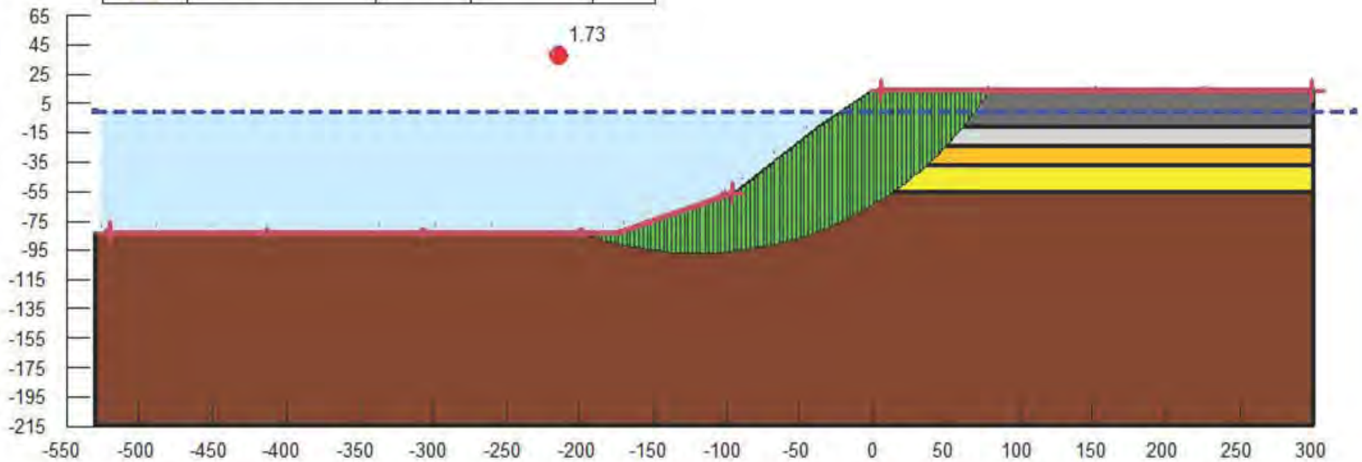
MIDDLE BREAKWATER - STANDOFF 200 FEET
YIELD ACCELERATION

LOS ANGELES AND LONG BEACH HARBOR, CALIFORNIA
NAVIGATION IMPROVEMENTS
PORT OF LONG BEACH
DREDGING SLOPE STABILITY
MIDDLE BREAKWATER
STANDOFF 200FT YIELD ACCELERATION

US Army Corps of Engineers ® Los Angeles District	CKD BY: JY/MR	PLATE
	DWN BY: EH	
	DATE: JANUARY 2021	D12

HERNANDEZ F: \\SPL\DOCUMENTS\GEOTECH\YANG\PORT OF LB\REPORT\FIGURES_PLATES\C-4 GPOLC_D12.DGN

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Class A Stone	111	0	45
	Class B Stone	120	0	45
	Clay Core	110	1,000	0
	Foundations Soils	136	1,200	9
	Sand Core	110	0	30



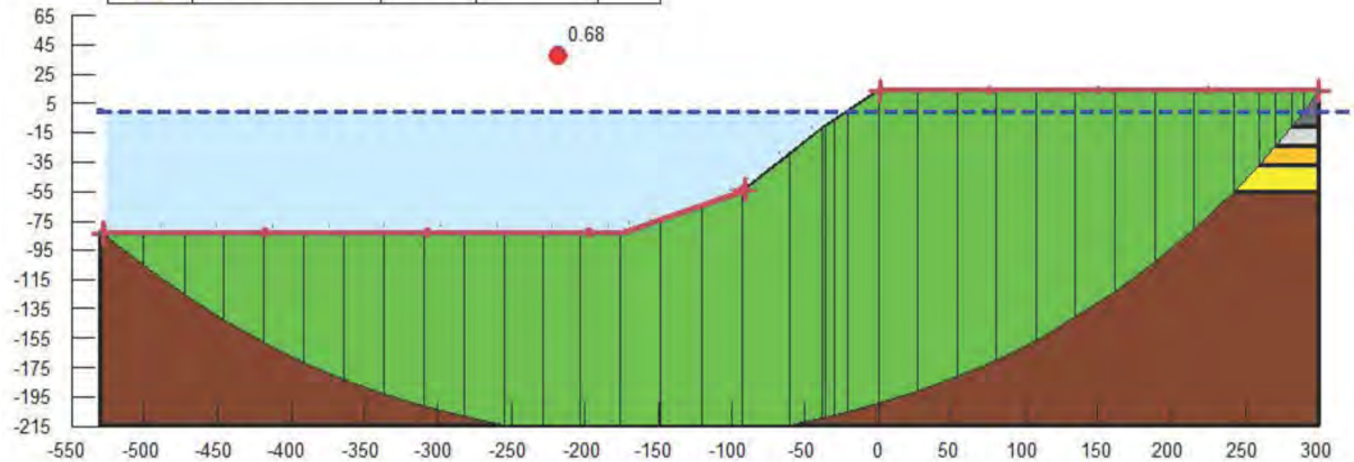
LONG BEACH BREAKWATER - NO STANDOFF
STATIC

LOS ANGELES AND LONG BEACH HARBOR, CALIFORNIA
NAVIGATION IMPROVEMENTS
PORT OF LONG BEACH
DREDGING SLOPE STABILITY
LONG BEACH BREAKWATER
NO STANDOFF STATIC

US Army Corps of Engineers® Los Angeles District	CKD BY: JY/MR	PLATE
	DWN BY: EH	D13
	DATE: JANUARY 2021	

HERNANDEZ F: \\SPL\DOCUMENTS\GEOTECH\YANG\PORT OF LB\REPORT\FIGURES_PLATES\C-4 GPOLC_D13.DGN

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Class A Stone	111	0	45
	Class B Stone	120	0	45
	Clay Core	110	1,000	0
	Foundations Soils	136	1,200	9
	Sand Core	110	0	30



LONG BEACH BREAKWATER - NO STANDOFF
SEISMIC

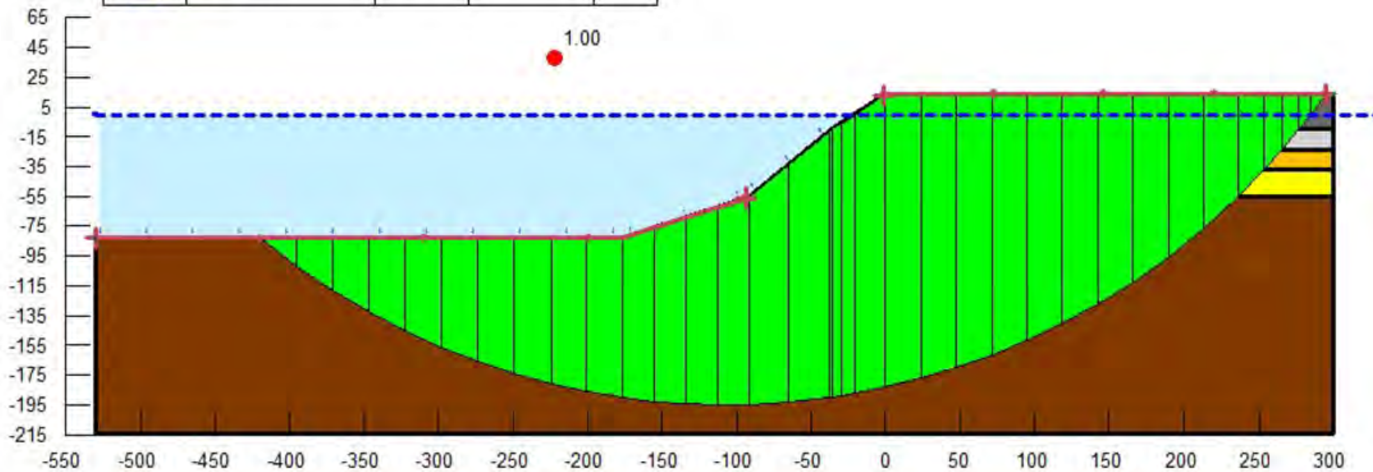
LOS ANGELES AND LONG BEACH HARBOR, CALIFORNIA
NAVIGATION IMPROVEMENTS
PORT OF LONG BEACH
DREDGING SLOPE STABILITY
LONG BEACH BREAKWATER
NO STANDOFF SEISMIC

US Army Corps of Engineers ®
Los Angeles District

CKD BY: JY/MR	PLATE
DWN BY: EH	D14
DATE: JANUARY 2021	

HERNANDEZ F: \\SPL\DOCUMENTS\GEOTECH\YANG\PORT OF LB\REPORT\FIGURES_PLATES\C-4 GPOLC_D14.DGN

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Class A Stone	111	0	45
	Class B Stone	120	0	45
	Clay Core	110	1,000	0
	Foundations Soils	136	1,200	9
	Sand Core	110	0	30



LONG BEACH BREAKWATER - NO STANDOFF
YIELD ACCELERATION

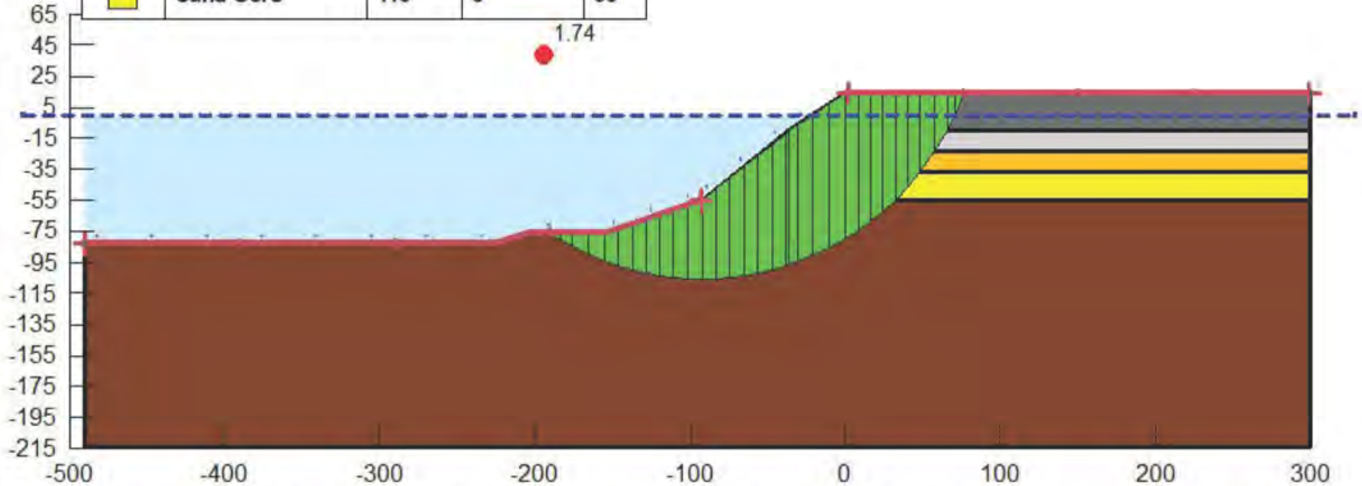
LOS ANGELES AND LONG BEACH HARBOR, CALIFORNIA
NAVIGATION IMPROVEMENTS
PORT OF LONG BEACH
DREDGING SLOPE STABILITY
LONG BEACH BREAKWATER
NO STANDOFF YIELD ACCELERATION

US Army Corps of Engineers ®
Los Angeles District

CKD BY: JY/MR	PLATE
DWN BY: EH	D15
DATE: JANUARY 2021	

HERNANDEZ F: \\SPL\DOCUMENTS\GEOTECH\YANG\PORT OF LB\REPORT\FIGURES_PLATES\C-4 GPOLC_D15.DGN

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Class A Stone	111	0	45
	Class B Stone	120	0	45
	Clay Core	110	1,000	0
	Foundations Soils	136	1,200	9
	Sand Core	110	0	30

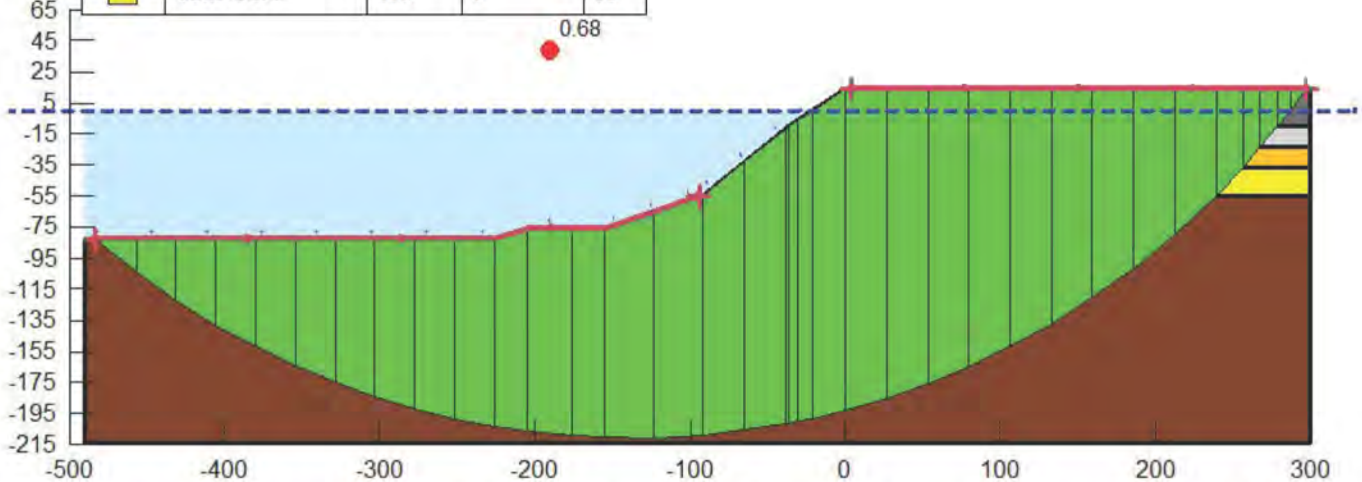


LONG BEACH BREAKWATER - 50 FEET STANDOFF STATIC

LOS ANGELES AND LONG BEACH HARBOR, CALIFORNIA
NAVIGATION IMPROVEMENTS
PORT OF LONG BEACH
DREDGING SLOPE STABILITY
LONG BEACH BREAKWATER
STANDOFF 50FT STATIC

US Army Corps of Engineers ® Los Angeles District	CKD BY: JY/MR	PLATE
	DWN BY: EH	D16
	DATE: JANUARY 2021	

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Class A Stone	111	0	45
	Class B Stone	120	0	45
	Clay Core	110	1,000	0
	Foundations Soils	136	1,200	9
	Sand Core	110	0	30



LONG BEACH BREAKWATER - 50 FEET STANDOFF SEISMIC

LOS ANGELES AND LONG BEACH HARBOR, CALIFORNIA
NAVIGATION IMPROVEMENTS

PORT OF LONG BEACH

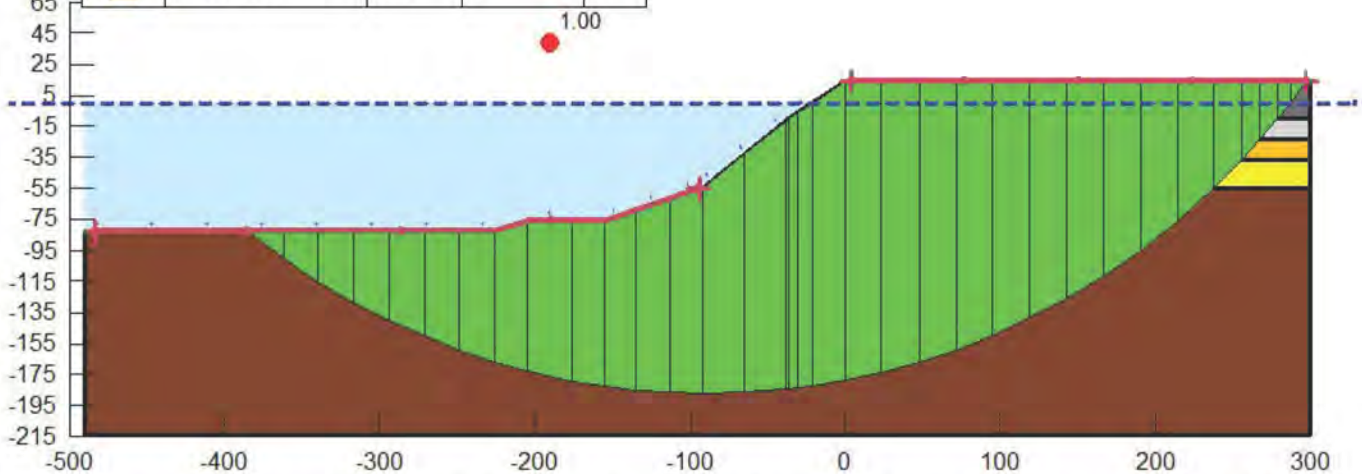
DREDGING SLOPE STABILITY
LONG BEACH BREAKWATER
STANDOFF 50FT SEISMIC

US Army Corps of Engineers ®
Los Angeles District

CKD BY: JY/MR	PLATE
DWN BY: EH	17
DATE: JANUARY 2021	

HERNANDEZ F: \\SPL\DOCUMENTS\GEOTECH\YANG\PORT OF LB\REPORT\FIGURES_PLATES\C-4 GPOLC_D17.DGN

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Class A Stone	111	0	45
	Class B Stone	120	0	45
	Clay Core	110	1,000	0
	Foundations Soils	136	1,200	9
	Sand Core	110	0	30



LONG BEACH BREAKWATER - 50 FEET STANDOFF
YIELD ACCELERATION

LOS ANGELES AND LONG BEACH HARBOR, CALIFORNIA
NAVIGATION IMPROVEMENTS

PORT OF LONG BEACH

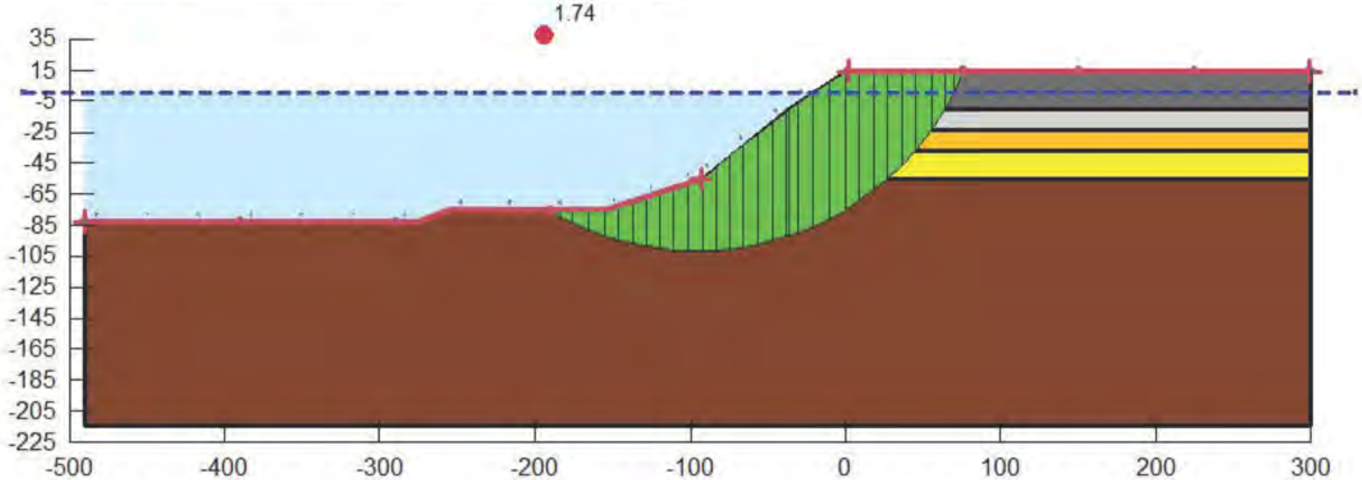
DREDGING SLOPE STABILITY
LONG BEACH BREAKWATER
STANDOFF 50FT YIELD ACCELERATION

US Army Corps of Engineers ®
Los Angeles District

CKD BY: JY/MR	PLATE
DWN BY: EH	D18
DATE: JANUARY 2021	

HERNANDEZ F: \\SPL\DOCUMENTS\GEOTECH\YANG\PORT OF LB\REPORT\FIGURES_PLATES\C-4 GPOLC_D18.DGN

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Class A Stone	111	0	45
	Class B Stone	120	0	45
	Clay Core	110	1,000	0
	Foundations Soils	136	1,200	9
	Sand Core	110	0	30



LONG BEACH BREAKWATER - 100 FEET STANDOFF STATIC

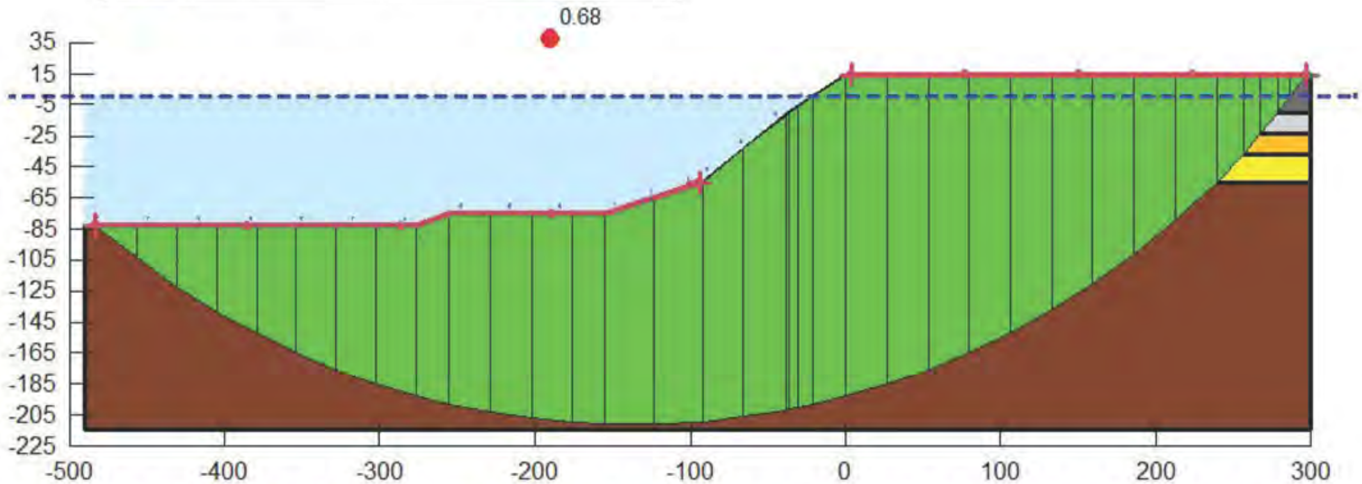
LOS ANGELES AND LONG BEACH HARBOR, CALIFORNIA
NAVIGATION IMPROVEMENTS
PORT OF LONG BEACH
DREDGING SLOPE STABILITY
LONG BEACH BREAKWATER
STANDOFF 100FT STATIC

US Army Corps of Engineers ®
Los Angeles District

CKD BY: JY/MR	PLATE
DWN BY: EH	D19
DATE: JANUARY 2021	

HERNANDEZ F: \\SPL\DOCUMENTS\GEOTECH\YANG\PORT OF LB\REPORT\FIGURES_PLATES\C-4 GPOLC_D19.DGN

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Class A Stone	111	0	45
	Class B Stone	120	0	45
	Clay Core	110	1,000	0
	Foundations Soils	136	1,200	9
	Sand Core	110	0	30



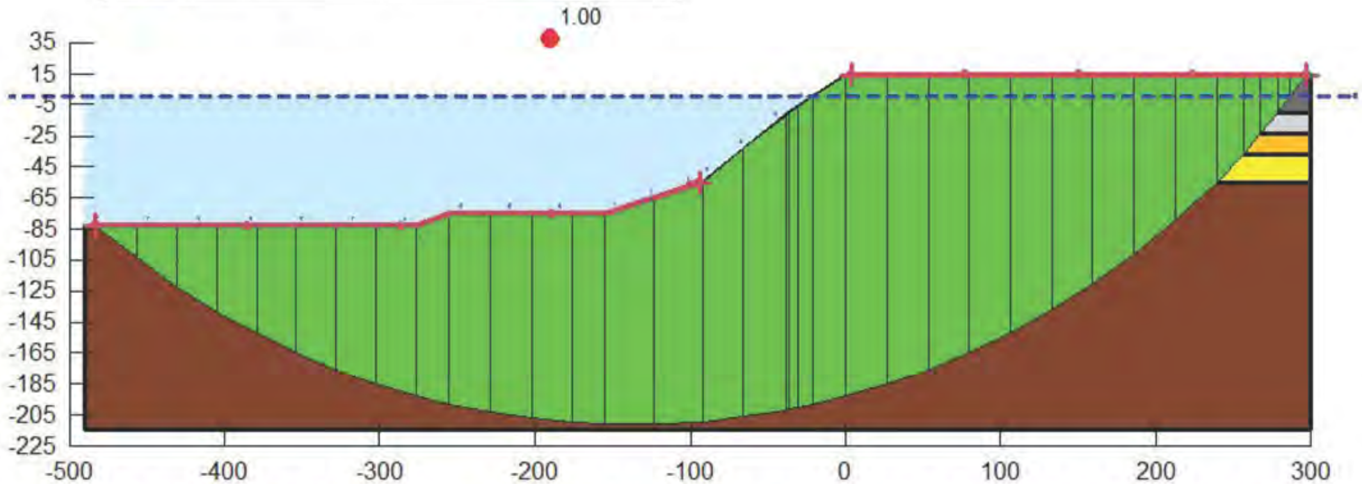
LONG BEACH BREAKWATER - 100 FEET STANDOFF SEISMIC

LOS ANGELES AND LONG BEACH HARBOR, CALIFORNIA
NAVIGATION IMPROVEMENTS
PORT OF LONG BEACH
DREDGING SLOPE STABILITY
LONG BEACH BREAKWATER
STANDOFF 100FT SEISMIC

US Army Corps of Engineers ®
Los Angeles District

CKD BY: JY/MR	PLATE
DWN BY: EH	20
DATE: JANUARY 2021	

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Class A Stone	111	0	45
	Class B Stone	120	0	45
	Clay Core	110	1,000	0
	Foundations Soils	136	1,200	9
	Sand Core	110	0	30



LONG BEACH BREAKWATER - 100 FEET STANDOFF

YIELD ACCELERATION

LOS ANGELES AND LONG BEACH HARBOR, CALIFORNIA
NAVIGATION IMPROVEMENTS

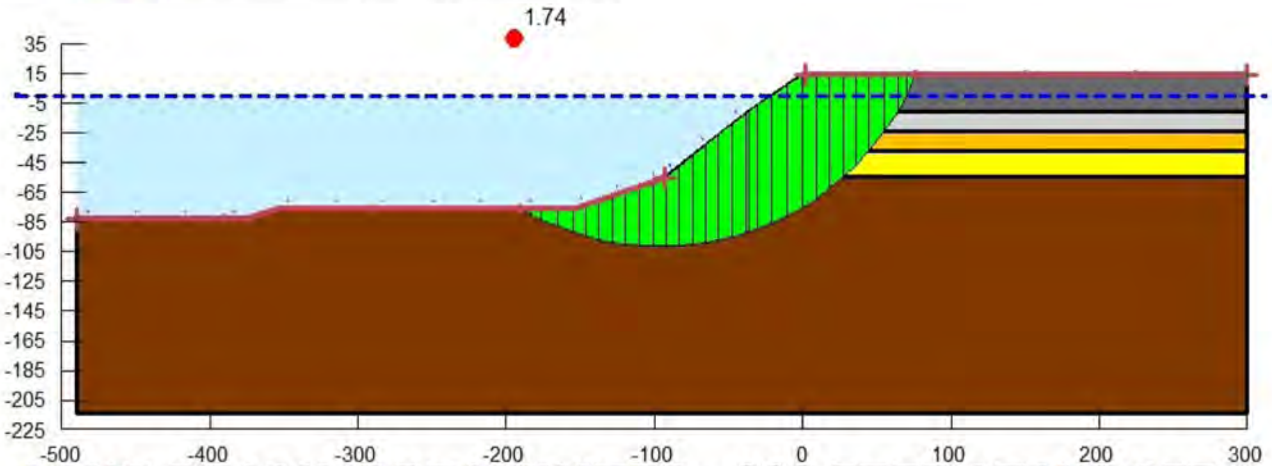
PORT OF LONG BEACH

DREDGING SLOPE STABILITY
LONG BEACH BREAKWATER
STANDOFF 100FT YIELD ACCELERATION

US Army Corps of Engineers ® Los Angeles District	CKD BY: JY/MR	PLATE
	DWN BY: EH	D21
	DATE: JANUARY 2021	

HERNANDEZ F: \\SPL\DOCUMENTS\GEOTECH\YANG\PORT OF LB\REPORT\FIGURES_PLATES\C-4 GPOLC_D21.DGN

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Class A Stone	111	0	45
	Class B Stone	120	0	45
	Clay Core	110	1,000	0
	Foundations Soils	136	1,200	9
	Sand Core	110	0	30



LONG BEACH BREAKWATER - 200 FEET STANDOFF

STATIC

LOS ANGELES AND LONG BEACH HARBOR, CALIFORNIA
NAVIGATION IMPROVEMENTS

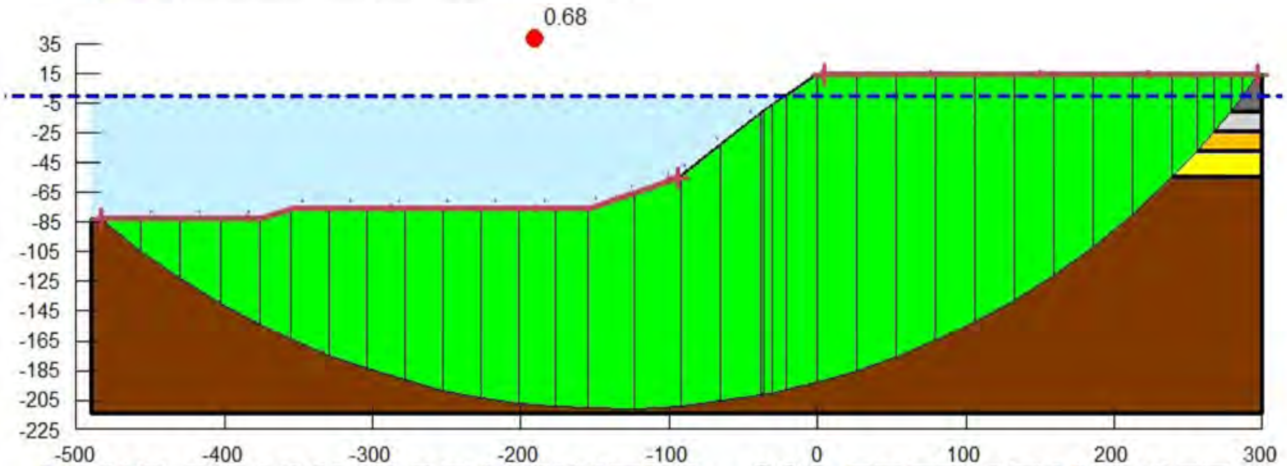
PORT OF LONG BEACH

DREDGING SLOPE STABILITY
LONG BEACH BREAKWATER
STANDOFF 200FT STATIC

US Army Corps of Engineers ®
Los Angeles District

CKD BY: JY/MR	PLATE
DWN BY: EH	D22
DATE: JANUARY 2021	

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Class A Stone	111	0	45
	Class B Stone	120	0	45
	Clay Core	110	1,000	0
	Foundations Soils	136	1,200	9
	Sand Core	110	0	30



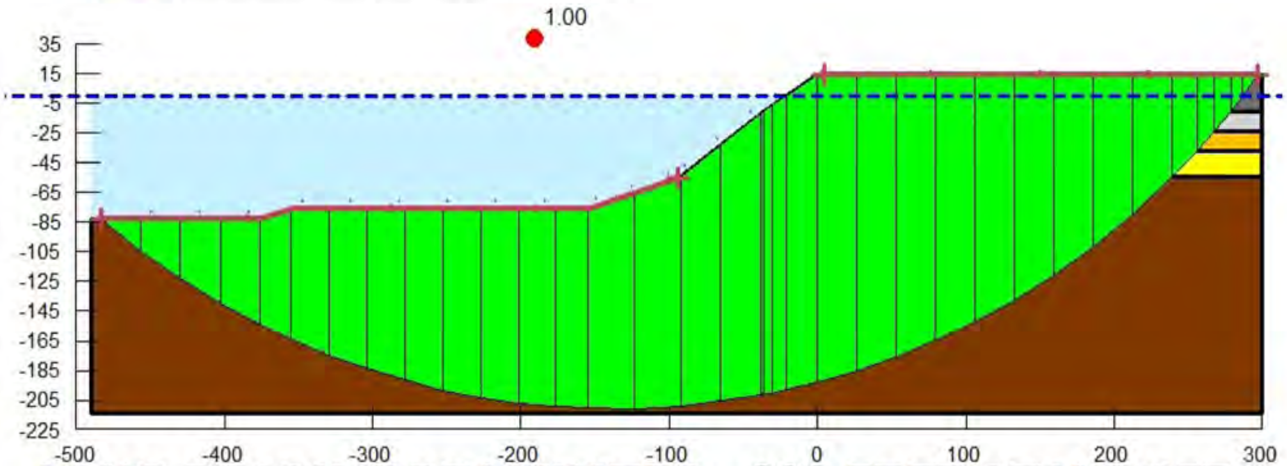
LONG BEACH BREAKWATER - 200 FEET STANDOFF SEISMIC

LOS ANGELES AND LONG BEACH HARBOR, CALIFORNIA
NAVIGATION IMPROVEMENTS
PORT OF LONG BEACH
DREDGING SLOPE STABILITY
LONG BEACH BREAKWATER
STANDOFF 200FT SEISMIC

US Army Corps of Engineers ® Los Angeles District	CKD BY: JY/MR	PLATE
	DWN BY: EH	D23
	DATE: JANUARY 2021	

HERNANDEZ F: \\SPL\DOCUMENTS\GEOTECH\YANG\PORT OF LB\REPORT\FIGURES_PLATES\C-4 GPOLC_D23.DGN

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Class A Stone	111	0	45
	Class B Stone	120	0	45
	Clay Core	110	1,000	0
	Foundations Soils	136	1,200	9
	Sand Core	110	0	30



LONG BEACH BREAKWATER - 200 FEET STANDOFF

YIELD ACCELERATION

LOS ANGELES AND LONG BEACH HARBOR, CALIFORNIA
NAVIGATION IMPROVEMENTS

PORT OF LONG BEACH

DREDGING SLOPE STABILITY
LONG BEACH BREAKWATER
STANDOFF 200FT YIELD ACCELERATION

US Army Corps of Engineers ® Los Angeles District	CKD BY: JY/MR	PLATE
	DWN BY: EH	D24
	DATE: JANUARY 2021	

HERNANDEZ F: \\SPL\DOCUMENTS\GEOTECH\YANG\PORT OF LB\REPORT\FIGURES_PLATES\C-4 GPOLC_D24.DGN

FINAL INTEGRATED FEASIBILITY REPORT AND ENVIRONMENTAL IMPACT STATEMENT / ENVIRONMENTAL IMPACT REPORT (EIS/EIR)

APPENDIX D: 404(b)(1) EVALUATION

PORT OF LONG BEACH
DEEP DRAFT NAVIGATION STUDY
Los Angeles County, California

October 2021

US Army Corps of Engineers®

Port of LONG BEACH
THE PORT OF CHOICE

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THE EVALUATION OF THE EFFECTS OF THE DISCHARGE OF DREDGED OR FILL MATERIAL INTO THE WATERS OF THE UNITED STATES IN SUPPORT OF THE INTEGRATED FEASIBILITY REPORT FOR PORT OF LONG BEACH DEEP DRAFT NAVIGATION STUDY LONG BEACH, CALIFORNIA

INTRODUCTION. The following evaluation is provided in accordance with Section 404(b)(1) of the Federal Water Pollution Control Act Amendments of 1972 (Public Law 92-500) as amended by the Clean Water Act of 1977 (Public Law 95-217). Its intent is to succinctly state and evaluate information regarding the effects of discharge of dredged or fill material into the waters of the U.S. As such, it is not meant to stand-alone and relies heavily upon information provided in the environmental document to which it is attached. Citation in brackets [] refer to expanded discussion found in the Final Integrated Feasibility Report (Final IFR), to which the reader should refer for details.

I. Project Description [1.1]

a. Location: [1.6] The Port of Long Beach is located in the city of Long Beach in the central portion of San Pedro Bay.

b. General Description: [1.2; 9.1] The proposed project is part of a continued effort to improve navigational efficiency and vessel safety throughout the Port of Long Beach (POLB).

The combination of measures for container vessels (constructing the Pier J Approach Channel and Turning Basin, and deepening the West Basin Channel to a new depth of -55’ MLLW) and liquid bulk vessels (deepening the Approach Channel to -80’ MLLW, and widening portions of the Main Channel to match the currently authorized depth in the Main Channel of -76’ MLLW) represents the General Navigation Features of the Recommended Plan (Alternative 3). Local Service Features (LSF) to be constructed by the POLB to fully realize benefits from the General Navigation Features include dredging of the Pier J Basin, berth dredging at J266-270, and structural improvement on the Pier J breakwaters at the entrance of the Pier J Slip necessary to accommodate deepening of the Pier J Slip and Approach Channel to -55’ MLLW. LSF require a Department of the Army permit; the USACE Regulatory Division will utilize this IFR when evaluating the permit application.

Total dredging is approximately 7,329,000 cubic yards (cy). Table 1 displays the approximate dredging volumes by location.

Table 1 Dredging Volume by Location

Dredge Location	Dredge Depth (ft MLLW)	Dredge Quantity (CY)
Approach Channel	-80	2,600,000
Main Channel Widening	-76	1,065,000
West Basin	-55	717,000
Pier J Approach	-55	2,673,000
Pier J Basin (Port Responsibility)	-55	337,000
Total Dredge Volume:		**7,392,000**

Dredged material would be placed in a nearshore placement site (i.e., Surfside Borrow Site Nearshore Placement Area) and disposed of at the United States Environmental Protection Agency-designated LA-2 and LA-3 ocean-dredged material disposal sites (ODMDS). The nearshore placement site, approximately 5 miles from the project, can accommodate about 2.5 million cubic yards (mcy) of dredged material. LA-2 and LA-3, approximately 9 miles and 22 miles, respectively, from the project site, in Federal waters, have an annual disposal volume limit of 1.0 and 2.5 mcy, respectively, from all sources. It is assumed that 0.9 mcy for LA-2 and 2.2 mcy for LA-3 is available for use by this project each year. The approximate duration of the Recommended Plan is approximately 28 months. Placement of dredged material from the Approach Channel at the nearshore placement site would occur over the first 5 months of dredging and would place approximately 2,500,000 cy. Dredging of the remaining areas would begin at the same time extending over the full duration of 28 months. For the General Navigation Features approximately 2,400,000 cy would be placed at the LA-2 ODMDS; approximately 2,155,000 cy would be placed at the LA-3 ODMDS (refer to Table 2). Disposal at the two ODMDS are outside the Clean Water Act authority and will not be addressed further in this Evaluation. Dredging for ocean disposal will be done by a clamshell dredge. Corps regulations at 33 CFR 323.2(d)(3) exempts from coverage of CWA Section 404 the movement of sediments caused by navigational dredging, with the following provision: "(3) Section 404 authorization is not required for the following:…(ii) incidental movement of dredged material occurring during normal dredging operations, defined as dredging for navigation in navigable waters of the United States, as that term is defined in 33 CFR part 322; with proper authorization from the Congress or the Corps pursuant to 33 CFR part 322; however, this exception is not applicable to dredging activities in wetlands, as that term is defined at Section 323.3(r) of this Chapter." Corps dredging using this equipment results in the incidental movement of dredged material during normal dredging operations and is therefore exempt from coverage under CWA section 404 and will not be addressed further in this Evaluation. This discharge of dredged material into the nearshore placement area would come from the Approach Channel and the Evaluation below will be confined to this area. Corps dredging in these areas will be done by a hopper dredge, which discharges dredged material from overflow operations that generates more than incidental movement of dredged material occurring during normal dredging operations. This Evaluation addresses dredged material discharged into navigable waters from overflow hopper dredging and discharges of fill material generated by placement of dredged material at the Surfside Borrow Site Nearshore Placement Area.

Table 2 Approximate Construction Equipment, Disposal Location, and Duration

Yr	Dredge Location	Dredge Quantity (CY)	Dredge Material Disposal Location	Dredge Disposal Location Capacity (CY)	Dredge Type	Dredge Rate (CY/day)	Dredging Days Required (days)
1	Approach Channel	2,600,000	Nearshore	2,500,000	Hopper	17,500	143
			LA2	100,000	Hopper	15,100	7
	Main Channel Widening	1,065,000	LA2	800,000	Clamshell	6,000	133
			LA3	265,000	Clamshell	6,000	44
	West Basin	717,000	LA3	717,000	Clamshell	6,000	120
	Pier J Basin	258,000	LA3	258,000	Clamshell	6,000	43
2	Pier J Basin	79,000	LA2	79,000	Clamshell	6,000	13
	Pier J Approach	1,994,000	LA2	821,000	Clamshell	6,000	137
			LA3	1,173,000	Clamshell	6,000	196
3	Pier J Approach	679,000	LA2	679,000	Clamshell	6,000	113

c. Basic and Overall Project Purpose. [1.4] The basic project purpose is navigation. The overall project purpose is to increase transportation efficiencies, during the period of analysis, for container and liquid bulk vessels operating in the POLB, for both the current and future fleet, and to improve conditions for vessel operations and safety, including reducing constraints of harbor pilot operating practices.

d. General Description of Dredged or Fill Material: [3.1 & 3.3, Appendix C]

(1) General Characteristics of Material (grain size, soil type): A sediment sampling program was conducted in 2018 to support maintenance dredging in the Approach Channel. While the areas and depths do not correspond to the proposed deepening in the Approach Channel, results provide information that is expected to be similar to or worse than what we expect to find in the proposed deepening area. That is because most of the deepening will entail dredging of virgin sediments that have never been dredged before with the underlying assumption that these sediments are clean. POLB Approach Channel locations were sampled and identified as being silty sand. The weighted average composite sand content for the dredge area as a whole was 55%. Overall analyte concentrations in the POLB Approach Channel area composite sample were below detection limits or low compared to the National Oceanic Atmospheric Administration (NOAA) effects-based screening values, which measures toxicity in marine sediment, and LA-2 reference concentrations. The only

constituents detected above NOAA effects range low (ERL) values were total DDT (dichlorodiphenyltrichloroethane) and 4,4'-DDE (dichlorodiphenyldichloroethylene), which were also elevated above ERL values in the LA-2 reference sample. There were no sample values that exceeded a NOAA effects range medium (ERM value. Low levels of metals and some PAH (polycyclic aromatic hydrocarbons) compounds were the only other constituents reported above a laboratory reporting limit. None of the sediments were toxic based on bioassay testing. Sediments were determined to be suitable for ocean disposal. Based on these results, the sediments in the deepening area should be compatible with the nearshore placement site and contaminants levels should represent minimal threat to the marine benthic environment.

(2) Quantity of Material: An unquantifiable amount of dredged material from overflow operations of the hopper dredge while dredging the Approach Channel and approximately 2,500,000 cy of sediments dredged from the Approach Channel would be placed in the Surfside Borrow Site Nearshore Placement Area.

(3) Source Material: Approach Channel of Port of Long Beach harbor.

e. Description of the Proposed Discharge Site:

(1) Suitable dredged material would be discharged back into the Approach Channel due to overflow operations from the hopper dredged, and suitable dredged material would be placed in the nearshore area of the Surfside Borrow Site Nearshore Placement Area. The characteristic habitat type subject to impact by dredge material discharge in the nearshore is open-coast sandy beach. The site is a borrow pit created by historic beach fill projects at Surfside and Sunset Beach for purposes of storm damage reduction. Current bottom elevations in the pit range from -55' to -65' MLLW in an area averaging -35' to -50' MLLW. Proposed fill depths would result in a final depth of no shallower than approximately –45' MLLW across the site.

(2) Size (acres): Overflow operations could occur within the approximately 800 acres of the Approach Channel. Suitable dredged material would be placed in approximately 195 acres of the Surfside Borrow Site Nearshore Placement Area.

(3) Type of Site (confined, unconfined, open water): Both the Surfside Borrow Site Nearshore Placement Area and the Entrance Channel consist of unconfined, open water.

(4) Types of Habitat: nearshore placement site is offshore of a typical southern California sandy beach. Bottom type is poorly graded, fine to medium sands. The borrow pit is expected to harbor a degraded benthic community, as shown in other nearby borrow pits, as a result of reduced water circulation and lowered dissolved oxygen levels.

f. Description of Disposal Method: [9.1] Material would be dredged and either discharged due to overflow operations by the hopper dredge while dredging or transported via hopper dredge for placement in the Surfside Borrow Site Nearshore Placement Area.

II. Factual Determinations

a. Physical Substrate Determinations

(1) Substrate Elevation and Slope.

Current bottom elevations in the Surfside Borrow Site Nearshore Placement Area range from -55’ to -65’ MLLW. The area is relatively flat with stable side slopes that have existed since the borrow pit was dredged in 2009. Burial from overflow operations in the Approach Channel would likely be a thin layer that would result in negligible changes to elevation and slope. The Recommended Plan is expected to fill in the borrow site to match surrounding bathymetry.

(2) Sediment Type.

Geotechnical studies indicate that the sediment consists primarily of poorly graded, fine to medium sands. Suitable sediments are expected to be compatible with existing borrow site materials, a sediment testing program would be conducted during the PED Phase to ensure compatibility. Sediment placed from overflow would be the same as already present in the Approach Channel having just been dredged from there.

(3) Dredged Material Movement.

Suitable dredged material would be placed into the Surfside Borrow Site Nearshore Placement Area. The area experiences low levels of sand movement, as evidenced by the continued existence of the borrow pits ten years after sand borrowed was placed on nearby beaches. Sediments are not expected to move but are expected to restore pre-borrow bathymetry. Sediments resulting from overflow would be returned to the bottom and experience the same conditions of movement as they are currently undergoing.

(4) Physical Effects on Benthos (burial, changes in sediment type, etc.).

Temporary, short-term adverse impacts would occur. The overflow operations and placement activities would bury benthic organisms. Burial from overflow operations would likely be a thin layer of sediments with organisms able to burrow back to the surface, reducing or eliminating benthic mortality. Recolonization at both sites would be expected to occur quickly. Minor turbidity levels may exist in the immediate vicinity of the dredging area and placement operations that may result in minor, temporary reductions in dissolved oxygen.

(5) Other Effects. The resulting bathymetry is expected to support a more diverse, populous community that would be equivalent to the surrounding area.

(6) Actions Taken to Minimize Impacts (Subpart H).

Needed: _X_ YES ____ NO

Monitoring of water quality to control turbidity and to monitor for possible resuspension of contaminants during dredging and disposal would occur. If turbidity exceeds set standards and/or dissolved oxygen fall below a set standard of 5 mg/l, dredging or disposal would be evaluated and modifications made to get back into compliance.

If needed, Taken: _X_ YES ___ NO

A water quality monitoring plan will be part of the construction contract and will be coordinated with the Regional Water Quality Control Board, Los Angeles Region.

b. Water Circulation, Fluctuation, and Salinity Determinations

(1) Water (refer to 40 CFR sections 230.11(b), 230.22 Water, and 230.25 Salinity Gradients; test specified in Subpart G may be required). Consider effects on salinity, water chemistry, clarity, odor, taste, dissolved gas levels, nutrients, eutrophication, others.

Overflow operations and placement of dredged material in the nearshore area of the Surfside Borrow Site Nearshore Placement Area is not expected to significantly affect water circulation, fluctuation, and/or salinity. Only clean, compatible sands from the project would be used for the nearshore placement. These sands are not a source of contaminants. Minor turbidity levels may exist in the immediate vicinity of the dredging area and placement operations that may result in minor, temporary reductions in dissolved oxygen. Sands will not be a source of nutrients; thus, eutrophication is not expected to result. Water used to entrain sands would be sea water as is water in the Approach Channel or adjacent to nearshore placement, thus there will be no effect on salinity levels.

(2) Current Patterns and Circulation (consider items in sections 230.11(b), and 230.23), Current Flow, and Water Circulation.

Overflow operations and placement of dredged material in the nearshore area is not expected to significantly affect circulation. Overflow operations and placement of material would result in minor, localized changes to circulation patterns within the area. However, long-term beneficial effects to current patterns or circulation are anticipated to occur.

(3) Normal Water Level Fluctuations (tides, river stage, etc.) (consider items in sections 230.11(b) and 230.24)

Overflow operations and placement of dredged material in the nearshore area is not expected to have a significant impact on normal water level fluctuations. There would no change to tidal elevations, which is determined by access to the open ocean, which would not be changed.

(4) Salinity Gradients (consider items in sections 230.11(b) and 230.25)

Overflow operations and placement of dredged material in the nearshore area is not expected to have any impact on normal water salinity nor is it expected to create salinity gradients. Sands and water used to entrain sands would be sea water as is water in the Approach Channel or adjacent to the Surfside Borrow Site Nearshore Placement Area, thus there will be no creation of salinity gradients.

(5) Actions That Will Be Taken to Minimize Impacts (refer to Subpart H)

Needed: _X_YES ___ NO

If needed, Taken: __X__YES ___ NO

All dredging and nearshore placement operations would be monitored for effects on water quality, including turbidity, temperature, salinity, dissolved oxygen, and pH; monthly water samples will be taken and analyzed for total dissolved solids and total reportable petroleum hydrocarbons (TRPH). Best management practices, such as modifying the dredging operation and the use of silt curtains (if feasible) would be implemented if turbidity and/or dissolved oxygen exceeds water quality criteria.

c. Suspended Particulate/Turbidity Determinations

(1) Expected Changes in Suspended Particulates and Turbidity Levels in Vicinity of Disposal Site (consider items in sections 230.11(c) and 230.21)

Placement of sediments generally results in negligible impacts to water quality from turbidity. Impacts would be temporary and adverse, but not significant. This is expected to be highly localized and visually indistinguishable from normal turbidity levels. The area is expected to return to background after dredging and placement ceases. Water quality monitoring during dredging and placement will allow USACE to modify operations (such as by slowing rate of discharge) until any water quality problems abate.

(2) Effects (degree and duration) on Chemical and Physical Properties of the Water Column (consider environmental values in section 230.21, as appropriate)

Only clean, sandy sediment would be placed in the nearshore area. Minor turbidity levels may exist in the immediate vicinity of the dredging area and placement operations that may result in minor, temporary reductions in dissolved oxygen.

(3) Effects on Biota (consider environmental values in sections 230.21, as appropriate).

Biota buried during overflow operations or disposal are expected to recover over the short term. Burial is likely to be under a thin layer of sediment with benthic organisms able to maintain their position relative to the water-sediment interface. Filling in the borrow pit is expected to result in improved benthic communities due to increased water circulation and higher levels of dissolved oxygen. Impacts will be temporary and adverse, but not significant.

(4) Actions taken to Minimize Impacts (Subpart H)

Needed: _X_ YES __ NO

If needed, Taken: __X__YES __ NO

Monitoring of water quality to control turbidity during placement would occur. If turbidity exceeds set standards and/or dissolved oxygen exceeds water quality criteria, dredging and disposal would be evaluated and modifications made to get back into compliance.

A water quality monitoring plan will be part of the construction contract and will be coordinated with the Regional Water Quality Control Board, Los Angeles Region.

d. Contaminant Determinations (consider requirements in section 230.11(d)): The following information has been considered in evaluating the biological availability of possible contaminants in dredged or fill material. (Check only those appropriate.)

(1) Physical characteristics _X_

(2) Hydrography in relation to known or anticipated sources of contaminants _X_

(3) Results from previous testing of the material or similar material in the vicinity of the proposed project _X_

(4) Known, significant sources of contaminants (e.g. pesticides) from land runoff or percolation

(5) Spill records for petroleum products or designated (Section 311 of the CWA) hazardous substances

(6) Other public records of significant introduction of contaminants from industries, municipalities, or other sources

(7) Known existence of substantial material deposits of substances which could be released in harmful quantities to the aquatic environment by man- induced discharge activities

(8) Other sources (specify) X

An evaluation of historic sediment testing indicates that the proposed dredged material is not a carrier of contaminants and that levels of contaminants are substantively similar in the extraction and placement sites and are not likely to be constraints.

e. Aquatic Ecosystem and Organism Determinations (use evaluation and testing procedures in Subpart G, as appropriate)

(1) Plankton, Benthos and Nekton

Hopper dredge overflow operations and disposal operations would result in short-term turbidity impacts that would affect plankton in the area. Organisms could stifle in the immediate vicinity as these small organisms are impacted by turbidity. However, these effects would be small in both area and time and the plankton would be expected to recover quickly once disposal is completed. Benthic organisms would be buried by overflow operations and nearshore placement, but the areas would be minor in area and would quickly recolonize. Larger organisms in the nekton would be expected to avoid dredging and disposal operations and would not be impacted.

(2) Food Web

Impacts to the bottom of the food chain (plankton and nekton) would be short term and occur in a small area. Recovery would be quick once dredging and disposal operations are concluded.

(3) Special Aquatic Sites

There are no special aquatic sites in the project area.

(4) Threatened & Endangered Species

There would be no effect to any listed threatened or endangered species or to their designated critical habitat. The federally listed endangered California least tern (*Sternula antillarum browni*) is a migratory bird. California least terns predominately nest on coastal foredunes and other sites with gravelly or sandy substrate and sparse vegetation. Because terns would abandon nests if disturbed, they require nest areas relatively free of human disturbance and predators. The historical habitat of the California least tern has been significantly reduced and modified by human activities including marine and industrial development and residential development along beaches. This loss of habitat has resulted in small isolated breeding colonies that are vulnerable to local extirpation. Primary threats to California least tern populations include increased predation and recreation-related disturbances. California least terns arrive and move through the harbor area in late April and utilize nest areas in Los Angeles County from mid-May through August. Although nesting does not occur in the vicinity of the Surfside Borrow Site Nearshore Placement Area, other areas in the region provide suitable habitat. These areas include Pier 400 in the Port of Los Angeles to the west. California least terns have been observed foraging San Pedro Bay and could forage in waters of the placement area during the breeding season. Because the placement area is routinely subject to elevated noise and activity of workers and equipment associated with common commercial and military practices, short-term project-related disturbances are not expected to affect the foraging and nesting of least terns.

(5) Other fish and wildlife:

Marine mammals would not be affected by hopper dredge overflow operations or placement activities. Birds would generally avoid the dredging and placement sites, although placement could attract birds to the benthic organisms coming out of the hopper dredge as an alternate food source. Benthic organisms would be buried, but populations are expected to recover quickly, particularly since the bottom elevations at the nearshore placement site would be raised to match the surrounding bottom eliminating the current borrow pit improving habitat characteristics for a normal benthic habitat than currently exists at the site.

(6) Actions to Minimize Impacts (refer to Subpart H)

Needed: _X_ YES __ NO

Monitor and control turbidity at the hopper dredge and Surfside Borrow Site Nearshore Placement Area to minimize impacts to plankton and nekton.

f. Proposed Disposal Site Determinations

(1) Mixing Zone Determination (consider factors in section 230.11(f)(2))

Is the mixing zone for each disposal site confined to the smallest practicable zone?
__X_ YES __ NO

Sediments do not require a mixing zone in order to remain in compliance with water quality standards. As such, the mixing zone is considered to be the smallest practicable.

(2) Determination of Compliance with Applicable Water Quality Standards (present the standards and rationale for compliance or non-compliance with each standard)

The Basin Plan for the Coastal Watersheds of Los Angeles and Ventura Counties (Basin Plan) adopted by the Los Angeles Regional Water Quality Control Board has established water quality standards, consisting of a combination of beneficial uses and their corresponding water quality objectives for inland surface waters and enclosed bays and estuaries, including the nearshore placement site. The State Board's Water Quality Control Plan for Ocean Waters of California (Ocean Plan), Water Quality Control Plan for Enclosed Bays and Estuaries of California, and the Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries of California (Thermal Plan) and any revision thereto, shall also apply to all ocean waters of the Region, with the Basin Plan applying in cases of differing objectives. The applicable objective and the rationale for compliance is discussed below. In addition, in a letter of support received on April 23, 2021, the Los Angeles Regional Water Quality Control Board agreed that the Recommended Plan was not expected to compromise water quality standards.

Preliminary sediment testing performed during the feasibility study indicates that the sediment is free from contaminants. Further testing will occur during PED, prior to the placement of material, and only contaminant free, physically compatible material would be placed in the aquatic environment. All testing will be coordinated with the SC-DMMT. Placement of material at the receiver site would result in short-term elevated turbidity levels and suspended sediment concentrations, but no appreciable long-term changes in other water quality parameters, including dissolved oxygen, pH, nutrients, or chemical contaminants. Factors considered in this assessment include the relatively localized nature of the expected turbidity plumes for the majority of the disposal/placement period and rapid diluting capacity of the receiving environment. Water quality monitoring would be required as part of the overall project. If monitoring indicated that suspended particulate concentrations outside the zone of initial dilution exceeded permissible limits, dredging and placement operations would be modified to reduce turbidity to permissible levels. Therefore, impacts to water quality would not violate water quality objectives or compromise beneficial uses listed in the Basin Plan. USACE will continue to coordinate with the Regional Water Quality Control Board during construction to minimize impacts to water quality.

(3) Potential Effects on Human Use Characteristic

(a) Municipal and Private Water Supply (refer to section 230.50)

There are no municipal or private water supply resources (i.e. aquifers, pipelines) in the Approach Channel or nearshore areas. Overflow operations and placement of dredged material in the nearshore area would have no effect on municipal or private water supplies or water conservation.

(b) Recreational and Commercial Fisheries (refer to section 230.51)

The harbor and nearshore areas are not subject to commercial fishing. Recreational fishing would move to avoid the hopper dredge overflow activities and placement activities and to follow fish out of these areas.

(c) Water Related Recreation (refer to section 230.52)

Construction equipment would be required to maintain ocean access for all uses. During dredging and placement activities, proper advanced notice to mariners would occur and navigational traffic would not be allowed within the dredge area or nearshore placement discharge area. The displacement of recreational boating would be temporary and short-term. However, dredging and the nearshore placement activities would not significantly impact surfing conditions or other water sports once completed. The currents are not expected to change in magnitude or direction. Therefore, the overflow operations and nearshore placement activities are not expected to measurably change currents or change surfing in any discernible way. To minimize navigation impacts and threats to vessel safety, all floating equipment would be equipped with markings and lightings in accordance with the U.S. Coast Guard regulations. The location and schedule of the work would be published in the U.S. Coast Guard Local Notice to Mariners

In the long term, the nearshore placement would create a uniform benthic environment filling in the existing borrow pit, enhancing the benthic community.

(d) Aesthetics (refer to section 230.53)

Minor, short term effects during hopper dredge overflow operations during dredging and nearshore placement are anticipated. During hopper dredging and nearshore placement activities, the visual character of the Approach Channel and nearshore placement site would be affected by the hopper dredge; however, overflow activities and nearshore placement is temporary, and as such, would not result in permanent effects to the visual character of the Approach Channel or nearshore placement site. Overflow operations would not result in any visible change to the Approach Channel. Placement of dredged material in the borrow pit would not result in any visible changes to the nearshore area.

(e) Parks, National and Historical Monuments, National Seashores, Wilderness Areas, Research Sites, and Similar Preserves (refer to section 230.54)

Hopper dredge overflow operations and nearshore placement activities would not have any effect on national and historic monuments, national seashores, wild and scenic rivers, wilderness areas or research sites.

(f) Determination of Cumulative Effects on the Aquatic Ecosystem (consider requirements in section 230.11 (g))

Cumulative effects were determined to be less than significant, refer to section 6 of the IFR.

(g) Determination of Secondary Effects on the Aquatic Ecosystem (consider requirements in section 230.11(h))

Secondary effects of the discharge of dredged material would be negligible. Areas outside the direct impact would have only negligible turbidity effects from hopper dredged overflow operations and nearshore disposal. Turbidity levels would be low and in the immediate vicinity of the overflow operations and nearshore disposal operations. Impacts of the federal action are all temporary construction impacts. Movement of sand downcoast would be indistinguishable from natural sand movement.

III. Findings of Compliance or Non-Compliance with the Restrictions on Discharge

a. Adaptation of the Section 404(b)(l) Guidelines to this Evaluation

No significant adaptations of the guidelines were made relative to this evaluation.

b. Evaluation of Availability of Practicable Alternatives to the Proposed Discharge Site Which Would Have Less Adverse Impact on the Aquatic Ecosystem:

The practicable alternatives to the Recommended Plan are Alternatives 2, 4, and 5, which are discussed in the IFR/EIS. Under the Guidelines, we are to consider whether any of these practicable alternatives are less environmentally harmful than the Recommended Plan. All practicable alternatives to the Recommended Plan include disposal of 2.5 mcy of dredged material at the Surfside Borrow Site Nearshore Placement Area, which is the same as the Recommended Plan. Because there is no significant or easily identifiable difference in impact, the alternatives to the Recommended Plan need not be considered to have less adverse impact than what is proposed under the Recommended Plan. See 45 Fed Reg. 85340, December 24, 1980. Therefore, there are no practicable alternatives to the proposed discharges which would have less adverse impact on the aquatic environment. Therefore, the Recommended Plan is the least environmentally damaging practicable alternative.

c. Compliance with Applicable State Water Quality Standards

The proposed project meets State of California water quality standards.

d. Compliance with Applicable Toxic Effluent Standard or Prohibition Under Section 307 of the Clean Water Act

No toxic materials/wastes are expected to be produced or introduced into the environment by nearshore placement.

e. Compliance with Endangered Species Act of 1973

As discussed above, the USACE has determined that overflow operations from the hopper dredge and placement of dredged material into the nearshore placement area would not have an effect on any species Federally-listed as threatened or endangered nor any designated critical habitat. Consultation pursuant to Section 7 of this Act is not required.

f. Compliance with Specified Protection Measures for Marine Sanctuaries Designated by the Marine Protection, Research, and Sanctuaries Act of 1972

No sanctuaries as designated by the Marine Protection, Research and Sanctuaries Act of 1972 would be affected by the hopper dredge overflow operations or nearshore placement activities.

g. Evaluation of Extent of Degradation of the Waters of the United States

(1) Significant Adverse Effects on Human Health and Welfare

(a) Municipal and Private Water Supplies

Hopper dredge overflow operations and nearshore placement activities would have no significant adverse effects on municipal and private water supplies.

(b) Recreational and Commercial Fisheries

Hopper dredge overflow operations and nearshore placement activities will have minor, short-term impacts, but no significant adverse effects on recreational fisheries. The Approach Channel and nearshore areas are not subject to commercial fishing. Recreational fishing would move to avoid the dredging and disposal activities and to follow fish out of these areas. To minimize navigation impacts and threats to vessel safety, all floating equipment would be equipped with markings and lightings in accordance with the U.S. Coast Guard regulations. The location and schedule of the work would be published in the U.S. Coast Guard Local Notice to Mariners.

(c) Plankton

Hopper dredge overflow operations and disposal operations would result in short-term turbidity impacts that would affect plankton in the area. Organisms could stifle in the immediate vicinity as these small organisms are impacted by turbidity. However, these effects would be small in both area and time and the plankton would be expected to recover quickly once dredging and disposal is completed.

(d) Fish

Larger organisms in the nekton would be expected to avoid dredging and disposal operations and would not be impacted.

(e) Shellfish

Benthic organisms, including shellfish, would be buried by overflow operations and nearshore disposal, but the areas would be minor in area and would quickly recolonize.

(f) Wildlife

Marine mammals would not be affected by overflow operations or nearshore disposal. Birds would generally avoid the dredging and nearshore disposal, although nearshore placement could attract birds to the benthic organisms coming out of the hopper dredge as an alternate food source.

(g) Special Aquatic Sites

There are no special aquatic sites in the project area.

(2) Significant Adverse Effects on Life Stages of Aquatic Life and Other Wildlife Dependent on Aquatic Ecosystems: Any adverse effects would be short-term and insignificant. Refer to section 5 of the Final IFR.

(3) Significant Adverse Effects on Aquatic Ecosystem Diversity, Productivity and Stability: Any adverse effects would be short-term and less than significant. Refer to section 5 of the Final IFR.

(4) Significant Adverse Effects on Recreational, Aesthetic, and Economic Values: Any adverse effects would be short-term and less than significant. Refer to section 5 of the Final IFR.

h. Appropriate and Practicable Steps Taken to Minimize Potential Adverse Impacts of the Discharge on the Aquatic Ecosystem

Specific environmental commitments are outlined in the analysis above and in the attached Final IFR. All appropriate and practicable steps have been taken which will minimize potential adverse impacts of the discharge on the aquatic ecosystem.

i. On the Basis of the Guidelines, the Proposed Disposal Site(s) for the Discharge of Dredged or Fill Material (specify which) is:

______ (1) Specified as complying with the requirements of these guidelines; or,

__X__ (2) Specified as complying with the requirements of these guidelines, with the inclusion of appropriate and practical conditions to minimize pollution or adverse effects on the aquatic ecosystem; or,

______ (3) Specified as failing to comply with the requirements of these guidelines.

Prepared by: __Larry Smith__ Date: ______________

FINAL INTEGRATED FEASIBILITY REPORT AND ENVIRONMENTAL IMPACT STATEMENT / ENVIRONMENTAL IMPACT REPORT (EIS/EIR)

APPENDIX E: ECONOMICS

PORT OF LONG BEACH
DEEP DRAFT NAVIGATION STUDY
Los Angeles County, California

October 2021

US Army Corps of Engineers®

Port of LONG BEACH THE PORT OF CHOICE

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1 INTRODUCTION

This document presents the economic evaluations performed for the Port of Long Beach Deep Draft Navigation Feasibility Study. This study serves as an interim response to the Resolution of the House Committee on Public Works adopted 10 July 1968 and in response to the Port of Long Beach's (POLB) request to the U.S. Army Corps of Engineers Los Angeles District (USACE) seeking Federal assistance to address on-going operating constraints to the efficient movement of goods through the port. The study is part of a continued effort to identify projects to improve navigational efficiency and vessel safety throughout the POLB. The USACE Los Angeles District, together with the Deep Draft Navigation Planning Center of Expertise, performed the economic analyses contained within this document in support of the feasibility study.

1.1 Study Purpose and Scope

The purpose of the study is to identify and evaluate alternatives to increase transportation efficiencies, for container and liquid bulk vessels operating in the Port of Long Beach, for both the current and future fleet, and to improve conditions for vessel operations and safety in the event of vessel malfunction or weather-related events. The scope of this feasibility study involves analysis of existing conditions and requirements, identifying opportunities for improvement, preparing economic analyses of alternatives, identifying environmental impacts, and analyzing the National Economic Development (NED) plan.

Navigational challenges identified include existing channel depths that do not meet the draft requirements of the current and future fleet of larger container and liquid bulk vessels. Tide restrictions, light loading, lightering, and other operational inefficiencies result in economic inefficiencies that translate into increased costs for the national economy at one of the nation's busiest ports. Container movements along the secondary channels serving Pier J and Pier T/West Basin, and liquid bulk vessel movements along the main channel have been identified as constrained by current conditions.

The concerns of POLB were used to develop the problem statements, study goals, and objectives for this study. The primary problem is the existing channel depths and widths that create limitation of the harbor, resulting in inefficient operation of deep draft vessels in the main channel (Federal) and secondary channels within the Port complex, which increases the Nation's transportation costs. The planning objectives are to 1) increase transportation efficiencies, during the period of analysis, for container and liquid bulk vessels operating in the Port of Long Beach, for both the current and future fleet, and to 2) improve conditions, during the period of analysis, for vessel operation and safety, including reducing constraints of harbor pilot operating practices.

Potential navigation improvements include deepening and bend easing of navigation channels, construction of a new approach channel, turning basins, and a standby area.

1.2 Document Layout

Section 2 details the existing conditions at the POLB. Sections 3 examines the future without project and the future with project conditions and includes an evaluation and description of the trade forecast, port improvement projects, and the vessel fleet and operations at the harbor. Section 4 presents the transportation cost savings benefit analysis.

2 EXISTING CONDITIONS

The without project conditions, as well as benefits and costs for proposed alternatives, are evaluated over a 50-year period of analysis, beginning with a Base Year of 2027. The Base Year corresponds to the year in which it is reasonable to assume that construction of the chosen project alternative is complete, and it begins to accrue benefits. These projections reflect existing conditions at the completion of the Feasibility Study, as well as anticipated changes in conditions throughout the period of analysis. This section focuses on existing conditions prior to the Base Year, while the following section focuses on the projections of relevant changes under future without project conditions.

The existing POLB channels have depths from -50 to -53 feet MLLW, limiting containerships to 44-49 foot draft with tide riding. Vessels have an additional 2-3 foot draft of usable tide with tide riding; however, tidal delays are also incurred depending on the time of day and pilot practices. Bar pilot limitations have led to offshore-waiting periods for large liquid bulk vessels until the one-way traffic in the main channel is cleared. This limitation has had a historic impact on 5-10% of crude oil imports, and a current impact on approximately 15% of crude oil imports. Current transportation inefficiencies for container and liquid bulk vessels will further be exacerbated by future fleet changes.

The Port of Long Beach has undergone significant expansion in the past century and has become a major transportation and trade center, providing the shipping terminals for nearly one-third of the waterborne trade moving through the West Coast. Currently, trade valued at more than $194 billion is moving through the port, classifying the POLB as the second- busiest seaport in the United States. The port handles more than 7.5 million twenty-foot equivalent units (TEUs) and 82 million tons of cargo with top imports and exports, including crude oil, electronics, plastics, furniture, petroleum products, chemicals, and agriculture. The port has over 2,000 vessel calls annually and the port's facilities include 10 piers, 62 berths, and 68 Post-Panamax gantry cranes.

2.1 Economic Study Area (Hinterland) and Regional Distribution Centers

The POLB is on the coast of southern California in San Pedro Bay, approximately 20 miles south of downtown Los Angeles, California. To the west and northwest of San Pedro Bay are the cities of San Pedro and Wilmington, respectively, and to the east, the community of Seal Beach. The study area includes the waters in the immediate vicinity (and shoreward) of the breakwaters through the entire POLB, and the downstream reaches the Los Angeles River that have direct impact on the Bay, including Outer Harbor, Inner Harbor, Cerritos Channel, West Basin, and the Back Channel (**Figure 2-1)**.

POLB is served by more than 140 shipping lines with connections to 217 seaports worldwide. Once vessels reach POLB, nearly half of all the cargo is moved by rail to the rest of the country, much of it loaded right on dock.

Figure 2-1: Study Area Location Map

The catchment area (geographic area from which the Port attracts a population that uses its services) for the San Pedro Bay Ports (Port of Long Beach and Port of Los Angeles) includes a local catchment area, comprising of area located within California, and an extended catchment area, including Colorado, New Mexico, Utah, Arizona, Nevada, and California (**Figure 2-2**Figure 2-2:).

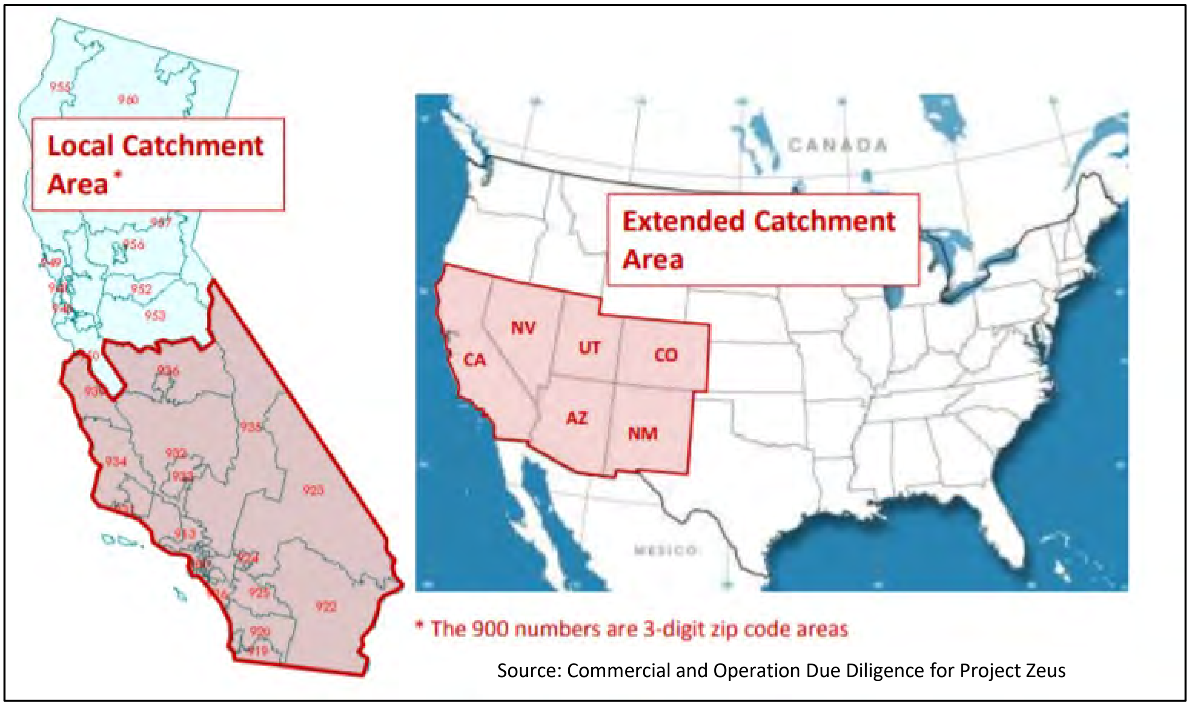


Figure 2-2: Local and Extended Catchment Areas for San Pedro Bay Ports

Because a majority of the services that call the POLB also call at the Port of Oakland, the local catchment encompasses only the areas in California that are closer in over-the-road mileage to the POLB. Areas that extend beyond this are included in the extended catchment area. Northern California is included in the extended catchment area due to importers stopping at the POLB to discharge containers with goods for consumption across California, emphasizing those that are trans-loaded because most of the population of California is located in Southern California. The other five states included in the extended catchment area are land-locked, with a majority of goods that are trans-loaded being handled through the POLB or the Port of Los Angeles.

Non-crude oil is the only high-volume commodity associated with liquid bulk exports. This encompasses refined products that are exported from local refineries in Southern California. The two high-volume commodities being shipped through the POLB are gypsum and salt. Gypsum accounts for the largest portion of dry bulk imports and is a major input to the construction industry. High commodity dry bulk exports include petroleum coke, coal, and metal scraps.

2.1.1 *Cargo Profile*

In Calendar Year (CY) 2019, the POLB served just under 2,700 large self-propelled vessels, including approximately over 7.6 million TEU's. The port's break bulk cargo totaled approximately 1.5 million tons in 2019. Top commodities include consumer goods, construction materials, machinery, chemicals, plastics, and woods. The POLB was the state's busiest seaport, moving more than 200 million barrels of petroleum liquid bulk in 2018. **Table 2-1** gives an overview of the commodities for the Port of Long Beach from 2013 through 2019. Petroleum and petroleum products accounts for close to 50% of the total tonnage in 2019.

Table 2-1: Commodity Report for Port of Long Beach

Commodity	CY 2019	CY2018	CY 2017	CY 2016	CY 2015	CY 2014	CY 2013
Coal, Lignite, & Coal Coke	1,473,813	1,292,556	1,241,887	310,439	628,263	1,662,778	1,610,989
Petroleum and Petroleum Products	35,896,310	38,033,907	39,942,990	34,549,242	33,667,183	36,508,670	36,525,023
Chemicals and Related Products	3,566,857	3,940,013	3,905,301	4,150,415	3,985,862	4,560,923	4,865,026
Crude Materials	5,351,823	5,442,023	5,565,988	5,403,920	5,615,393	6,397,247	7,452,433
Primary Manufactured Goods	5,983,504	7,019,591	5,826,873	5,592,172	5,698,318	6,334,496	6,203,893
Food and Farm Products	8,675,166	8,503,167	8,207,360	8,413,161	8,423,959	8,275,904	8,337,633
Manufactured Equipment	18,473,470	20,504,352	19,538,746	17,711,594	18,557,878	19,643,239	18,545,534
Waste Material	661	207	112	105	142	85	62
Miscellaneous	1,271,802	1,800,338	1,767,835	1,682,185	1,587,599	1,642,722	952,146
Total	80,693,406	86,536,154	85,997,092	77,813,233	78,164,597	85,026,064	84,492,739

2.1.2 Cargo Value

Table 2-2 presents the top ten U.S seaport districts in dollar value of goods handled in the Calendar Year (CY) 2019. As shown in the table below, the Los Angeles/Long Beach district ranks number one in dollar value of shipments, with cargo valued at about $380 billion in CY 2019. Imports totaled more than $300 billion and exports totaled more than $60 billion for CY 2019.

Table 2-2: Top Ten U.S Seaport Districts in Dollar Value (Millions) of All goods Handled CY 2019

Port District	**Imports**	**Exports**	**TOTAL**
Los Angeles/Long Beach, CA	$ 319,307.72	$ 64,580.56	$ 383,888.28
Houston-Galveston, TX	$ 78,772.87	$ 142,498.31	$ 221,271.18
New York City, NY	$ 163,182.64	$ 42,610.81	$ 205,793.45
Savannah, GA	$ 91,431.45	$ 34,242.69	$ 125,674.14
New Orleans, LA	$ 30,553.52	$ 61,218.51	$ 91,772.03
Seattle, WA	$ 62,938.59	$ 20,030.32	$ 82,968.91
San Francisco, CA	$ 51,224.44	$ 29,814.22	$ 81,038.67
Charleston, SC	$ 47,692.39	$ 27,324.86	$ 75,017.25
Norfolk, VA	$ 50,063.09	$ 24,871.75	$ 74,934.85
Baltimore, MD	$ 43,440.98	$ 14,967.28	$ 58,408.25

*"Exports" are FAS value of U.S. exports of domestic
**Source: U.S Census Bureau Merchandise Trade Report FT920 December 2019

2.2 Facilities and Infrastructure

The Port of Long Beach has undergone significant expansion in the past century and has become a major transportation and trade center, providing the shipping terminals for nearly one-third of the waterborne trade moving through the West Coast. There are 22 shipping terminals to process break bulk (lumber, steel), bulk (salt, cement, and gypsum), containers, and liquid bulk (petroleum). The surrounding area includes 1.7 billion square feet of warehouse and distribution facilities. See **Figure 2-3** for an overview of the POLB facilities.

The following sections focus on terminals, vessel fleets and characteristics, trade, shipping operations, and design vessels for container and liquid bulk vessels, which are the vessel types that are the focus of this Feasibility Study.

2.3 Container Services

According to the Waterborne Commerce Statistics Center, in 2019, the POLB was the third largest U.S container port in terms of TEU throughput. The container terminals are located at Piers A, C, E, G, J, and T. These terminals handle various kinds of cargo moving within the standard shipping containers -- primarily finished goods like clothes, toys, and furniture. East Asia accounts for approximately 90% of container shipments. **Figure 2-3** depicts the container terminals and their design depths.

POLB Container Terminals					
Pier	**Operator**	**Size (Acres)**	**Cargoes**	**On Dock Rail**	**Design Depth**
A	SSA Terminals	159.3	General	Yes	50'
C	SSA Terminals	70	General & Autos	No	42'
E	Long Beach Container Terminal, Inc.	170	General	Yes	55'
G	International Transportation Service	246	General	Yes	42'-52'
J	Pacific Container Terminal	256	General	Yes	50'
T	Total Terminals, International	385	General	Yes	55'

Figure 2-3: POLB Container Terminals

2.3.1 Existing Container Terminals and Capabilities

As discussed, the POLB container terminals include Pier A, Pier C, Pier E, Pier G, Pier J, and Pier T. The terminals had a record throughput of 8 million TEUs in CY 2018, with a 10.7% increase from the previous year. **Figure 2-3** outlines the container terminals infrastructure.

2.3.2 Carriers and Trade Lanes

According to the data gathered from the Port, the POLB has had, on average, about 17 weekly container calls from 2010-2019. **Table 2-3** provides a snapshot of the weekly ocean carrier services for the POLB. Some of the major lines include Maersk, MSC, CMA CGM, OOCL, and Evergreen.

Table 2-3: Port of Long Beach Weekly Ocean Carrier Services

TERMINAL	ALLIANCE	CARRIER	SERVICE CODE	ROTATION
SSA Pier A	Oceana Vessel Sharing Agreement	Hamburg Sud Hapag-Lloyd ANL MSC PIL	PANZ - WSN - PCX - Oceana Loop 1 - AOS	Oakland - Seattle - Vancouver - LONG BEACH - Auckland - Sydney - Melbourne - Adelaide - Sydney - Tauranga - Papeete - Oakland
SSA Pier A	Independent	Hamburg Sud Polynesia Line	SSEA	Papeete - Apia - Pago Pago - LONG BEACH - Oakland - Papeete
SSA Pier A	Independent	Swire	WCNA - West Coast North America	Brisbane - Port Kembla - Melbourne - Tauranga - Vancouver BC - Everett - LONG BEACH - Suva - Brisbane
SSA Pier A	Independent	SM Lines	CPX China Pacific Express	Ningbo - Shanghai - Kwangyang - Busan - LONG BEACH - Busan - Kwangyang - Ningbo
SSA Pier A	Independent	Hamburg Sud Hapag-Lloyd	MPS MedPac Service	Cagliari - Livorno - Genoa - Marseilles-Fos - Barcelona - Valencia - Cartagena - Puerto Quetzal - Manzanillo (Mexico) - LONG BEACH - Oakland - Seattle - Vancouver - Oakland - LONG BEACH - Manzanillo (Mexico) - Cartagena - Caucedo - Tangier - Valencia - Cagliari
SSA Pier C	Independent	Matson	CLX1 - China Long Beach Express	Naha - Ningbo - Shanghai - LONG BEACH - Honolulu - Guam - Naha
SSA Pier C	Independent	Matson	Hawaii Service Loop 2	Honolulu - LONG BEACH - Honolulu
Long Beach Container Terminal (LBCT) Pier E	OCEAN Alliance	OCEAN Alliance COSCO OOCL CMA CGM Evergreen APL	AAS - PVCS - SCS South China Sea - SC6 South China Loop 6	Cai Mep - Hong Kong - Yantian/Shenzhen - Kaohsiung - LONG BEACH - Kaohsiung - Cai Mep

TERMINAL	ALLIANCE	CARRIER	SERVICE CODE	ROTATION
Long Beach Container Terminal (LBCT) Pier E	OCEAN Alliance	OCEAN Alliance COSCO OOCL CMA CGM Evergreen APL PIL	AAC4 - PCC1 - HIX Hibiscus Express - PCC1 - CC9 Central China Loop 9 - AC7	Ningbo - Shanghai - Busan - LONG BEACH - Busan - Ningbo
International Transportation Services (ITS) Pier G	THE Alliance	THE Alliance ONE Hapag-Lloyd Yang Ming	PS3	Nhava Sheva - Pipavav - Colombo - Port Kelang - Singapore - Laem Chabang - Cai Mep - LONG BEACH - Oakland - Pusan - Ningbo - Shekou - Singapore - Port Kelang - Nhava Sheva
International Transportation Services (ITS) Pier G	THE Alliance	THE Alliance ONE Hapag-Lloyd Yang Ming	AL5	Southampton - Le Havre - Rotterdam - Hamburg - Antwerp - Savannah - Cartagena -Balboa - Los Angeles - Oakland - Seattle - Vancouver - LONG BEACH - Balboa - Cartagena - Caucedo - Savannah - Southampton
Pacific Container Terminal (PCT) Pier J	Independent	PIL WHL COSCO YML OOCL	ACS - CP2 - AAC3 - AAC - PCC2	Lianyungang - Shanghai - Ningbo - LONG BEACH - Seattle - Lianyungang
Pacific Container Terminal (PCT) Pier J	Independent	PIL WHL COSCO CMA CGM APL	AC5 - CP1 - SEA - PSX Pacific South Express - SC3	Haiphong - Nansha - Hong Kong - Yantian/Shenzhen - LONG BEACH - Oakland - Yantian/Shenzhen - Haiphong
Total Terminals Inc. (TTI) Pier T	2M+H	Maersk MSC HSD HMM	TP2 - Jaguar - UPAS2 - PS3	Singapore - Cai Mep - Yantian/Shenzhen - Ningbo - Shanghai - LONG BEACH - Oakland - Vostchny - Busan - Ningbo - Shekou/Chiwan - Singapore
Total Terminals Inc. (TTI) Pier T	2M+H	Maersk MSC HSD HMM	TP8 - New Orient - UPAS1 -PS4	Xingang - Qingdao - Ningbo - Shanghai - Busan - Yokohama - Prince Rupert - LONG BEACH - Oakland - Vostochniy - Xingang
Total Terminals Inc. (TTI) Pier T	Independent	MSC	CEX	Gioia Tauro - Civitavecchia - La Spezia - Valencia - Sines - Cristobal - Balboa - Manzanillo - LONG BEACH - Oakland - Vancouver - Seattle - Oakland - LONG BEACH - Balboa - Cristobal - Gioia Tauro
Total Terminals Inc. (TTI) Pier T	2M+H	HMM Maersk MSC	PS2 - TP7 - Lotus	Laem Chabang - Cai Mep - Kaohsiung - Busan - LONG BEACH - Oakland - Busan - Kaohsiung - Hong Kong - Laem Chabang
Total Terminals Inc. (TTI) Pier T	Independent	Maersk Hamburg Sud Sealand Alianca APL CMA CGM	WCCA2 - WC2	Balboa - Corinto - Acajutla - Lazaro Cardenas - LONG BEACH - Oakland - Lazaro Cardenas - Corinto - Puerto Caldera - Arrijan- Balboa

*Source: Port of Long Beach Website

2.3.3 TEU Weight per Containers

Data was collected from the POLB to determine weight per TEU. **Table 2-4** provides the weight per TEU by trade route. Generally, exports are heavier than imports, as noted in the data.

Table 2-4: Average Weight per Loaded TEU by Trade Lane

Route Group	Description	Import Weight/TEU (Metric Tons)	Export Weight/TEU (Metric Tons)	Imports and Exports Weight/TEU (Metric Tons)
NEA-WCUS	Northeast Asia Container Route	5.7	9.7	6.8
SEA-WCUS	Southeast Asia + ISCME Container Route	5.8	9.4	6.9
EU-NA-LA-WCUS	Europe/North America/Latin America/ WCUS	8.3	9.1	8.5
OCEANIA-WCUS	New Zealand/Australia/Pacific Island/Hawaii	8.6	8.5	8.5

2.4 Historical Commerce

In 2019 , 7.63 million loaded TEUs were reported, including items from clothing, shoes, toys, furniture, and electronics. **Figure 2-4**Figure 2-4: illustrates the total container throughput (TEUs) for the port, from 2010 through 2019. During this time frame, throughput increased by approximately 1.4 million TEUs, which is an increase by about 19%.

Figure 2-4: Port of Long Beach Historical Container Throughput

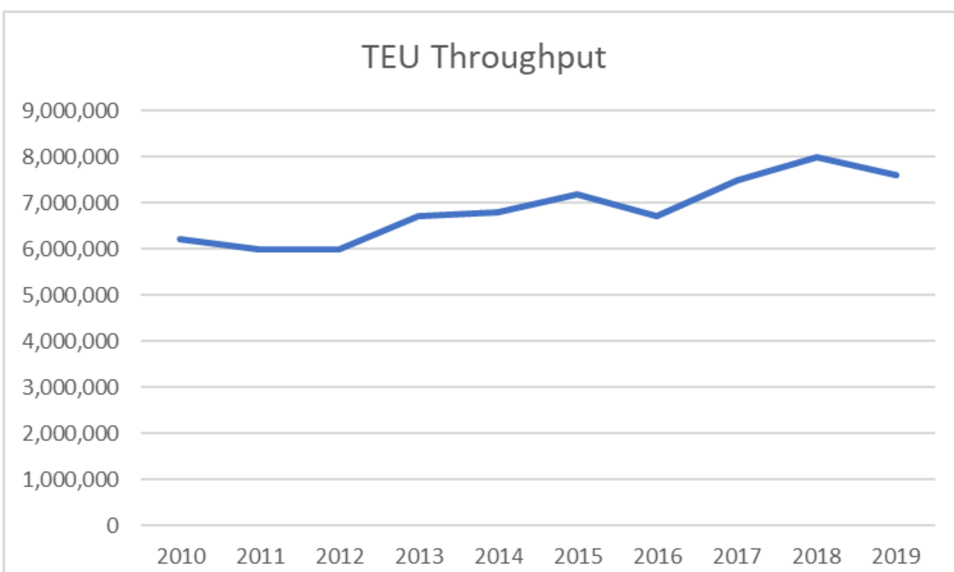


Figure 2-5 illustrates the historic tonnage of crude oil, the primary liquid bulk commodity for the POLB. From 2011 through 2019, there was no discernable trend in tonnage. In 2019, crude oil tonnage was above 25 million tons.

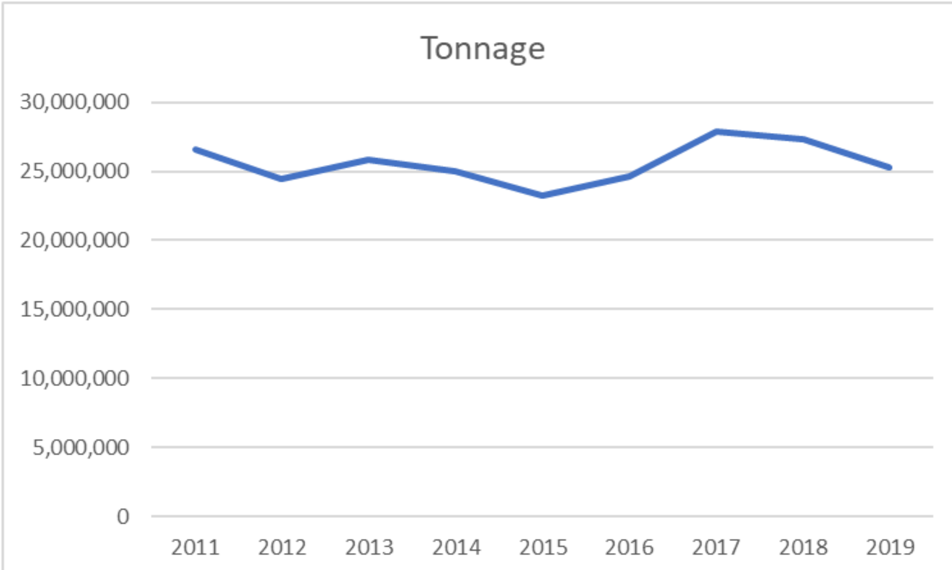
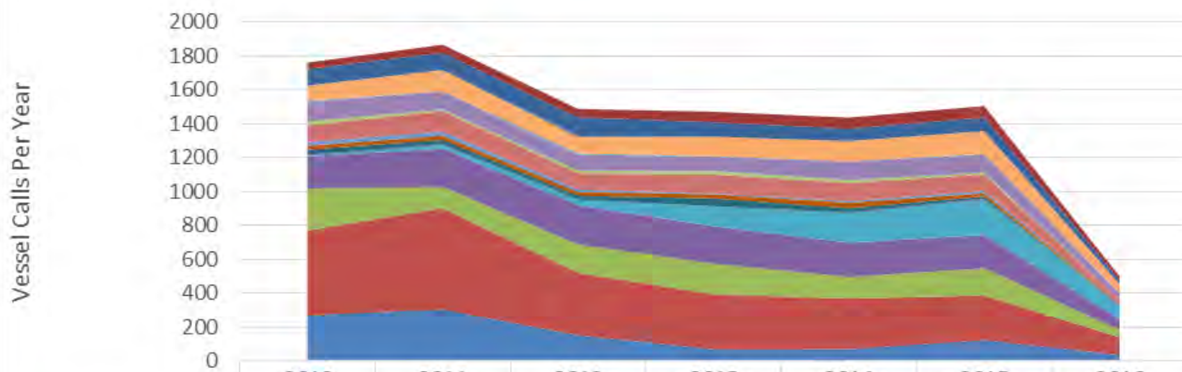


Figure 2-5: Port of Long Beach Historical Crude Oil Tonnage

In 2020, the Port of Long Beach moved more than 8.1 million container units, with 6.3% more TEUs handled than in 2019. Imports increased 6.6% while exports increased 0.2%, even with the Covid-19 pandemic in 2020.

2.5 Existing Fleet

Data for the existing fleet was obtained from the POLB and a variety of tanker and container ships called to the port between 2010 and 2016. Container ships are classified as sub-Panamax (SPX), Panamax (PX), Post-Panamax Generation 1 (PPX Gen 1), Post-Panamax Generation II (PPX Gen 2), Post-Panamax Generation III (PPX Gen 3), and Post-Panamax Generation IV (PPX Gen 4) depending on their capacity. Tanker vessels are classified as Handymax (HX), Medium Range 1 (MR1) or 2 (MR2), Panamax (PX), Aframax (AX), Suezmax (SX), or Very Large Crude Carriers (VLCC) depending on their capacity as well. The vessels are distinguished based on their physical and operation characteristics, including lengths overall (LOA), design draft, beam, speed, and TEU capacity. It is common practice to separate the containership fleet in TEU bands or classes to analyze the supply within the industry. However, due to the evolution of vessel design over time, these TEU bands do not correspond to a breakdown of the fleet by dimensions, such as beam or draft. **Figure 2-6** shows the vessel calls at the POLB from 2010 - 2016, broken down by vessel class and tanker capacity. Detailed vessel call information was provided by the Port. At the time it was provided, Data was the latest available.



	2010	2011	2012	2013	2014	2015	2016
400K DWT Tanker	0	0	1	0	0	0	0
300K DWT Tanker	38	47	50	62	65	68	22
200K DWT Tanker	98	102	113	85	73	80	22
100K DWT Tanker	90	125	99	115	119	135	55
80K DWT Tanker	7	1	8	2	1	2	2
70K DWT Tanker	114	106	94	85	109	108	32
60K DWT Tanker	23	10	16	21	18	11	2
50K DWT Tanker	99	121	95	112	108	97	25
40K DWT Tanker	22	25	14	5	8	14	2
30K DWT Tanker	23	24	23	24	33	18	8
20K DWT Tanker	29	24	22	46	24	13	3
10K DWT Tanker	5	4	1	0	3	4	0
PPX4	0	0	0	0	0	0	1
PPX3	5	24	33	118	176	210	78
PPX2	190	225	232	220	202	197	64
PPX1	247	126	167	182	128	161	43
PX	500	597	367	324	298	262	105
SPX	271	305	153	70	71	125	37

Figure 2-6: POLB Vessel Calls by Class, 2010 - 2016

Table 2-5: POLB Existing Fleet Vessel Characteristics

Vessel Fleet Subdivision (Containerships)		**From**	**To**
Sub Panamax (SPX) (MSI size brackets: 0.1-1.3, 1.3-2.9 k TEU)	**Beam**	55	98
	Draft	8.2	38.1
	LOA	222	813.3
Panamax (PX) (MSI size brackets: 1.3-2.9, 2.9-3.9, 3.9-5.2, 5.2-7.6 k TEU)	**Beam**	98	106
	Draft	30.8	44.8
	LOA	572	970
Post-Panamax (PPX1) (MSI size brackets: 2.9-3.9, 3.9-5.2, 5.2-7.6, 7.6-12 k TEU)	**Beam**	106	138
	Draft	35.4	47.6
	LOA	661	1045
Super Post-Panamax (PPX2) (MSI size brackets: 5.2-7.6, 7.6-12 k TEU)	**Beam**	138	144
	Draft	39.4	49.2
	LOA	911	1205
Ultra Post-Panamax (PPX3) (MSI size brackets: 5.2-7.6, 7.6-12, 12 k + TEU)	**Beam**	144	168
	Draft	Up to	55
	LOA	Up to	1220
Post-Panamax (PPX4) (MSI size brackets: 12 k + TEU)	**Beam**	168	200
	Draft	Up to	55
	LOA	1000	1300
Vessel Fleet Subdivision (Tankers)		**From**	**To**
Handymax (HX) (DWT size brackets: 10,000 – 26,999 DWT)	**Beam**	65	136
	Draft	27.7	52.8
	LOA	405	868
Medium Range 1 (MR1) (DWT Size brackets: 27,000 – 39,999 DWT)	**Beam**	83	190
	Draft	25.5	85.3
	LOA	540	1092
Medium Range 2 (MR2) (DWT Size brackets: 40,000 – 54,999 DWT)	**Beam**	62.5	122
	Draft	13.3	302
	LOA	577	748
Panamax (PX) (DWT Size brackets: 55,000 – 79,999 DWT)	**Beam**	104	106
	Draft	40	49
	LOA	601	820
Aframax (AX) (DWT Size brackets: 80,000 – 122,000 DWT)	**Beam**	104	197
	Draft	21.5	55
	LOA	748	1092
Suezmax (SX) (DWT Size brackets: 123,000 – 193,000 DWT)	**Beam**	137	518
	Draft	46.5	59
	LOA	799	925
Very Large Crude Carrier (VLCC) (DWT Size brackets: 265,000 – 400,000 DWT)	**Beam**	164	229
	Draft	30.5	70
	LOA	942	1115

2.6 Shipping Operations

2.6.1 Underkeel Clearance

The measure of underkeel clearance (UKC) for economic studies is applied according to the planning guidance. According to this guidance, UKC is evaluated based on actual vessel operator and pilot practice within a harbor and subject to present conditions, with adjustment as appropriate or practical for with-project conditions. Generally, practices for UKC are determined through a review of written pilotage rules and guidelines, interviews with pilots and vessel operators, and analysis of actual past and present practices based on relevant data for vessel movements. Typically, UKC is measured relative to immersed vessel draft in the static condition (i.e., motionless at dockside). When clearance is measured in the static condition, explicit allowances for squat, trim, and sinkage are unnecessary. Evaluation of when the vessel is moved or initiates transit relative to immersed draft, tide stage, and commensurate water depth allows reasonable evaluation of clearance throughout the time of vessel transit.

Evaluation of all movements renders a distribution of UKC requirements. Evaluation of minimal clearance (i.e., some level of clearance below which operators or pilots will not move a vessel due to concerns for insufficient safety) helps to quantify the period of time each day, within a tide cycle; a given vessel with a specified immersed draft can be moved relative to tide.

Given the general evaluation of practices for UKC at most coastal ports in the U.S., minimal clearances for all vessel types are often 2.0 to 3.0 feet measured in the static condition for many historical fleets having Panamax or lesser service. The average UKC for vessels of sub-Panamax up through Post-Panamax Gen IV is approximately 4.5 feet. It is important to consider, however, that most coastal ports have comparatively limited distances between ocean approaches and dock facilities (i.e., less than 20 miles).

Regarding vessel sizes under with-project conditions, it is understood that most Post-Panamax vessels need more clearance depending on blockage factors, currents, and relative confinement of the waterway. As such, most Post-Panamax containerships need about 4 to 5 feet for vessels with breadths of 120 to nearly 200 feet, LOA approaching 1,300 feet, and summer loadline drafts of 46.0 to approximately 55.0 feet. **Table 2-6** displays the UKC requirements for the Sub-Panamax through the Post-Panamax Generation IV.

Table 2-6: Vessel Underkeel Clearance

Vessel Class	Total Underkeel Clearance (feet)
Sub-Panamax (SPX)	4.0
Panamax (PX)	4.0
Post-Panamax Gen I (PPX1)	4.0
Post-Panamax Gen II (PPX2)	4.5
Post-Panamax Gen III (PPX3)	4.5
Post-Panamax Gen IV (PPX4)	5.0
40k dwt	3.0
50k dwt	3.5
60k dwt	3.5
70k dwt	3.5
80k dwt	4.0
90k dwt	4.3
100k dwt	4.5
200k dwt	6.2
300k dwt	7.9

2.6.2 Tidal Range

The variability of sea level must also be considered when determining the level of water needed for navigation. According to the 2019 NOAA tidal data, the POLB experienced an average tide range of approximately 3.9 feet MLLW. **Table 2-7** summarizes the High Tide and Low Tide data for the Port of Long Beach in 2019. **Table 2-8** presents the tidal data through the tidal epoch relative the MLLW. **Figure 2-7** depicts a tide prediction table for NOAA. The solid blue line depicts a curve fit between the high and low values.

Table 2-7: Tide Statistics Summary (feet MLLW)

	Low Tide	High Tide	Low and High Tide
Min	3.4	2.9	-1.9
Max	-1.9	7.3	7.3
Mean	0.9	4.8	2.9

Table 2-8: Tidal Data at Port of Long Beach Station 9410660 (1983-2001 Tidal Epoch)

Datum	**Value (feet)**	**Description**
MHHW	5.49	Mean Higher-High Water
MHW	4.75	Mean High Water
MTL	2.84	Mean Tide Level
MSL	2.82	Mean Sea Level
MLW	0.94	Mean Low Water
MLLW	0	Mean Lower-Low Water

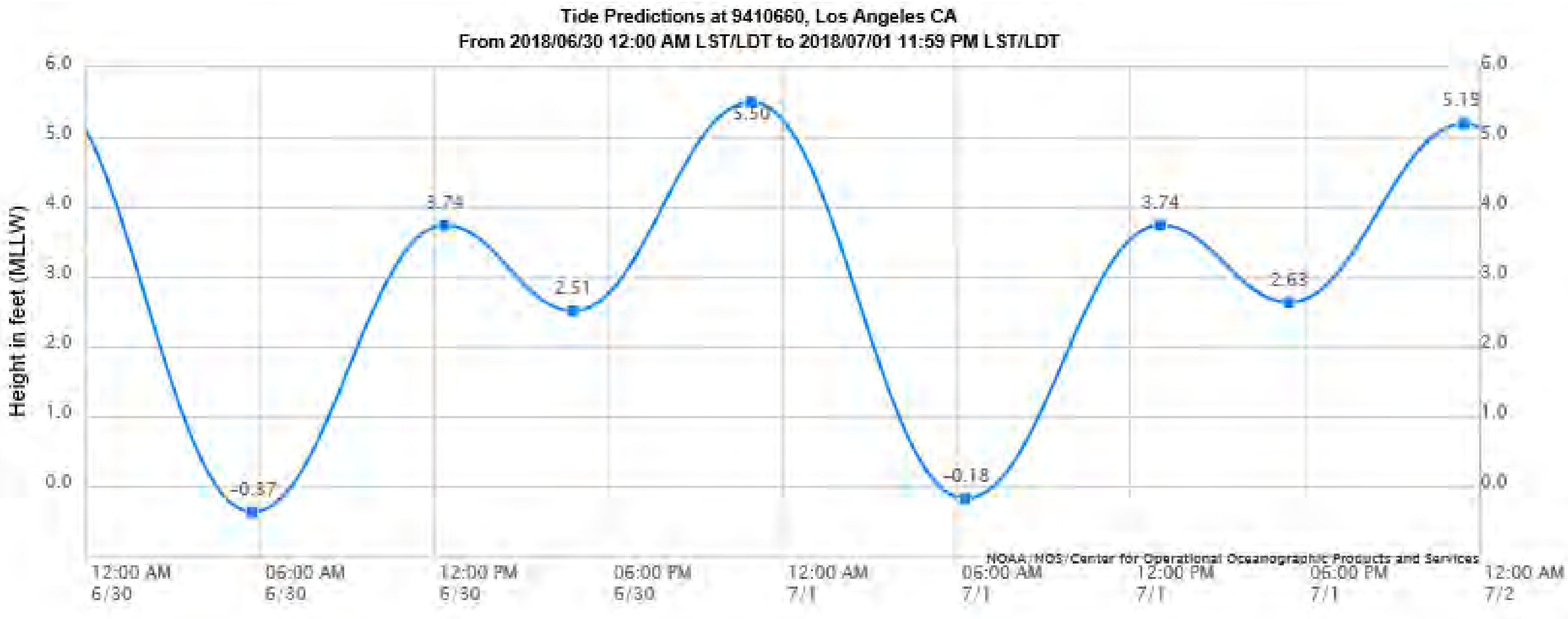


Figure 2-7: Tide predictions for Port of Long Beach (Feet MLLW)

2.7 Design Vessel

"For deep-draft projects, the design ship or ships is/are selected on the basis of economic studies of the types and sizes of the ship fleet expected to use the proposed channel over the project life. The design ship is chosen as the maximum or near maximum size ship in the forecasted fleet" (USACE 1984, 1995, 1999).

The selection of vessel specifications for fleet service forecasts and waterway engineering evaluations sometimes poses unique concerns given the requirements to evaluate design and improvements for waterway systems over time. Generally, waterway improvements should be designed to be optimized across the entire fleet forecast regime or structure. Typically, it may include service by several sizes and types of vessels (i.e., bulk carriers, containerships, tankers, etc.). Where vessel designs are relatively mature (tankers and dry bulk carriers), the task is comparatively straightforward. However, where consideration is to include fully cellular containership services, associated hull designs are still evolving. On a world fleet basis, containership designs continue to change with respect to size and cargo carrying capacity, and have not reached an absolute limiting threshold for rated carrying capacity as measured by weight (deadweight tonnage) or nominal intake for standard-unit slot capacity (i.e., nominal TEUs).

With respect to current and projected fleet service for deep-draft harbors, such as the POLB, post and new Panamax designs are divided into three (3) general groupings, largely separated by beam or extreme breadth and capacity for nominal TEU intake. Building trends for the first two groupings (Generation I and Generation II, with beams typically less than 150 to 152 feet) are reasonably well established with respect to typical physical dimensions and size relative to displacement, associated deadweight capacity, and typical homogeneous and nominal TEU ratings. What can be termed the Generation III class of containership (beams exceeding 150 feet through 168 feet) has only recently become better defined in terms of typical dimensions that a project analyst would expect to encounter due in large part to announcement of the specifications for maximum hull size to be accommodated by the new locks currently nearing completion of construction for the Panama Canal. This class has dimensions designed with an emphasis of consideration for specifications of the new locks under construction for the Panama Canal expansion. The length and beam limitations of the new locks for the Panama Canal are now known and these parameters are considered fixed. Conversely, while the specification for draft typically does have a limit, as with employment of the existing lock system, actual immersed draft can be adjusted or allowed to vary based on variability in cargo density, loading, and utilization of weight carrying capacity of the hull.

Table 2-9 shows the containerized design vessel specification that were recommended by the Economics team in collaboration with the USACE's Institute for Water Resources (IWR). **Table 2-10** shows the liquid bulk design vessel specifications.

Table 2-9: Containerized Design Vessel

Post Panamax Gen IV	
Maximum Draft:	52 ft
LOA:	1,300 ft
Beam:	193 ft
DWT:	188,000
TEUs:	18,000 - 19,000

Table 2-10: Liquid Bulk Design Vessel

VLCC	
Maximum Draft:	70 ft
LOA:	1,100 ft
Beam:	200-210 ft
DWT:	325,000

In addition to new or evolving Panamax specification, fleet service for harbors on the west of the United States such as the POLB have the potential to be serviced by the new Post-Panamax class(es) of ships, especially where concerns for depth and limitation on air draft of little concern. The primary issue for these carriers is a matter of timing or when they will initiate service, frequency of service, and applicable load factor specifications applicable to the trades involved. These vessels fall within the classification of what could be called Generation IV (and above) Post-Panamax (with the definition of Post-Panamax based on the original or lock specifications of the Canal) or new Post-Panamax based on the new locks expected to be placed into service by 2015. The Generation IV Post-Panamax class of containership have beams exceeding 168 feet through 185 to nearly 190 feet and accordingly this class of ship represent hulls that are considered to clearly exceed the margins for accommodation of the new lock system of the Panama canal and as previously described fall into the realm of what may be considered to the "new" Post-Panamax standard once the new lock system is commissioned into service.

2.8 Liquid Bulk Services

Liquid forms of bulk cargo include crude oil, gasoline, and miscellaneous chemicals. The primary liquid bulk commodity for the port is crude oil imports. Current liquid bulk facilities include Marathon Petroleum, Petro-Diamond Terminal Co., Chemoil Marine Terminal, and Vopak Terminal Long Beach (**Table 2-11**). These facilities are located on piers F, B, C, and S. As shown previously in **Figure 2-5**, crude oil imports have varied with no discernable trend from 2011 through 2019. Projected imports are not anticipated to be significantly different from historical volumes.

Table 2-11: Liquid Bulk Facilities

Terminal Operator	Petro-Diamond Terminal Co.	Chemoil Marine Terminal	Marathon Petroleum	Marathon Petroleum	Marathon Petroleum	Vopak Terminal Long Beach
Terminal Location	Pier B Berths B82, B83	Pier F Berth F209; Pier G Berth G211A	Pier B Berths B76-B80	Pier B Berths B84-B87	Pier T Berth 121	Pier S Berth S101
Cargoes Served	Gasoline, ethanol, gasoline blend stocks, diesel, biodiesel	Petroleum products and bunker fuel	Petroleum products: i.e., gasoline, blending stocks, MTBE, diesel, naphtha jet fuel, nonenes tetramers, fuel oils, carbon black, crude oil.	Crude oil, petroleum products, bunker fuel.	Crude oil and petroleum products	Miscellaneous bulk liquid chemicals
Total Terminal Area	6 ac. | 2.43 ha.	5 ac. | 2.02 ha.	18 ac. | 7.28 ha.	11 ac. | 4.45 ha.	6 ac. | 2.43 ha.	10 ac. | 4 ha.
Length of Berths	1,060 ft. | 323 m	800 ft. | 244 m	2,200 ft. | 671 m	1,980 ft. | 604 m	1,140 ft. | 347 m	700 ft. | 213.4 m
Wharf Height	14.4 ft. | 4.4 m	19.1 ft. | 5.8 m	14.4 ft. | 4.4 m	16.8 ft. | 5.1 m	22.4 ft. | 6.8 m	15.5 ft. | 4.7 m
Special Equipment & Facilities	Terminal has pipeline connections which allow petroleum products to be shipped to most L.A. Basin refiners and common carrier pipelines. Two 8-inch dock hoses connecting into two 10-inch dock lines capable of receiving up to 12,000 BBLS per hour. Truck rack at the terminal is capable of loading 150 trucks per twenty-four hour period. Permits are available for DSP and bonded storage. Capacity for petroleum products: 590,000 BBLS.	Storage capacity: 425,000 BBLS. Pipeline system to handle ships, barges, trucks and railcars. Pipeline connection to Carson tank farm, which supplies petroleum products to most L.A. Basin refiners and terminals. Rail served.	Capacity for storage: 1,800,000 BBLS. Terminal has several pipeline connections to other companies. Loading arms on dock are 8" Chiksan and are capable of loading rates of 10,000 to 15,000 BBLS per hour. Three vessels can be loaded or discharged simultaneously.	Discharge capacity: 32,000 BBLS per hour, 24-inch pipeline to storage and tank farm. Storage capacity: 245,000 BBLS	Four 16-inch diameter articulated crude unloading arms and one 8" dia. articulated bunker/diesel loading arm; 275 psi max. working pressure; designed to accommodate tankers from 50,000 to 265,000 dwt; Storage tankage available at ARCO facilities in Carson and the inner harbor via 42" and 24" pipelines.	Dedicated pump and piping systems to transfer products to and from ships, barges, railcars, and tank trucks. Storage capacity: 15 million gallons.

3 FUTURE CONDITIONS

3.1 Terminal Expansions

The Port's ability to accommodate large container ships and handle additional cargo is a key objective of the POLB. In preparation of the next generation of vessels, the POLB has a 10 year, $4.0 billion capital program to update their infrastructure and facilities to improve the efficiency of cargo operations. The program has a plan for projected spending of $2.3 billion over the next 10 years. This includes the Middle Harbor Redevelopment Project, the Gerald Desmond Bridge Replacement, the Pier B Rail Support Facility, the Pier G and J modification project, and berth deepening.

3.1.1 Existing Container Terminal Facilities and Infrastructure

Figure 2-3 outlines the existing container terminal facilities and infrastructure. These facilities include:

- Pier A: SSA terminals
- Pier C: SSA Terminal
- Pier E: Long Beach Container Terminal Inc.
- Pier G: International Transportation Service
- Pier J: Pacific Container Terminal
  Pier T: Total Terminals International

As aforementioned, the POLB has an improvement plan of $2.3 billion projected capital spends over the next 10 years. This includes the following improvements:

- Middle Harbor Redevelopment Project: $1.5 billion to combine and modernize two aging shipping terminals. The project will quintuple dock rail capacity and is expected to be completed in 2021.

- Gerald Desmond Bridge Replacement: A $1.5 billion project to build a new bridge that spans the port's main channel. This will allow for better traffic management and was completed in 2020.

- Pier B Rail Support Facility: The Pier B support facility will provide a more efficient transfer of cargo between marine terminals and Class 1 railroads.

- Pier G and Pier J modernization: Berth and rail facility improvements.

- Berth deepening

Additionally, the Port is currently updating their master plan. This includes improvements to Pier G, which would allow the design vessel to call on that berth, and the infill of Pier J South, which would allow greater landside terminal facilities and capacity for Pier J North.

3.2 Operations

3.2.1 Container Terminal Use Plan

The POLB's future container use plan will generally conform to its historical practices, however, as ships get larger, terminal operators globally are looking for ways to handle higher densities of cargo more efficiently and in a cost effective manner. The Long Beach City Council recently directed the city's harbor department to study the economic implications of automation on the city. Construction for the Middle Harbor Terminal Redevelopment Project began in 2011 and is creating one of the world's greenest container shipping terminals. The 311 acre facility will be able to handle twice as much cargo and will be nearly fully electric with zero emissions. The first phase (170 acres) of the project opened in 2016 with Orient Overseas Container Line agreeing in 2012 to a 40 year lease to operate the new terminal.

3.3 Commodity Forecast

An essential step when evaluating navigation improvements is to analyze the types and volumes of cargo moving through the port. Trends in cargo history can offer insights into a port's long-term trade forecasts, and thus, the estimated cargo volume upon which future vessel calls are based. Under future without and future with project conditions, the same volume of cargo is assumed to move through the Port of Long Beach. However, a deepening project will allow shippers to load their vessels more efficiently or take advantage of larger vessels. This efficiency translates to savings and is the main driver of National Economic Development (NED).

3.3.1 Baseline

To minimize the impact of potential anomalies in trade volumes on long-term forecasts, seven years of data were employed to establish the baseline for the commodity forecast. Empirical data from 2010 to 2016 were used to develop a baseline, allowing the forecast to capture both economic prosperity and downturn which occurred over that timeframe. The year 2015 was used as the baseline for the forecast. While this study was underway, two additional years of data (2016 and 2017) became available. Those data were evaluated, and no significant changes were found; therefore, the baseline condition was not changed.

Containerized Imports

Table 3-1 illustrates the historical import TEUs for the POLB from 2008 – 2019.

Table 3-1: Historical Containerized TEU Imports

Fiscal Year	Loaded	Empty	Total
2019	3,758,438	74,706	3,833,144
2018	4,097,377	91,364	4,188,741
2017	3,863,187	75,710	3,938,897
2016	3,442,575	99,349	3,541,924
2015	3,625,264	101,560	3,726,824
2014	3,517,512	89,184	3,606,696
2013	3,455,331	71,760	3,527,091
2012	3,062,301	82,605	3,144,906
2011	3,024,964	107,441	3,132,405
2010	3,128,859	95,907	3,224,766
2009	2,461,137	82,399	2,543,536
2008	3,189,363	112,911	3,302,274

Containerized Exports

Table 3-2: illustrates the historical containerized TEU exports for POLB from 2008 – 2019.

Table 3-2: Historical Containerized TEU Exports

Fiscal Year	**Loaded**	**Empty**	**Total**
2019	1,472,802	2,326,087	3,798,889
2018	1,523,008	2,379,274	3,902,282
2017	1,470,514	2,135,096	3,605,610
2016	1,529,497	1,703,750	3,233,247
2015	1,525,561	1,939,684	3,465,245
2014	1,604,395	1,609,716	3,214,111
2013	1,704,924	1,498,558	3,203,482
2012	1,540,179	1,360,579	2,900,758
2011	1,506,702	1,421,995	2,928,697
2010	1,562,398	1,476,334	3,038,732
2009	1,352,052	1,094,547	2,446,599
2008	1,687,052	1,498,491	3,185,543

3.3.2 Trade Forecast

The preceding section describes the methodology that was used to develop the import and export baseline. The following sections discuss the methodology employed to develop the import and export long-term trade forecasts. While the forecasts presented in the following sections are truncated in the year 2040, the Port will in all likelihood continue to grow. However, due to the substantial uncertainty of developing projections past 2040, benefits are assumed to remain constant for the remainder of the period of analysis (2027-2076).

The long-term trade forecast for the POLB study combined data obtained from the Mercator International LLC and empirical data obtained from the POLB. The Cargo Forecast from the Mercator Report identifies the economic factors that drive future performance of commodities and uses an Econometric model to provide a forecast of volumes by commodity and direction.

First, a baseline was established from historical trade information, as discussed in Section 3.3.1. Next, a long-term trade forecast for the POLB was obtained from the Mercator Report. In the following sections, the methodology to develop a long-term containerized trade forecast for the Port of Long Beach is discussed.

Mercator Report

The Mercator Report was released in February 2016 and provides a 25-year volume forecast for container and non-container cargo for the Ports of Long Beach and Los Angeles, collectively referred to as the San Pedro Bay Ports (SPB). The Port of Long Beach comprises approximately 50% of SPB values. The forecast is conducted by separating volumes by direction, commodity, and major segments. Economic factors are identified that may influence the performance of each commodity by direction to create a 25-year forecast. These forecasted economic variables are used as inputs for an Econometric model to create a 25-year forecast of both the SPB ports and national volumes by commodity and direction. This is combined with the quantified risk of cargo diversion to other ports based on changes to the SPB ports over the 25 year time frame. This analysis is done with three macro-economic assumptions to produce three separate volume forecasts: High, Expected, and Low. Additional analysis was conducted on cargo types that had the potential of diversion that quantified the risk of diversion based on three sets of assumptions: Upside, Base case, and Downside. These are defined by the amount of volume that is diverted, with Base case being the most likely volume diverted, Upside being the least volume diverted, and downside with the greatest volume diverted. The analysis therefore produced nine forecast scenarios, with the Expected economic assumptions and Base Case risk diversion assumption resulting in the most likely outcome. We only reference the results of the Expected-Base case results in this appendix. It is noted that the analysis is unconstrained and actual future volumes will be constrained by physical and operation capacities of the SPB ports.

Oxford Economics and Haver Analytics provided data and models for trade forecasts. This includes information on macroeconomic factor effects from the Oxford Economic's Global Scenarios Service that was combined to build import/export change scenarios for the U.S. and the Port of Long Beach.

Mercator Trade Forecast

a. Mercator Containerized Imports

The relationship between imports into SPB ports and the nation as a whole were analyzed for each commodity and region combination. Two important factors when performing this analysis were the SPB port's changing structure through time and the SPB port's importance to the national economy. Structural economic factors (population growth, manufacturing and service sector growth) imply that the SPB port's share of US container imports are set to grow over the 25-year forecast period. Average container growth from 2015-2020 is 5.7% and 3.75% from 2021-2041.

SPB import arrivals are shown to be comprised of higher densities from the Asia-Pacific region (79%) than the national average. Because the imports from regions other than Northeast Asia (NEA) grew faster than that of NEA, we would expect the proportion of imports from the NEA region to decrease comparatively, while the share of imports from other regions are expected to increase throughout the overall analysis period. **Figure 3-1** and **Figure 3-2** show container imports for the SPB region over the analysis period by source region.

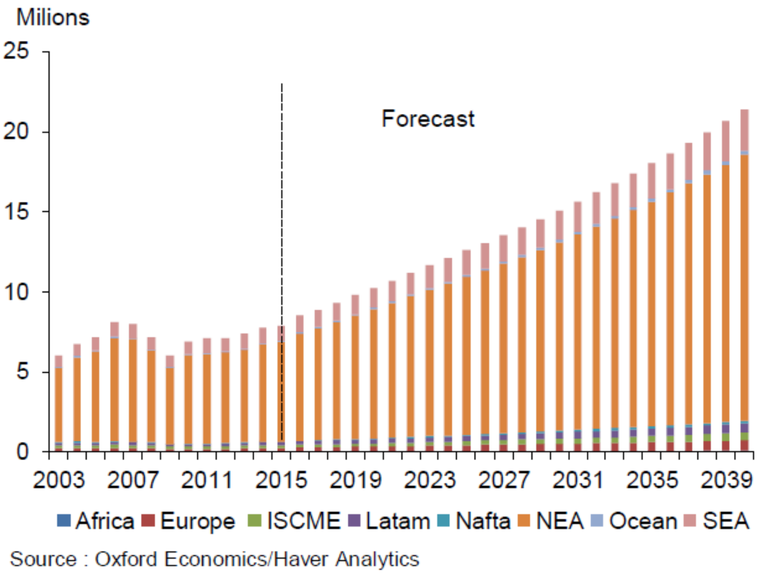


Figure 3-1: SPB Container Imports by Source Region

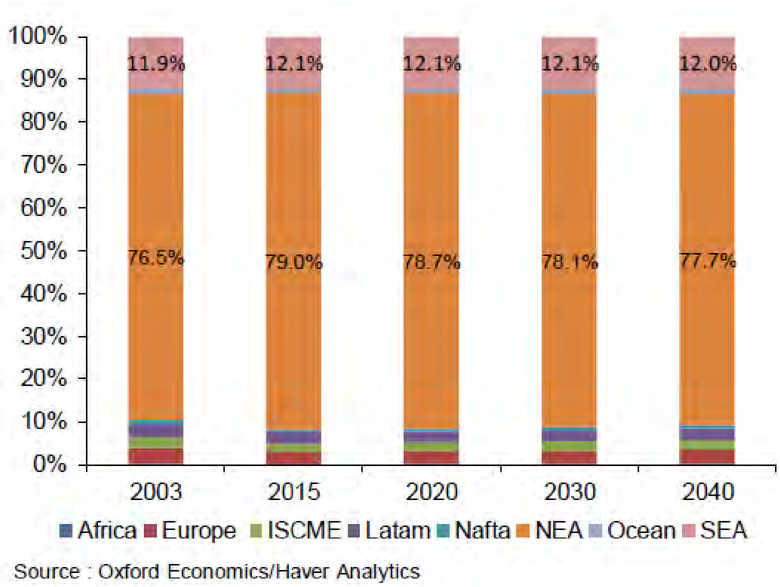


Figure 3-2: SPB Container Imports by Region

b. Mercator Containerized Exports

A similar analysis was performed as with the containerized imports in the Mercator Report. National TEU container exports are expected to rise 4.7% per year from 2015-2020. Energy products (Chemicals and machinery) are expected to be an increase proportion of the US export, as well as wood products through the analysis period. Europe is expected to have a decreasing share of US exports compared to that of emerging markets. The most rapid growth is seen in the Indian Sub-Continent and Middle East region, as well as growth in NEA and SEA. It is estimated that SPB port's exports of TEU's will increase 5.5% per annum from 2016-2020. Machinery and waste are expected to be an increasing portion of the exports from SPB, with NEA having an increasing portion of SPB exports. **Figure 3-3** and **Figure 3-4** show container exports for the SPB region over the analysis period by destination region.

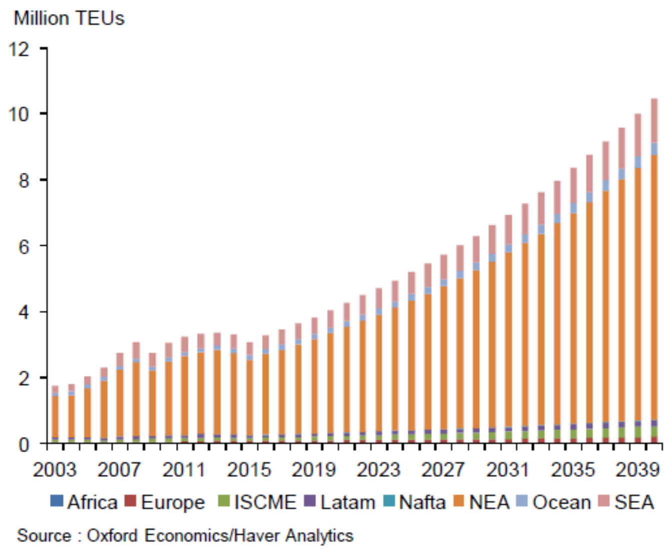


Figure 3-3: SPB Ports Exports by Destination Region

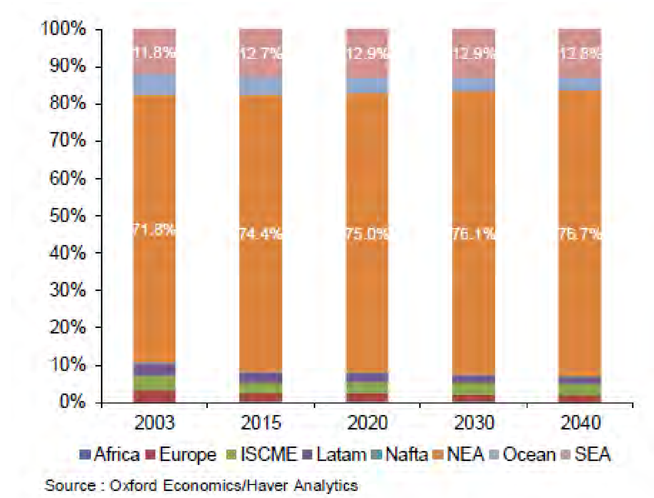


Figure 3-4: SPB Ports Exports by Region

3.3.3 Port of Long Beach Long-Term Trade Forecast – Methodology

Numerous container services call on the POLB, which have trade routes that originate all of the world. **Table 3-3** displays the trade routes used for the analyses in this study. Distances of the services included in the route group were evaluated to determine the minimum, most likely, and maximum sailing distances in nautical miles to the prior port, next port, and remaining sailing distance.

Table 3-3: Trade Routes

Route Group Name	Description
NEA-WCUS	Northeast Asia Container Route
SEA-WCUS	Southeast Asia + ISCME Container Route
EU-NA-LA-WCUS	Europe/North America/Latin America/ WCUS
OCEANIA-WCUS	New Zealand/Australia/Pacific Island/Hawaii
WCSA-WCUS	West Coast South America / WCUS
LATAM-WCUS	Latin America / WCUS
AL-WCUS-MEX	Alaska / WCUS /Mexico / Crude Oil

Table 3-4 presents the total growth rates that were developed by generating the route groups to represent all world regions. It should be noted that each trade route contains unique characteristics, such as cargo volume, cargo weight, ports of call, vessel types, mix of vessels, etc., and are therefore evaluated separately before being combined as part of the National Economic Development (NED) analysis presented in the next chapter.

Table 3-4: Port of Long Beach Forecast (Import and Export) - Total Rate of Change (%)

Year	EU-NA-LA-WCUS	NEA-WCUS	OCEANIA-WCUS	SEA-WCUS
2015	-	-	-	-
2016	5.74%	5.74%	5.74%	5.74%
2017	5.43%	5.43%	5.43%	5.43%
2018	5.15%	5.15%	5.15%	5.15%
2019	4.90%	4.90%	4.90%	4.90%
2020	4.67%	4.67%	4.67%	4.67%
2021	4.46%	4.46%	4.46%	4.46%
2022	4.75%	4.75%	4.75%	4.75%
2023	4.54%	4.54%	4.54%	4.54%
2024	4.34%	4.34%	4.34%	4.34%
2025	4.16%	4.16%	4.16%	4.16%
2026	3.99%	3.99%	3.99%	3.99%
2027	3.84%	3.84%	3.84%	3.84%
2028	3.70%	3.70%	3.70%	3.70%
2029	3.57%	3.57%	3.57%	3.57%
2030	3.44%	3.44%	3.44%	3.44%
2031	4.68%	4.68%	4.68%	4.68%
2032	4.47%	4.47%	4.47%	4.47%
2033	4.28%	4.28%	4.28%	4.28%
2034	4.11%	4.11%	4.11%	4.11%
2035	3.94%	3.94%	3.94%	3.94%
2036	3.80%	3.80%	3.80%	3.80%
2037	3.66%	3.66%	3.66%	3.66%
2038	3.53%	3.53%	3.53%	3.53%
2039	3.41%	3.41%	3.41%	3.41%
2040	3.29%	3.29%	3.29%	3.29%

Containerized Import Trade

The respective world region route import rates of change were applied to the 2015 baseline to estimate the POLB long-term import forecast, as shown in **Table 3-5**. Port capacity is not forecasted to be reached before 2040. The forecast to 2040 was included in the economic analysis presented in the next chapter of this appendix given the expectation that port capacity will not be exceeded by 2040 with benefits being held constant throughout the remaining period of analysis.

Table 3-5: Port of Long Beach Containerized Trade Forecasts - Import Tonnes

Year	EU-NA-LA-WCUS	NEA-WCUS	OCEANIA-WCUS	SEA-WCUS	Total
2015	4,280,121	9,431,645	2,178,759	5,994,495	21,885,020
2021	5,754,179	12,679,869	2,929,115	8,058,978	29,422,142
2030	8,215,775	18,104,223	4,182,169	11,506,549	42,008,716
2040	12,063,948	26,584,032	6,141,049	16,896,084	61,685,113

Containerized Export Trade

Table 3-6: Port of Long Beach Containerized Trade Forecasts - Export Tonnes

Year	EU-NA-LA-WCUS	NEA-WCUS	OCEANIA-WCUS	SEA-WCUS	Total
2015	2,599,801	5,728,903	1,323,406	3,641,134	13,293,245
2021	3,495,163	7,701,917	1,779,183	4,895,128	17,871,391
2030	4,990,368	10,996,740	2,540,304	6,989,227	25,516,639
2040	7,327,799	16,147,486	3,730,152	10,262,900	37,468,337

Using the containerized trade forecast for imports and exports and the average weight per loaded container (in terms of twenty-foot equivalent units, or TEUs), a loaded container forecast was developed. **Table 3-7** provides the weight per loaded container for the four route groups. Additionally, **Table 3-8** provides the loaded import and export TEU forecast for the four route groups.

Table 3-7 Port of Long Beach Containerized Trade Weight per TEU

Year	EU-NA-LA-WCUS	NEA-WCUS	OCEANIA-WCUS	SEA-WCUS
2015	8.47	6.78	8.52	6.87
2021	8.44	6.81	8.44	6.81
2030	8.47	6.90	8.36	6.83
2040	8.50	7.01	8.32	6.81

Table 3-8: Port of Long Beach TEU Forecast

Route Group	2015	2021	2030	2040
EU-NA-LA-WCUS	517,787	696,100	982,611	1,427,312
NEA-WCUS	1,646,550	2,226,954	3,199,399	4,693,378
OCEANIA-WCUS	254,273	346,424	499,958	733,858
SEA-WCUS	1,038,691	1,427,687	2,054,473	3,073,389
Total Imports	**3,457,301**	**4,697,166**	**6,736,442**	**9,927,937**
Route Group	**2015**	**2021**	**2030**	**2040**
EU-NA-LA-WCUS	287,368	388,727	565,307	846,502
NEA-WCUS	593,749	796,727	1,138,080	1,675,691
OCEANIA-WCUS	155,802	211,033	304,166	449,892
SEA-WCUS	386,455	520,833	749,937	1,114,428
Total Exports	**1,423,373**	**1,917,320**	**2,757,490**	**4,086,514**

Crude Oil Import Trade

Table 3-9 shows the forecasted crude oil imports for POLB through year 2040. As shown, crude oil shows a decrease after years 2021, through 2030 and 2040. Improvements in energy efficiency is expected to drive the easing of oil import demand. The compounded annual growth rate (CAGR) from 2015-2021 was 0.66%. The CAGR from 2021 to 2030 is -0.56%. The CAGR from 2030 to 2040 is -.057%.

Table 3-9: Forecasted Crude Oil Imports

Year	Crude Oil Imports
2015	22,985,501
2021	23,917,152
2030	22,751,027
2040	22,494,704

The crude oil import and export forecast was defined by a 2020 IHS Markit analysis. This analysis includes a forecasted recession due to the Covid 19 pandemic, followed by a recovery period starting in 2022. The growth in petroleum product demand will be driven by the increase in refinery utilization and increase crude oil demand from the economic recovery. The U.S. is expected to remain a heavy importer of heavy crude, with increasing volumes of Canadian barrels via pipeline. The increased import from Canada is expected to cause a decrease in the volumes of offshore imports (**Figure 3-5**).

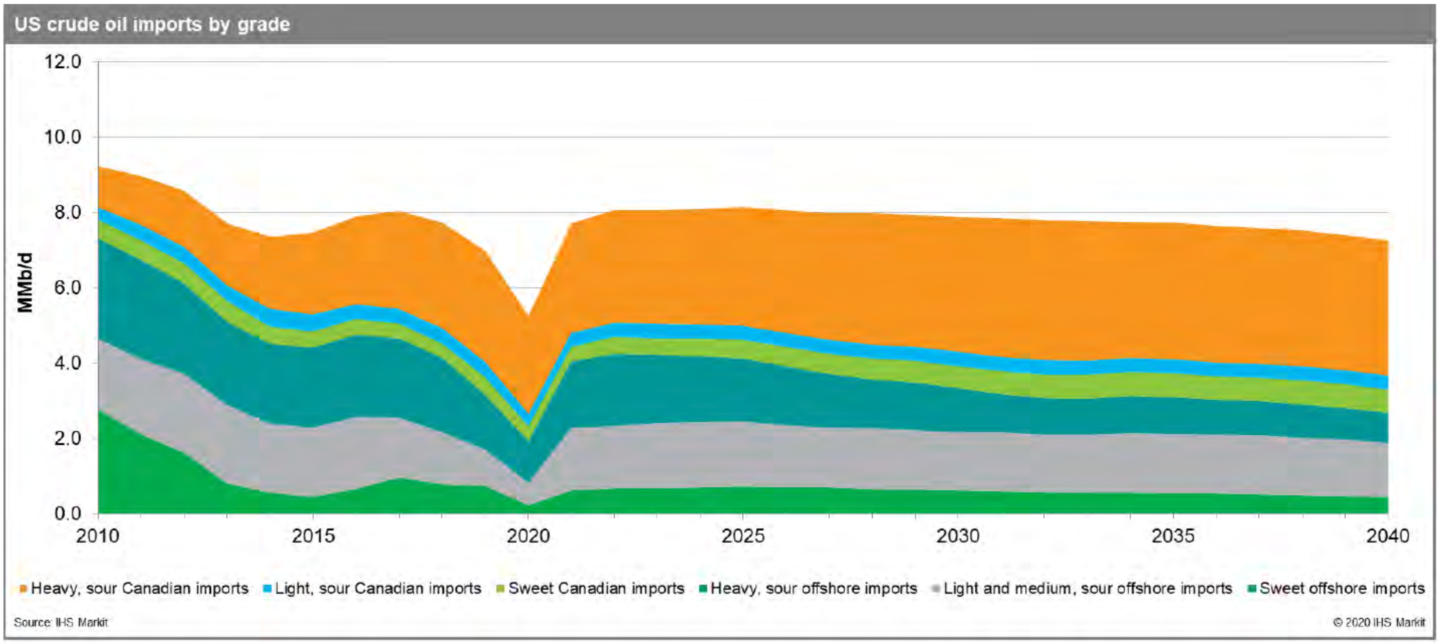


Figure 3-5: U.S. Crude Oil Imports by Grade

3.4 Vessel Fleet

3.4.1 World Fleet

In addition to a commodity forecast, a forecast of the future fleet is required when evaluating navigation projects. To develop projections of the future fleet calling at the POLB, the study team obtained a World Fleet forecast of containerships developed by Maritime Strategies Inc. (MSI), which forecasted the total capacity calling at the POLB and provided a breakdown of that capacity calling into the containership size and TEU classes.

The methodology developed by MSI was then linked to the IHS commodity forecast data for U.S. West Coast and the Mercator Report for Long Beach. The commodity forecasts were unconstrained forecasts, and consequently MSI's model was similarly unconstrained with respect to the inter-port competition on the U.S. West Coast. Furthermore, MSI did not consider land-based infrastructure as a limiting factor in its approach to forecasting the world fleet. **Table 3-10** shows the fleet subdivision using the common vessel labeling terminology and vessel specifications for design draft, beam, and length overall (LOA).

Table 3-10: Fleet Subdivisions on Draft, Beam, and LOA (feet)

Vessel Fleet Subdivision (Containerships)		From	To
Sub Panamax (SPX) (MSI size brackets: 0.1-1.3, 1.3-2.9 k TEU)	**Beam**	55	98
	Draft	8.2	38.1
	LOA	222	813.3
Panamax (PX) (MSI size brackets: 1.3-2.9, 2.9-3.9, 3.9-5.2, 5.2-7.6 k TEU)	**Beam**	98	106
	Draft	30.8	44.8
	LOA	572	970
Post-Panamax (PPX1) (MSI size brackets: 2.9-3.9, 3.9-5.2, 5.2-7.6, 7.6-12 k TEU)	**Beam**	106	138
	Draft	35.4	47.6
	LOA	661	1045
Super Post-Panamax (PPX2) (MSI size brackets: 5.2-7.6, 7.6-12 k TEU)	**Beam**	138	144
	Draft	39.4	49.2
	LOA	911	1205
Ultra Post-Panamax (PPX3) (MSI size brackets: 5.2-7.6, 7.6-12, 12 k + TEU)	**Beam**	144	168
	Draft	44	55
	LOA	950	1220
Post-Panamax (PPX4) (MSI size brackets: 12 k + TEU)	**Beam**	168	200
	Draft	52.5	55
	LOA	1000	1300

By combining information from the commodity forecast with MSI's forecasted fleet capacity and the POLB's average share of cargo on a containerized vessel, the study team was able to allocate a number of Post-Panamax, Panamax, and sub-Panamax vessels calls to the POLB fleet. The number of transits, particularly those made by larger vessels, is a key variable in calculating the transportation costs. MSI's forecasting technique begins with performing a detailed review of the current world fleet and how it is deployed throughout various trade routes of the world. Forecasting of the world fleet was made possible through MSI's proprietary Container Shipping Planning Service (CSPS) model (**Figure 3-6**), which applies the historical and forecasted time series data from 1980 to 2035 for:

- Macroeconomic indicators
- Global container trade and movements by region
- TEU lifts by type (primary/transshipment and full/empty) and by region
- Bilateral trade data for major routes
- Containership supply and fleet developments by vessels size range
- Explicit scrapping, cancellation and slippage assumptions
- Time-charter rates, freight rates and operating costs by segment
- Newbuilding, secondhand (by age) and scrap prices by segment

Data sources for the CSPS model include:

- Macroeconomics: Oxford Economics, leading investment banks;
- World Trade: UNCTAD, Drewry Shipping Consultants, Containerization International;
- Fleet Supply: LR-Fairplay, Worldyards, Howe Robinson;
- Charter Rates, Freight Rates and Vessel Prices: Drewry Shipping Consultants, Howe Robinson, Clarksons and various contacts at shipping lines; and

World Trade history is provided by UNCTAD, Drewry Shipping Consultants and Containerization International. MSI's forecast for trade in dry goods, including containerized trade, are derived from a series of constantly evolving econometric relationships between trade volumes and macroeconomic drivers. The latter drivers are country/regional specific and form the proprietary core of MSI's business.

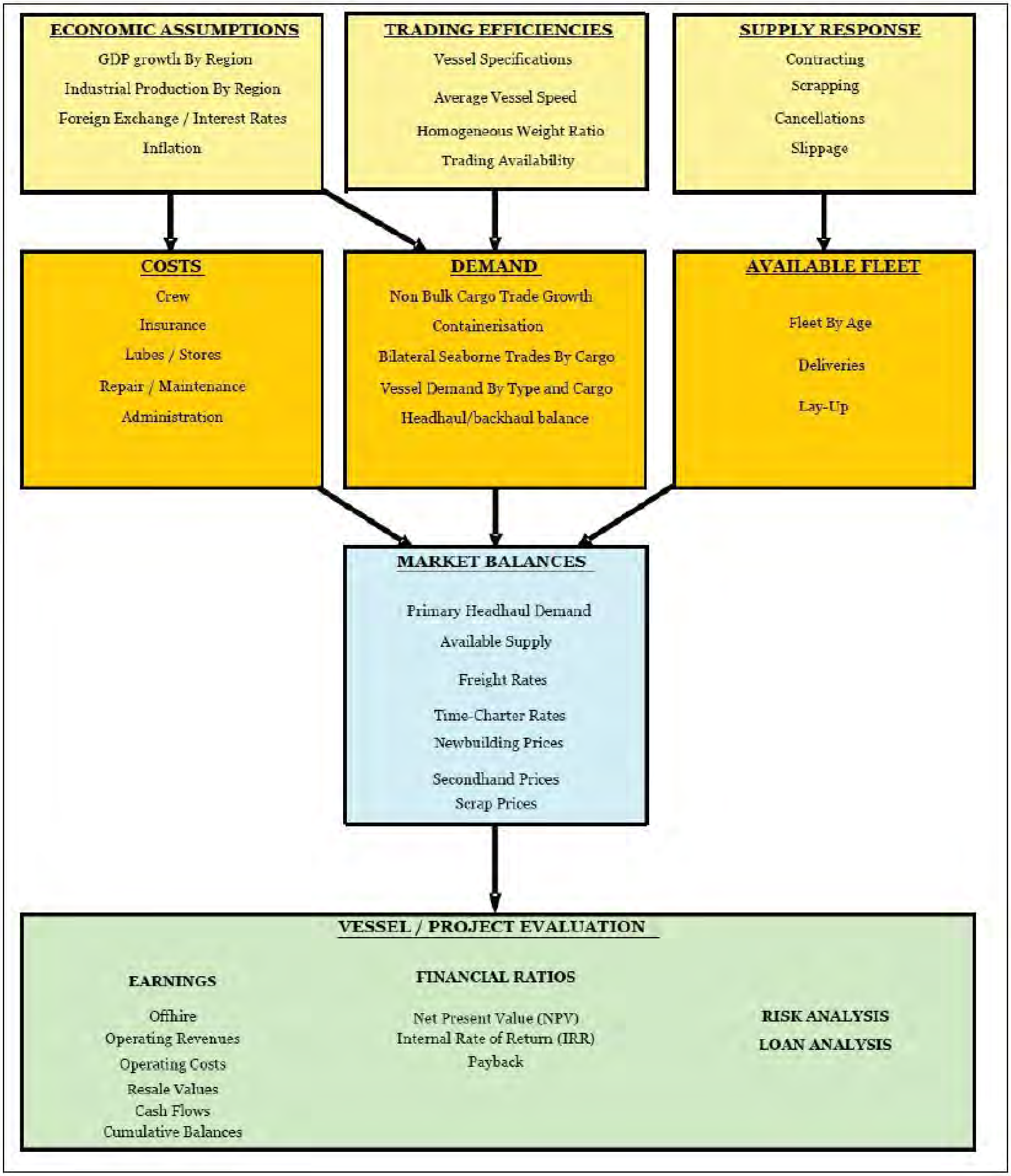


Figure 3-6: Schematic Overview of MSI's CSPS Model

When evaluating data on vessel composition, vessel age, and container markets, MSI considered the "order book" to estimate new deliveries to the fleet into the future. Vessel scrapping is accounted for based on historical scrapping rates by vessel class and age. Containerships, particularly the largest ones, are relatively new, so widespread scrapping is not expected to take place until well in the future. Likewise, when economies are strong, vessel owners are more likely to hold onto their existing vessels (or build new ones) and less likely to scrap them. The forecasted world fleet provides a frame of reference to verify the validity of the POLB fleet forecast and is provided as background information. As new larger vessels become a greater percentage of the world fleet and are deployed to the POLB, they replace smaller vessels which are redeployed to shorter routes, which may utilize the smaller vessels more efficiently.

There is a strong relationship between the economic condition of a port and its total nominal vessel capacity. As an economy grows, exports from the port often increase (from the increased output) or demand for imports increase (from increased consumer purchasing power). Vessels respond accordingly to satisfy this increased level of trade. In the Charleston port deepening study, MSI examined the empirical relationship between the nominal capacity of the fleet calling at the port and the historical tonnages moving through the port. MSI found the variables to be highly correlated, having an R-squared value of 0.967. The same statistical relationship observed in that port's study was then applied to the POLB's forecasted tonnages in order to estimate the future nominal TEU vessel capacity calling the POLB. Similar to the previously mentioned study, as the tonnage in the POLB grew over time, the nominal TEU vessel capacity, i.e., the total number of available container slots, also grew. Capacity was adjusted by operators to match the demand. Once the forecasted nominal TEU vessel capacity at the POLB was determined, the future containers were allocated to various vessel classes (Post-Panamax, Panamax, and sub-Panamax). The allocation to vessel classes was based on MSI's examination of historical utilization of Panamax vessels, current trends in vessel design and orders, and the worldwide redeployment of vessels affected by the expansion of the Panama Canal.

World Fleet

A projection of the world fleet provides the necessary background for evaluating the future fleet forecast for the POLB. The starting point for this projection was the world fleet by vessel class extracted from the Lloyd's Register (LR)-Fairplay database for the years 2013, 2014, and 2017[1]. As shown in **Table 3-11**, larger vessels are quickly becoming a higher percentage of the world fleet. In 2013, container vessels larger than 12,000 TEUs made up just under 3 percent of the world fleet while vessels greater than 7,600 TEUs totaled around 10.5 percent. As of 2017, 12,000 TEU vessels have increased to about 7.6 percent of the world fleet and vessels greater than 7,600 TEUs now make up about 20 percent.

Table 3-11: World Fleet by TEU Band – 2013, 2014 and 2017

TEU Band	2013	2014	2017
0.1 - 1.3 k TEU	1,600	1,557	1,553
1.3 - 2.9 k TEU	1,352	1,333	1,476
2.9 - 3.9 k TEU	303	295	271
3.9 - 5.2 k TEU	762	750	656
5.2 - 7.6 k TEU	519	536	468
7.6 - 12 k TEU	379	438	670
12 k TEU +	151	193	422
TOTAL	**5,066**	**5,102**	**5,516**

[1] LR-Fairplay maintains the largest maritime databases covering ships, movements, owners and managers, maritime companies, ports and terminals.

The "Order Book"

The "order book" is shorthand for the vessels that have been contracted to be built by ship builders around the world. Vessel deliveries are primarily the function of new building contracting. These contracts can take several forms. There are firm contracts for vessels that are under construction. There are also option contracts that secure the capacity of the shipyard but do not require the buyer to exercise the option to construct the vessel. Some contracts have financing that is committed; others do not. There are several other nuances that pose possible challenges in translating the number of vessels and types of contracts into future vessels coming online at a specific time. This requires knowledge and expertise of this market and this process. Forecasts must be made for future contracts, vessel scrapping, and vessel deliveries[2]. Over the long term, new building investment tends to equate to the incremental demand for new tonnages to meet cargo growth or replacement of aged or obsolete ships.

A historical breakdown of contracting by TEU band was accomplished using a widely recognized fleet database provided by LR-Fairplay. The breakdown was expressed as a percentage of ships for each TEU band size. These percentages were used as a baseline for forecasting future contracting. **Figure 3-7** depicts historical and future forecasted contracting by TEU bands for fully cellular container (FCC) vessels[3] for years 2000 to 2035.

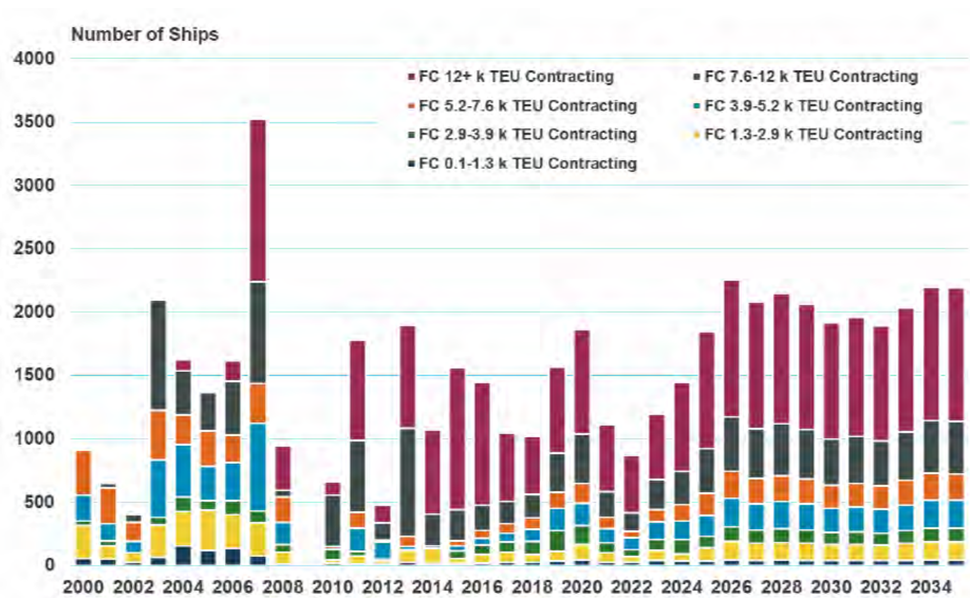


Figure 3-7: Container Contracting, 2000-2035 (Source: MSI)

Deliveries and Scrapping Assumptions

MSI modeled the relationship between annual contracting and annual deliveries by TEU band. The forecast of deliveries by TEU band are depicted in **Figure 3-8**. The number of new vessel deliveries is expected to increase each year until a 2030 peak, and then taper off to the end of the forecast period, with an upward bounce in 2034.

[2] Factors such as economic conditions, price of steel, exchange rates, and a host of others can influence the forecasted world fleet.

[3] The term "fully cellular" refers to vessels that are purposely built to carry ocean containers. The containers are generally stored in vertical slots on the ship.

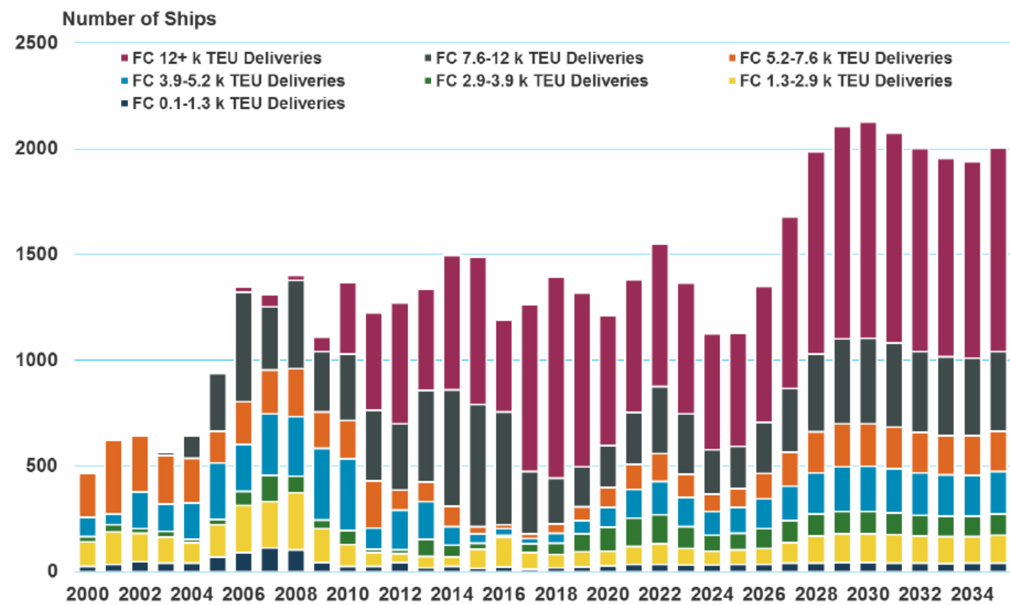


Figure 3-8: Containership Deliverables. 2000-2035 (Source: MSI)

An estimate of annual scrapping was accomplished by examining the LR-Fairplay database for the world fleet each year and noting which vessels drop out each year. This was done by TEU band and transformed into a scrapping profile for each band. **Figure 3-9** shows the estimated scrapping by TEU band class.

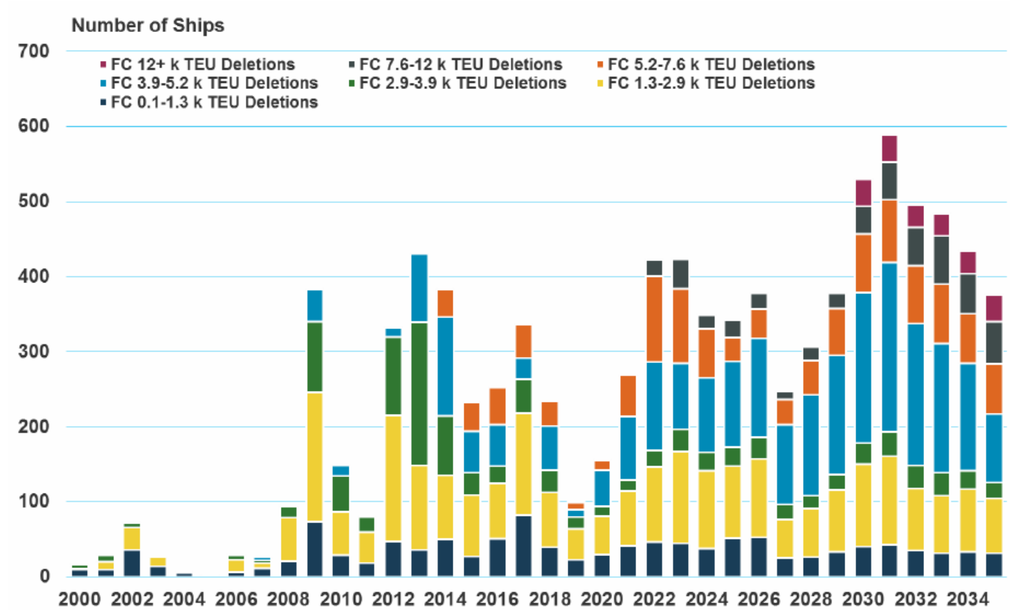


Figure 3-9: Containership Deletions, 2000-2035 (Source MSI)

World Fleet Forecast

With data for deliveries, scrapping, and the 2011 fleet calculated, forecast of the fleet for the end of each forecast year was estimated using the following equation:

$$Fleet\ EoP\ (Year)\ =\ Fleet\ EoP\ (Year-1)\ +\ Deliveries\ (Year) - Scrapping\ (Year)\ EoP\ =\ End\ of\ period$$

Figure 3-10 displays the world FCC forecast by TEU band through 2035.

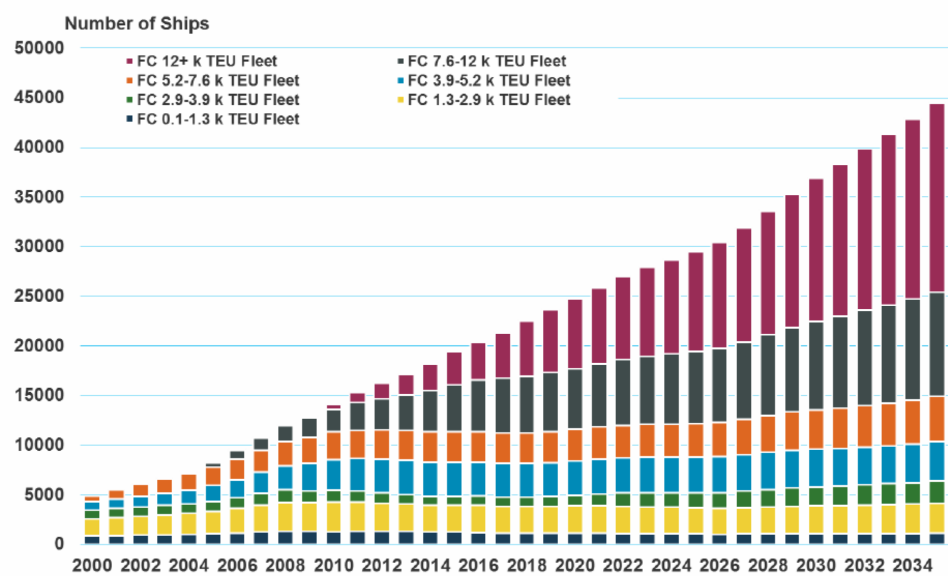
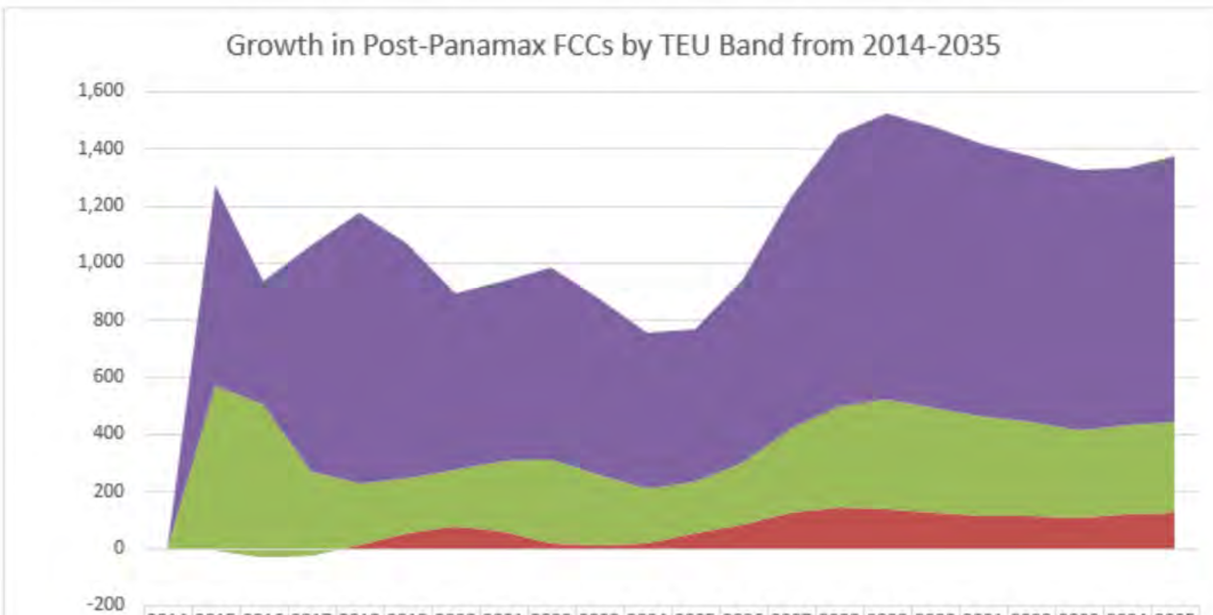


Figure 3-10: World Fleet, Historical and Forecasted FCC by TEU Band, 2000-2035 (Source: MSI)

Figure 3-11 shows the net growth in selected Post-Panamax TEU bands from the 2014 fleet. The figure shows the additional vessels added to the fleet. These types of vessels are a key factor in the evaluation of port deepening studies such as the POLB.



	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
12+ k	0	698	432	791	950	823	616	627	677	617	547	536	644	815	956	1006	987	956	931	910	900	927
7.6-12 k	0	576	534	296	217	187	198	244	293	248	192	178	218	291	350	380	367	347	331	307	313	319
5.2-7.6 k	0	-4	-32	-22	11	57	81	63	17	10	17	56	82	128	147	141	125	115	114	108	121	126

Figure 3-11: World Fleet Net Growth Forecast of Selected TEU Bands

4 TRANSPORTATION COST SAVINGS BENEFIT ANALYSIS

The purpose of this analysis is to describe the benefits associated with the deepening and widening at the Port of Long Beach channels. NED benefits were estimated by calculating the reduction in transportation cost for each project depth using the HarborSym Model (HSM), developed by IWR. The HSM incorporates USACE guidance on transportation cost savings analysis. Within this section, the HSM is described in detail and its application in this study.

4.1 Methodology

Channel improvement modifications result in reduced transportation cost by allowing a more efficient future fleet mix (and less congestion) when traversing the harbor. The HSM was designed to allow users to model these benefits. With a deepened channel, carriers will be able to load Post-Panamax vessels more efficiently and thereby reduce transiting costs. In the future, these carriers are anticipated to replace smaller less efficient vessels with the larger more efficient vessels on West Coast service lanes that will call the POLB. There are three primary effects from channel deepening that can benefit the future fleet at the POLB. The first is an increase in a vessel's maximum practicable loading capacity, if the vessel is depth constrained in the current channel. Channel restrictions can limit a vessel's capacity by limiting its ability to load to its design draft. Deepening the channel can reduce this constraint and the vessel's maximum practicable capacity can increase towards its design capacity if commodities are available to transit, vessel loading practices allow, and the weight of all commodities on a vessel can "push" deeper into the water. This increase in vessel capacity utilization can result in fewer vessel trips being required to transport the forecasted cargo. The second effect of increased channel depth is the increased operational reliability of water depth, which encourages the deployment of larger vessels to high volume lanes. The third effect is a consequence of the second; the increase in Post-Panamax vessels displaces the less economically efficient Panamax class vessels.

While lesser in magnitude when compared to channel deepening, additional transportation cost saving benefits result from the channel modifications aimed at reducing congestion within the harbor. The creation of meeting areas reduces wait times within the harbor. HarborSym allows for detailed modeling of vessel movements and transit rules on the waterway.

To begin, HarborSym was setup with the basic required variables. To estimate Origin- Destination (OD) cost saving benefits, a tool was used to generate a vessel call list based on the commodity forecast at the POLB for particular, defined years and available channel depth under the various examined depth alternatives. The resulting vessel traffic was simulated using HarborSym, producing an average annual vessel OD transportation cost. The transportation costs saving benefits were then calculated from the existing channel depths for each additional project depth. The NED Plan was identified by considering the highest net benefit based on the OD transportation cost saving benefits.

Preliminary benefits were calculated using the 2019 deep-draft vessel operating costs developed by the Institute for Water Resources and published for use by analysts of the US Army Corps of Engineers for assessment of potential economic benefits associated with waterway improvement projects. Vessel operating costs were updated in July 2020. The updated vessel operating costs were used to calculate benefits in the final alternative analysis. Per EGM 20-04, "Recent years have seen dramatic fluctuations in oil prices that have had remarkable effects on the VOCs." This was mitigated by a year to year cap of 5% per year.

4.1.1 HarborSym Model

IWR developed HarborSym as a planning level, general-purpose model to analyze the transportation costs of various waterway modifications within a harbor. HarborSym is a Monte Carlo simulation model of vessel movements at a port for use in economic analyses. While many harbor simulation models focus on landside operations, such as detailed terminal management, HarborSym instead concentrates on specific vessel movements and transit rules on the waterway, fleet and loading changes, as well as incorporating calculations for both within harbor costs and costs associated with the ocean voyage.

HarborSym represents a port as a tree-structured network of reaches, docks, anchorages, and turning areas. Vessel movements are simulated along the reaches, moving from the bar to one or more docks, and then exiting the port. Features of the model include intra-harbor vessel movements, tidal influence, the ability to model complex shipments, incorporation of turning areas and anchorages, and within-simulation visualization. The driving parameter for the HarborSym model is a vessel call at the port. A HarborSym analysis revolves around the factors that characterize or affect a vessel movement within the harbor.

Model Behavior

HarborSym is an event driven model. Vessel calls are processed individually and the interactions with other vessels are taken into account. For each iteration, the vessel calls for an iteration that fall within the simulation period are accumulated and placed in a queue based on arrival time. When a vessel arrives at the port, the route to all of the docks in the vessel call is determined. This route is comprised of discrete legs (contiguous sets of reaches, from the entry to the dock, from a dock to another dock, and from the final dock to the exit). The vessel attempts to move along the initial leg of the route.

Potential conflicts with other vessels that have previously entered the system are evaluated according to the user-defined set of rules for each reach within the current leg, based on information maintained by the simulation as to the current and projected future state of each reach. If a rule activation occurs, such as no passing allowed in a given reach, the arriving vessel must either delay entry or proceed as far as possible to an available anchorage, waiting there until it can attempt to continue the journey. Vessels move from reach to reach, eventually arriving at the dock that is the terminus of the leg.

After the cargo exchange calculations are completed and the time the vessel spends at the dock has been determined, the vessel attempts to exit the dock, starting a new leg of the vessel call; rules for moving to the next destination (another dock or an exit of the harbor) are checked in a similar manner to the rule checking on arrival, before it is determined that the vessel can proceed on the next leg. As with the entry into the system, the vessel may need to delay departure and re-try at a later time to avoid rule violations and, similarly, the waiting time at the dock is recorded.

A vessel encountering rule conflicts that would prevent it from completely traversing a leg may be able to move partially along the leg, to an anchorage or mooring. If so, and if the vessel can use the anchorage (which may be impossible due to size constraints or the fact that the anchorage is filled by other vessels), then HarborSym will direct the vessel to proceed along the leg to the anchorage, where it will stay and attempt to depart periodically, until it can do so without causing rule conflicts in the remainder of the leg. The determination of the total time a vessel spends within the system is the summation of time waiting at entry, time transiting the reaches, time turning, time transferring cargo, and time waiting at docks or anchorages. HarborSym collects and reports statistics on individual vessel movements, including time in system, as well as overall summations for all movements in an iteration.

Each vessel call has a known (calculated) associated cost, based on time spent in the harbor and ocean voyage and cost per hour. Also, for each vessel call, the total quantity of commodity transferred to the port (both import and export) is known, in terms of commodity category, quantity, tonnage and value. The basic problem is to allocate the total cost of the call to the various commodity transfers that are made. Each vessel call may have multiple dock visits and multiple commodity transfers at each visit, but each commodity transfer record refers to a single commodity and specifies the import and export tonnage. Also, at the commodity level, the "tons per unit" for the commodity is known, so that each commodity transfer can be associated with an export and import tonnage. As noted above, the process is greatly simplified if all commodity transfers within a call are for categories that are measured in the same unit, but that need not be the case.

When a vessel leaves the system, the total tonnage, export tonnage, and import tonnage transferred by the call are available, as is the total cost of the call. The cost per ton can be calculated at the call level (divide total cost by respective total of tonnage). Once these values are available, it is possible to cycle through all of the commodity transfers for the vessel call. Each commodity transfer for a call is associated with a single vessel class and unit of measure. Multiplying the tons or value in the transfer by the appropriate per ton cost, the cost totals by class and unit for the iteration can be incremented. In this fashion, the total cost of each vessel call is allocated proportionately to the units of measure that are carried by the call, both on a tonnage and a value basis. Note that this approach does not require that each class or call carry only a commensurate unit of measure.

The model calculates import and export tons, import and export value, and import and export allocated cost. This information allows for the calculation of total tons and total cost, allowing for the derivation of the desired metrics at the class and total level. The model can thus deliver a high level of detail on individual vessel, class, and commodity level totals and costs.

Either all or a portion of the at-sea costs are associated with the subject port, depending on whether the vessel call is a partial or full load. The at-sea cost allocation procedure is implemented within the HarborSym Monte-Carlo processing kernel and utilizes the estimate total trip cargo (ETTC) field from the vessel call information along with import tonnage and export tonnage. In all cases the ETTC is the user's best estimate of total trip cargo.

Data Requirements

The data required to run HarborSym are separated into six categories, as described below. Key data for the POLB Channel Improvement study are provided.

Simulation Parameters

Parameters include start date, the duration of the iteration, the number of iterations, the level of detail of the result output, and the wait time before rechecking rule violations when a vessel experiences a delay. These inputs were included in the model runs for this study. For this analysis, detailed forecasts were developed for years 2021, 2030, and 2040. After 2040 the forecasted number of TEUs and liquid bulk were held constant throughout the period of analysis.

Physical and Descriptive Harbor Characteristics: These data inputs include the specific network of the POLB, such as the node location and type, reach length, width, and depth, in addition to tide and current stations. This also includes information about the docks in the harbor, such as length and maximum number of vessels the dock can accommodate at any given time. **Figure 4-1** displays the Node network used for Long Beach Harbor.

General Information

General information used as inputs to the model include: specific vessel and commodity classes, route groups **(Table 4-1),** commodity transfer rates at each dock **(Table 4-2),** specifications of turning area usage at each dock, and specifications of anchorage use within the harbor. Distances between the route groups were developed by evaluating the 9 trade routes calling on the Port of Long Beach in 2015. The route group distance included in the analysis for each trade lane is calculated from the average distance for each trade route that was identified.

Figure 4-1: POLB HarborSym Node Network

Table 4-1: HarborSym Route Groups

Route Group Name	Description	Sea Distance (nautical miles)
NEA-WCUS	Northeast Asia Container Route	14,000
SEA-WCUS	Southeast Asia + ISCME Container Route	16,000
EU-NA-LA-WCUS	Europe/North America/Latin America/ WCUS	17,000
OCEANIA-WCUS	New Zealand/Australia/Pacific Island/Hawaii	13,000
WCSA-WCUS	West Coast South America / WCUS	7,000
LATAM-WCUS	Latin America / WCUS	7,000
AL-WCUS-MEX	Alaska / WCUS /Mexico / Crude Oil	2,800
FE-WCUS	Far East / WCUS / Crude Route	12,500

Table 4-2: HarborSym Transfer Rates

Dock Name	Loading/Unloading Rate for Containerized Commodities (tonnes/hour)		
	Min	Most Likely	Max
Pier J North TEUs	880	1,936	2,816
Pier J South TEUs	880	1,936	2,816
Pier T TEUs	950	1,000	1,200
Pier T-Crude MT	5,400	6,000	6,600

Vessel Speeds

The speed at which vessels operate in the harbor, by vessel class both loaded and light loaded, were determined for each channel segment by evaluating pilot logs and port records as well as by verifying the data with the pilots. Vessel speed inputs are provided in **Table 4-3** for each reach of the node network for containerized vessels.

Table 4-3: HarborSym Vessel Speed in Reaches (knots)

Reach	Sub-Panamax		Panamax		PPX1		PPX2		PPX3 & PPX4		Tankers	
	Light	Loaded	Light	Loaded	Light	Loaded	Light	Loaded	Light	Loaded	Light	Loaded
All Reaches	12	10	12	10	12	10	12	10	12	10	12	10

Vessel Operations

Hourly operating costs while in-port and at-sea were determined for both domestic and foreign flagged containerized vessels. Sailing speeds at-sea were also determined. These values are entered as a triangular distribution. The inputs are shown in **Table 4-4**.

Table 4-4: Vessel Operations

Description	Panamax	PPX 1	PPX 2	PPX 3	PPX4	Sub Panamax	Tankers
Vessel Speed at Sea, Min (knots)	19.0	20.0	20.0	20.0	20.0	16.0	13.0
Vessel Speed at Sea, Most Likely (knots)	20.0	21.0	21.0	21.0	21.0	17.0	14.0
Vessel Speed at Sea, Max (knots)	21.0	22.0	22.0	22.0	22.0	18.0	15.0

Reach Transit Rules

Vessel transit rules for each reach reflect restrictions on passing, overtaking, and meeting in particular segments of Long Beach Harbor, and are used to simulate actual conditions in the reaches. For the Tidal Advantage and Meeting Area analysis, underkeel clearance requirements are also used along with tide to determine if a vessel can enter the system.

Vessel Calls

The vessel call lists are made up of forecasted vessel calls for a given year. Each vessel call list contains the following information: arrival date, arrival time, vessel name, entry point, exit point, arrival draft, import/export, dock name, dock order, commodity, units, origin/destination, vessel type, Lloyds Registry, net registered tons, gross registered tons, dead weight tons, capacity, length overall, beam, draft, flag, tons per inch immersion factor, ETTC, and the route group for which it belongs.

4.1.2 Vessel Call List

The forecasted commodities for the POLB were allocated to the future fleet using a forecast spreadsheet tool. This produces a containership-only future vessel call list based on user inputs describing commodity forecasts at docks and the available fleet. The module is designed to process in two unique steps to generate a shipment list for use in HarborSym. First, a synthetic fleet of vessels is generated that can service the port. This fleet includes the maximum possible vessel calls based on the user provided availability information. Second, the commodity forecast demand is allocated to individual vessels from the generated fleet, creating a vessel call and fulfilling an available call from the synthetic fleet.

In order to successfully utilize this tool on a planning study, users provide extensive data describing containership loading patterns and services frequenting the study port. The user provides a vessel fleet forecast by vessel class, season, and service, and a commodity forecast by dock, season, and region.

Container Loading Practice Changes

A load factor analysis (LFA) was done to determine the maximum practicable draft and the maximum practicable cargo capacity for each trade unit. A load factor analysis is used to account for the physical components that determine the vessel draft. Combining these factors allows the analyst to determine whether the vessel will reach its volumetric capacity before it reaches its deadweight capacity. Once the vessel reaches its volumetric cargo capacity, the vessel is said to have "cubed out", meaning it can carry no more cargo no matter how much additional channel depth is available. **Table 4-5** provides details on the vessel subclasses, which is used by the LFA to create vessels to satisfy the commodity forecast. The user provides the linkage between the HarborSym vessel class and the IWR-defined vessel subclass.

Table 4-5: Vessel Class Inputs

Service	Vessel Class	AVG Loading Weight Per Loaded TEU (tonnes)	AVG Container Weight Per TEU (tonnes)	Empty TEU Allotment	Vacant Slot Allotment	Operation Allowance (% of DWT)	Variable Ballast (% of DWT)	Import Shipment Size Proportion	Export Shipment Size Proportion
NEA-WCUS	PX	7.28	2	22.3%	6.2%	7.1%	14.9%	23%	15%
NEA-WCUS	PPX 1	7.28	2	19.2%	6.2%	7.1%	14.9%	28%	12%
NEA-WCUS	PPX 2	7.28	2	24.9%	6.2%	7.1%	14.9%	46%	28%
NEA-WCUS	PPX 3	7.28	2	21.2%	6.2%	7.1%	14.9%	49%	36%
NEA-WCUS	PPX 4	7.28	2	21.2%	6.2%	6.1%	13.0%	44%	25%
NEA-WCUS	SPX	7.28	2	21.2%	6.2%	6.1%	11.5%	32%	18%
SEA-WCUS	PX	7.22	2	22.3%	6.2%	7.1%	14.9%	23%	15%
SEA-WCUS	PPX 1	7.22	2	19.2%	6.2%	7.1%	14.9%	29%	12%
SEA-WCUS	PPX 2	7.22	2	24.9%	6.2%	7.1%	14.9%	46%	29%
SEA-WCUS	PPX 3	7.22	2	21.2%	6.2%	7.1%	14.9%	49%	36%
SEA-WCUS	PPX 4	7.22	2	21.2%	6.2%	6.1%	13.0%	44%	25%
SEA-WCUS	SPX	7.22	2	21.2%	6.2%	6.1%	11.5%	32%	18%
EU-NA-LA-WCUS	PX	8.86	2	22.3%	6.2%	7.1%	14.9%	20%	13%
EU-NA-LA-WCUS	PPX 1	8.86	2	19.2%	6.2%	7.1%	14.9%	26%	11%
EU-NA-LA-WCUS	PPX 2	8.86	2	24.9%	6.2%	7.1%	14.9%	43%	27%
EU-NA-LA-WCUS	PPX 3	8.86	2	21.2%	6.2%	7.1%	14.9%	47%	35%
EU-NA-LA-WCUS	PPX 4	8.86	2	21.2%	6.2%	6.1%	13.0%	44%	24%
EU-NA-LA-WCUS	SPX	8.86	2	21.2%	6.2%	6.1%	11.5%	32%	18%
OCEANIA-WCUS	PX	8.79	2	29.6%	6.2%	7.1%	14.9%	21%	14%
OCEANIA-WCUS	PPX 1	8.79	2	22.3%	6.2%	7.1%	14.9%	26%	11%
OCEANIA-WCUS	PPX 2	8.79	2	9.7%	6.2%	7.1%	14.9%	43%	27%
OCEANIA-WCUS	PPX 3	8.79	2	9.7%	6.2%	7.1%	14.9%	46%	34%
OCEANIA-WCUS	PPX 4	8.79	2	12.4%	6.2%	6.1%	13.0%	44%	24%

The percentage share of each subclass was defined by historical data provided by the Port. **Table 4-6** provides additional detail on the shipment sizes per trade unit. The table illustrates the average combined imported and exported shipment per vessel call for each alternative depth evaluated. The additional cargo transported on each call was developed by taking into account the additional cargo capacity available with deeper channel depths, the probability of a vessel utilizing the additional capacity, and the tons per inch calculated by IWR to quantify the tonnage needed to achieve that depth. **Table 4-7** provides detail on the annual cargo tonnage projected for 2021.

Table 4-6: Mean Shipment Size by Trade Unit & Alternative Depth

	Class	50 feet (Existing Condition)	53 feet	55 feet	57 feet
NEA-WCUS	SPX	4,690	4,690	4,690	4,690
	PX	11,973	11,973	11,973	11,973
	PPX1	24,510	24,510	24,510	24,510
	PPX2	39,096	39,096	39,096	39,096
	PPX3	45,711	46,174	46,174	46,174
	PPX4	45,711	50,648	50,781	50,781
SEA-WCUS	SPX	4,690	4,690	4,690	4,690
	PX	11,973	11,973	11,973	11,973
	PPX1	24,510	24,510	24,510	24,510
	PPX2	39,096	39,096	39,096	39,096
	PPX3	45,711	46,147	46,147	46,147
	PPX4	45,711	50,648	50,781	50,781
EU-NA-LA-WCUS	SPX	4,690	4,690	4,690	4,690
	PX	11,973	11,973	11,973	11,973
	PPX1	24,510	24,510	24,510	24,510
	PPX2	39,096	39,096	39,096	39,096
	PPX3	45,711	46,269	46,269	46,269
	PPX4	45,711	50,648	50,781	50,781
OCEANIA-WCUS	SPX	4,690	4,690	4,690	4,690
	PX	11,973	11,973	11,973	11,973
	PPX1	24,510	24,510	24,510	24,510
	PPX2	39,096	39,096	39,096	39,096
	PPX3	45,711	46,269	46,269	46,269
	PPX4	45,711	50,648	50,781	50,781

Table 4-7: Annual Container Cargo by Trade Unit and Measure Depth (metric tonnes)

	Class	50 feet (Existing Condition)	53 feet	55 feet	57 feet
NEA-WCUS	SPX	135,748	135,748	135,748	135,748
	PX	1,970,127	1,909,795	1,908,616	1,908,616
	PPX1	2,091,005	2,045,756	2,044,872	2,044,872
	PPX2	3,955,982	3,925,816	3,925,227	3,925,227
	PPX3	3,495,291	3,532,299	3,532,299	3,532,299
	PPX4	1,031,716	1,130,455	1,133,108	1,133,108
SEA-WCUS	SPX	75,476	75,476	75,476	75,476
	PX	439,033	407,399	406,810	406,810
	PPX1	778,189	754,464	754,022	754,022
	PPX2	3,604,218	3,588,401	3,588,106	3,588,106
	PPX3	2,498,072	2,519,878	2,519,878	2,519,878
	PPX4	663,990	713,360	714,686	714,686
EU-NA-LA-WCUS	SPX	486,255	486,255	486,255	486,255
	PX	1,483,844	1,456,945	1,456,355	1,456,355
	PPX1	627,063	606,888	606,446	606,446
	PPX2	1,653,618	1,640,168	1,639,873	1,639,873
	PPX3	1,035,202	1,046,357	1,046,357	1,046,357
	PPX4	468,197	517,567	518,893	518,893
OCEANIA-WCUS	SPX	495,560	495,560	495,560	495,560
	PX	1,009,372	1,009,372	1,009,372	1,009,372
	PPX1	949,456	949,456	949,456	949,456
	PPX2	474,728	474,728	474,728	474,728
	PPX3	-	-	-	-
	PPX4	-	-	-	-

Vessel Calls

Vessel calls by vessel class for containerized vessels are shown in **Table 4-8**. Vessel calls by vessel class for bulker vessels are shown in **Table 4-9**. These are a result of the containerized trade forecast for the POLB, the available vessel fleet by service, and the LFA data inputs.

Table 4-8: Containerized Vessel Calls by Class and Channel Depth

Vessel Class	50 feet (Existing Condition)	53 feet	55 feet	57 feet
2021				
SPX	252	252	252	252
PX	408	399	398	398
PPX 1	180	180	180	180
PPX 2	248	244	244	244
PPX 3	150	150	150	150
PPX 4	40	40	40	40
Total	**1,278**	**1,265**	**1,264**	**1,264**
2030				
SPX	212	212	212	212
PX	328	296	296	296
PPX 1	212	199	199	199
PPX 2	332	327	327	327
PPX 3	280	280	280	280
PPX 4	130	130	130	130
Total	**1,494**	**1,444**	**1,444**	**1,444**
2040				
SPX	188	188	188	188
PX	116	102	102	102
PPX 1	192	159	159	159
PPX 2	288	255	254	254
PPX 3	490	490	490	490
PPX 4	450	450	450	450
Total	**1,724**	**1,644**	**1,643**	**1,643**

Table 4-9: Tanker Vessel Calls by Vessel Class and Channel Depth

Vessel Class	76 feet (Existing Condition)	78 feet	80 feet	83 feet
2021				
10K DWT Tanker	1	1	1	1
20K DWT Tanker	46	46	46	46
30K DWT Tanker	35	35	35	35
40K DWT Tanker	4	4	4	4
50K DWT Tanker	217	217	217	217
60K DWT Tanker	18	18	18	18
70KDWT Tanker	155	151	147	147
80K DWT Tanker	5	5	5	5
100K DWT Tanker	179	178	177	177
200K DWT Tanker	167	167	167	167
300K DWT Tanker	105	105	105	105
Total	**932**	**927**	**922**	**922**
2030				
10K DWT Tanker	1	1	1	1
20K DWT Tanker	46	46	46	46
30K DWT Tanker	34	34	34	34
40K DWT Tanker	4	4	4	4
50K DWT Tanker	213	213	213	213
60K DWT Tanker	18	18	18	18
70K DWT Tanker	151	147	146	146
80K DWT Tanker	5	5	5	5
100K DWT Tanker	176	175	173	173
200K DWT Tanker	167	167	167	167
300K DWT Tanker	101	101	101	101
Total	**916**	**911**	**908**	**908**
2040				
10K DWT Tanker	1	1	1	1
20K DWT Tanker	43	43	43	43
30K DWT Tanker	33	33	33	33
40K DWT Tanker	4	4	4	4
50K DWT Tanker	213	213	213	213
60K DWT Tanker	18	18	18	18
70K DWT Tanker	151	147	145	145
80K DWT Tanker	5	5	5	5
100K DWT Tanker	176	174	173	173
200K DWT Tanker	167	167	167	167
300K DWT Tanker	101	101	101	101
Total	**912**	**906**	**903**	**903**

Table 4-10 displays the average load for crude oil imports by channel depth for all tanker classes. The additional cargo transported on each call was developed by taking into account the additional cargo capacity available with deeper channel depths, the probability of a vessel utilizing the additional capacity, and the tons per inch calculated by IWR to quantify the tonnage needed to achieve that depth. The trend shows that as depth increases, the average load increases until a depth of 80 feet.

Table 4-10: Crude Oil Average Load by Channel Depth (metric tons)

Year	76 feet (Existing Condition)	78 feet	80 feet	81 -83 feet*
2021	25,156	25,354	25,478	25,478
2030	24,418	24,585	24,714	24,714
2040	24,498	24,617	24,766	24,766

*81-83 feet does not load deeper, but has additional tide delay reduction

Sailing Draft Distribution Changes

Table 4-11 provides details on the change to the average arrival draft for PPX3 and PPX4 container vessels. **Figures 4-2 – 4-5** provide tanker sailing draft changes by channel depth.

Table 4-11: Container Sailing Draft Changes by Channel Depth

	Vessel Class	50 feet	53 feet	55 feet	57 feet
NEA-WCUS	PPX3	37.48	37.86	37.86	37.86
	PPX4	37.48	41.53	41.64	41.64
SEA-WCUS	PPX3	37.48	37.84	37.84	37.84
	PPX4	37.48	41.53	41.64	41.64
EU-NA-LA-WCUS	PPX3	37.48	37.94	37.94	37.94
	PPX4	37.48	41.53	41.64	41.64
OCEANIA-WCUS	PPX3	37.48	37.48	37.48	37.48
	PPX4	37.48	37.48	37.48	37.48

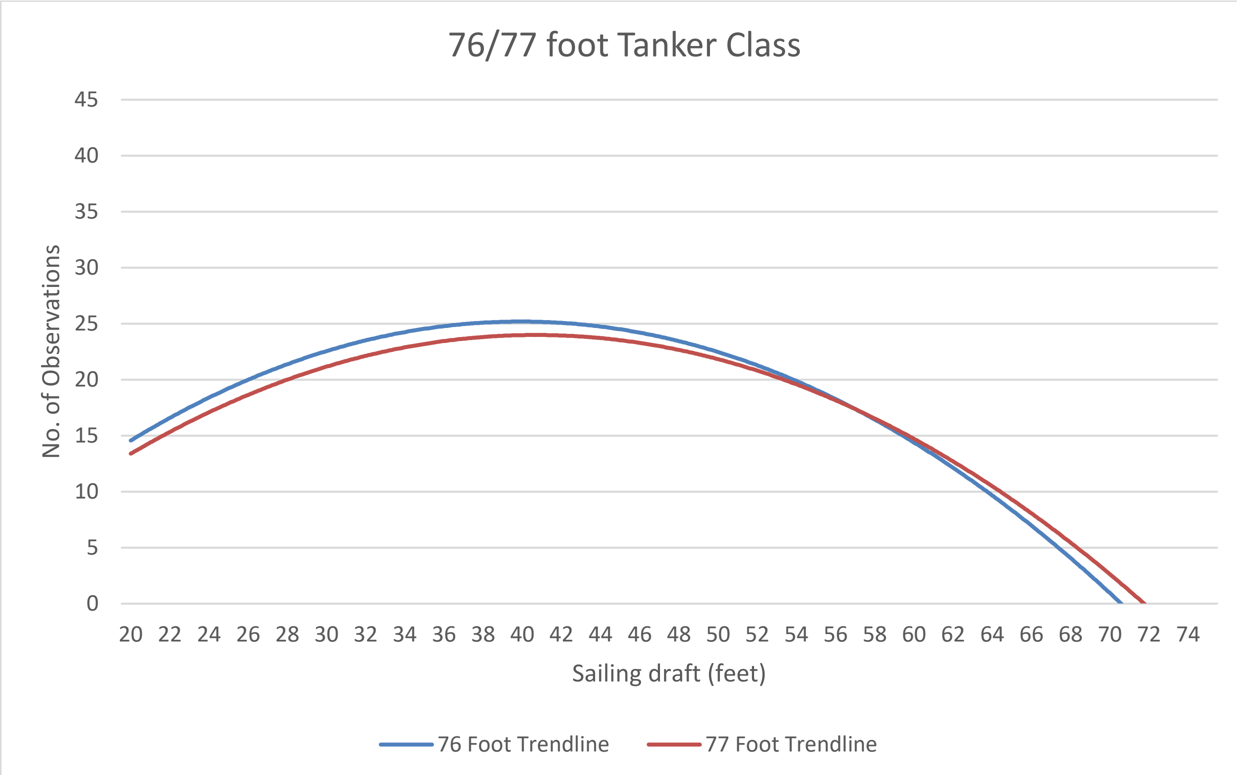


Figure 4-2: 76 ft vs 77 ft Tanker Class Sailing Drafts

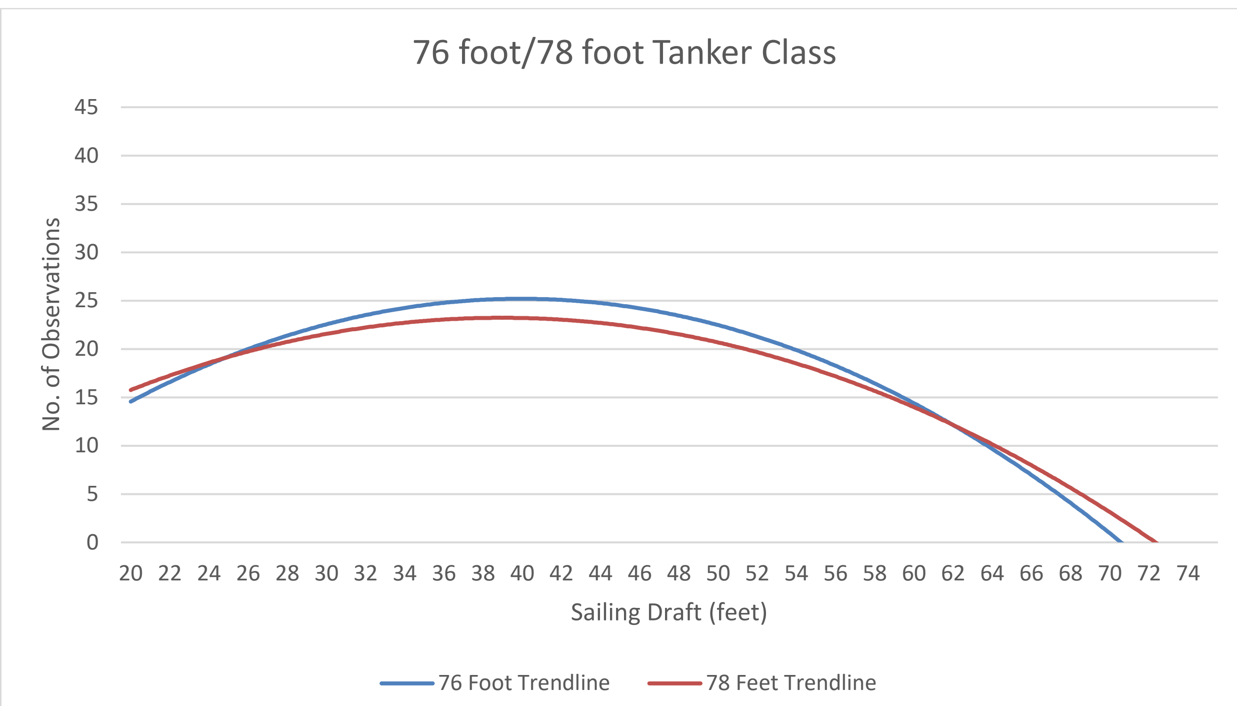


Figure 4-3: 76 ft vs 78 ft Tanker Class Sailing Drafts

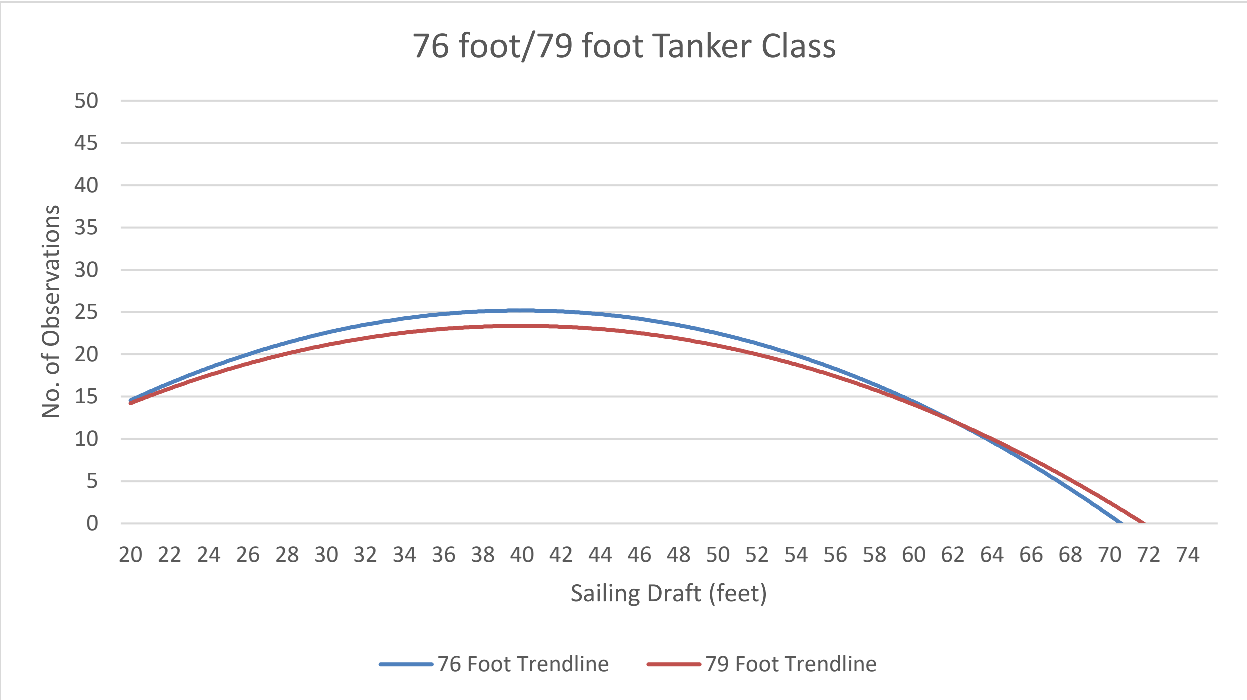


Figure 4-4: 76 ft vs 79 ft Tanker Class Sailing Drafts

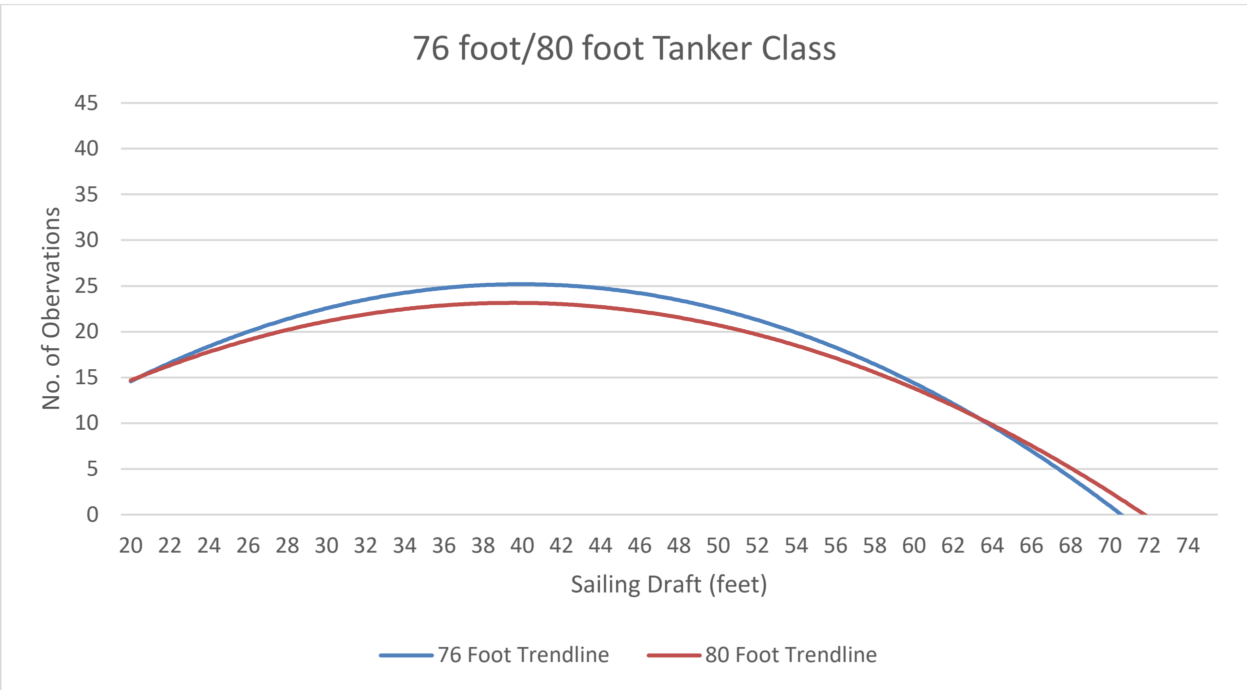


Figure 4-5: 76 ft vs 80 ft Tanker Class Sailing Drafts

4.2 Origin-Destination (OD) Transportation Cost Savings Benefit by Project Depth

From the onset of this analysis, the alternatives considered—primarily deepening scenarios but also a potential stand-by area—acknowledged that there were three "separable elements" (independent beneficial measures that must be economically justified) to be analyzed. The first separable element would address depths needed to allow calls by Post–Panamax container ships that are becoming the norm in international maritime shipping and are already calling on West Coast ports, albeit not fully loaded. With the existing depth for container Piers T and J being 53' and 50' respectively, team economists discussed anticipated future operational needs and decided to examine scenarios of 53', 55', and 57' depths.

Additionally, POLB officials were interested in the benefits accruing to each facility separately (Pier J South vs Pier T West Basin). Also, the Port indicated that their long-term plans are to implement modifications that would fill in and therefore eliminate Pier J South by about 20 years after the Base Year (approximately 2047). Thus, the economic model runs and results incorporated these issues. Benefits and costs were separated out for the two container piers and the benefiting stream for Pier J South was truncated to year 2046 (rather than the full period of analysis end year of 2076).

The next element that was addressed was liquid bulk tankers, primarily for crude oil shipments. The approach and Main Channel currently have a draft of 76', making it necessary for tankers to arrive into POLB particularly light-loaded due to pilots rules concerning safety underkeel clearances of 10% design draft for these classes of vessels (thus translating to underkeel clearance safety factors to upwards of 8'). Large crude/liquid bulk vessels use the west side of Pier T abutted against the Main Channel. Meetings with Port officials and pilots resulted in the decision to analyze deeper depths of 78', 80', and 83' to accommodate vessels to transit the harbor with crude amounts closer to their capacity. Tidal delays rather than vessel design draft lead to analyzing depths greater than 80'.

Finally, the Port and pilots expressed an interest in providing a stand-by area for vessels waiting to dock and providing some degree of safety coverage by being within the harbor breakwater rather than in open water. Based upon design drafts of both design vessel classes, the team decided to analyze stand-by area depth of 67', 68', 71', 72', and 73'. Primarily, this stand-by area would accommodate tankers waiting to load at the single Pier T crude facility. The analysis did not analyze two-way traffic, only queuing needs which, per guidance, did not result in an incremental economic justification.

Transportation cost benefits were estimated using the HarborSym Economic Reporter, a tool that summarizes and annualizes HarborSym results from multiple simulations. This tool collects the transportation costs from various model run output files and generates the transportation cost reduction for all project years, and then produces an Average Annual Equivalent (AAEQ). Results and calculations were also verified using spreadsheet models used in previous deep draft navigation analyses.

Transportation costs were estimated for a 50-year period of analysis for the years 2027 through 2076. Transportation costs were calculated using the Corps certified HarborSym model for the years 2021, 2030, and 2040 and are shown in **Table 4-12** and **Table 4-13**. Results for the base year 2027 are calculated by interpolating between the 2021 and 2030 results. This was due to a change in the anticipated base year (2027 from 2021) during the study phase of the analysis. Also, due to the risk and uncertainty associated with forecasting beyond 2040, along with time frame any additional benefits would be discounted back to the base year 2027, transportation costs were held constant beyond 2040. Transportation costs were then determined for each alternative project depth.

In the following cost-benefit tables, all calculations of transportation cost savings used the FY 2019 Federal Discount Rate of 2.875% (including figures estimated by interpolating between the modeled years and calculating Net Present Value). All cost estimates provided by Cost Estimating are in FY 2019 (Oct 2018) Price Levels and were annualized using the same Federal Discount rate and amortized over 50 years. **Table 4-13** shows decreasing transportation costs to the recommended depth of 80 feet. **Table 4-17** demonstrates a decrease in net benefits as depths deeper than 80 feet. Therefore, detailed costs are not provided in **Table 4-13**.

Table 4-12: Container Vessel Transportation Costs

Model Year	Class	FWOP	53 feet	55 feet	57 feet
2021	SPX	$ 114,794,282	$ 114,794,282	$ 114,794,282	$ 114,794,282
	PX	$ 482,202,619	$ 479,677,998	$ 473,997,601	$ 473,366,446
	PPX1	$ 500,201,662	$ 500,201,662	$ 498,534,323	$ 496,866,984
	PPX2	$ 900,189,684	$ 900,189,684	$ 900,189,684	$ 900,189,684
	PPX3	$ 681,907,102	$ 681,907,102	$ 681,907,102	$ 681,907,102
	PPX4	$ 161,407,340	$ 161,407,340	$ 161,407,340	$ 161,407,340
2030	SPX	$ 98,038,353	$ 98,038,353	$ 98,038,353	$ 98,038,353
	PX	$ 389,637,859	$ 387,107,743	$ 378,252,338	$ 377,619,809
	PPX1	$ 588,838,317	$ 588,838,317	$ 582,295,669	$ 582,295,669
	PPX2	$ 1,203,256,658	$ 1,203,256,658	$ 1,203,256,658	$ 1,203,256,658
	PPX3	$ 1,283,963,703	$ 1,283,963,703	$ 1,283,963,703	$ 1,283,963,703
	PPX4	$ 476,025,237	$ 476,025,237	$ 476,025,237	$ 476,025,237
2040	SPX	$ 87,822,491	$ 87,822,491	$ 87,822,491	$ 87,822,491
	PX	$ 144,545,910	$ 143,277,964	$ 139,474,124	$ 138,840,151
	PPX1	$ 571,267,073	$ 558,848,223	$ 552,638,799	$ 552,638,799
	PPX2	$ 1,075,974,124	$ 1,075,974,124	$ 1,075,974,124	$ 1,075,974,124
	PPX3	$ 2,164,422,412	$ 2,164,422,412	$ 2,164,422,412	$ 2,164,422,412
	PPX4	$ 1,612,179,964	$ 1,612,179,964	$ 1,612,179,964	$ 1,612,179,964

Table 4-13: Tanker Vessel Transportation Cost

Model Year	Class	FWOP	78 feet	79 feet	80 feet
2021	10K DWT Tanker	$250,900	$250,900	$250,900	$250,900
	20K DWT Tanker	$19,434,426	$19,434,426	$19,434,426	$19,434,426
	30K DWT Tanker	$17,432,431	$17,432,431	$17,432,431	$17,432,431
	40K DWT Tanker	$2,635,599	$2,635,599	$2,635,599	$2,635,599
	50K DWT Tanker	$154,512,012	$154,512,012	$154,512,012	$154,512,012
	60K DWT Tanker	$8,487,067	$8,487,067	$8,487,067	$8,487,067
	70K DWT Tanker	$104,871,066	$102,164,716	$100,811,540	$99,458,365
	80K DWT Tanker	$1,667,498	$1,667,498	$1,667,498	$1,667,498
	100K DWT Tanker	$64,654,526	$64,293,328	$63,932,129	$63,932,129
	200K DWT Tanker	$73,381,804	$73,381,804	$73,381,804	$73,381,804
	300K DWT Tanker	$31,392,999	$31,392,999	$31,392,999	$31,392,999
2030	10K DWT Tanker	$249,660	$249,660	$249,660	$249,660
	20K DWT Tanker	$18,043,291	$18,043,291	$18,043,291	$18,043,291
	30K DWT Tanker	$16,813,147	$16,813,147	$16,813,147	$16,813,147
	40K DWT Tanker	$2,547,115	$2,547,115	$2,547,115	$2,547,115
	50K DWT Tanker	$147,125,724	$147,125,724	$147,125,724	$147,125,724
	60K DWT Tanker	$7,461,248	$7,461,248	$7,461,248	$7,461,248
	70K DWT Tanker	$91,938,429	$89,502,974	$89,502,974	$88,894,110
	80K DWT Tanker	$1,448,981	$1,448,981	$1,448,981	$1,448,981
	100K DWT Tanker	$55,194,292	$54,880,688	$54,253,480	$54,253,480
	200K DWT Tanker	$64,588,626	$64,588,626	$64,588,626	$64,588,626
	300K DWT Tanker	$28,514,713	$28,514,713	$28,514,713	$28,514,713
2040	10K DWT Tanker	$250,424	$250,424	$250,424	$250,424
	20K DWT Tanker	$14,990,002	$14,990,002	$14,990,002	$14,990,002
	30K DWT Tanker	$16,310,580	$16,310,580	$16,310,580	$16,310,580
	40K DWT Tanker	$2,640,507	$2,640,507	$2,640,507	$2,640,507
	50K DWT Tanker	$151,631,922	$151,631,922	$151,631,922	$151,631,922
	60K DWT Tanker	$9,115,057	$9,115,057	$9,115,057	$9,115,057
	70K DWT Tanker	$85,467,452	$83,203,414	$83,203,414	$82,071,394
	80K DWT Tanker	$1,653,664	$1,653,664	$1,653,664	$1,653,664
	100K DWT Tanker	$62,260,526	$61,553,020	$61,199,267	$61,199,267
	200K DWT Tanker	$68,926,301	$68,926,301	$68,926,301	$68,926,301
	300K DWT Tanker	$34,845,677	$34,845,677	$34,845,677	$34,845,677

Table 4-14 through Table 4-18 presents the preliminary economic benefit summaries using the FY 2019 Federal Discount Rate of 2.875% by measure for each of the two container terminals, then separately for containers and tankers, and finally for a stand-by area**.** The preliminary economic benefits were calculated before the release of the EGM 20-04 updated guidance for vessel operating costs. The benefit cost analysis for the final analysis was performed using the methodology in the EGM 20-04. An estimated 7.4 million cubic yards of material would be dredged. Proposed disposal sites include LA-2, LA-3, surfside borrow pits off Huntington Beach/Seal Beach, and Port fill sites (nearshore). LA -2 disposal site is located at the upper southern wall of San Pedro Sea Valley, about 6.8 miles south-southwest of the Queens Gate entrance to Los Angeles and Long Beach Harbor. LA -3 disposal site is located on the continental slope near the Newport Submarine Canyon about 5.4 miles southwest of the entrance of Newport Harbor.

Container annualized benefits were calculated separately for Pier J (for 20 years, as previously described per Port master plans) and Pier T/West Basin. Cost Estimating figures were allocated appropriately between each and subsequently annualized. As the table shows, each pier is economically justified as a separable element of subsequent alternatives. Moreover, each pier shows maximized annual net benefits at a project improvement depth of -55-ft.

Table 4-14: Preliminary Economic Benefit Summary for Pier J

Alternative	Avg Annual Benefits Pier J	Avg Annual Costs Pier J	Net Annual Benefits	Benefit-Cost Ratio
Containers 53 Offshore	$2,752,936.08	$2,015,000	$737,936	1.4
Containers 55 Offshore	$6,184,171.13	$2,557,000	$3,627,171	2.4
Containers 57 Offshore	$6,468,887.54	$3,569,000	$2,899,888	1.8
Containers 53 Nearshore	$2,752,936.08	$1,832,000	$920,936	1.5
Containers 55 Nearshore	$6,184,171.13	$2,283,000	$3,901,171	2.7
Containers 57 Nearshore	$6,468,887.54	$3,267,000	$3,201,888	2.0

Table 4-15: Preliminary Economic Benefit Summary for Pier T

Alternative	Avg Annual Benefits Pier T	Avg Annual Costs Pier T	Net Annual Benefits	Benefit-Cost Ratio
Containers 53 Offshore	$6,076,565	$685,000	$5,391,565	8.9
Containers 55 Offshore	$13,650,343	$846,000	$12,804,343	16.1
Containers 57 Offshore	$14,278,798	$1,778,000	$12,500,798	8.0
Containers 53 Nearshore	$6,076,565	$623,000	$5,453,565	9.8
Containers 55 Nearshore	$13,650,343	$755,000	$12,895,343	18.1
Containers 57 Nearshore	$14,278,798	$1,628,000	$12,650,798	8.8

Once both container terminals were shown to be incrementally justified, annualized costs were updated (thus, they may not match exactly the costs presented in the previous table) and combined to show that the overall container analysis was also economically justified. **Table 4-16** documents that the combined elements of Nearshore sediment placement and a channel depth of -55-ft maximizes container annual net benefits at just shy of $16.8M and results in a containers Benefit-Cost ratio of 6.5.

Table 4-16: Preliminary Container Economic Benefit Summary

Alternative	Avg Annual Benefits Pier J	Avg Annual Benefits Pier T	Avg Annual Benefits	Avg Annual Costs	Net Annual Benefits	Benefit-Cost Ratio
Containers 53 Offshore	$2,753,000	$6,077,000	$8,830,000	$2,700,000	$ 6,130,000	3.3
Containers 54 Offshore	$4,460,000	$9,863,000	$14,332,000	$3,048,000	$11,284,000	4.7
Containers 55 Offshore	$6,184,000	$13,650,000	$19,835,000	$3,402,000	$16,432,000	5.8
Containers 56 Offshore	$6,327,000	$13,965,000	$20,291,000	$4,417,000	$15,874,000	4.6
Containers 57 Offshore	$6,469,000	$14,279,000	$20,748,000	$6,961,000	$13,787,000	3.0
Containers 53 Nearshore	$2,753,000	$6,077,000	$8,830,000	$2,455,000	$6,375,000	3.6
Containers 54 Nearshore	$4,469,000	$9,863,000	$14,332,000	$2,743,000	$11,590,000	5.2
Containers 55 Nearshore	**$6,184,000**	**$13,650,000**	**$19,835,000**	**$3,038,000**	**$16,797,000**	**6.5**
Containers 56 Nearshore	$6,327,000	$13,965,000	$20,291,000	$4,388,000	$15,903,000	4.6
Containers 57 Nearshore	$6,469,000	$14,279,000	$20,748,000	$6,509,000	$14,239,000	3.2

Table 4-17 displays the same analysis of the Pier T liquid bulk terminal. Annual benefits were calculated for project depths of -78-ft through -83-ft, considering both Nearshore and Offshore placement site cost estimates. Annual net benefits top out at approximately $2.2M and at an improved project depth of -80 feet. The tanker vessel class, which drives the benefits, is not able to load deeper beyond 80', therefore benefits beyond 80' are associated with reductions in tide delays Model results for the 81' alternative demonstrated net benefits were decreasing. The 83' alternative was run to confirm this trend.

Table 4-17: Preliminary Tanker Economic Benefit Summary

Alternative	Avg Annual Benefits	Avg Annual Costs	Net Annual Benefits	Benefit-Cost Ratio
Tankers 78 Offshore	$2,928,000	$1,972,000	$956,000	1.5
Tankers 79 Offshore	$3,584,000	$2,441,000	$1,142,000	1.5
Tankers 80 Offshore	$4,613,000	$2,919,000	$1,694,000	1.6
Tankers 81 Offshore	$4,713,000	$3,547,000	$1,166,000	1.3
Tankers 82 Offshore	$4,763,000	$4,100,000	$663,000	1.2
Tankers 83 Offshore	$4,763,000	$4,679,000	$84,000	1.0
Tankers 78 Nearshore	$2,928,000	$1,677,000	$1,251,000	1.7
Tankers 79 Nearshore	$3,584,000	$1,995,000	$1,589,000	1.8
Tankers 80 Nearshore	**$4,613,000**	**$2,375,000**	**$2,238,000**	**1.9**
Tankers 81 Nearshore	$4,713,000	$2,797,000	$1,916,000	1.7
Tankers 82 Nearshore	$4,762,700	$3,164,000	$1,598,000	1.5
Tankers 83 Nearshore	$4,762,700	$3,554,000	$1,209,000	1.3

Finally, the results of the stand-by measure are displayed in **Table 4-18**. The tanker vessel class drives the benefits of increasing the depths of the stand-by area. Therefore, the NED depth alternative of 80' was used in the HarborSym analysis to calculate the decrease in transportation costs with channel improvements made to the stand-by area. This was completed by altering the stand-by area depth of the 80' alternative from 67' to 73'. Benefits were generated by comparing the transportation costs to the future with project 80' scenario. None of the proposed depths for the stand-by area for either material placement option proved to be economically justified. Nearshore material placement at -67 and -68-ft come close to reaching unity.

Table 4-18: Preliminary Economic Benefit Summary for Standby Area

Alternative	Avg Annual Benefits	Avg Annual Costs	Net Annual Benefits	Benefit-Cost Ratio
Standby Area 67 Nearshore Clamshell	$650,000	$1,781,000	$(1,131,000)	0.4
Standby Area 68 Nearshore Clamshell	$776,000	$1,809,000	$(1,033,000)	0.4
Standby Area 71 Nearshore Clamshell	$1,030,000	$2,283,000	$(1,253,000)	0.5
Standby Area 72 Nearshore Clamshell	$1,093,000	$2,519,000	$(1,426,000)	0.4
Standby Area 73 Nearshore Clamshell	$1,155,000	$2,756,000	$(1,601,000)	0.4
Standby Area 67 Nearshore Hopper	$650,000	$671,000	$(21,000)	0.97
Standby Area 68 Nearshore Hopper	$776,000	$818,000	$(42,000)	0.95
Standby Area 71 Nearshore Hopper	$1,030,000	$1,413,000	$(383,000)	0.7
Standby Area 72 Nearshore Hopper	$1,093,000	$1,631,000	$(538,000)	0.7
Standby Area 73 Nearshore Hopper	$1,155,000	$1,853,000	$(698,000)	0.6

4.3 Preliminary Transportation Cost Savings Benefit Analysis Summary for Final Array Plans

Based upon the analysis results shown on Tables 4-16 through 4-18, it was determined that net benefits maximized at a depth of -55' for container alternatives and -80' for liquid bulk alternatives for both disposal options/scenarios. However, dredging to depths of -53' to -57' for containers and -78' to -83' for liquid bulk vessels were also economically justified. Based upon these results, three scales of combined container/liquid bulk alternatives were selected for more detailed analysis as Final Array plans. These included a smaller scale plan of -53'/-78', the tentative NED scale of -55'/-80', and a larger scale plan of -57'/-83', representing the depths of deepening for container and liquid bulk vessels, respectively. In addition, an additional plan is being carried forward into the Final Array, that is based upon the NED scale of -55'/-80' for container and liquid bulk vessels, plus a -67' Standby Area measure. Although the Standby Area was not economically justified, it is being included as a Final Array plan option as it may be considered as a locally preferred plan by the non-Federal sponsor.

Table 4-19 below provides the Origin-Destination benefit cost analysis for these alternatives based upon rough order cost analysis.

As shown, the 55'/80' depth provides the greatest total net benefits.

Table 4-19 Origin-Destination Benefit Cost Analysis (Million $)

Project Depth	Total AAEQ Costs	O-D AAEQ Benefits	Total Net Benefits	Incremental Net Benefits	Benefit/Cost Ratio
53/78	$4.10	$11.80	$7.70	-	2.9
55/80	$5.40	$24.40	$19.00	$11.30	4.5
57/83	$10.10	$25.50	$15.40	($3.60)	2.5
55/80/67*	$6.10	$25.10	$19.00	$0	4.1

**Net benefits slightly lower for 55/80/67 Plan*

4.4 Economic Cost Analysis (Refined Costs for Final Array Plans)

This section presents the evaluation of costs based upon refined costs for the Final Array Plans identified in the prior section. These costs also incorporate contingencies based upon an abbreviated cost risk analysis. Interest during construction (IDC) was calculated for the Federal Costs assuming that the schedule may vary depending on the time required to obtain congressional authorization and funding. Other areas of project uncertainties include the dredging industry execution of bid and contract requirements, availability of contractors' dredging equipment to comply with environmental windows and delays due to unexpected weather conditions. Based on these uncertainties, the construction duration for the project may vary from 24 to 60 months. **Table 4-20**, **Table 4-21**, **Table 4-22, and Table 4-23** show the initial project costs for each alternative, including the federal and non-federal portions.

Table 4-20: Alternative 2 Initial Costs (2.875% Fed Discount Rate)

Alternative 2 - 53 feet / 78 feet				
	PED	Navigation	Construction Management	Total Initial Cost
Local Service Facilities	$2,206,000	$11,234,000	$2,068,000	$15,508,000
General Navigation Features	$11,625,000	$77,507,000	$5,193,000	$94,325,000
Total	$13,831,000	$88,741,000	$7,261,000	$109,833,000
Interest during Construction (2 Years at 2.875% Fed Discount Rate) - $3,180,000				

Table 4-21 Alternative 3 Initial Costs

Alternative 3 - 55 feet / 80 feet				
	PED	Navigation	Construction Management	Total Initial Cost
Local Service Facilities	$2,297,000	$14,998,000	$2,153,000	$19,448,000
General Navigation Features	$16,177,000	$107,853,000	$7,226,000	$131,256,000
Total	$18,474,000	$122,851,000	$9,379,000	$150,704,000
Interest during Construction (3 Years at 2.875% Fed Discount Rate) - $6,604,000				

Table 4-22 Alternative 4 Initial Costs

Alternative 4 - 57 feet / 83 feet				
	PED	Navigation	Construction Management	Total Initial Cost
Local Service Facilities	$11,585,000	$76,106,000	$10,861,000	$98,552,000
General Navigation Features	$28,490,000	$189,909,000	$12,724,000	$231,123,000
Total	$40,075,000	$266,015,000	$23,585,000	$329,675,000
Interest during Construction (5 years at 2.875% Fed Discount Rate) - $24,529,000				

Table 4-23 Alternative 5 Initial Costs

Alternative 5 - 55 feet / 80 feet / 67 feet				
	PED	Navigation	Construction Management	Total Initial Cost
Local Service Facilities	$2,297 ,000	$14,998,000	$10,861,000	$2,153,000
General Navigation Features	$21,579,000	$143,845,000	$9,637,000	$175,061,000
Total	$40,075,000	$266,015,000	$23,585,000	$194,509,000
Interest during Construction (4 Years at 2.875% Fed Discount Rate) - $11,469,000				

The cost benefit analysis for the Final Array Plans based upon the refined and updated costs is shown in **Table 4-24**, with the NED plan highlighted in yellow. The NED plan has approximately $15 million average annual net benefits, about $0.9 million more than Alternative 5. Alternative 3 was identified as the Tentatively Selected Plan (FY 2016 vessel operating costs). Following the TSP milestone, the costs for the TSP (Alternative 3) were refined and updated to reflect the FY 21/ Oct 20; 2.5% Discount Rate).

Table 4-24: Alternative Cost - Benefit Analysis

Alternative	Total Initial cost	Total Investment Cost	Annualized Investment Cost	Annual O&M	Total Annual Economic Cost	Average Annual Benefits	Net Average Annual Benefits	Incremental Benefits	B/C
1 - No Action	-	-	-	-	-	-	-	-	
2 - 53/78	$109,833,000	112,596,000	$3,987,000	$101,000	$4,088,000	$10,081,000	$5,990,000	($9,102,000)	2.5
3 - 55/80*	**$155,749,000**	**$163,576,000**	**$5,767,000**	**$101,000**	**$5,868,000**	**$20,960,000**	**$15,092,000**	**-**	**3.6**
4 - 57/83	$329,675,000	$350,908,000	$12,389,000	$101,000	$12,490,000	$21,872,000	$9,379,000	($5,713,000)	1.8
5 - 55/80/67	$194,509,000	$204,449,000	$7,215,000	$101,000	$7,326,000	$21,518,000	$14,189,000	($903,000)	2.9

***Total initial cost includes Local Service Facilities and Aids to Navigation Costs including cost contingencies**

5 MULTIPORT ANALYSIS

Multiport competition was assessed qualitatively for this study as it relates to shifting of cargo from one port to another port based on factors such as deepening of a harbor. The recommended plan includes a deeper channel to more efficiently operate larger containerships and crude oil tankers. Larger ships alone do not drive growth for the harbor. Many factors may influence the growth of a particular harbor: landside development and infrastructure, location of distribution centers for imports, source locations for exports, population and income growth and location, port logistics and fees, business climate and taxes, carrier preferences, labor stability and volatility, and business relationships. Harbor depth is just one of many factors involved in determining growth and market share for a particular port. The economic analysis was conducted with the historical cargo share at the POLB remaining the same in both the future without-project and future with-project conditions. Cargo may vary in the future as investments are made in port facilities and supporting infrastructure, and long-term leases are renewed or changed at individual terminals; however, the POLB's share of cargo is expected to remain relatively consistent with growth in the future being attributed to GDP growth for the U.S. West Coast and associated hinterland based on the information provided in the Mercator Report's commodity forecast conducted for this study in 2016. To restate the multiport considerations in another way, justification of the recommendation for this study is not based on an assumption that cargo will shift to the POLB based on deepening alone. It does take into account an evaluation of historical cargo data along the West Coast, including changes in growth when other harbor improvements have been made at various other West Coast ports. Based on that evaluation, the analysis takes into account that the POLB will receive a relatively similar share of regional cargo volumes with or without navigation improvements.

Two other deep water reports were considered for this study: the Ports of Los Angeles (adjacent to POLB) and Oakland. With rail transport being the preferred transportation mode for both exports and imports across the United States, rail services to these ports were examined. As the map below illustrates, both Oakland and LA/LB areas are served by major rail lines. Oakland is served by Union Pacific via major distribution cities of Reno, Salt Lake City, and Denver before reaching the markets of the Midwest. LA/LB is served by both Union Pacific and BNSF which provide access to Phoenix, Tucson, and El Paso before reaching the major southwest markets of Dallas/Fort Worth, Houston, and Memphis. While there may inevitably be some overlap in the areas served, these rail routes and their demand for goods would not be shifted from Northern to Southern CA due to the Federal project.

Figure 5-1: North American Intermodal Network

Next, the overall economic health of the potentially impacted ports was considered. According to the Port of Oakland, it recognizes that it is one of the three Pacific Coast gateways for cargo, along with Seattle & Tacoma and LA/LB. In 2018, 78% of its trade was with Asia, 11% with Europe, and 2% with Australia/New Zealand/Oceana. Its container history has grown from approximately 1.7M TEUs in 2002 to 2.6M TEUs in 2018, which amounts to around 2.7% growth per year.

The Port of Los Angeles also reports robust activity. In 2018, it handled about 9.5M TEUs and has a main channel water depth of 53'. It has ranked as the number one container port in the US since the year 2000. Its Top Five Trade Routes in 2018 were Northeast Asia (73%), Southeast Asia (21%), the Indian Subcontinent (2%), Northern Europe (1%) and the Middle East (1%).

Finally, the trade routes of the POLB were examined vis-à-vis Los Angeles and Oakland. East Asian trade already accounts for upwards of 90% of POLB shipments. Their top trading partners are China, South Korea, Japan, Hong Kong, Taiwan, Vietnam, Iraq, Australia, Ecuador, and Indonesia. So, while there definitely are some overlapping trade lanes to the other two ports, all three are already heavily invested in Asia, while Oakland also has a sizable market with Europe and Los Angeles has had a deeper channel for some time. These factors, as well as contracts and established business partnerships lend to the unlikelihood of the recommended Federal project substantially shifting cargo from either LA or Oakland to the POLB.

6 REGIONAL ECONOMIC DEVELOPMENT ANALYSIS

The regional economic development (RED) account measures changes in the distribution of regional economic activity that would result from each alternative plan. Evaluations of regional effects are measured using nationally consistent projection of income, employment, output, and population. For this regional analysis, the anticipated impacts of the recommended plan have been evaluated.

6.1 Regional Analysis

The USACE online Regional Economic System (RECONS), a regional economic impact modeling tool developed by the USACE Institute for Water Resources, the Louis Berger Group, and Michigan State University, is a system designed to provide estimates of regional, state, and national contributions of federal spending associated with Civil Works and American Recovery and Reinvestment Act ARRA Projects. It also provides a means for estimating the forward linked benefits (stemming from effects) associated with non-federal expenditures sustained, enabled, or generated by USACE Recreation, Navigation, and Formally Utilized Sites Remedial Action Program (FUSRAP). Contributions are measured in terms of economic output, jobs, earnings, and/or value added. The system was used to perform the following regional analysis for the proposed Long Beach Harbor, CA improvement project.

This RECONS report provides estimates of the economic impacts of Civil Works Budget Analysis for Long Beach Harbor, CA. It provide estimates of regional and national job creation, and retention and other economic measures such as income, value added, and sales. This modeling tool automates calculations and generates estimates of jobs and other economic measures, such as income and sales associated with USACE's ARRA spending, annual Civil Work program spending and stem-from effects for Ports, Inland Water Way, FUSRAP and Recreation. This is done by extracting multipliers and other economic measures from more than 1,500 regional economic models that were built specifically for USACE's project locations. These multipliers were then imported to a database and the tool matches various spending profiles to the matching industry sectors by location to produce economic impact estimates. The tool will be used as a means to evaluate project and program expenditures associated with the annual expenditure by the USACE.

Table 6-1: Project Information

Project Name:	LONG BEACH HARBOR CHANNEL DEEPENING, CA
Project ID:	
Division:	SPD
District:	LOS ANGELES DISTRICT
Type of Analysis:	Civil Works Budget Analysis
Business Line:	Navigation
Work Activity:	CWB - Navigation

Table 6-2: Economic Impact Regions

Regional Impact Area:	Los Angeles Long Beach Santa Ana CA MSA
Regional Impact Area ID:	24
Counties included	Los Angeles/Orange/
State Impact Area:	California
National Impact:	Yes

6.2 Results of the Economic Impact Analysis

The RED impact analysis was evaluated at three geographical levels: Local, State, and National. The local represents the Los Angeles/Long Beach/Santa Ana MSA impact area which encompasses the area included in about a 50-mile radius around the project area. The State level will include the State of California. The National level will include the 48 contiguous United States.

The following table displays the overall spending profile that makes up the dispersion of the total project construction cost among the major industry sectors. The spending profile also identifies the geographical capture rate, also called Local Purchase Coefficient (LPC) in RECONS, of the cost components. The geographic capture rate is the portion of USACE spending on industries (sales) captured by industries located within the impact area. In many cases, IMPLAN's trade flows Regional Purchase Coefficients (RPCs) are utilized as a proxy to estimate where the money flows for each of the receiving industry sectors of the cost components within each of the impact areas.

Table 6-3: Input Assumptions (Spending and LPC)

Category	Spending (%)	Spending Amount	Local LPC (%)	State LPC (%)	National LPC (%)
Dredging Fuel	6%	$9,272,000	87%	87%	90%
Metals and Steel Materials	4%	$6,536,000	45%	55%	90%
Textiles, Lubricants, and Metal Valves and Parts (Dredging)	2%	$3,192,000	44%	45%	65%
Pipeline Dredge Equipment and Repairs	5%	$7,904,000	48%	51%	100%
Aggregate Materials	3%	$4,408,000	57%	78%	97%
Switchgear and Switchboard Apparatus Equipment	0%	$456,000	38%	42%	80%
Hopper Equipment and Repairs	2%	$2,888,000	1%	10%	97%
Construction of Other New Nonresidential Structures	14%	$20,672,000	100%	100%	100%
Industrial and Machinery Equipment Rental and Leasing	7%	$11,096,000	100%	100%	100%
Planning, Environmental, Engineering and Design Studies and Services	5%	$6,992,000	100%	100%	100%
USACE Overhead	7%	$10,032,000	71%	71%	100%
Repair and Maintenance Construction Activities	4%	$6,232,000	100%	100%	100%
Industrial Machinery and Equipment Repair and Maintenance	11%	$15,960,000	100%	100%	100%
USACE Wages and Benefits	13%	$20,216,000	75%	100%	100%
Private Sector Labor or Staff Augmentation	15%	$23,256,000	100%	100%	100%
All Other Food Manufacturing	2%	$2,888,000	58%	75%	90%
Total	**100%**	**$152,000,000**	**-**	**-**	**-**

The USACE is planning on expending approximately $152,000,000 on the project. Of this total project expenditure about $127 million will be captured within the regional impact area. The rest will be leaked out to the state or the nation. The expenditures made by the USACE for various services and products are expected to generate additional economic activity in that can be measured in jobs, income, sales and gross regional product as summarized in the following table and includes impacts to the region, the State impact area, and the Nation. **Table 6-4** is the overall economic impacts for this analysis.

The labor income represents all forms of employment earnings. In IMPLAN's regional economic model, it is the sum of employee compensation and proprietor income. The Gross Regional Product (GRP) which is also known as value added, is equal to gross industry output (i.e., sales or gross revenues The Gross Regional Product (GRP) which is also known as value added, is equal to gross industry output (i.e., sales or gross revenues) less its intermediate inputs (i.e., the consumption of goods and services purchased from other U.S. industries or imported). The number of jobs equates to the labor income. An interesting note is that in the local geography one job averages an annual wage of $59,908, the state equivalent is $61,636 and the National equivalent is $60,951 (labor income/job). The total impact, direct and secondary, yields a local average wage of $56,700, state $56,862 and $54,818 nationally.

Table 6-4: Overall Summary Economic Impacts

Impacts	Impact Areas	Regional	State	National
Total Spending		$152,000,000	$152,000,000	$152,000,000
Direct Impact				
	Output	$127,067,481	$134,731,844	$148,665,586
	Job	1,261.91	1,314.77	1,411.64
	Labor Income	$75,598,302	$81,037,070	$86,040,213
	GRP	$88,396,051	$94,569,662	$100,883,443
Total Impact				
	Output	$252,273,259	$278,942,389	$395,725,178
	Job	2,113.21	2,292.96	3,040.36
	Labor Income	$119,819,949	$130,382,377	$166,667,393
	GRP	$164,766,600	$180,573,851	$240,533,691

The next three tables present the economic impacts by Industry Sector both for each geographical region. Note that Labor -5001- is the largest impact area at the regional, state and national levels, implying that all the labor demand can be met at the regional level. Impacts at the National level show a tremendous expansion most certainly due to the many multiple turnover of money that ripples throughout the national economy.

Table 6-5: Economic Impact at Regional Level

IMPLAN No.	Industry Sector	Sales	Jobs	Labor Income	GRP
	Direct Effects				
115	Petroleum refineries	$6,816,525	0.87	$208,791	$1,052,790
171	Steel product manufacturing from purchased steel	$1,972,786	4.30	$355,146	$435,289
198	Valve and fittings other than plumbing manufacturing	$989,594	3.00	$269,434	$505,167
201	Fabricated pipe and pipe fitting manufacturing	$2,277,084	9.02	$523,865	$911,247
26	Mining and quarrying sand, gravel, clay, and ceramic and refractory minerals	$692,165	4.55	$326,450	$390,521
268	Switchgear and switchboard apparatus manufacturing	$97,465	0.29	$24,953	$47,315
290	Ship building and repairing	$5,967	0.03	$1,836	$2,276
319	Wholesale trade businesses	$3,324,767	18.61	$1,467,856	$2,590,822
322	Retail Stores - Electronics and appliances	$14,563	0.10	$7,407	$9,666
323	Retail Stores - Building material and garden supply	$601,950	6.81	$293,442	$420,493
324	Retail Stores - Food and beverage	$20,168	0.30	$10,191	$14,760
326	Retail Stores - Gasoline stations	$212,996	1.36	$87,237	$148,445
332	Transport by air	$7,731	0.03	$2,245	$3,857
333	Transport by rail	$124,717	0.36	$45,419	$70,997
334	Transport by water	$50,463	0.11	$8,282	$21,314
335	Transport by truck	$2,087,600	16.59	$994,114	$1,177,760
337	Transport by pipeline	$47,135	0.05	$23,315	$22,307
36	Construction of other new nonresidential structures	$20,672,000	127.53	$8,542,519	$10,695,378
365	Commercial and industrial machinery and equipment rental and leasing	$11,096,000	37.55	$2,937,481	$6,202,534
375	Environmental and other technical consulting services	$6,987,778	69.95	$4,779,851	$4,797,617
386	Business support services	$7,086,144	111.02	$4,796,089	$4,748,826
39	Maintenance and repair construction of nonresidential structures	$6,225,445	42.84	$2,793,596	$3,526,921
417	Commercial and industrial machinery and equipment repair and maintenance	$15,960,000	128.48	$9,843,672	$11,851,481
439	* Employment and payroll only (federal govt, non-military)	$15,162,000	119.99	$13,797,729	$15,162,000
5001	Labor	$23,256,000	554.34	$23,256,000	$23,256,000
69	All other food manufacturing	$1,278,438	3.79	$201,382	$330,268
	Total Direct Effects	$127,067,481	1,261.91	$75,598,302	$88,396,051
	Secondary Effects	$125,205,779	851.30	$44,221,647	$76,370,549
	Total Effects	**$252,273,259**	**2,113.21**	**$119,819,949**	**$164,766,600**

Table 6-6: Economic Impact at State Level

IMPLAN No.	Industry Sector	Sales	Jobs	Labor Income	GRP
	Direct Effects				
115	Petroleum refineries	$6,816,525	0.87	$208,791	$1,052,790
171	Steel product manufacturing from purchased steel	$2,562,457	5.59	$464,297	$568,247
198	Valve and fittings other than plumbing manufacturing	$989,594	3.00	$269,434	$505,167
201	Fabricated pipe and pipe fitting manufacturing	$2,413,581	9.56	$555,267	$965,871
26	Mining and quarrying sand, gravel, clay, and ceramic and refractory minerals	$1,505,798	10.13	$710,189	$849,574
268	Switchgear and switchboard apparatus manufacturing	$115,261	0.34	$29,509	$55,955
290	Ship building and repairing	$241,847	1.08	$83,529	$100,383
319	Wholesale trade businesses	$3,486,199	19.52	$1,539,127	$2,716,618
322	Retail Stores - Electronics and appliances	$14,563	0.10	$7,407	$9,666
323	Retail Stores - Building material and garden supply	$687,724	7.80	$335,256	$480,411
324	Retail Stores - Food and beverage	$20,168	0.30	$10,191	$14,760
326	Retail Stores - Gasoline stations	$248,964	1.59	$102,183	$173,623
332	Transport by air	$7,731	0.03	$2,245	$3,857
333	Transport by rail	$138,610	0.40	$50,478	$78,906
334	Transport by water	$50,463	0.11	$8,282	$21,314
335	Transport by truck	$2,147,403	17.09	$1,022,592	$1,211,498
337	Transport by pipeline	$48,218	0.06	$23,885	$22,855
36	Construction of other new nonresidential structures	$20,672,000	127.53	$8,542,519	$10,695,378
365	Commercial and industrial machinery and equipment rental and leasing	$11,096,000	37.55	$2,937,481	$6,202,534
375	Environmental and other technical consulting services	$6,988,323	69.96	$4,780,224	$4,797,991
386	Business support services	$7,086,144	111.02	$4,796,089	$4,748,826
39	Maintenance and repair construction of nonresidential structures	$6,225,445	42.84	$2,793,596	$3,526,921
417	Commercial and industrial machinery and equipment repair and maintenance	$15,960,000	128.48	$9,843,672	$11,851,481
439	* Employment and payroll only (federal govt, non-military)	$20,208,380	160.26	$18,390,038	$20,208,380
5001	Labor	$23,256,000	554.34	$23,256,000	$23,256,000
69	All other food manufacturing	$1,744,447	5.21	$274,788	$450,655
	Total Direct Effects	$134,731,844	1,314.77	$81,037,070	$94,569,662
	Secondary Effects	$144,210,546	978.18	$49,345,306	$86,004,189
	Total Effects	**$278,942,389**	**2,292.96**	**$130,382,377**	**$180,573,851**

Table 6-7: Economic Impact at National Level

IMPLAN No.	Industry Sector	Sales	Jobs	Labor Income	GRP
	Direct Effects				
115	Petroleum refineries	$6,942,381	0.89	$213,872	$1,075,828
171	Steel product manufacturing from purchased steel	$4,734,505	10.40	$866,356	$1,057,996
198	Valve and fittings other than plumbing manufacturing	$1,636,838	5.15	$445,657	$835,573
201	Fabricated pipe and pipe fitting manufacturing	$6,242,182	24.72	$1,480,489	$2,576,557
26	Mining and quarrying sand, gravel, clay, and ceramic and refractory minerals	$2,177,380	14.74	$1,026,931	$1,228,482
268	Switchgear and switchboard apparatus manufacturing	$285,109	0.87	$72,994	$138,950
290	Ship building and repairing	$2,762,848	12.39	$956,643	$1,148,924
319	Wholesale trade businesses	$3,533,468	19.81	$1,559,995	$2,753,452
322	Retail Stores - Electronics and appliances	$14,592	0.10	$7,422	$9,685
323	Retail Stores - Building material and garden supply	$816,060	9.52	$397,818	$570,060
324	Retail Stores - Food and beverage	$20,216	0.30	$10,215	$14,795
326	Retail Stores - Gasoline stations	$250,338	1.86	$102,755	$174,585
332	Transport by air	$8,835	0.03	$2,566	$4,408
333	Transport by rail	$180,288	0.53	$65,656	$102,632
334	Transport by water	$50,760	0.11	$8,343	$21,447
335	Transport by truck	$2,277,650	18.20	$1,084,615	$1,284,980
337	Transport by pipeline	$101,957	0.13	$52,182	$50,082
36	Construction of other new nonresidential structures	$20,672,000	127.53	$8,542,519	$10,695,378
365	Commercial and industrial machinery and equipment rental and leasing	$11,096,000	37.55	$2,937,481	$6,202,534
375	Environmental and other technical consulting services	$6,991,073	69.99	$4,782,137	$4,799,911
386	Business support services	$10,028,833	164.27	$6,787,778	$6,720,888
39	Maintenance and repair construction of nonresidential structures	$6,230,223	42.88	$2,795,740	$3,529,628
417	Commercial and industrial machinery and equipment repair and maintenance	$15,960,000	128.48	$9,843,672	$11,851,481
439	* Employment and payroll only (federal govt, non-military)	$20,215,998	160.32	$18,396,971	$20,215,998
5001	Labor	$23,256,000	554.34	$23,256,000	$23,256,000
69	All other food manufacturing	$2,180,050	6.53	$343,405	$563,188
	Total Direct Effects	$148,665,586	1,411.64	$86,040,213	$100,883,443
	Secondary Effects	$247,059,593	1,628.72	$80,627,180	$139,650,248
	Total Effects	**$395,725,178**	**3,040.36**	**$166,667,393**	**$240,533,691**

The total economic impact from the improvements made at the POLB on the State of California, as shown in **Table 6-6,** is just under $279 million in sales, around 2,300 jobs equating to about $130 million in labor income, and a contribution of $180.5 million to GRP.

Table 6-8 displays the impact region profile for 19 selected sectors. It displays the geographical capture amounts for the Los Angeles/Long Beach/Santa Ana CA MSA, which is that portion of USACE spending that is captured in the impact area. The labor income represents all forms of employment earnings. In IMPLAN's regional economic model, it is the sum of employee compensation and proprietor income. The Gross Regional Product (GRP) which is also known as value added, is equal to gross industry output (i.e., sales or gross revenues) less its intermediate inputs (i.e., the consumption of goods and services purchased from other U.S. industries or imported). The number of jobs equates to the labor income. The total Long Beach Harbor project economic impact for the metropolitan statistical area is composed of $1.3 trillion in output (sales), 7.7 million in employment, $450 billion in labor income and a contribution of $721 billion to GRP. An interesting note is that in the MSA one job averages an annual wage of $57,955 (labor income/employment).

Table 6-8: Impact Region Profile (2019)

Regional Impact Area ID:	24			
Regional Impact Area Name:	Los Angeles Long Beach Santa Ana CA MSA			
Impact Area Type	Metropolitan Impact Area			
State Impact Region::	California			
Section	**Output (millions)**	**Labor Income (millions)**	**GRP (millions)**	**Employment**
Accommodations and Food Service	$34,802	$12,634	$19,394	506,670
Administrative and Waste Management Services	$36,818	$19,270	$24,621	559,124
Agriculture, Forestry, Fishing and Hunting	$974	$480	$502	12,122
Arts, Entertainment, and Recreation	$29,510	$12,142	$18,228	246,606
Construction	$55,939	$24,103	$26,420	362,746
Education	$32,654	$25,051	$28,196	480,559
Finance, Insurance, Real Estate, Rental and Leasing	$176,324	$46,865	$119,045	815,966
Government	$54,465	$39,280	$44,929	482,253
Health Care and Social Assistance	$63,661	$35,073	$41,503	641,159
Imputed Rents	$90,657	$12,833	$58,782	500,434
Information	$121,758	$32,480	$55,129	305,431
Management of Companies and Enterprises	$19,459	$8,784	$11,785	86,388
Manufacturing	$269,098	$49,317	$71,290	633,174
Mining	$7,887	$1,771	$4,942	12,415
Professional, Scientific, and Technical Services	$127,029	$58,047	$76,317	761,141
Retail Trade	$62,231	$26,340	$42,944	735,704
Transportation and Warehousing	$30,287	$13,148	$18,379	221,871
Utilities	$20,803	$3,943	$11,364	17,165
Wholesale Trade	$73,293	$27,959	$47,838	375,410
Total	**$1,307,649**	**$449,521**	**$721,610**	**7,756,338**

The following table shows the top ten industries that typically benefit from the types of expenditures made for this project by the USACE. This analysis was conducted at the national level and thus it cannot be guaranteed that these industries would be present in the regional impact area as analyzed.

Table 6-9: Top Ten Industries Affected by Work Activity (2019)

Project:	LONG BEACH HARBOR, CA		
Business Line:	Navigation		
Work Activity:	CWB - Navigation		
Rank	**Industry (millions)**	**IMPLAN No.**	**% of Total Employment**
1	* Employment and payroll only (federal govt, non-military)	439	8 %
2	Business support services	386	7 %
3	Construction of other new nonresidential structures	36	6 %
4	Food services and drinking places	413	5 %
5	Commercial and industrial machinery and equipment repair and maintenance	417	4 %
6	Real estate establishments	360	3 %
7	Wholesale trade businesses	319	3 %
8	Employment services	382	3 %
9	Maintenance and repair construction of nonresidential structures	39	3 %
10	Offices of physicians, dentists, and other health practitioners	394	2 %
			43 %

7 SENSITIVITY ANALYSIS

The Principle & Guidelines and subsequent ER 1105-2-100 recognize the inherent variability to water resources planning. Navigation projects and container studies in particular are fraught with uncertainty about future conditions. Therefore, a sensitivity analysis with changes to key quantitative assumptions and computations is required to assess their effect on the final outcome. The sensitivity analysis for this study was a repeat of the primary analysis, substituting commodity and fleet forecasts with a range of values that were projected to be below the base scenario. The HarborSym model used in the baseline evaluation included variations or ranges for many of the variables involved in the vessel operating costs, loading practices, trade lane distances, etc. However, it used only one base line commodity forecast, a key area of potential uncertainty. This sensitivity analysis presents the results of multiple forecasts of future commodity traffic at Long Beach Harbor.

For the analysis, the impact of Pier J going offline in 15 years, as opposed to 20 years, was analyzed. The change in timeline for Pier J resulted in a drop in incremental benefits of approximately 7%, from $6.2 million to $5.8 million. The costs amortized over a 5 year shorter timeframe would rise by approximately 26%, from $2.3 million to $2.8 million. The incremental Benefit-Cost ratio would be 2.0, down from 2.7, but would remain economically justified.

7.1 Inputs for Sensitivity Analysis

Benefits are a function of projected cargo and fleet forecasts, vessel operating costs, vessel itineraries, and changes in the overall economy, including the balance of trade between nations – for Long Beach, Asia in particular. There are also uncertainties regarding changes in port operations and infrastructure. To evaluate the uncertainty in the calculated benefits for the proposed project, multiple commodity and vessel fleet forecasts were developed for lower growth scenarios based on the baseline forecast presented in Section 3.3.3. The focus of these sensitivity scenarios are changes in the anticipated number of containers handled at the POLB. Crude oil imports were not included in the scenarios because the annual throughput is not anticipated to significantly change during the period of analysis.

Three lower growth scenarios were developed to assess the risk in Federal Investment of the proposed channel modifications at the Port of Long Beach. Scenario 1 assumed that commodity growth would occur from the baseline tonnage (2015) through 2021, at the same rate as the NED analysis. Then, from 2022 through the period of analysis the benefits were held constant. Scenario 2 assumed a lower growth rate of 2 percent annually from the baseline tonnage, 2015, to the base year that would continue throughout the period of analysis. Scenario 3 assumed a growth rate of 1.2 percent from the baseline tonnage through 2076. **Table 7-1** displays the total TEU forecast for each scenario.

Table 7-1: Total TEUs for Sensitivity Scenarios

Total TEU Throughput (million)				
Year	NED Analysis	Scenario 1	Scenario 2	Scenario 3
2015	4.9	4.9	4.9	4.9
2021	6.6	6.6	5.7	5.4
2030	9.5	6.6	6.6	6.0
2040	14.0	6.6	8.1	6.6

7.2 Sensitivity Results

HarborSym was run with changes in commodities imported and exported from base year tonnage. The results of the three sensitivity analyses are provided in the table below. As with the "most likely" scenario, the results for 2027 are calculated using the detailed model runs from 2021 and 2030. The results are compared to both the nearshore and offshore placement areas. As shown in each scenario the 55 foot recommended channel depth remains justified.

Table 7-2: Benefit/Cost for Sensitivity Scenarios

	Scenario 1	Scenario 2	Scenario 3
Average Annual Benefit	$ 10,045,000	$ 11,067,000	$ 9,472,000
Average Annual Cost (Nearshore)	$ 3,038,000	$ 3,038,000	$ 3,038,000
Net Benefits	$ 7,007,000	$ 8,029,000	$ 6,434,000
BC Ratio	3.3	3.6	3.1
Average Annual Cost (Offshore)	$ 3,402,000	$ 3,402,000	$ 3,402,000
Net Benefits	$ 6,643,000	$ 7,665,000	$ 6,070,000
BC Ratio	3.0	3.3	2.8

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FINAL INTEGRATED FEASIBILITY REPORT AND ENVIRONMENTAL IMPACT STATEMENT / ENVIRONMENTAL IMPACT REPORT (EIS/EIR)

APPENDIX F: COST ENGINEERING

PORT OF LONG BEACH
DEEP DRAFT NAVIGATION STUDY
Los Angeles County, California

October 2021

US Army Corps of Engineers®

Port of LONG BEACH
THE PORT OF CHOICE

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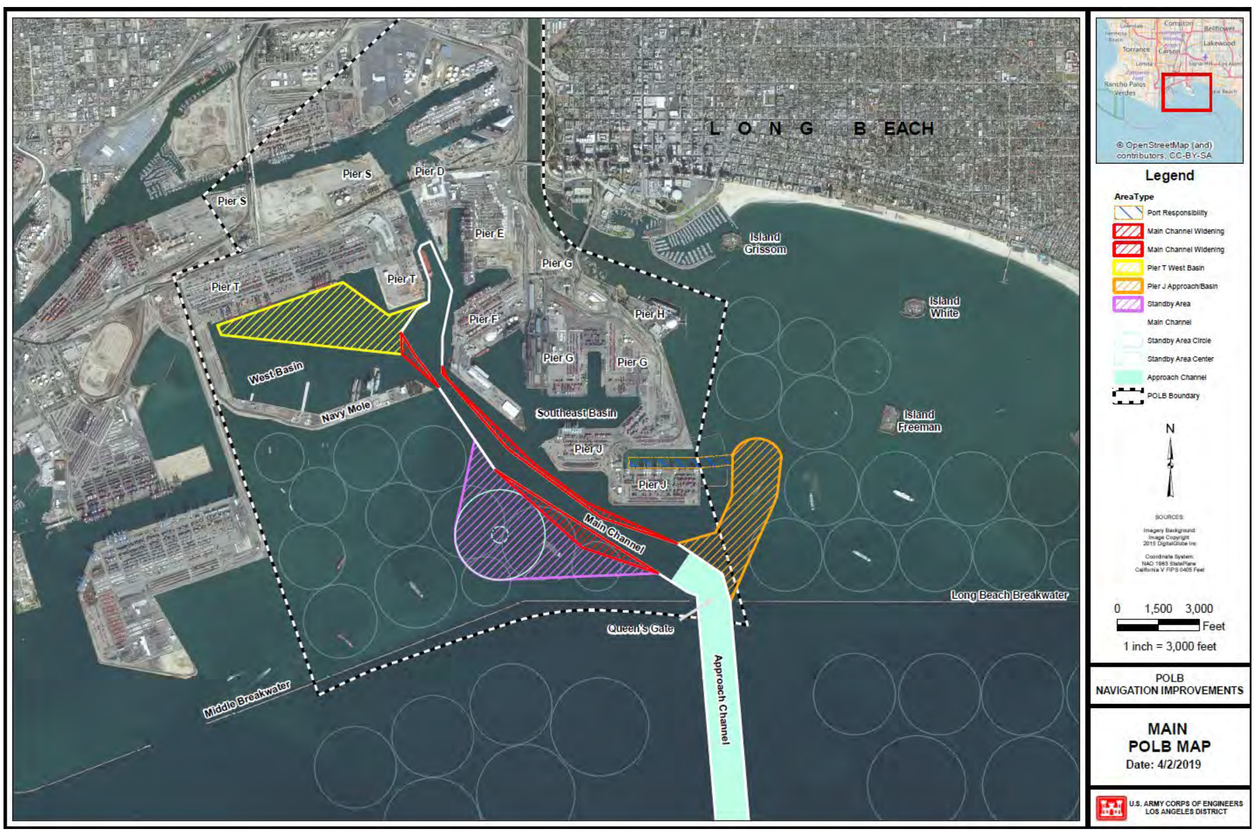
Port of Long Beach Deepening (P2 403268)

Los Angeles, California

Feasibility Study

Appendix F; Cost Engineering



Prepared by: Cost Engineering, Louisville District for

Los Angeles District, South Pacific Division

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Executive Summary

Purpose

The purpose of the study is to identify and evaluate improvements to existing navigation channels within the Port of Long Beach (POLB). The study focuses on improving conditions for current and future container and liquid bulk vessel operations in relation to safety, reliability, and waterborne transportation efficiencies. The purpose of this report is to summarize and document the Total Project Costs for the NED plan (recommended plan), which was Alternative 3 in the alternative array.

The alternative costs provided have undergone District Quality Control Review by the Los Angeles District Coastal Section and the Walla Walla Cost Center of Expertise. These reviews have verified the reasonableness of total project costs, including the construction costs and calculated contingencies using the mandated Abbreviated Risk Analysis techniques.

Project Scope

1) The design vessels considered in the analysis include the Post-Panamax Generation IV (containerized carrier) with a design draft of 52 feet and very large crude carriers (VLCC) for bulk liquid cargoes with a design draft of 70 feet.

2) Dredged material will be disposed of either in a nearshore placement site (i.e. Surfside Borrow Site), an ocean-dredged material disposal site (ODMDS) (LA-2 and/or LA-3), or a combination of the two. The nearshore placement site can accommodate up to 2.5 mcy of dredged material. Each ODMDS has a maximum annual disposal volume; LA-2 is assumed to be 0.9 mcy from all sources, and LA-3 is assumed to be 2.2 mcy from all sources.

3) It is assumed that dredging will be performed using a hopper dredge as well as a clamshell dredge. To minimize transit time, disposal of material from the hopper dredge will maximize use of the nearshore site until all hopper dredging is complete, while a clamshell dredge will be evaluated for disposal at an ODMDS. If there is capacity available at the nearshore site for the clamshell dredging, that will be utilized first.

4) Dredging areas are named as follows:

a) Approach Channel
b) West Basin
c) West Basin Berth (Non-Federal)
d) Pier J Basin Slip and Berth (Non-Federal)
e) Pier J Approach Channel and Transition from Main Channel
f) Main Channel Widening

Cost

The cost estimate for the project has been developed from detail using the Cost Engineering Dredge Estimating Program (CEDEP) estimating software to ensure that cost estimates for dredging areas are prepared accurately and efficiently. This program meets the requirement for preparing estimates in lieu of using the Micro-Computer Aided Cost Engineering system (MCACES) software program, since none of the cost alternatives include land work.

Estimates include non-federal costs. Costs were provided for Non-federal activities performed by the sponsor, the Port of Long Beach. Non-federal work performed by the sponsor includes:

1) Pier J Wharf improvement/stabilization: underwater bulkhead (sheet pile) to accommodate deepening
2) Pier J Breakwater Stabilization: bulkhead wall
3) Pier T Wharf Improvements
4) Electric Substation near Berth J 260

Non-federal work performed by the COE, but paid by the sponsor includes:

1) Berth Dredging near Pier J and
2) Berth Dredging near West Basin Area

Additionally, costs have been provided to USACE by the United Stats Coast Guard (USCG) for the necessary Aids to Navigation (ATON, as shown in the TPCS sheet). These costs are paid for by USCG but are considered Federal Costs.

Environmental Mitigation costs are not anticipated per Environmental Coordinator.

Real Estate costs are identified in the TPCS under Account 01, Lands and Damages. RE Costs were provided by the Real Estate PDT member for use in the cost estimate. All marine work is performed on State/Federal waters.

The estimate considers all project costs including construction, engineering, design, and contract supervision & administration. Total Project Costs for the recommended plan is identified in Table 1.

Schedule

The Total Project Schedule has been developed using Microsoft Project. It can be found at the end of this appendix.

Risk

A Cost & Schedule Risk Analysis was performed on the final recommended plan in accordance with ER 1110-1-1300 Cost Engineering Policy and General Requirements, with project contingencies calculated accordingly. The 80% Confidence Level (P80) of this CSRA is more likely to ensure the funds received will be adequate for implementation and is the recommended level for USACE cost estimates. The risk analysis results are also intended to provide project leadership with contingency information for scheduling, budgeting, and project control purposes, as well as provide tools to support decision making and risk management as the project progresses through implementation.

1 Scope of Work

1.1 Federal Construction

1.1.1 12 – Ports

Scope of work includes the following alternatives:

- Recommended (NED) Plan:
    - Deepen West Basin Channel to -55 feet.
    - Deepen Pier J Approach Channel to -55 feet, including the transition from the Main Channel to Pier J Approach Channel.
    - Widening of Main Channel to a design depth of -76’
    - Deepen Approach Channel to a design depth of -80’

1.1.2 12 – Ports

Aids to Navigation (ATON) scope and costs provided by the USCG. Scope of work includes the following alternatives:

1.2 Non-Federal Construction

1.2.1 12 – Ports

- The primary purpose of the Port’s project is to deepen the West Basin Berth (Pier T); the Pier J Basin Slip and Berth to facilitate safety and improve navigation for the fleet vessels. Depth analyzed range from -53’ to -57’.
- Wharf improvements, breakwater improvements, and electric substation construction work is performed and priced by the sponsor.

1.3 Non-Construction

1.3.1 30 – Planning, Engineering, & Design (PED)

The work covered under this account includes project management, project planning, preparation of plans & specifications, engineering during construction, contract advertisement, opening of bids, and contract award. PED was estimated based on average historical percentages. Additionally, a percentage of cost was allocated for monitoring activities assumed to be required after discussion with the PDT. These costs are captured on the TPCS under “Monitoring and Adaptive Management” and are assumed include sediment sampling, water sampling, and other necessary activities during dredging.

1.3.2 31 – Supervision & Administration (S&A)

The work covered under this account includes contract supervision, contract administration, construction administration, technical management activities, and District office supervision and administration costs. S&A was estimated based on average historical percentages.

2 Major Assumptions

2.1.1 Construction

- All work inside the breakwater (Queen's Gate), within the port, is performed by an electric clamshell in order to meet air quality standards required by the Port of Long Beach.
- All work outside the breakwater (Queen's Gate) is performed by a generic large hopper. Work encompass dredging the Approach Channel. A large hopper is well suited for work on the Approach Channel. Dredging a large volume of sand outside the breakwater justifies the use of the larger vessel. The excavation consists of a thin layer (1-3 feet) along the ocean bottom.
- There is an existing electric substation near Pier T that can serve as a power supply to the electric clamshell dredge when working on the West Basin, Main Channel Widening, and Stand-By areas.
- Marine fuel prices are based on average of current prices due to market fluctuation
- Mob/demob costs are dependent on the placement sites limitations. Once the yearly placement sites volume capacities are met, it is assumed dredging equipment is demobilized. Dredging is resumed the following year with associated mobilization costs.
- Contracts assumed to be low bid/bid opening.
- Real estate costs provided by RE team member and used as provided.
- Environmental mitigation costs are anticipated at no expense
- Additional assumptions are documented within the CEDEP files.

2.1.2 Scheduling

- It is assumed that dredging will be performed using one hopper dredge and one clamshell dredge. To minimize transit time, disposal of material from the hopper dredge will maximize use of the Nearshore Placement Site, while a clamshell dredge will be evaluated for disposal at LA2 or LA3 Placement Sites.
- Dredging of Pier J Slip, berth, and Approach is dependent on construction of the electric substation near Pier J.
- Nearshore placement site (Surfside borrow site) can accommodate 2,500,000 CY of material (Max.)
- Offshore placement sites (LA2 and LA3) max allowable placements are 900,000 CY/year (LA2) and 2,200,000 CY/year (LA3). However, these volumes are also limited by the work that one clamshell can perform per year.
- Assume Approach Channel sediment is transported to the Nearshore placement site first.

3 Cost Estimate

Cost estimates were prepared in CEDEP for all dredging feature accounts and summarized on the Cost Summary Alternative Comparison, as well as input into MII to show a total project cost consistent with the TPCS file. Costs were primarily developed from detail while some were provided by the sponsor, Port of Long Beach, and some by the United States Coast Guard.

3.1 Estimate Methodology

3.1.1 Reasons for selecting the hopper dredge to work on the Approach Channel

In selecting the dredging equipment, engineering considers traffic, disposal site restrictions, hauling distance and cost.

The hopper dredge is the equipment of choice in heavy traffic and it is capable of high productions resulting in a cost effective choice. The hopper dredge maneuverability is excellent and is therefore more mobile in traffic. The hopper dredge does not need scows (barges), thus equipment footprint in the area near Queen's Gate is reduced and vessel traffic impacts are reduced. Reduction of traffic impacts near Queen's Gate is encouraged by the project requirements.

The use of a clamshell (mechanical dredge) in the area is unlikely. When excavating close to a wharf, deck or confined areas the clamshell is the dredge of choice due to its dredging accuracy. However, the clamshell dredging operation is significantly more expensive than the hopper dredge operation because the clamshell low capacity and production is significantly slower than the hopper dredge.

Also, the best choice in disposing material in the open sea is the hopper for hauling distances below 10 miles. With hauling distances over 10 miles, the clamshell-scow operation may be more economical.

Converting the diesel hopper dredge into an electric hopper dredge is not feasible as it is a seagoing ship. A suction pipe hydraulically discharges material into a self-contained hopper, and the material is then transported to a disposal site. The use of an electric line (cord) would prevent the hopper from sailing or transporting the material to the disposal site.

3.1.2 Reasons for selecting the clamshell dredge to work inside the harbor

A conventional clamshell dredge was selected to dredge the areas on the harbor side of Queen's Gate. The hydraulic cutterhead would not be suitable for long delivery distances. Hauling distances to LA1 and LA2 placement sites range mostly from 10 miles and 25 miles out in the ocean. Also, the clamshell dredge seems more economical and suitable for site conditions: selected dredge must run on electric power, a large part of the required deepening of the sea floor runs along the wharf face, and cutting depths are greater than -55 feet.

3.1.3 Non-Federal Estimates

Non-federal work encompass Pier J Basin wharf improvements, Pier J berth dredging, and Pier J Basin slip dredging.

Pier J Basin wharf improvements include breakwater improvements (bulkhead wall) and electric substation construction near Berth J 260 construction. Costs were provided by the Port of Long Beach.

Pier J berth and slip dredging work will be performed through a USACE contract (Contract 1) in conjunction with the bulk of the channel dredging operations.

3.1.4 Detailed CEDEP Cost Estimate

The CEDEP estimating software was used to develop production rates. Equipment selection and production rates were reviewed by the COE Coastal Section and the Port of Long Beach. A construction sequence for area of work was developed based on placement site limitations and equipment production rates. Crews were developed in correspondence with the work being performed. The labor rates were adjusted to the local and current Davis-Bacon wage determinations. CEDEP area factors were updated.

3.2 Direct Costs

Direct costs are based on anticipated equipment, labor, and materials necessary to construct the project. Following formulation of the direct cost, a determination was made that the work is suitable for a marine prime contractor.

3.2.1 Overtime

Overtime is anticipated. Dredging work is assumed to occur 24 hours a day, 6 days per week, Monday through Saturday. Sunday was allowed for equipment maintenance.

3.2.2 Labor - Wage Determination

Los Angeles County, California Davis-Bacon wage rates were obtained from the Department of Labor and used for all craft labor. The base wage rate and taxable fringe were entered into CEDEP and applied accordingly.

3.2.3 Equipment Costs

The clamshell dredge is electric, therefore, the CEDEP program was altered to accommodate the diesel to electric conversion.

The hopper dredge runs on diesel, and the generic large dredge was the best fit to attain required production rates.

3.2.4 Crews

Project specific crews are applied to the detailed costs as appropriate. Number of crew members was modified according to the number of shifts. In considering the crews and productivities, the engineer considered historical project data, input from Coastal Engineering, and the sponsor for checking the overall dredging production rates.

Quantities were developed by the COE Coastal Section. Quantities were confirmed by the estimator and adjusted to account for non-pay dredging volume.

3.3 Indirect Costs

3.3.1 Contractor Acquisition Strategy

Through discussions with the PDT, two contracts are assumed for this project. Contract 1 is assumed to be administered by USACE as a full and open Invitation For Bid (IFB) type contract. Dredging work is assumed to be performed by a marine prime contractor. The scope of work associated with land or marine non-federal is assumed to be coordinated with the Port of Long Beach and for the Port of Long Beach to contract out the work. Acquisition strategy uncertainties have been captured in the CSRA.

3.3.2 Contractor Markups

3.3.2.1 Field Office Overhead (FOOH)

For Field Office Overhead (FOOH), the cost estimate includes a percentage based upon the estimator's judgment, discussion with the PDT, and current estimated construction duration. This value represents the anticipated prime contractor field overhead costs for items such as project supervision, contractor quality control, contractor field office supplies, personal protective equipment, field engineering, and other incidental field overhead costs.

3.3.2.2 Home Office Overhead (HOOH)

For Home Office Overhead (HOOH) expense, the cost estimate includes an allowance applied as a percentage of direct cost plus FOOH. HOOH includes items such as office rental/ownership costs, utilities, office equipment ownership/maintenance, office staff (managers, accountants, clerical, etc.), insurance, and miscellaneous. In reality, the range of home office overhead can be quite broad and depends largely on the contractor's annual volume of work and the type of work that is generally performed by the contractor.

3.3.2.3 Profit

Profit was applied to the prime contractor on the CEDEP estimates since working estimates are built for project authorization.

3.3.2.4 Bond

For the main contract, bond was assumed to be 1% and applied as a running percentage.

3.4 Owner Costs

3.4.1 Contingency

Contingencies for Alternative Project Costs were determined through a Cost & Schedule Risk Analysis (CSRA) workshop with the PDT and Port of Long Beach personnel. The resulting overall project contingency developed was 36%.

3.4.2 Escalation

No escalation was applied to the construction costs except on the TPCS. The civil works breakdown structure (CWBS) feature accounts associated with each contract were escalated to the mid-point of construction or design period using the Civil Works Construction Cost Index System (CWCCIS) factors as contained in EM 1110-2-1304.

4 Cost MCX Review

Cost MCX cursory review of the final array of alternatives was performed to ensure that all cost engineering products are well developed, consistent, and to a level of quality and detail necessary in order to determine the TSP.

5 NED Plan (Alternative 3)

5.1 Total Project Cost Summary (TPCS)

****** TOTAL PROJECT COST SUMMARY ******

PROJECT: **Port of Long Beach**
PROJECT NO: **403268**
LOCATION: **Long Beach, CA**

DISTRICT: **Los Angeles District** PREPARED: **4/15/2021**
POC: **CHIEF, AE MANAGEMENT, COST AND VALUE ENGINEERING, Mark Cooke, P.E.**

This Estimate reflects the scope and schedule in report; POLB Navigation Improvements

Civil Works Work Breakdown Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)						TOTAL PROJECT COST (FULLY FUNDED)			
						Program Year (Budget EC): 2021									
						Effective Price Level Date: 1-Oct- 20									
WBS NUMBER	Civil Works Feature & Sub-Feature Description	COST ($K)	CNTG ($K)	CNTG (%)	TOTAL ($K)	ESC (%)	COST ($K)	CNTG ($K)	REMAINING COST ($K)	Spent Thru: 1-Oct-20 ($K)	TOTAL FIRST COST ($K)	ESC (%)	COST ($K)	CNTG ($K)	FULL ($K)
12	NAVIGATION PORTS & HARBORS	$81,758	$29,433	36%	$111,190		$81,758	$29,433	$111,190		$111,190	15.8%	$94,636	$34,069	$128,705
12	LOCAL SERVICE FACILITIES	$13,468	$4,848	36%	$18,316		$13,468	$4,848	$18,316			excluded from Fully Funded Costs			
12	ASSOCIATED COSTS (ATON)	$480	$173		$653		$480	$173	$653			excluded from Fully Funded Costs			
	CONSTRUCTION ESTIMATE TOTALS:	$95,705	$34,454		$130,159		$95,705	$34,454	$130,159		$111,190	15.8%	$94,636	$34,069	$128,705
01	LANDS AND DAMAGES	$1,169	$292	25%	$1,462		$1,169	$292	$1,462		$1,462	9.0%	$1,275	$319	$1,593
30	PLANNING, ENGINEERING & DESIGN	$12,264	$4,415	36%	$16,679		$12,264	$4,415	$16,679		$16,679	14.3%	$14,022	$5,048	$19,070
31	CONSTRUCTION MANAGEMENT	$5,478	$1,972	36%	$7,450		$5,478	$1,972	$7,450		$7,450	22.5%	$6,710	$2,416	$9,126
	PROJECT COST TOTALS:	$114,616	$41,133	36%	$155,749		$114,616	$41,133	$155,749		**$136,780**	15.9%	$116,643	$41,851	$158,494

__________________ CHIEF, AE MANAGEMENT, COST AND VALUE ENGINEERING, Mark Cooke, P.E.

__________________ PROJECT MANAGER, Susan M. Ming, P.E.

__________________ CHIEF, REAL ESTATE, Cheryl Connett

__________________ CHIEF, ENGINEERING, Eric Stevens, P.E.

ESTIMATED FULLY FUNDED TOTAL PROJECT COST:	**$158,494**
GENERAL NAVIGATION FEATURES:	**$128,705**
PROJECT FIRST COST:	**$136,780**
LOCAL SERVICE FACILITIES COST[1]:	*$18,316*
ASSOCIATED COSTS[2]:	*$653*
LERR:	*$1,462*
INCREMENTAL AVERAGE ANNUAL O&M[3]:	*$101*

[1]LOCAL SERVICE FACILITIES ARE 100% NON-FEDERAL COSTS
[2]ASSOCIATED COSTS ARE 100% FEDERAL (USCG) COST
[3]O&M IS BASED ON 50 YEAR ANALYSIS, COST IS NOT INCLUDED IN Project First Cost or Fully-Funded Cost

****** TOTAL PROJECT COST SUMMARY ******

****** CONTRACT COST SUMMARY ******

PROJECT: Port of Long Beach
LOCATION: Long Beach, CA
This Estimate reflects the scope and schedule in report; POLB Navigation Improvements

DISTRICT: Los Angeles District
POC: CHIEF, AE MANAGEMENT, COST AND VALUE ENGINEERING, Mark Cooke, P.E.
PREPARED: 4/15/2021

WBS Structure		**ESTIMATED COST**				**PROJECT FIRST COST (Constant Dollar Basis)**				**TOTAL PROJECT COST (FULLY FUNDED)**				
		Estimate Prepared: 15-Apr-21 Estimate Price Level: 1-Oct-20				Program Year (Budget EC): 2021 Effective Price Level Date: 1 -Oct-20								
WBS NUMBER	Civil Works Feature & Sub-Feature Description	COST ($K)	CNTG ($K)	RISK BASED CNTG (%)	TOTAL ($K)	ESC (%)	COST ($K)	CNTG ($K)	TOTAL ($K)	Mid-Point Date	ESC (%)	COST ($K)	CNTG ($K)	FULL ($K)
A	*B*	*C*	*D*	*E*	*F*	*G*	*H*	*I*	*J*	*P*	*L*	*M*	*N*	*O*
	CONTRACT 1													
12	NAVIGATION PORTS & HARBORS - Year 1	$42,077	$15,148	36.0%	$57,225		$42,077	$15,148	$57,225	2025Q3	13.8%	$47,898	$17,243	$65,141
12	NAVIGATION PORTS & HARBORS - Year 2	$22,405	$8,066	36.0%	$30,471		$22,405	$8,066	$30,471	2026Q3	17.1%	$26,245	$9,448	$35,693
12	NAVIGATION PORTS & HARBORS - Year 3	$7,593	$2,734	36.0%	$10,327		$7,593	$2,734	$10,327	2027Q3	20.5%	$9,152	$3,295	$12,447
12	NAVIGATION PORTS & HARBORS - Electric Substation	$9,682	$3,485	36.0%	$13,167		$9,682	$3,485	$13,167	2026Q3	17.1%	$11,341	$4,083	$15,424
	CONSTRUCTION ESTIMATE TOTALS:	$81,758	$29,433	36.0%	$111,190		$81,758	$29,433	$111,190			$94,636	$34,069	$128,705
01	LANDS AND DAMAGES	$1,169	$292	25.0%	$1,462		$1,169	$292	$1,462	2024Q1	9.0%	$1,275	$319	$1,593
30	PLANNING, ENGINEERING & DESIGN													
1.5%	Project Management	$1,226	$442	36.0%	$1,668		$1,226	$442	$1,668	2024Q1	11.9%	$1,372	$494	$1,866
0.5%	Planning & Environmental Compliance	$409	$147	36.0%	$556		$409	$147	$556	2024Q1	11.9%	$457	$165	$622
8.0%	Engineering & Design	$6,541	$2,355	36.0%	$8,895		$6,541	$2,355	$8,895	2024Q1	11.9%	$7,316	$2,634	$9,950
0.5%	Reviews, ATRs, IEPRs, VE	$409	$147	36.0%	$556		$409	$147	$556	2024Q1	11.9%	$457	$165	$622
1.0%	Life Cycle Updates (cost, schedule, risks)	$818	$294	36.0%	$1,112		$818	$294	$1,112	2024Q1	11.9%	$915	$329	$1,244
0.5%	Contracting & Reprographics	$409	$147	36.0%	$556		$409	$147	$556	2026Q3	22.5%	$501	$180	$681
1.5%	Engineering During Construction	$1,226	$442	36.0%	$1,668		$1,226	$442	$1,668	2026Q3	22.5%	$1,502	$541	$2,043
1.0%	Planning During Construction	$818	$294	36.0%	$1,112		$818	$294	$1,112	2026Q3	22.5%	$1,002	$361	$1,362
0.5%	Adaptive Management & Monitoring	$409	$147	36.0%	$556		$409	$147	$556	2026Q3	22.5%	$501	$180	$681
31	CONSTRUCTION MANAGEMENT													
6.7%	Construction Management	$5,478	$1,972	36.0%	$7,450		$5,478	$1,972	$7,450	2026Q3	22.5%	$6,710	$2,416	$9,126
	CONTRACT COST TOTALS:	$100,668	$36,112		$136,780		$100,668	$36,112	**$136,780**			$116,643	$41,851	**$158,494**

****** TOTAL PROJECT COST SUMMARY ******

****** CONTRACT COST SUMMARY ******

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WBS NUMBER	Civil Works Feature & Sub-Feature Description	COST ($K)	CNTG ($K)	RISK BASED CNTG (%)	TOTAL ($K)	ESC (%)	COST ($K)	CNTG ($K)	TOTAL ($K)	Mid-Point Date	ESC (%)	COST ($K)	CNTG ($K)	FULL ($K)
A	*B*	*C*	*D*	*E*	*F*	*G*	*H*	*I*	*J*	*P*	*L*	*M*	*N*	*O*
	CONTRACT 2													
12	NAVIGATION PORTS & HARBORS - Mob/Dredging	$5,567	$2,004	36.0%	$7,572		$5,567	$2,004	$7,572	2026Q3	17.1%	$6,521	$2,348	$8,869
12	NAVIGATION PORTS & HARBORS - Pier J Improvements	$4,713	$1,697	36.0%	$6,410		$4,713	$1,697	$6,410	2026Q3	17.1%	$5,521	$1,988	$7,508
	CONSTRUCTION ESTIMATE TOTALS:	$10,281	$3,701	36.0%	$13,982		$10,281	$3,701	$13,982			$12,042	$4,335	$16,378
01	LANDS AND DAMAGES			25.0%										
30	PLANNING, ENGINEERING & DESIGN													
6.0%	POLB Administration Costs	$617	$222	36.0%	$839		$617	$222	$839	2024Q1	11.9%	$690	$248	$939
10.0%	POLB Engineering & Design Costs	$1,028	$370	36.0%	$1,398		$1,028	$370	$1,398	2024Q1	11.9%	$1,150	$414	$1,564
31	CONSTRUCTION MANAGEMENT													
15.0%	POLB Construction Management Costs	$1,542	$555	36.0%	$2,097		$1,542	$555	$2,097	2026Q3	22.5%	$1,889	$680	$2,569
	CONTRACT COST TOTALS:	$13,468	$4,848		$18,316		$13,468	$4,848	**$18,316**			$15,771	$5,678	**$21,449**

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WBS Structure		ESTIMATED COST				PROJECT FIRST COST (Constant				TOTAL PROJECT COST (FULLY FUNDED)				
		Estimate Prepared: 15-Apr-21				Program Year (Budget EC): 2021								
		Estimate Price Level: 1-Oct-20				Effective Price Level Date: 1 -Oct-20								
WBS NUMBER	Civil Works Feature & Sub-Feature Description	COST ($K)	CNTG ($K)	RISK BASED CNTG (%)	TOTAL ($K)	ESC (%)	COST ($K)	CNTG ($K)	TOTAL ($K)	Mid-Point Date	ESC (%)	COST ($K)	CNTG ($K)	FULL ($K)
A	*B*	*C*	*D*	*E*	*F*	*G*	*H*	*I*	*J*	*P*	*L*	*M*	*N*	*O*
	Associated Costs													
12	Aids to Navigtion (ATON)	$480	$173	36.0%	$653		$480	$173	$653	2026Q3	17.1%	$562	$202	$765
	CONSTRUCTION ESTIMATE TOTALS:	$480	$173	36.0%	$653		$480	$173	$653			$562	$202	$765
01	LANDS AND DAMAGES													
30	PLANNING, ENGINEERING & DESIGN													
31	CONSTRUCTION MANAGEMENT													
	CONTRACT COST TOTALS:	$480	$173		$653		$480	$173	**$653**			$562	$202	**$765**

**** TOTAL PROJECT COST SUMMARY ****

**** CONTRACT COST SUMMARY ****

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PREPARED: 4/15/2021

WBS Structure		**ESTIMATED COST**				**PROJECT FIRST COST (Constant**				**TOTAL PROJECT COST (FULLY FUNDED)**				
		Estimate Prepared:			**15-Apr-21**	Program Year (Budget EC):			2021					
		Estimate Price Level:			1-Oct-20	Effective Price Level Date:			1 -Oct-20					
				RISK BASED										
WBS NUMBER	Civil Works Feature & Sub-Feature Description	COST ($K)	CNTG ($K)	CNTG (%)	TOTAL ($K)	ESC (%)	COST ($K)	CNTG ($K)	TOTAL ($K)	Mid-Point Date	ESC (%)	COST ($K)	CNTG ($K)	FULL ($K)
A	*B*	*C*	*D*	*E*	*F*	*G*	*H*	*I*	*J*	*P*	*L*	*M*	*N*	*O*
	O&M Dredging													
12	O&M Dredging - Cycle 1 (Year 25)	$2,075	$747	36.0%	$2,822		$2,075	$747	$2,822	2053Q1	149.8%	$5,183	$1,866	$7,049
12	O&M Dredging - Cycle 2 (Year 50)	$2,075	$747	36.0%	$2,822		$2,075	$747	$2,822	2078Q1	410.5%	$10,592	$3,813	$14,405
	CONSTRUCTION ESTIMATE TOTALS:	$4,150	$1,494	36.0%	$5,644		$4,150	$1,494	$5,644			$15,775	$5,679	$21,455
01	LANDS AND DAMAGES			25.0%										
30	PLANNING, ENGINEERING & DESIGN													
15.0%	PED - Cycle 1	$311	$112	36.0%	$423		$311	$112	$423	2052Q3	239.3%	$1,056	$380	$1,436
15.0%	PED - Cycle 2	$311	$112	36.0%	$423		$311	$112	$423	2077Q3	826.5%	$2,884	$1,038	$3,922
31	CONSTRUCTION MANAGEMENT													
6.7%	Construction Management - Cycle 1	$139	$50	36.0%	$189		$139	$50	$189	2053Q1	246.2%	$481	$173	$655
6.7%	Construction Management - Cycle 2	$139	$50	36.0%	$189		$139	$50	$189	2078Q1	845.3%	$1,314	$473	$1,787
	CONTRACT COST TOTALS:	$5,051	$1,818		$6,869		$5,051	$1,818	**$6,869**			$21,511	$7,744	**$29,254**
												Annualized Cost (over 50 years):		**$101**

5.2 Cost & Schedule Risk Analysis

Cost and Schedule Risk Analysis

Port of Long Beach Deepening

Risk Facilitator: Taylor Canfield

Risk Register Meeting

Date: 7/14/2020

Attendance	Name	Office	Representing
Full	Taylor Canfield	LRL	Planning
Full	Maricris Lee	SPL	PM
Full	Susan Ming	SPL	PM
Full	Arden Sansom	SWF	Econ
Full	John Goertz	SPL	Engineering
Full	Joe Ryan	SPL	Engineering
Full	Larry Smith	SPL	Engineering
Full	Jeff Khouri	AECOM	Design
Full	Julia Yang	AECOM	Engineering
Full	Lynette Ulloa	SPL	Real Estate
Full	Naser Khan	AECOM	Design
Full	Derek Davis	POA	POLB (Sponsor)
Full	Heather Schlosser	SPL	Planning

Follow-Up Discussions - Individual or group discussions

Date: ______ **through** ______

Attendance	Name	Office	Representing

Follow-Up Meeting Notes

PDT members supplied additional data based on the questions from the CSRA with regards to the following:

Project Development Stage/Alternative: **Design Charrette**

Risk Category: **Moderate Risk: Typical Project or Possible Life Safety** **Meeting Date:** **7/14/2020**

Schedule Duration		Oct-2024	May-2027	Schedule Duration:	31.0 Months	20%
		From (Month/Year)	From (Month/Year)			Schedule Contingency
					80% Finish Date	Nov-2027

	WBS	Feature of Work	Contract Cost	% Contingency	$ Contingency	Total
	Risk Not included within CSRA Model					
	01 LANDS AND DAMAGES	Real Estate	$ -	0%	$ -	$ -
	Risk included within CSRA Model					
1	12 NAVIGATION, PORTS AND HARBORS	**Mob/Demob**	**$ 8,693,901**	**28%**	$ 2,434,292	$ 11,128,193
2	12 NAVIGATION, PORTS AND HARBORS	**Approach Channel Dredging (Hopper)**	**$ 16,420,000**	**28%**	$ 4,597,600	$ 21,017,600
3	12 NAVIGATION, PORTS AND HARBORS	**West Basin Dredging (Clam)**	**$ 8,066,250**	**28%**	$ 2,258,550	$ 10,324,800
4	12 NAVIGATION, PORTS AND HARBORS	**Pier J Approach/Transition from Main Channel**	**$ 26,395,950**	**28%**	$ 7,390,866	$ 33,786,816
5	12 NAVIGATION, PORTS AND HARBORS	**Main Channel Widening**	**$ 10,405,500**	**28%**	$ 2,913,540	$ 13,319,040
6	12 NAVIGATION, PORTS AND HARBORS	**Pier J Basin Slip and Berth**	**$ 5,442,928**	**28%**	$ 1,524,020	$ 6,966,948
7	12 NAVIGATION, PORTS AND HARBORS	**Pier J Breakwater Stabilization**	**$ 4,713,306**	**28%**	$ 1,319,726	$ 6,033,032
8	12 NAVIGATION, PORTS AND HARBORS	**Electric Substation Near Berth J 260**	**$ 9,681,900**	**28%**	$ 2,710,932	$ 12,392,832
23	30 PLANNING, ENGINEERING, AND DESIGN	**Planning, Engineering, & Design**	**$ 13,671,000**	**28%**	$ 3,827,880	$ 17,498,880
24	31 CONSTRUCTION MANAGEMENT	**Construction Management**	**$ 7,665,000**	**28%**	$ 2,146,200	$ 9,811,200
XX	FIXED DOLLAR RISK ADD (EQUALLY DISPERSED TO ALL, MUST INCLUDE JUSTIFICATION SEE BELOW)				$ -	

Totals	Contract Cost	% Contingency	$ Contingency	Total
Real Estate	$ -	0%	$ -	$ -
Total Construction Estimate	$ 89,819,735	28%	$ 25,149,526	$ 114,969,261
Total Planning, Engineering & Design	$ 13,671,000	28%	$ 3,827,880	$ 17,498,880
Total Construction Management	$ 7,665,000	28%	$ 2,146,200	$ 9,811,200
Fixed Dollar Risk Equally Distributed	$ -	0%	$ -	$ -
Total	**$ 111,155,735**	**28%**	**$ 31,123,606**	**$ 142,279,341**

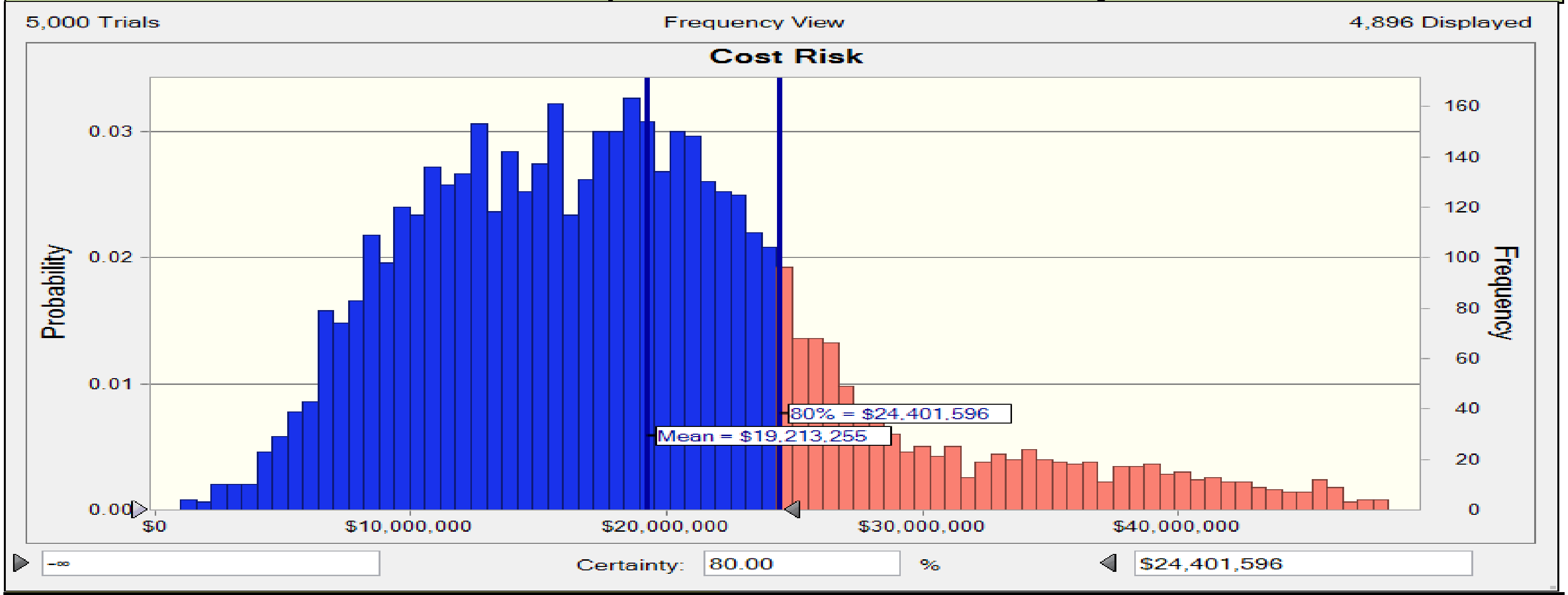
				Project Cost			Project Schedule			Other Information			Cost Model: COST			Schedule Model: Schedule Model			Cost due to Schedule Risk: Cost From Scheudule			TOTAL Cost		TOTAL Schedule	
CREF	Risk/Opportunity Event	Risk Event Description	PDT Discussions on Impact and Likelihood	Likelihood ©	Impact ©	Risk Level ©	Likelihood (S)	Impact (S)	Risk Level (S)	Cost Variance Distribution	Schedule Variance Distribution	Correlation to Other(s)	Low Variance (Min)	Likely (C)	High Variance (80%H)	Low Variance (S) (Min)	Likely (S)	High Variance (S) (80%H)	Low Variance (CS) (Min)	Likely Added Cost (CS)	High Variance (CS) (80%H)	Event Prob (PC)	Simulated Cost (C) + (CS)	Event Prob (PS)	Simulated Sched (S)
Organizational and Project Management Risks (PM)																									
PM1	Funding risks	should be low		Unlikely	Marginal	Low	Unlikely	Negligible	Low	N/A -Not Modeled	N/A -Not Modeled														
Regulatory Environmental Risks (RG)																									
RG1	Endangered species possibly present	Could possibly be sea turtles present	Port doing monitoring for turtles, we won't have to worry about it if there are no turtles. Should the monitoring show any sign of turtles, additional monitoring will have to occur (one add'l employee on the dredge to look out for them). If turtles are sighted then dredging must stop for a period of time. The add'l monitoring cost would likely amount to somewhere between the negligible/marginal range ($1k/day for dredging) would be needed on both dredges if going simultaneously. Assume maybe 2% chance of occurrence. *Upon further discussion with the team, the montioring cost is less than negligible. This risk can be classified as Low with no input to the model*	Unlikely	Marginal	Low	Unlikely	Negligible	Low	N/A -Not Modeled	N/A -Not Modeled														
RG2	West Basin may be unsuitable for planned disposal sites	Sediment testing might come back with unexpected results	If the sediment testing shows unsuitable soil for the planned disposal sites, new sites will need to located. Nearshore disposal requires chemical/physical compatibility. If not nearshore, could go offshore (as long as not contaminated). Offshore requires it to not be contaminated. Then the sediment would have to be removed from the marine environment or placed into a hole with clean material capping it. Probably some monitoring involved as well. West Basin probably has a higher probability of failing than others. Assume something like 25/75 for liklihood. Probably shorter trip but more precise placement. Then material from another area can be placed on top. For this exercise, assume that the remaining quantity (separate from the above areas) could have an additional qty of 25% added for placement on top, with the tradeoff between the shorter trip and more precise placement coming out to a wash. For threshold purposes, assume a range of 20-30% addtional dredged material for cap being required with likely at 25% *add'l monitoring cost would be negligible*	Likely	Significant	High	Likely	Negligible	Low	Triangular	N/A -Not Modeled	RG3, RG4	$1,613,250	$0	$2,419,875	0 Months	0 Months	2 Months				25%	$0	25%	0 Mo
RG3	Approach Channel may be unsuitable for planned disposal sites	Sediment testing might come back with unexpected results	If the sediment testing shows unsuitable soil for the planned disposal sites, new sites will need to located. Nearshore disposal requires chemical/physical compatibility. If not nearshore, could go offshore (as long as not contaminated). Offshore requires it to not be contaminated. Then the sediment would have to be removed from the marine environment or placed into a hole with clean material capping it. Probably some monitoring involved as well. Assume maybe 10% chance of occurrence. Worst-case impact for the approach channel would be take to offshore site. Low threshold assumes LA2; High assumes LA3, with Yes/No model at 10% chance of occurrence	Possible	Significant	Medium	Possible	Negligible	Low	Triangular	N/A -Not Modeled	RG2, RG4	$2,950,000	$0	$17,700,000							10%	$0	10%	0 Mo
RG4	Remaining Areas may be unsuitable for planned disposal sites	Sediment testing might come back with unexpected results	If the sediment testing shows unsuitable soil for the planned disposal sites, new sites will need to located. Nearshore disposal requires chemical/physical compatibility. If not nearshore, could go offshore (as long as not contaminated). Offshore requires it to not be contaminated. Then the sediment would have to be removed from the marine environment or placed into a hole with clean material capping it. Probably some monitoring involved as well. Assume maybe 10% chance of occurrence. Probably shorter trip but more precise placement.Then material from another area can be placed on top. For this exercise, assume that the remaining quantity (separate from the above areas) could have an additional qty of 25% added for placement on top, with the tradeoff between the shorter trip and more precise placement coming out to a wash. *look into add'l monitoring cost later* **add'l monitoring cost would be negligible**	Unlikely	Significant	Medium	Unlikely	Negligible	Low	Triangular	N/A -Not Modeled	RG2, RG3	$10,110,747	$0	$10,110,747	22 Months	0 Months	22 Months				10%	$0	10%	0 Mo
RG5	POLB will need to go through USACE Regulatory for our permits	Already include in schedule but just noted	Could be some additional requirements from Regulatory but likely minor in impact	Possible	Negligible	Low	Possible	Negligible	Low	N/A -Not Modeled	N/A -Not Modeled														
Contract Acquisition Risks (CA)																									
CA1	Undefined acquisition strategy	Acquisition strategy to be identified during PED	Potentially 4 contracts - hopper, clamshell, substation, and Port contract for Pier J dredging and breakwater work. *look into cost impacts for Corps having to do Pier J work*. For this exercise, assumption is that Port would be able to contract both the Pier J work and the Substation work. Assume 1 contract for the dredging work, and 1 contract for the POLB work. Because of the way that estimates are developed, each one has mobilization and demobilization for each feature. As such, the current estimating methodlody should be sufficient to cover any increase in contract number, other than the additional contracting requirements and engineering work to put them into separate packages. Assume a range of $500k-$1M additional work.	Unlikely	Moderate	Low	Unlikely	Negligible	Low	Triangular	N/A -Not Modeled		$500,000	$0	$1,000,000							25%	$0	25%	0 Mo
General Technical Risks (TR)																									
TR1	Design development stage, incomplete or preliminary	Feasibility level design		Unlikely	Negligible	Low	Unlikely	Negligible	Low	N/A -Not Modeled	N/A -Not Modeled		$0	$0	$1							100%	$0	100%	0 Mo
TR2	Confidence in scope, investigations, design, critical quantities	Distribution in the analysis for sand and gravel can still have implications similar to native materials	Combined with risk TR3 below so as not to double count	Unlikely	Negligible	Low	Unlikely	Negligible	Low	N/A -Not Modeled	N/A -Not Modeled														
TR3	Design confidence	Plan form analytical approach used not a 2D model for end losses	Assume a range of quantities for the dredging work may be realized due to the design method/level of confidence. Aside from the basic quantity variation outlined in the risks below for each area, assume an overall range of -5 to +15% based on the basis for qtys.	Likely	Marginal	Medium	Likely	Marginal	Medium	Triangular	Triangular		-$4,869,693	$0	$9,739,386	-1 Months	0 Months	2 Months				100%	$0	100%	0 Mo
Approach Channel Dredging																									
AC1	Potential to undercut adjacent jetty	Risk that hopper dredging may need to switch to clamshell	If clamshell needs to be used in order to more precisely dredge around the breakwater, costs/schedule would be impacted. At this point we don't expect an issue, but it is a possibility that along the breakwater this will be required. This would probably impact somewhere between 10-15,000 CY, so in terms of cost/schedule this likely wouldn't be significant at this volume. Keep as a low risk.	Possible	Negligible	Low	Possible	Marginal	Low	N/A -Not Modeled	N/A -Not Modeled														
AC2	Stage 13 beach nourishment not occurring in time	Risk that this nourishment doesn't occur, which will take away the nearshore disposal site	Alternative would be that hopper would need to go all the way out to LA3. Assume a worst-case scenario of maybe half the volume (1.25m CY) needing to go to LA3 because of capacity issues. Get with Susie Ming offline to discuss probability of the stage 13 renourishment not occurring. Assume a 40/60 chance that funding will not be received by 1 Oct 24 (POLB start date).	Possible	Moderate	Medium	Possible	Moderate	Medium	Uniform	N/A -Not Modeled		$8,850,000	$0	$8,850,000	3 Months	0 Months	3 Months				40%	$0	40%	0 Mo
AC3	Qty increase due to sedimentation	Could be some minor qty increase due to sedimentation	Would be small, on the order of 1-2% of qty here.	Possible	Moderate	Medium	Possible	Negligible	Low	Triangular	N/A -Not Modeled		$164,200	$0	$328,400							100%	$0	100%	0 Mo
Main Channel Dredging																									
MC1	Qty variation	Will probably have some slight qty variation	Vary this +/- 2% in either direction for variation.	Possible	Moderate	Medium	Possible	Negligible	Low	Triangular	N/A -Not Modeled		-$208,110	$0	$208,110							100%	$0	100%	0 Mo
West Basin Dredging																									
WB1	Qty variation	Will probably have some slight qty variation	Vary this +/- 2% in either direction for variation.	Possible	Moderate	Medium	Possible	Negligible	Low	Triangular	N/A -Not Modeled		-$161,325	$0	$161,325							100%	$0	100%	0 Mo
Pier J Berth and Basin																									
PJB1	Qty increase	Increase due to most recent survey; total now 337,500 CY	Added to estimate	Certain	Negligible	Relook at Basis of Estimate	Certain	Negligible	Relook at Basis of Schedule	N/A -Not Modeled	N/A -Not Modeled														
Pier J Approach Dredging																									
CV1	Qty variation	Will probably have some slight qty variation	Vary this +/- 5% in either direction for variation.	Very Likely	Marginal	Medium	Very Likely	Negligible	Low	Triangular	N/A -Not Modeled		-$1,501,874	$0	$1,501,874							100%	$0	100%	0 Mo
Pier J Breakwater Stabilization																									
ES1	Increased seismic design	Increased seismic design for this feature would add a lot of cost	The mechanism for failure would be an earthquake or seismic event which, if strong enough to cause the finger piers to collapse, would probably also cause damage to other areas of the Port, the Port of LA, City of Long Beach etc. The seismic paramaters for which this is designed is not insufficient though; it would bea similar risk to Acts of God risk (EX1) so it will be covered there so as not to double-count	Unlikely	Moderate	Low	Unlikely	Negligible	Low	N/A -Not Modeled	N/A -Not Modeled														
ES2	Finger Pier Cost estimate maturity	AECOM estimate based on unit costs/historical costs	Cost estimate provided by AECOM contains unit prices for specific line items in the estimate. Costs seems reasonable on a comparison basis; assume class 3 and allow range of -10% to +30% on distribution.	Possible	Critical	High	Possible	Negligible	Low	Triangular	N/A -Not Modeled		-$471,331	$0	$1,413,992							100%	$0	100%	0 Mo
Electrical Substation																									
ES1	Needs to be in place before any clamshell dredging	Transformer has long lead time (8-12 mo); coordination with SC Edison to tie-in to existing grid	Just things to be coordinated; likely no significant cost or schedule risk.	Unlikely	Negligible	Low	Unlikely	Negligible	Low	N/A -Not Modeled	N/A -Not Modeled														
ES2	Potential increase to substation capacity	Sized for electric clamshell used in other projects	Capacity should be fine; will be worked out in design phase but a slight increase in capacity would still likely have a negligible cost impact per AECOM opinion.	Unlikely	Negligible	Low	Unlikely	Negligible	Low	N/A -Not Modeled	N/A -Not Modeled														
ES3	Electric Substation Estimate maturity	AECOM estimate based on unit costs/historical costs	Cost estimate provided by AECOM contains historical parametric prices for line items in the estimate. Costs seem reasonable on a comparison basis; based on lack of detail and cost engineer's judgement, assume that the estimate for this particular feature class 4 and allow range of -15% to +50% on distribution.	Unlikely	Negligible	Low	Unlikely	Negligible	Low	Triangular	N/A -Not Modeled		-$1,452,285	$0	$4,840,950							100%	$0	100%	0 Mo
Commissioning/Certification (CC)																									
CC1	Coastal Commission Certification	This cert is being put off until the design phase	Could be additional requirements that the coastal commission places on the project; add'l water quality, monitoring, rec impacts, etc. Shouldn't' be additional time added to the critical path for this though, so keep as a low risk	Possible	Negligible	Low	Possible	Negligible	Low	N/A -Not Modeled	N/A -Not Modeled														
CC2	Water Quality Certification	This cert is being put off until the design phase	Ditto, could be add'l requirements placed on the project but likley negligible.	Possible	Negligible	Low	Possible	Negligible	Low	N/A -Not Modeled	N/A -Not Modeled														
Lands and Damages (LD)																									
LD1	Currently looking at RE Plan	May be costs, Lynnette/Sponsor to look into this and respond	Should be no RE Costs at this point, nothing to acquire.	Unlikely	Negligible	Low	Unlikely	Negligible	Low	N/A -Not Modeled	N/A -Not Modeled			$0								100%	$0	100%	0 Mo

Contingency on Base Estimate		
Base Construction Estimate	$89,819,735	
Baseline Estimate Cost Contingency Amount ->	$25,149,526	28%
Baseline Estimate Construction Cost (80% Confidence) ->	$114,969,261	

Contingency on Schedule		
Project Base Schedule Duration ->	31.0 Months	
Schedule Contingency Duration ->	6.2 Months	20%
Project Schedule Duration (80% Confidence) ->	37.2 Months	

Port of Long Beach Deepening
14-Jul-20

- Cost Outputs Distribution and Sensitivity -



- Schedule Outputs Distribution and Sensitivity -

Contingency on Base Estimate	80% Confidence Project Cost	
Base Construction Estimate	$89,819,735	28%
Baseline Estimate Cost Contingency Amount ->	$25,149,526	
Baseline Estimate Construction Cost (80% Confidence) ->	$114,969,261	

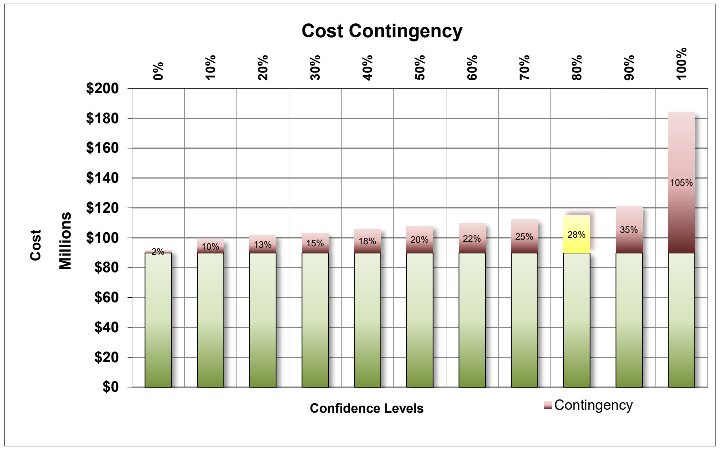
Contingency on Schedule	80% Confidence Project Schedule	
Project Base Schedule Duration ->	31.0 Months	20%
Schedule Contingency Duration ->	6.2 Months	
Project Schedule Duration (80% Confidence) ->	37.2 Months	

Port of Long Beach Deepening
14-Jul-20

- PROJECT CONTINGENCY DEVELOPMENT -

INITIAL CONSTRUCTION
Contingency Analysis

Base Case Estimate (Excluding 01)	$89,819,735	
Confidence Level	Contingency Value	Contingency
0%	1,796,395	2%
10%	8,981,974	10%
20%	11,676,566	13%
30%	13,472,960	15%
40%	16,167,552	18%
50%	17,963,947	20%
60%	19,760,342	22%
70%	22,454,934	25%
80%	25,149,526	28%
90%	31,436,907	35%
100%	94,310,722	105%

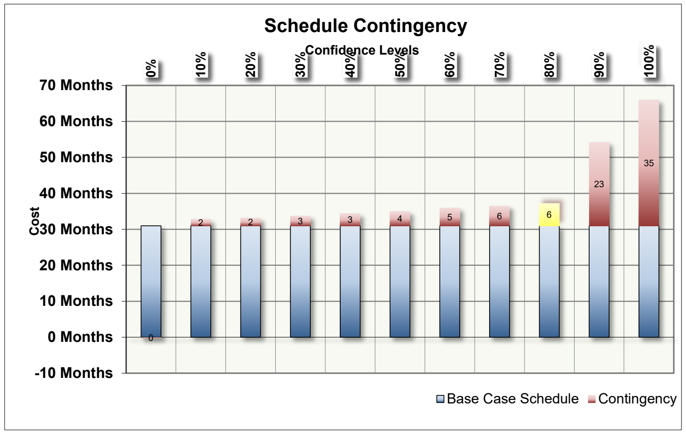


Port of Long Beach Deepening
14-Jul-20

- SCHEDULE CONTINGENCY (DURATION) DEVELOPMENT -

Contingency Analysis

Base Case Schedule	31.0 Months	
Confidence Level	Contingency Value	Contingency
0%	0 Months	-1%
10%	2 Months	6%
20%	2 Months	7%
30%	3 Months	9%
40%	3 Months	11%
50%	4 Months	13%
60%	5 Months	16%
70%	6 Months	18%
80%	6 Months	20%
90%	23 Months	75%
100%	35 Months	113%



Pier J New Electrical Substation

SELECTED OPTION: SUBSTATION NEAR BERTH J266 - COST SUMMARY

Item	Descriptions	Item	Quantity	Total Unit Cost	Total Cost	Remarks	USACE Remarks	Rev Cost		
1	Modifications to existing 66kV system as required for providing service to new 15MVA transformer	LS	1	$400,000.00	$400,000.00	Assume SCE cost		$ 400,000		
2	New 15kVA transformer, 66-12.47kV		1	$3,220,000.00	$4,315,107.96	Eaton Cost plus installation, escalated 7 years (5% per year)		$ 4,315,000		
3	12.47kV Amp Switchgear & Relay (@ Existing 66kV SCE Substation at Pier J		1		$643,245.91	Parametric calcs based on Port of New Orleans project, escalated 7 years (5% per year)		$ 853,000		
4	Underground Cable/Ductbank Concrete Encased		4,300	$342.00	$2,206,974.06	Parametric calcs based on Port of Miami project, escalated 7 years (5% per year)		$ 3,203,500	$ 745.00	$ 3,205,000
5	12.47KV Cable, 3#500KCMIL		25,800	$16.00	$731,300.38	Based on Okonite data escalated 7 years (10% per year)		$ 722,400	$ 28.00	$ 731,000
6	Manholes		6	$12,000.00	$96,486.89	Parametric calcs based on Port of Miami project, escalated 7 years (5% per year)		$ 138,000	$ 23,000.00	$ 140,000
7	SCE Misc Charge (Assume)				$50,000.00	Assume SCE cost, assume no upgrade on existing SCE infrastructure		$ 50,000		
				Total	$ 8,443,115.20		**Total**	**$ 9,681,900**		

Pier J Finger Pier Improvements
Construction Cost Estimate - Based on Concept Design

OPTION 3A - SHEET PILE WALL OPTION

BidItem	Bid Description	Bid Quantity	Units	Total Direct Unit Cost	Direct Total			
3000	**OPTION #3A - SSP TOE WALL >STATIC + OLE 55'**	**680**	**LF**					$ -
3010	MOB/DEMOB PILE OPERATION	1	LS	$ 316,000	$ 316,000			$ 316,000
3020	FURN & INSTALL AZ 42 SHEETPILE	21,760	SF	$ 125	$ 2,720,000			$ 2,720,000
3110	EXCAV PROT TRENCH FRONT OF SSP	1,020	CY	$ 143	$ 145,860			$ 145,860
3120	FURN & INSTALL BEDDING FOR ARMOR ROCK	255	CY	$ 99	$ 25,245			$ 25,245
3130	FURN & INSTALL ARMOR ROCK 500-1500#	1,530	TON	$ 85	$ 130,050			$ 130,050
						TOTAL DIRECT COST		$ 3,337,155
						INDIRECTS (10%)	15%	$ 500,573
						SUBTOTAL		$ 3,837,728
						OH&P (21%)	23%	$ 875,578
							Total	**$ 4,713,306**

COST ESTIMATE CLASSIFICATION MATRIX FOR THE PROCESS INDUSTRIES

The five estimate classes are presented in figure 1 in relationship to the identified characteristics. Only the level of project definition determines the estimate class. The other four characteristics are secondary characteristics that are generally correlated with the level of project definition, as discussed in the generic standard. The characteristics are typical for the process industries but may vary from application to application.

This matrix and guideline provide an estimate classification system that is specific to the process industries. Refer to the generic standard for a general matrix that is non-industry specific, or to other addendums for guidelines that will provide more detailed information for application in other specific industries. These will typically provide additional information, such as input deliverable checklists to allow meaningful categorization in those particular industries.

	Primary Characteristic	*Secondary Characteristic*			
ESTIMATE CLASS	**LEVEL OF PROJECT DEFINITION** Expressed as % of complete definition	**END USAGE** Typical purpose of estimate	**METHODOLOGY** Typical estimating method	**EXPECTED ACCURACY RANGE** Typical variation in low and high ranges [a]	**PREPARATION EFFORT** Typical degree of effort relative to least cost index of 1 [b]
Class 5	0% to 2%	Concept Screening	Capacity Factored, Parametric Models, Judgment, or Analogy	L: -20% to -50% H: +30% to +100%	1
Class 4	1% to 15%	Study or Feasibility	Equipment Factored or Parametric Models	L: -15% to -30% H: +20% to +50%	2 to 4
Class 3	10% to 40%	Budget, Authorization, or Control	Semi-Detailed Unit Costs with Assembly Level Line Items	L: -10% to -20% H: +10% to +30%	3 to 10
Class 2	30% to 70%	Control or Bid/ Tender	Detailed Unit Cost with Forced Detailed Take-Off	L: -5% to -15% H: +5% to +20%	4 to 20
Class 1	50% to 100%	Check Estimate or Bid/Tender	Detailed Unit Cost with Detailed Take-Off	L: -3% to -10% H: +3% to +15%	5 to 100

Notes: [a] The state of process technology and availability of applicable reference cost data affect the range markedly. The +/- value represents typical percentage variation of actual costs from the cost estimate after application of contingency (typically at a 50% level of confidence) for given scope.
[b] If the range index value of "1" represents 0.005% of project costs, then an index value of 100 represents 0.5%. Estimate preparation effort is highly dependent upon the size of the project and the quality of estimating data and tools.

Assume Electrical Substation Class 4	-15% to +50%
Assume Finger Pier Improvements Class 3	-10% to + 30%

5.3 MII Estimate

Estimated by Taylor Canfield, PE, CCE, LRL-EDM-C (502) 315-6268
Designed by Los Angeles District
Prepared by Taylor Canfield, PE, CCE, LRL-EDM-C (502) 315-6268
Preparation Date 10/30/2020
Effective Date of Pricing 10/1/2020
Estimated Construction Time 1,855 Days
Checked by: Neal Ralston

Right click here and select "Update Field" to build the Table of Contents for this report.

Designed by
Los Angeles District

Estimated by
Taylor Canfield, PE, CCE, LRL-EDM-C (502) 315-6268

Prepared by
Taylor Canfield, PE, CCE, LRL-EDM-C (502) 315-6268

Design Document Main Report & Appendices
Document Date 11/12/2020

District Los Angeles District
Contact Taylor Canfield, stephen.t.canfield@usace.army.mil
Budget Year 2025
UOM System Original

Direct Costs
LaborCost
EQCost
MatlCost
SubBidCost
UserCost1

Timeline/Currency
Preparation Date 10/30/2020
Escalation Date 10/1/2020
Eff. Pricing Date 10/1/2020
Estimated Duration 1855 Day(s)

Currency US dollars
Exchange Rate 1.000000

Costbook CB16EN: 2016 MII English Cost Book

Labor D-B_2020: CA200022 CA22, Heavy Dredging

Note: http://www.wdol.gov is the website for current Davis Bacon & Service Labor Rates. Fringes paid to the laborers are taxable. In a non-union job the whole fringes are taxable. In a union jo pay fring

Labor Rates
LaborCost1
LaborCost2
LaborCost3
LaborCost4

Equipment EP18R07: 2018_EP1110-1-8_Mii_Library_Region_07_R1

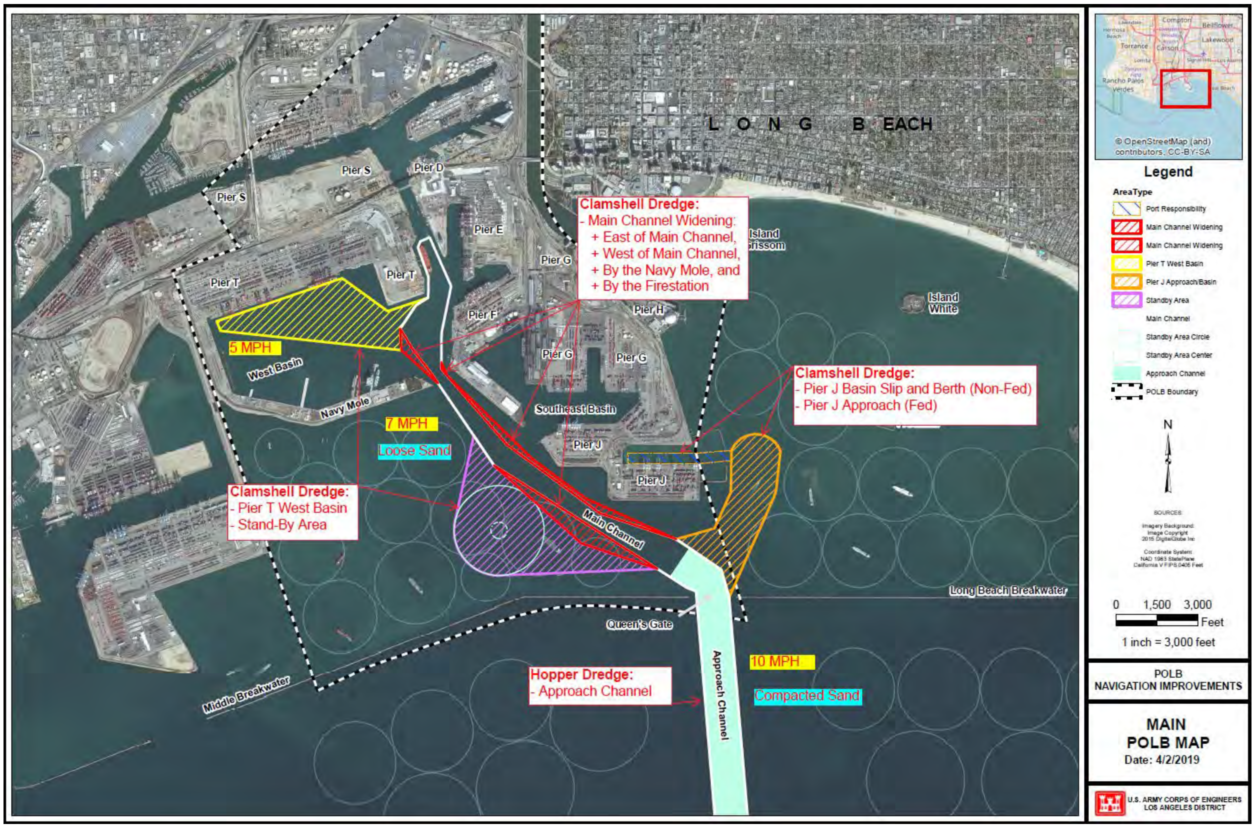
Region 07 -	WEST, (2018)
Sales Tax	8.00
Working Hours per Year	1,560
Labor Adjustment Factor	1.13
Cost of Money	1.13
Cost of Money Discount	25.00
Tire Recap Cost Factor	1.50
Tire Recap Wear Factor	1.80
Tire Repair Factor	0.15
Equipment Cost Factor	1.00
Standby Depreciation Factor	0.50

Fuel	
Electricity	0.105
Gas	3.080
Diesel Off-Road	2.810
Diesel On-Road	3.380

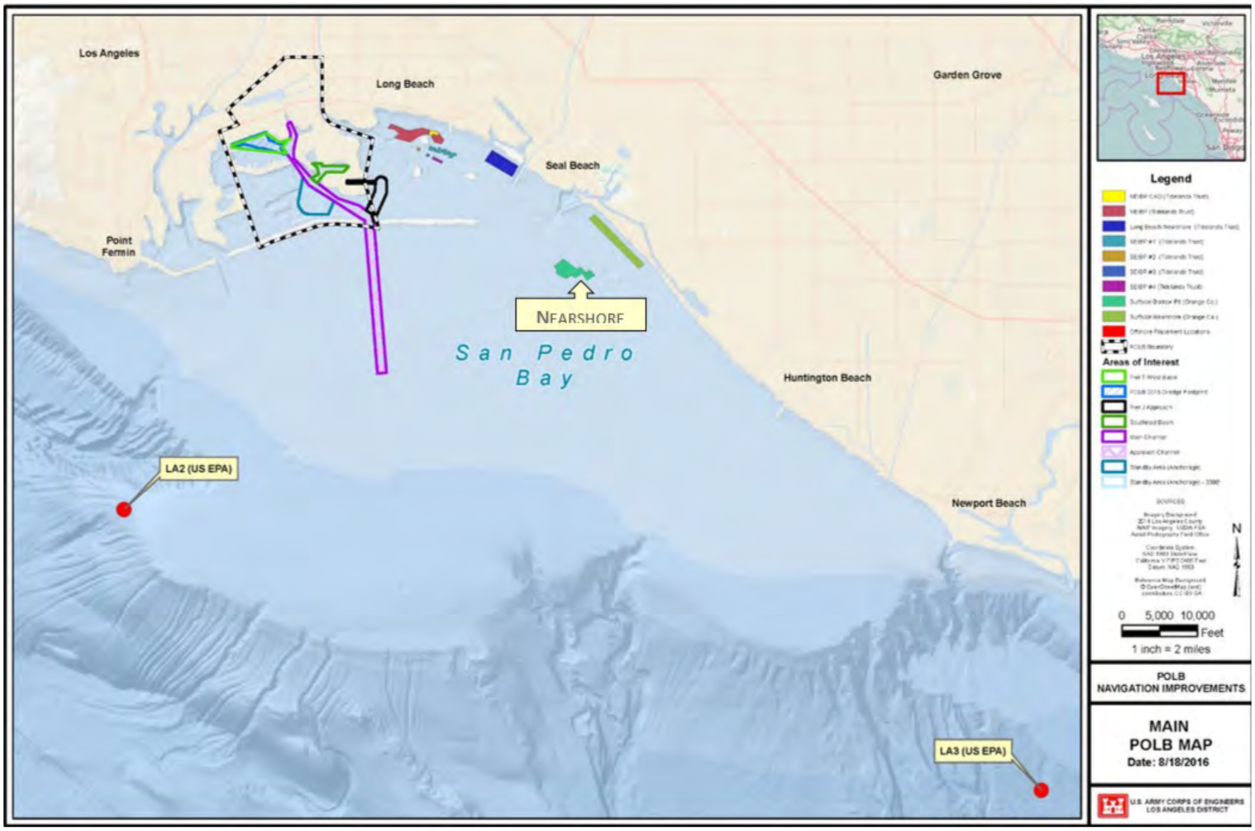
Shipping Rates	
Over 0 CWT	34.16
Over 240 CWT	26.48
Over 300 CWT	22.46
Over 400 CWT	19.79
Over 500 CWT	25.46
Over 700 CWT	21.82
Over 800 CWT	12.23

Description	Quantity	UOM	CostToPrime	PrimeCMU	ContractCost
Summary by Contract			**111,155,934.75**	**0.00**	**111,155,934.75**
TSP	**1.00**	**EA**	**111,155,934.75**	**0.00**	**111,155,934.75**
Contract 1 - Corps	**1.00**	**LS**	**85,167,801.00**	**0.00**	**85,167,801.00**
01 Land & Damages	**1.00**	**LS**	**0.00**	**0.00**	**0.00**
12 Navigation Ports & Harbors	**1.00**	**LS**	**69,981,601.00**	**0.00**	**69,981,601.00**
0001 Mobilization and Demobilization	**1.00**	**LS**	**8,693,901.00**	**0.00**	**8,693,901.00**
0002 Approach Channel Dredging to - 80 ft Placement at Surfside Borrow site	**2,600,000.00**	**CY**	**16,420,000.00**	**0.00**	**16,420,000.00**
0003 Main Channel Widening to - 76 ft Placement at LA-2 or LA-3	**1,065,000.00**	**CY**	**10,405,500.00**	**0.00**	**10,405,500.00**
0004 West Basin Dredging to - 55 ft Placement at LA-2 or LA-3	**717,000.00**	**CY**	**8,066,250.00**	**0.00**	**8,066,250.00**
0005 Pier J Approach Dredging to -55 ft (Transition from -80 ft to -55 ft) Placement at LA-2 or LA-3	**2,673,000.00**	**CY**	**26,395,950.00**	**0.00**	**26,395,950.00**
30 Planning, Engineering & Design	**1.00**	**LS**	**10,497,200.00**	**0.00**	**10,497,200.00**
31 Construction Management	**1.00**	**LS**	**4,689,000.00**	**0.00**	**4,689,000.00**
Contract 2 - POLB	**1.00**	**LS**	**25,988,133.75**	**0.00**	**25,988,133.75**
01 Land & Damages	**1.00**	**LS**	**0.00**	**0.00**	**0.00**
12 Navigation Ports & Harbors	**1.00**	**LS**	**19,838,133.75**	**0.00**	**19,838,133.75**
0001 Mobilization and Demobilization	**1.00**	**LS**	**1,801,391.00**	**0.00**	**1,801,391.00**
0002 Electric Substation Near Berth J	**1.00**	**JOB**	**9,681,900.00**	**0.00**	**9,681,900.00**
0003 Pier J Breakwater Stabilization	**1.00**	**JOB**	**4,713,305.95**	**0.00**	**4,713,305.95**
0004 Pier J Slip Dredging to - 55 ft Placement at LA-2 or LA-3	**337,000.00**	**CY**	**3,641,536.80**	**0.00**	**3,641,536.80**
30 Planning, Engineering & Design	**1.00**	**LS**	**3,174,000.00**	**0.00**	**3,174,000.00**
31 Construction Management	**1.00**	**LS**	**2,976,000.00**	**0.00**	**2,976,000.00**

5.4 Port of Long Beach Study Map

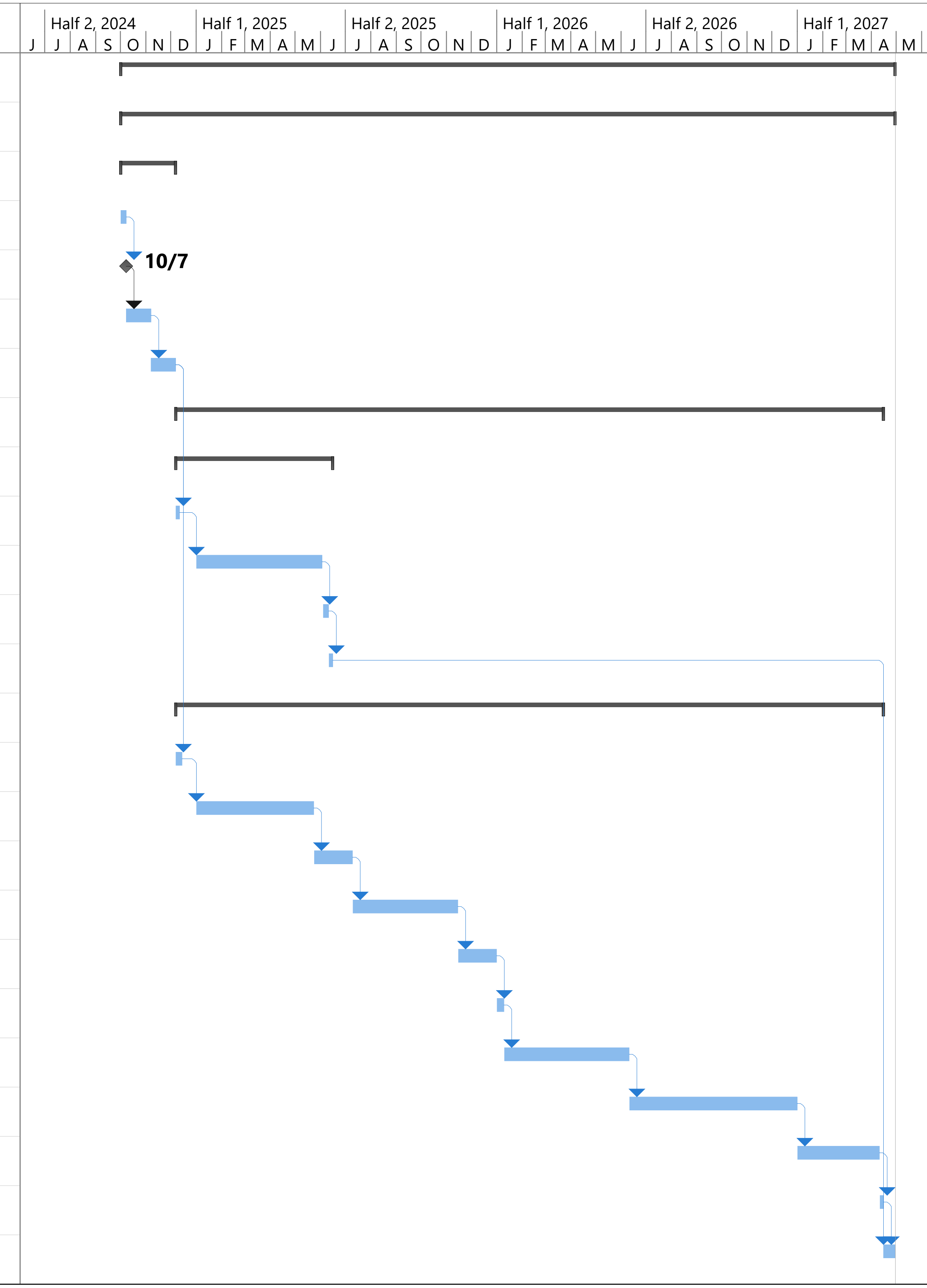


5.5 Potential Material Placement Sites



5.6 Schedule

ID	Task Mode	Task Name	Duration	Start	Finish	Predecessors
1		**Construction Schedule**	**941 days**	**Tue 10/1/24**	**Thu 4/29/27**	
2		Alternative 3	941 days	Tue 10/1/24	Thu 4/29/27	
3		**Preconstruction Phase**	**67 days**	**Tue 10/1/24**	**Fri 12/6/24**	
4		Construction Contract Award	5 days	Tue 10/1/24	Mon 10/7/24	
5		Notice to Proceed	0 days	Mon 10/7/24	Mon 10/7/24	4
6		Generate Contractor Submittals	30 edays	Mon 10/7/24	Wed 11/6/24	5
7		Review/Approve Submittals	30 edays	Wed 11/6/24	Fri 12/6/24	6
8		**Construction Phase**	**860 days**	**Sat 12/7/24**	**Thu 4/15/27**	
9		**Hopper Dredging**	**191 days**	**Sat 12/7/24**	**Sun 6/15/25**	
10		Mobilization	5 days	Sat 12/7/24	Wed 12/11/24	7
11		Approach Channel Dredging - Nearshore Disposal	143 days	Wed 1/1/25	Mon 6/2/25	10
12		Approach Channel Dredging - LA2 Disposal	7 days	Wed 6/4/25	Tue 6/10/25	11
13		Demobilization	5 days	Wed 6/11/25	Sun 6/15/25	12
14		**Clamshell Dredging**	**860 days**	**Sat 12/7/24**	**Thu 4/15/27**	
15		Mobilization	8 days	Sat 12/7/24	Sat 12/14/24	7
16		Main Channel Widening - LA2 Disposal	133 days	Wed 1/1/25	Fri 5/23/25	15
17		Main Channel Widening - LA3 Disposal	44 days	Sat 5/24/25	Wed 7/9/25	16
18		West Basin - LA3 Disposal	120 days	Thu 7/10/25	Fri 11/14/25	17
19		Pier J Basin - LA3 Disposal	43 days	Sat 11/15/25	Wed 12/31/25	18
20		Pier J Basin 2nd Year - LA2 Disposal	8 days	Thu 1/1/26	Fri 1/9/26	19
21		Pier J Approach 2nd Year - LA2 Disposal	142 days	Sat 1/10/26	Wed 6/10/26	20
22		Pier J Approach 2nd Year - LA3 Disposal	190 days	Thu 6/11/26	Thu 12/31/26	21
23		Pier J Approach 3rd Year - LA2 Disposal	93 days	Fri 1/1/27	Sat 4/10/27	22
24		Demobilization	5 days	Sun 4/11/27	Thu 4/15/27	23
25		Contract Closeout	14 edays	Thu 4/15/27	Thu 4/29/27	13,24



Project: POLB Deepening_Alt 3-
Date: Thu 7/18/19

Task	Project Summary	Manual Task	Start-only
Split	Inactive Task	Duration-only	Finish-only
Milestone	Inactive Milestone	Manual Summary Rollup	External Tasks
Summary	Inactive Summary	Manual Summary	External Milestone
Deadline	Progress	Manual Progress	

5.7 Cost Certification

WALLA WALLA COST ENGINEERING MANDATORY CENTER OF EXPERTISE

COST AGENCY TECHNICAL REVIEW

CERTIFICATION STATEMENT

For Project No. 403268

SPL – Port of Long Beach Deepening
Navigation Channel Improvements
Feasibility Study

The Port of Long Beach Feasibility Study, as presented by Los Angeles District, has undergone a successful Cost Agency Technical Review (Cost ATR), performed by the Walla Walla District Cost Engineering Mandatory Center of Expertise (Cost MCX) team. The Cost ATR included study of the project scope, report, cost estimates, schedules, escalation, and risk-based contingencies. This certification signifies the products meet the quality standards as prescribed in ER 1110-2-1150 Engineering and Design for Civil Works Projects and ER 1110-2-1302 Civil Works Cost Engineering.

As of April 16, 2021, the Cost MCX certifies the estimated total project cost:

FY21 Project First Cost: $136,780,000
Fully Funded Amount: $154,089,000

It remains the responsibility of the District to correctly reflect these cost values within the Final Report and to implement effective project management controls and implementation procedures including risk management through the period of Federal Participation.

JACOBS.MICHAEL.P[redacted]ally signed by
[redacted]BS.MICHAEL.PIERRE.[redacted]
IERRE.[redacted]
Date: 2021.04.19 14:54:17 -07'00'

Michael P. Jacobs, PE, CCE
Chief, Cost Engineering MCX
Walla Walla District

****** TOTAL PROJECT COST SUMMARY ******

PROJECT: **Port of Long Beach**
PROJECT NO: **403268**
LOCATION: **Long Beach, CA**

DISTRICT: **Los Angeles District** PREPARED: **4/15/2021**

POC: **CHIEF, AE MANAGEMENT, COST AND VALUE ENGINEERING, Mark Cooke, P.E.**

This Estimate reflects the scope and schedule in report; POLB Navigation Improvements

Civil Works Work Breakdown Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)						TOTAL PROJECT COST (FULLY FUNDED)			
						Program Year (Budget EC): 2021									
						Effective Price Level Date: 1-Oct- 20									
WBS NUMBER	Civil Works Feature & Sub-Feature Description	COST ($K)	CNTG ($K)	CNTG (%)	TOTAL ($K)	ESC (%)	COST ($K)	CNTG ($K)	REMAINING COST ($K)	Spent Thru: 1-Oct-20 ($K)	TOTAL FIRST COST ($K)	ESC (%)	COST ($K)	CNTG ($K)	FULL ($K)
12	NAVIGATION PORTS & HARBORS	$81,758	$29,433	36%	$111,190		$81,758	$29,433	$111,190		$111,190	13.1%	$92,492	$33,297	$125,790
12	LOCAL SERVICE FACILITIES	$13,468	$4,848	36%	$18,316		$13,468	$4,848	$18,316			excluded from Fully Funded Costs			
12	ASSOCIATED COSTS (ATON)	$480	$173	36%	$653		$480	$173	$653			excluded from Fully Funded Costs			
	CONSTRUCTION ESTIMATE TOTALS:	$95,705	$34,454		$130,159		$95,705	$34,454	$130,159		$111,190	13.1%	$92,492	$33,297	$125,790
01	LANDS AND DAMAGES	$1,169	$292	25%	$1,462		$1,169	$292	$1,462		$1,462	7.4%	$1,256	$314	$1,570
30	PLANNING, ENGINEERING & DESIGN	$12,264	$4,415	36%	$16,679		$12,264	$4,415	$16,679		$16,679	9.2%	$13,387	$4,819	$18,206
31	CONSTRUCTION MANAGEMENT	$5,478	$1,972	36%	$7,450		$5,478	$1,972	$7,450		$7,450	14.4%	$6,267	$2,256	$8,523
	PROJECT COST TOTALS:	$114,616	$41,133	36%	$155,749		$114,616	$41,133	$155,749		**$136,780**	12.7%	$113,403	$40,687	$154,089

_______________ CHIEF, AE MANAGEMENT, COST AND VALUE ENGINEERING, Mark Cooke, P.E.

_______________ PROJECT MANAGER, Susan M. Ming, P.E.

_______________ CHIEF, REAL ESTATE, Cheryl Connett

_______________ CHIEF, ENGINEERING, Eric Stevens, P.E.

ESTIMATED FULLY FUNDED TOTAL PROJECT COST:	**$154,089**
GENERAL NAVIGATION FEATURES:	**$125,790**
PROJECT FIRST COST:	**$136,780**
LOCAL SERVICE FACILITIES COST[1]:	*$18,316*
ASSOCIATED COSTS[2]:	*$653*
LERR:	*$1,462*
INCREMENTAL AVERAGE ANNUAL O&M[3]:	*$101*

[1]LOCAL SERVICE FACILITIES ARE 100% NON-FEDERAL COSTS
[2]ASSOCIATED COSTS ARE 100% FEDERAL (USCG) COST
[3]O&M IS BASED ON 50 YEAR ANALYSIS, COST IS NOT INCLUDED IN Project First Cost or Fully-Funded Cost

****** TOTAL PROJECT COST SUMMARY ******

****** CONTRACT COST SUMMARY ******

PROJECT: Port of Long Beach
LOCATION: Long Beach, CA
This Estimate reflects the scope and schedule in report; POLB Navigation Improvements

DISTRICT: Los Angeles District
POC: CHIEF, AE MANAGEMENT, COST AND VALUE ENGINEERING, Mark Cooke, P.E.
PREPARED: 4/15/2021

WBS Structure		**ESTIMATED COST**				**PROJECT FIRST COST (Constant Dollar Basis)**				**TOTAL PROJECT COST (FULLY FUNDED)**				
		Estimate Prepared: 15-Apr-21 Estimate Price Level: 1-Oct-20		RISK BASED		Program Year (Budget EC): 2021 Effective Price Level Date: 1 -Oct-20								
WBS NUMBER *A*	Civil Works Feature & Sub-Feature Description *B*	COST ($K) *C*	CNTG ($K) *D*	CNTG (%) *E*	TOTAL ($K) *F*	ESC (%) *G*	COST ($K) *H*	CNTG ($K) *I*	TOTAL ($K) *J*	Mid-Point Date *P*	ESC (%) *L*	COST ($K) *M*	CNTG ($K) *N*	FULL ($K) *O*
	CONTRACT 1													
12	NAVIGATION PORTS & HARBORS - Year 1	$42,077	$15,148	36.0%	$57,225		$42,077	$15,148	$57,225	2025Q3	11.5%	$46,921	$16,891	$63,812
12	NAVIGATION PORTS & HARBORS - Year 2	$22,405	$8,066	36.0%	$30,471		$22,405	$8,066	$30,471	2026Q3	14.3%	$25,609	$9,219	$34,829
12	NAVIGATION PORTS & HARBORS - Year 3	$7,593	$2,734	36.0%	$10,327		$7,593	$2,734	$10,327	2027Q3	17.2%	$8,896	$3,203	$12,099
12	NAVIGATION PORTS & HARBORS - Electric Substation	$9,682	$3,485	36.0%	$13,167		$9,682	$3,485	$13,167	2026Q3	14.3%	$11,066	$3,984	$15,050
	CONSTRUCTION ESTIMATE TOTALS:	$81,758	$29,433	36.0%	$111,190		$81,758	$29,433	$111,190			$92,492	$33,297	$125,790
01	LANDS AND DAMAGES	$1,169	$292	25.0%	$1,462		$1,169	$292	$1,462	2024Q1	7.4%	$1,256	$314	$1,570
30	PLANNING, ENGINEERING & DESIGN													
1.5%	Project Management	$1,226	$442	36.0%	$1,668		$1,226	$442	$1,668	2024Q1	7.6%	$1,319	$475	$1,794
0.5%	Planning & Environmental Compliance	$409	$147	36.0%	$556		$409	$147	$556	2024Q1	7.6%	$440	$158	$598
8.0%	Engineering & Design	$6,541	$2,355	36.0%	$8,895		$6,541	$2,355	$8,895	2024Q1	7.6%	$7,035	$2,533	$9,568
0.5%	Reviews, ATRs, IEPRs, VE	$409	$147	36.0%	$556		$409	$147	$556	2024Q1	7.6%	$440	$158	$598
1.0%	Life Cycle Updates (cost, schedule, risks)	$818	$294	36.0%	$1,112		$818	$294	$1,112	2024Q1	7.6%	$879	$317	$1,196
0.5%	Contracting & Reprographics	$409	$147	36.0%	$556		$409	$147	$556	2026Q3	14.4%	$468	$168	$636
1.5%	Engineering During Construction	$1,226	$442	36.0%	$1,668		$1,226	$442	$1,668	2026Q3	14.4%	$1,403	$505	$1,908
1.0%	Planning During Construction	$818	$294	36.0%	$1,112		$818	$294	$1,112	2026Q3	14.4%	$935	$337	$1,272
0.5%	Adaptive Management & Monitoring	$409	$147	36.0%	$556		$409	$147	$556	2026Q3	14.4%	$468	$168	$636
31	CONSTRUCTION MANAGEMENT													
6.7%	Construction Management	$5,478	$1,972	36.0%	$7,450		$5,478	$1,972	$7,450	2026Q3	14.4%	$6,267	$2,256	$8,523
	CONTRACT COST TOTALS:	$100,668	$36,112		$136,780		$100,668	$36,112	**$136,780**			$113,403	$40,687	**$154,089**

**** TOTAL PROJECT COST SUMMARY ****

**** CONTRACT COST SUMMARY ****

PROJECT: Port of Long Beach
LOCATION: Long Beach, CA
This Estimate reflects the scope and schedule in report; POLB Navigation Improvements

DISTRICT: Los Angeles District
POC: CHIEF, AE MANAGEMENT, COST AND VALUE ENGINEERING, Mark Cooke, P.E.
PREPARED: 4/15/2021

WBS Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)				TOTAL PROJECT COST (FULLY FUNDED)				
		Estimate Prepared: 15-Apr-21 Estimate Price Level: 1-Oct-20				Program Year (Budget EC): 2021 Effective Price Level Date: 1 -Oct-20								
WBS NUMBER	Civil Works Feature & Sub-Feature Description	COST ($K)	CNTG ($K)	RISK BASED CNTG (%)	TOTAL ($K)	ESC (%)	COST ($K)	CNTG ($K)	TOTAL ($K)	Mid-Point Date	ESC (%)	COST ($K)	CNTG ($K)	FULL ($K)
A	*B*	*C*	*D*	*E*	*F*	*G*	*H*	*I*	*J*	*P*	*L*	*M*	*N*	*O*
	CONTRACT 2													
12	NAVIGATION PORTS & HARBORS - Mob/Dredging	$5,567	$2,004	36.0%	$7,572		$5,567	$2,004	$7,572	2026Q3	14.3%	$6,364	$2,291	$8,654
12	NAVIGATION PORTS & HARBORS - Pier J Improvements	$4,713	$1,697	36.0%	$6,410		$4,713	$1,697	$6,410	2026Q3	14.3%	$5,387	$1,939	$7,327
	CONSTRUCTION ESTIMATE TOTALS:	$10,281	$3,701	36.0%	$13,982		$10,281	$3,701	$13,982			$11,751	$4,230	$15,981
01	LANDS AND DAMAGES			25.0%										
30	PLANNING, ENGINEERING & DESIGN													
6.0%	POLB Administration Costs	$617	$222	36.0%	$839		$617	$222	$839	2024Q1	7.6%	$664	$239	$903
10.0%	POLB Engineering & Design Costs	$1,028	$370	36.0%	$1,398		$1,028	$370	$1,398	2024Q1	7.6%	$1,106	$398	$1,504
31	CONSTRUCTION MANAGEMENT													
15.0%	POLB Construction Management Costs	$1,542	$555	36.0%	$2,097		$1,542	$555	$2,097	2026Q3	14.4%	$1,764	$635	$2,399
	CONTRACT COST TOTALS:	$13,468	$4,848		$18,316		$13,468	$4,848	**$18,316**			$15,284	$5,502	**$20,787**

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DISTRICT: Los Angeles District
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PREPARED: 4/15/2021

WBS Structure		ESTIMATED COST				PROJECT FIRST COST (Constant				TOTAL PROJECT COST (FULLY FUNDED)				
		Estimate Prepared: 15-Apr-21 Estimate Price Level: 1-Oct-20		RISK BASED		Program Year (Budget EC): 2021 Effective Price Level Date: 1 -Oct-20								
WBS NUMBER	Civil Works Feature & Sub-Feature Description	COST ($K)	CNTG ($K)	CNTG (%)	TOTAL ($K)	ESC (%)	COST ($K)	CNTG ($K)	TOTAL ($K)	Mid-Point Date	ESC (%)	COST ($K)	CNTG ($K)	FULL ($K)
A	*B*	*C*	*D*	*E*	*F*	*G*	*H*	*I*	*J*	*P*	*L*	*M*	*N*	*O*
	Associated Costs													
12	Aids to Navigtion (ATON)	$480	$173	36.0%	$653		$480	$173	$653	2026Q3	14.3%	$549	$198	$746
	CONSTRUCTION ESTIMATE TOTALS:	$480	$173	36.0%	$653		$480	$173	$653			$549	$198	$746
01	LANDS AND DAMAGES													
30	PLANNING, ENGINEERING & DESIGN													
31	CONSTRUCTION MANAGEMENT													
	CONTRACT COST TOTALS:	$480	$173		$653		$480	$173	**$653**			$549	$198	**$746**

**** TOTAL PROJECT COST SUMMARY ****

**** CONTRACT COST SUMMARY ****

PROJECT: Port of Long Beach
LOCATION: Long Beach, CA
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PREPARED: 4/15/2021

WBS Structure		ESTIMATED COST				PROJECT FIRST COST (Constant				TOTAL PROJECT COST (FULLY FUNDED)				
		Estimate Prepared: 15-Apr-21 Estimate Price Level: 1-Oct-20				Program Year (Budget EC): 2021 Effective Price Level Date: 1 -Oct-20								
WBS NUMBER	Civil Works Feature & Sub-Feature Description	COST ($K)	CNTG ($K)	RISK BASED CNTG (%)	TOTAL ($K)	ESC (%)	COST ($K)	CNTG ($K)	TOTAL ($K)	Mid-Point Date	ESC (%)	COST ($K)	CNTG ($K)	FULL ($K)
A	*B*	*C*	*D*	*E*	*F*	*G*	*H*	*I*	*J*	*P*	*L*	*M*	*N*	*O*
	O&M Dredging													
12	O&M Dredging - Cycle 1 (Year 25)	$2,075	$747	36.0%	$2,822		$2,075	$747	$2,822	2053Q1	136.6%	$4,910	$1,768	$6,677
12	O&M Dredging - Cycle 2 (Year 50)	$2,075	$747	36.0%	$2,822		$2,075	$747	$2,822	2078Q1	383.5%	$10,034	$3,612	$13,646
	CONSTRUCTION ESTIMATE TOTALS:	$4,150	$1,494	36.0%	$5,644		$4,150	$1,494	$5,644			$14,944	$5,380	$20,323
01	LANDS AND DAMAGES			25.0%										
30	PLANNING, ENGINEERING & DESIGN													
15.0%	PED - Cycle 1	$311	$112	36.0%	$423		$311	$112	$423	2052Q3	133.7%	$727	$262	$989
15.0%	PED - Cycle 2	$311	$112	36.0%	$423		$311	$112	$423	2077Q3	377.5%	$1,486	$535	$2,021
31	CONSTRUCTION MANAGEMENT													
6.7%	Construction Management - Cycle 1	$139	$50	36.0%	$189		$139	$50	$189	2053Q1	137.0%	$330	$119	$448
6.7%	Construction Management - Cycle 2	$139	$50	36.0%	$189		$139	$50	$189	2078Q1	384.4%	$673	$242	$916
	CONTRACT COST TOTALS:	$5,051	$1,818		$6,869		$5,051	$1,818	**$6,869**			$18,160	$6,538	**$24,698**
													Annualized Cost (over 50 years):	**$101**

FINAL INTEGRATED FEASIBILITY REPORT AND ENVIRONMENTAL IMPACT STATEMENT / ENVIRONMENTAL IMPACT REPORT (EIS/EIR)

APPENDIX H: AIR QUALITY ANALYSIS

PORT OF LONG BEACH
DEEP DRAFT NAVIGATION STUDY
Los Angeles County, California

October 2021

US Army Corps of Engineers®

Port of LONG BEACH
THE PORT OF CHOICE

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Appendix H1. Criteria Pollutant and GHG Emission Calculations

H1.1 Introduction

This appendix describes the methods and assumptions used to quantify criteria pollutant and greenhouse gas (GHG) emissions generated from construction of the Deep Draft Navigation Project and Alternatives. Section H1.2 defines the pollutants, averaging times, analysis years, emission sources, and geographical boundaries included in the emission calculations under NEPA and CEQA. Section H1.3 describes the methodology for the construction emission calculations. Detailed source activity and emission calculation tables for the Action Alternatives are included as attachments at the end of this appendix.

Implementation of the No Action and Action Alternatives would not result in operational activities and would therefore not result in operational impacts. Furthermore, the No Action Alternative would not construct an Approach Channel to Pier J South, deepen the West Basin Channel, deepen the Approach Channel, widen portions of the Main Channel, or construct the Local Service Facilities. However maintenance dredging of existing channel depths would continue, when and where needed. The No Action Alternative would not increase ship calls or throughput, and would not incrementally increase operational emissions within the study area. Future maintenance dredging and disposal of dredged material would be subject to separate detailed analysis under CEQA and/or NEPA. Emission calculations associated with maintenance dredging are not included in this appendix. Please refer to Chapter 2 and Chapter 4 for a detailed explanation of the No Action Alternative and Action Alternatives, respectively.

The Action Alternatives are described in detail in Section 4 (Plan Formulation). The No Action Alternative is also described in detail in Section 4 (Plan Formulation), is assessed qualitatively in Sections 5.5 (Air Quality Environmental Consequences) and 5.6 (Greenhouse Gas Environmental Consequences) of the DEIS/DEIR, and therefore is not included in this appendix.

H1.2 Emission Parameters

Pollutants

The air quality analysis quantified emissions of the following criteria pollutants or precursors: volatile organic compounds (VOC), carbon monoxide (CO), nitrogen oxides (NO_x), particulate matter less than 10 microns (PM_{10}), particulate matter less than 2.5 microns ($PM_{2.5}$), and sulfur oxides (SO_x). Emissions of diesel particulate matter (DPM), a subset of PM_{10}, were also quantified because DPM is the dominant toxic air contaminant in the health risk evaluation conducted for this EIS/EIR. Estimates of lead emissions were not calculated. Lead emissions from mobile sources in California have significantly decreased due to the near elimination of lead in fuels. Emission factors developed by the U.S. Environmental Protection Agency, the California Air Resources Board, and the South Coast Air Quality Management District (SCAQMD), including those in CalEEMod, the SCAQMD-approved emission modeling software, do not provide estimated emissions for lead. Little to no quantifiable and foreseeable lead emissions would be generated by the Action Alternatives.

The air quality analysis also quantified emissions of the following GHGs: carbon dioxide (CO_2), nitrous oxide (N_2O), and methane (CH_4), which are products of engine exhaust. Global warming potential (GWP) is the ability of a gas or aerosol to trap heat in the atmosphere. GHGs have varying amounts of GWP. By convention, CO_2 is assigned a GWP of 1. In comparison, CH_4 has a GWP of 25, which means that it has a global warming effect 25 times greater than CO_2 on an equal-mass basis. N_2O has a GWP of 298 (IPCC, 2007). To account for their GWP, GHG emissions are reported in the emission tables as carbon dioxide equivalent (CO_2e). CO_2e was calculated by multiplying each GHG emission by its GWP and adding the results together to produce a single, combined emission rate representing all GHGs. The GWPs used in the emission calculations are shown in tables at the end of this appendix.

Averaging Times

For criteria pollutants, annual emissions were calculated for comparison against the General Conformity applicability rates in nonattainment or maintenance areas (40 CFR Part 93). For CEQA impacts, peak daily (24-hour) emissions were calculated for comparison against the South Coast Air Quality Management District (SCAQMD) daily significance thresholds (SCAQMD 2019). Annual, peak 24-hour, peak 8-hour (for CO), and peak 1-hour criteria pollutant emissions were calculated to support the dispersion modeling analysis used to predict local ambient pollutant concentrations.

For GHG, annual and total construction emissions were calculated for presentation under NEPA. For CEQA impacts, total construction emissions were amortized over a 30-year period in accordance with SCAQMD guidance (SCAQMD 2008) for comparison against the SCAQMD CO_2e annualized significant emissions threshold for industrial projects (SCAQMD 2019).

Analysis Years

Construction emissions were based on anticipated equipment utilization in each construction year. Tables detailing construction schedules for all Action Alternatives are included as attachments at the end of this appendix. The following general construction schedules were used for the Action Alternatives:

- All Action Alternatives include widening of the Main channel to the authorized depth of -76' mean lower low water (MLLW), construction of structural improvements to the Pier J breakwater as described in Section 4.6.5, deepening Pier J Basin, berth dredging at the Pier J South Slips in the Pier J Basin and along Pier T, and, with implementation of MM-AQ-1, use of electric clamshell dredges and construction of an electrical substation at Pier J. Dredged material would be disposed at the Surfside Borrow Area, LA-2, and/or LA-3.
- Alternative 2. In addition, Alternative 2 includes constructing an approach channel to Pier J South to -53 ft MLLW; constructing a turning basin outside of Pier J South to -53 ft MLLW; deepening the West Basin to -53 ft MLLW; and the deepening of the Approach Channel to -78' MLLW. Construction activities associated with Alternative 2 would occur over approximately 34 months, from January 2024 through October 2026.
- Alternative 3. In addition to activities common to all Action Alternatives, Alternative 3 includes constructing an approach channel to Pier J South to -55 ft MLLW; constructing a turning basin outside of Pier J South to -55 ft MLLW; deepening the West Basin to -55 ft MLLW; and deepening of the Approach Channel to -80' MLLW. Construction activities associated with Alternative 3 would occur over approximately 40 months, from January 2024 through April 2027.
- Alternative 4. In addition to activities common to all Action Alternatives, Alternative 4 includes constructing an approach channel to Pier J South to -57 ft MLLW; constructing a turning basin outside of Pier J South to -57 ft MLLW; deepening the West Basin to -57 ft MLLW; deepening of the Approach Channel to -82' MLLW, Pier T wharf upgrades, and Pier J wharf upgrades. Construction activities associated with Alternative 4 would take occur over approximately 62 months, from January 2024 through February 2029.
- Alternative 5. In addition to activities common to all Action Alternatives, Alternative 5 includes constructing an approach channel to Pier J South to -55 ft MLLW; constructing a turning basin outside of Pier J South to -55 ft MLLW; deepening the West Basin to -55 ft MLLW; the deepening of the Approach Channel to -80' MLLW (like Alternative 3), and the construction of a Standby Area adjacent

to the Main Channel dredged to -67' MLLW, with a 300-foot diameter center anchor placement with a depth of -73'MLLW. Construction activities associated with Alternative 5 would take occur over approximately 50 months, from January 2024 through February 2028.

For the purposes of the emission calculations, construction activities were assumed to occur in the earliest foreseeable years. Should construction be delayed beyond the assumed dates, emissions would be lower due to the gradual replacement of older construction equipment with newer equipment meeting the existing State and federal off-road engine emission standards.

Emission Sources

Criteria pollutant and GHG emission sources associated with construction activities would include dredging equipment (hopper and clamshell dredges), harbor craft, off-road construction equipment, on-road vehicles, and worker vehicles. Earth-disturbance activities, such as grading, bulldozing, material handling, and driving over paved and unpaved surfaces, would be minimal and would generate particulate matter (PM) emissions in the form of fugitive dust. The same emission sources and utilization assumptions were analyzed under both NEPA (including General Conformity applicability) and CEQA. The emission calculation approach for each source category is described in Section H1.3 of this appendix.

Geographical Boundaries

All activity and therefore all emissions would occur within the South Coast Air Basin (SCAB). Therefore, criteria pollutant and GHG construction emissions were calculated within the SCAB to align with the General Conformity applicability rates in nonattainment and maintenance areas and SCAQMD daily emission significance thresholds.

H1.3 Methodology for Construction Emission Calculations

Air pollutant emissions from the proposed construction activities were calculated using the most current emission factors and methods available at the time the calculations were performed. Annual emissions, which were used for General Conformity applicability, GHG impacts, and dispersion modeling, were quantified based on the annual construction activity assumptions in each year of construction. To estimate peak daily construction emissions, emissions were first calculated for the individual construction activities and then summed for overlapping construction activities, per the anticipated construction schedule. The combination of construction activities producing the highest daily emissions was then selected as the peak day and compared to the SCAQMD emission thresholds for construction. The specific emission calculation approach for each construction source category is described below.

The Federal actions annual VOC, CO, NO_2, PM_{10} and $PM_{2.5}$ (including precursors) emission rates for each Action Alternative were first calculated for the applicable analysis years. For purposes of this evaluation, emissions of NO_2 are assumed to equal emissions of NO_x since NO_2 is the predominant form of NO_x. These emissions are associated with mobile and area sources expected to be used for on-site construction-related purposes. The annual emissions (tons per year) from each of the Action Alternatives where then compared to the General Conformity applicability rates, presented in Table 5.5-2, to assess General Conformity applicability under the Clean Air Act.

Dredging Equipment. As described in Section 4, hopper dredges would be used to dredge sediment in the Approach Channel and transport and place the dredged sediment at nearshore (primarily), LA-2, and/or LA-3 placement sites. Hopper dredge engines are large marine engines used for propulsion and operation of the dredging equipment. Emission factors for hopper dredge propulsion and auxiliary engines therefore reflect existing USEPA marine engine standards (USEPA 2016a). Hopper dredge propulsion and auxiliary engines were assumed to be Tier 2 marine diesel engines, per USACE.

As described in Section 4, clamshell dredges would be used to dredge the Main Channel, West Basin, Pier J Basin (including berth dredging at Pier J South), Pier J Approach Channel and turning basin, Pier T Berths, and Standby Area (Alternative 5 only). Clamshell dredges are not self-propelled and emission factors for these engines reflect existing USEPA non-road engine standards; clamshell dredge engines were assumed to be Tier 3 non-road diesel engines, per USACE and the Port.

Both hopper dredge and clamshell dredge utilization, schedule, activity, engine size, and load factors were based on project-specific dredging requirements presented in tables at the end of this appendix.

Harbor Craft. Tugboats would be used to position clamshell dredges and transport sediment-laden barges to the nearshore, LA-2, and/or LA-3 placement sites. Crew boats and survey boats would also be used to support dredging activities. Harbor craft utilization, schedule, activity, and engine sizes, provided by the USACE and the Port, were used in the analysis. Harbor craft load factors were obtained from the Port 2013 Emissions Inventory (POLB 2013), which is consistent with the most recent Port emissions inventory (POLB 2017) available at the time the emission calculations were performed.

Emission factors for harbor craft reflect USEPA marine engine standards (USEPA 2016a) and harbor craft engine types common at the Port, as documented in the Port's Air Emissions Inventory (POLB 2017). The Port's 2017 Air Emissions Inventory identifies that most harbor craft propulsion engines operating at the Port in 2017 were USEPA Tier 2 diesel engines and that approximately half of all harbor craft auxiliary engines were Tier 3. This analysis conservatively used USEPA Tier 2 harbor craft emission standards for both propulsion and auxiliary engines.

Off-road Construction Equipment. Off-road construction equipment would be used during non-dredging activities such as construction of the electrical substation at Pier J (only for mitigated emissions), Pier J breakwater improvements, and wharf upgrades. Equipment type, utilization, schedule, activity, and engine sizes, provided by the Port, were used in the analysis, as shown in Table H1.6.

Criteria pollutant and GHG emission factors for off-road construction equipment reflect USEPA non-road engine standards (USEPA 2016b) and CARB requirements. Emission factors were generated using CARB's 2017 OFFROAD Inventory Model (CARB 2017a) for an average equipment fleet composition in the SCAB.

On-Road Construction Vehicles and Worker Vehicles. Construction vehicles would be used during non-dredging activities to deliver construction materials, such as sheetpiles (for wharf upgrades and Pier J breakwater improvements) and concrete (for the electrical substation), and haul away waste. Vehicle type, utilization, schedule, activity, and engine sizes, provided by the Port, were used in the analysis, as shown in Table H1.6.

Criteria pollutant and GHG emission factors reflect USEPA on-road engine standards and CARB requirements. Emission factors were generated using CARB's on-road EMFAC2017 model for truck and passenger vehicle fleets representative of the South Coast region (CARB 2017b). Emissions include engine exhaust, entrained road dust, and brake and tire wear.

Fugitive Dust. PM_{10} and $PM_{2.5}$ fugitive dust emissions from construction activities, such as grading, bulldozing, and material and debris loading and handling were calculated using emission factors from EPA's AP-42 emission factor handbook (USEPA 2006) and default parameters for soil and wind conditions from CalEEMod (CAPCOA 2016). PM_{10} and $PM_{2.5}$ emissions from on- and off-site paved road dust were calculated using CARB's Miscellaneous Process Methodology (CARB 2016).

H1.4 Quantified Regulations for Construction

The following regulations were incorporated into the unmitigated emission calculations for the Action Alternatives, as applicable. These regulations are described in greater detail in the Air Quality Regulatory Setting and GHG Regulatory Setting of the EIS/EIR.

- Dredging Equipment: USEPA Emission Standards for Nonroad Diesel Engines; USEPA Emission Standards for Marine Diesel Engines; CARB In-Use Off-Road Diesel-Fleets Regulation; CARB Portable Diesel-Fueled Engines Air Toxic Control Measure (ATCM).
- Harbor Craft: USEPA Emission Standards for Marine Diesel Engines; CARB Commercial Harbor Craft Regulation.
- Off-Road Construction Equipment: USEPA Emission Standards for Nonroad Diesel Engines; California Diesel Fuel Regulations (Ultra Low Sulfur Diesel [ULSD] fuel); CARB In-Use Off-Road Diesel-Fleets Regulation; CARB Portable Diesel-Fueled Engines ATCM; Statewide Portable Equipment Registration Program.
- On-Road Construction Vehicles and Worker Vehicles: USEPA Emission Standards for On-Road Trucks; California Diesel Fuel Regulations (ULSD fuel); Heavy Duty Vehicle National Program to reduce fuel consumption and GHG; State Standards for Light-Duty Vehicle GHG Emissions and Corporate Average Fuel Economy Standards.
- Fugitive Dust: SCAQMD Rule 403 Compliance.

H1.5 Quantified Mitigation Measures for Construction

The EIS/EIR identifies mitigation measures designed to reduce construction emissions. The following three measures were quantified in the mitigated emission calculations for the Action Alternatives. The remaining mitigation measures were assessed qualitatively in the EIS/EIR.

MM-AQ-1: Electric clamshell dredge. This mitigation measure requires the use of an electric clamshell dredge and requires the construction of an electrical substation at Pier J to provide electric power to the clamshell dredge. The analysis assumes that it would not be possible to electrify all equipment on a clamshell dredge. Therefore, per communication with Dutra Group, a dredging contractor, the analysis conservatively assumes that 90 percent of clamshell dredge horsepower-hours would be electric (Dutra Group 2019). Criteria pollutant and GHG emissions associated with construction of the electrical substation, and indirect GHG emissions associated with clamshell dredge electricity consumption, were quantified for all mitigated Action Alternatives.

MM-AQ-2: Fleet Modernization of Harbor Craft. Harbor craft (tugboats, crew boats, and survey boats) with Category 1 or Category 2 marine engines shall meet USEPA Tier 3 emission standards for marine engines. In addition, the construction contractor shall require all construction tugboats that home fleet in the San Pedro Bay Ports: 1) to shut down their main engines and 2) to refrain from using auxiliary engines while at dock and instead to use electrical shore power, if feasible.

MM-AQ-3: Fleet Modernization of Construction Equipment. Self-propelled, diesel-fueled off-road construction equipment 25 hp or greater shall meet USEPA/CARB Tier 4 emission standards for non-road equipment.

H1.6 References for Appendix H1

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CARB 2016. Entrained Road Travel, Paved Road Dust. November 2016. Available: https://ww3.arb.ca.gov/ei/areasrc/fullpdf/full7-9_2016.pdf. Accessed: July 2019.

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Appendix H1. Tables

Table H1.1
Construction Schedule: Alternative 2. (-53 and -78 MLLW)

Task ID	Alternative 2	Start Date	End Date	Duration (days)
1	Electrical Substation Construction at Pier J (mitigation only)	1/1/2024	12/31/2024	60
2	Pier J Breakwater Construction	1/1/2024	3/2/2024	54
3	Approach Channel (hopper dredge 1,144,000 CY)	1/1/2025	3/8/2025	66
4	Main Channel Widening (clam shell dredge 1,065,000 CY)	1/1/2025	6/28/2025	178
5	West Basin (clam shell dredge 501,000 CY)	6/29/2025	9/21/2025	84
6	Pier J Basin (clam shell dredge 202,000 CY)	9/22/2025	10/26/2025	34
7	Pier J Approach (clam shell dredge 270,000 CY)	10/27/2025	12/11/2025	45
8	Pier J Approach (clam shell dredge 1,699,000 CY)	1/1/2026	10/11/2026	283

Source:
Dredging Alternative 2: POLB Channel Deepening - 53 and 78 Rev4.xlsx.
Substation and Pier J Breakwater - Email From: Khan, Naser <naser.khan@aecom.com>, Sent: Friday, May 31, 2019 10:54 PM, To: Barrera, Baron <baron.barrera@polb.com>.

Table H1.2
Construction Schedule: Alternative 3 NED (-55 and -80 MLLW)

Task ID	Alternative 3	Start Date	End Date	Duration (days)
1	Electrical Substation Construction at Pier J (mitigation only)	1/1/2024	12/31/2024	60
2	Pier J Breakwater Construction	1/1/2024	3/2/2024	54
3	Approach Channel (hopper dredge 2,600,000 CY)	1/1/2025	5/31/2025	150
4	Main Channel Widening (clam shell dredge 1,065,000 CY)	1/1/2025	6/27/2025	177
5	West Basin (clam shell dredge 717,000 CY)	6/28/2025	10/26/2025	120
6	Pier J Basin (clam shell dredge 258,000 CY)	10/27/2025	12/9/2025	43
7	Pier J Basin (clam shell dredge 46,000 CY)	1/1/2026	1/9/2026	8
8	Pier J Approach (clam shell dredge 1,994,000 CY)	1/10/2026	12/8/2026	332
9	Pier J Approach (clam shell dredge 679,000 CY)	1/1/2027	4/24/2027	113

Source:
Dredging Alternative 3: POLB Channel Deepening - NED 55 and 80 Rev4.xlsx.
Substation and Pier J Breakwater - Email From: Khan, Naser <naser.khan@aecom.com>, Sent: Friday, May 31, 2019 10:54 PM, To: Barrera, Baron <baron.barrera@polb.com>.

Table H1.3
Construction Schedule: Alternative 4: (-57 and -83 MLLW)

Task ID	Alternative 4	Start Date	End Date	Duration (days)
1	Electrical Substation Construction at Pier J (mitigation only)	1/1/2024	12/31/2024	60
2	Pier J Breakwater Construction	1/1/2024	3/2/2024	54
3	Pier J Wharf Upgrade	1/1/2024	6/24/2024	175
4	Pier T Wharf Upgrade	1/1/2024	11/16/2024	320
5	Approach Channel (hopper dredge 5,447,000 CY)	1/1/2025	2/4/2026	399
6	Main Channel Widening (clam shell dredge 1,065,000 CY)	1/1/2026	6/28/2026	178
7	West Basin (clam shell dredge 975,000 CY)	6/29/2026	12/9/2026	163
8	West Basin (clam shell dredge 513,000 CY)	1/1/2027	3/28/2027	86
9	Pier T Berths (clam shell dredge Berths T132 to T140, 44,000 CY)	3/29/2027	4/5/2027	7
10	Pier J Basin (clam shell dredge 408,000 CY)	4/6/2027	6/13/2027	68
11	Pier J Approach (clam shell dredge 1,066,000 CY)	6/14/2027	12/9/2027	178
12	Pier J Approach (clam shell dredge 2,040,000 CY)	1/1/2028	12/6/2028	340
13	Pier J Approach (clam shell dredge 297,000 CY)	1/1/2029	2/20/2029	50

Source:
Dredging Alternative 4: POLB Channel Deepening - 57 and 83 Rev4.xlsx.
Substation and Pier J Breakwater - Email From: Khan, Naser <naser.khan@aecom.com>, Sent: Friday, May 31, 2019 10:54 PM, To: Barrera, Baron <baron.barrera@polb.com>.

Table H1.4
Construction Schedule: Alternative 5 and Standby Area (-55 and -80 MLLW)

Task ID	Alternative 5	Start Date	End Date	Duration (days)
1	Electrical Substation Construction at Pier J (mitigation only)	1/1/2024	12/31/2024	60
2	Pier J Breakwater Construction	1/1/2024	3/2/2024	54
3	Approach Channel (hopper dredge 2,600,000 CY)	1/1/2025	5/31/2025	150
4	Main Channel Widening (clam shell dredge 1,065,000 CY)	1/1/2025	6/27/2025	177
5	West Basin (clam shell dredge 717,000 CY)	6/28/2025	10/26/2025	120
6	Pier J Basin (clam shell dredge 258,000 CY)	10/27/2025	12/9/2025	43
7	Pier J Basin (clam shell dredge 46,000 CY)	1/1/2026	1/9/2026	8
8	Pier J Approach (clam shell dredge 1,994,000 CY)	1/10/2026	12/8/2026	332
9	Pier J Approach (clam shell dredge 679,000 CY)	1/1/2027	4/24/2027	113
10	Standby Area (clam shell dredge 921,000 CY)	4/25/2027	12/8/2027	227
11	Standby Area (clam shell dredge 118,000 CY)	1/1/2028	2/24/2028	54

Source:
Dredging Alternative 5: POLB Channel Deepening - NED and Standby Area Rev4.xlsx.
Substation and Pier J Breakwater - Email From: Khan, Naser <naser.khan@aecom.com>, Sent: Friday, May 31, 2019 10:54 PM, To: Barrera, Baron <baron.barrera@polb.com>.

Table H1.5
Dredging Activity

		Activity				Rating		
		Quantity	Number of Engines	(hr/day)	Load	(hp)	(kw)	Engine Tier
Hopper Dredging								
Hopper propulsion engine	dredging	1	2	18	10%	9,000	6,711	Marine Tier 2
Hopper propulsion engine	transit	1	2	4	85%	9,000	6,711	Marine Tier 2
Hopper auxiliary engine	disposal	1	2	1.5	25%	600	447	Marine Tier 2
Hopper Crew boat propulsion engine	support	1	2	2	38%	325	242	Marine Tier 2
Hopper Crew boat auxiliary engine	support	1	1	2	32%	80	60	Marine Tier 2
Hopper Survey boat propulsion engine	dredging	1	1	8	38%	580	433	Marine Tier 2
Clamshell Dredging								
Clamshell Dredge hoist	dredging	1	1	22	50%	1,200	895	Offroad Tier 3
Clamshell Dredge generator	dredging	1	1	22	50%	900	671	Offroad Tier 3
Clamshell Barge dump scow	disposal	1	1	1	80%	175	130	Offroad Tier 3
Clamshell Tugboat propulsion engine	dredging	1	2	4	31%	300	224	Marine Tier 2
Clamshell Tugboat auxiliary engine	dredging	1	1	4	43%	78	58	Marine Tier 2
Clamshell Tugboat propulsion engine	transit	2	2	18	31%	600	447	Marine Tier 2
Clamshell Tugboat auxiliary engine	transit	2	2	18	43%	78	58	Marine Tier 2
Clamshell Crew boat propulsion engine	support	1	2	2	38%	325	242	Marine Tier 2
Clamshell Crew boat auxiliary engine	support	1	1	2	32%	80	60	Marine Tier 2
Clamshell Survey boat propulsion engine	dredging	1	1	2	38%	580	433	Marine Tier 2
Pier J Breakwater Construction								
Pier J Breakwater Tugboat propulsion engine		2	2	12	31%	475	354	Marine Tier 2
Pier J Breakwater Tugboat auxiliary engine		2	2	12	43%	78	58	Marine Tier 2
Pier J Breakwater Crew boat propulsion engine		1	2	2	38%	325	242	Marine Tier 2
Pier J Breakwater Crew boat auxiliary engine		1	1	2	32%	80	60	Marine Tier 2
Pier J Breakwater Survey boat propulsion engine		1	1	2	38%	580	433	Marine Tier 2
Pier J Wharf Upgrade								
Pier J Wharf Tugboat propulsion engine		1	2	12	31%	1000	746	Marine Tier 2
Pier J Wharf Tugboat auxiliary engine		1	2	12	43%	78	58	Marine Tier 2
Pier J Wharf Crew boat propulsion engine		1	2	2	38%	400	298	Marine Tier 2
Pier J Wharf Crew boat auxiliary engine		1	1	2	32%	80	60	Marine Tier 2
Pier J Wharf Survey boat propulsion engine		1	1	2	38%	400	298	Marine Tier 2
Pier T Wharf Upgrade								
Pier T Wharf Tugboat propulsion engine		1	2	12	31%	1000	746	Marine Tier 2
Pier T Wharf Tugboat auxiliary engine		1	2	12	43%	78	58	Marine Tier 2
Pier T Wharf Crew boat propulsion engine		1	2	2	38%	400	298	Marine Tier 2
Pier T Wharf Crew boat auxiliary engine		1	1	2	32%	80	60	Marine Tier 2
Pier T Wharf Survey boat propulsion engine		1	1	2	38%	400	298	Marine Tier 2

Notes:

Hopper dredge is used only during dredging of Approach Channel.

Dutra's hopper ship Stuyvensant has 2 aux engines (used for jet pumps which are only active during disposal events). These engines are scheduled to be upgraded to Tier 3 in a couple of years. Analysis conservatively assumed Tier 2 auxiliary engines.

Dutra's dredge pumps are electric and are powered via main engines.

Hopper auxiliary engine is only used during disposal events. 15 min per event and 6 events per day.

Survey boats have outboard propulsion. If there is hopper and clamshells working concurently then one survey boat can support both operations.

Dutra's biggest clamshell dredge generator is 895bhp.

Barge dump scow engine only runs for about 15 min while disposal event occures; assumed 4 loads per day.

Dutra's anchor tug fleet has typical twin 300 hp tier II configuration.

Tugboats used for disposal - Dutra uses 1200 hp on the low end. Used this conservatively in lieu of 2017 POLB EI.

Dutra survey boats don't have aux engines. Equipment is run off of inverters.

Source:

Dredging: KeyAssumptionsSummary Dutra revision.xlsx e-mailed 4/3/2019. Provided by USACE and Dutra

Pier J Breakwater:

E-mail from: Khan, Naser <naser.khan@aecom.com> Sent: Tuesday, May 21, 2019 10:51 PM To: Barrera, Baron <baron.barrera@polb.com>; Paulsen, Eric <eric.paulsen@polb.com>

E-mail from: Khan, Naser <naser.khan@aecom.com> Sent: Thursday, May 30, 2019 11:56 AM To: Barrera, Baron <baron.barrera@polb.com>; Paulsen, Eric <eric.paulsen@polb.com>
E-mail from: Khan, Naser <naser.khan@aecom.com> Sent: Friday, May 31, 2019 10:54 PM To: Barrera, Baron <baron.barrera@polb.com>

Table H1.6
Landside Construction Equipment Activity

Equipment	Number of Pieces (peak day)	Number of Active Days	Utilization (hr/day)	HP (each) or other info	Transit Distance Offsite (mi)	Transit Distance Onsite (mi)
Electrical Substation Construction at Pier J						
Offroad Equipment						
Caterpillar 320 excavator	1	20	8	164		
Small asphalt roller	1	26	8	33		
Water truck	1	20	8	300		
Forklift	1	22	2	50		
Mobile crane (35 ton)	1	2	8	282		
Onroad Equipment						
Dump trucks	3	5	8	600	11	1
Concrete trucks	7	5	8	335	20	1
Workers	20	60			30	
Pier J Breakwater Construction						
Offroad Equipment						
Piling crane	1	54	10	250		
Long arm excavator	1	54	10	315		
Onroad Equipment						
Pile delivery truck	5	5			200	1
Workers	21	54			30	
Pier J Wharf Upgrade						
Offroad Equipment						
Const Barge - piling crane	1	170	10	250		
Cong Barge - long arm excavator	1	170	10	315		
Const barge - deck equipment	1	170	10	100		
Sheet pile barge - deck equipment	1	170	10	100		
Onroad Equipment						
Workers	19	175			30	
Pier T Wharf Upgrade						
Offroad Equipment						
Const Barge - piling crane	1	310	10	250		
Cong Barge - long arm excavator	1	310	10	315		
Const barge - deck equipment	1	310	10	100		
Sheet pile barge - deck equipment	1	310	10	100		
Onroad Equipment						
Workers	19	320			30	

Notes:

1-way transit distance multiplied by 2 for total transit distance. Telephone conversation with Naser Khan (AECom) 5/21/19.

Source:

Telephone conversation with Naser Khan (AECom) 5/21/19.
E-mail from: Khan, Naser <naser.khan@aecom.com> Sent: Tuesday, May 21, 2019 10:51 PM To: Barrera, Baron <baron.barrera@polb.com>; Paulsen, Eric <eric.paulsen@polb.com>
E-mail from: Khan, Naser <naser.khan@aecom.com> Sent: Thursday, May 30, 2019 11:56 AM To: Barrera, Baron <baron.barrera@polb.com>; Paulsen, Eric <eric.paulsen@polb.com>
E-mail from: Khan, Naser <naser.khan@aecom.com> Sent: Friday, May 31, 2019 10:54 PM To: Barrera, Baron <baron.barrera@polb.com>

Table H1.7

Soil Handling - Electrical Substation Construction

Task	Peak Day Volume of Soil Handled (cyd/day)	Total Volume of Soil Handled (cyd)	Peak Day Volume of Soil Handled (ton/day)	Total Volume of Soil Handled (ton)
Electrical Substation Construction at Pier J	72	1500	91.8	1912.5

Table H1.8

Wharf Upgrades: Pier J, Berths 266-270

Activity No.	Description	No. of Working Days	Equipment	Horsepower	No. of People	Notes
1	Mobilize/Demobilize	5	Construction Barge with piling crane and long arm excavator. Tug boat	Piling Crane: 250 HP	8	Assume piling frame is constructed off site and placed onto barge at contractors' yard
		5		Long Arm Excavator: 315 HP		
		5		Tugboat: 2,000 HP		
2	Sheet Pile Delivery	10	As Activity No. 1	Construction Barge Deck Equipment: 100 HP	As above	Assume sheet piles are delivered onsite via a small barge as needed. Sheet piles will be loaded onto the small barge at the contractors' yard and delivered onsite from the waterside.
		10	Small barge for sheet piles	Sheet pile Barge Deck Equipment: 100 HP		
		10	Tug Boat	Survey Boat: 400 HP		
3	Clearing of seabed of any obstruction prior to pile driving	20	As Activity No. 1	Crew Boat: 400 HP	As above	Any debris will be cleared using the long arm excavator mounted on the construction barge, includes team of four divers
		20	Survey boat		7	
4	Driving of bulkhead wall	135	As Activity No. 3		19	Assumes driving rate of 20 LF per day
		135	Crew Boat		2	
5	Installation of anti-scour rock in front of new bulkhead wall	130	Small barge for storage of rock		4	Long arm excavator on construction barge used to place rock. Overlaps with activity No. 4, finish at probably the same time.
		130	Tug Boat			
6	Survey of installed bulkhead wall	5	Survey boat		3	Survey team

Source:
E-mail: From: Barrera, Baron <baron.barrera@polb.com>, Sent: Thursday, June 6, 2019 1:13 PM, To: Lora Granovsky <lora.granovsky@ilancoenvironmental.com>, Subject: FW: LB Deep Draft Nav Study - Construction Schedule for Pier J and T Sheet Pile Wall.

Duration: 175 working days for Pier J, Berths 266-270

Wharf upgrades apply to Alternative 4 only.

Table H1.9

Wharf Upgrades: Pier T, Berths 134-140

Activity No.	Description	No. of Working Days	Equipment	Horsepower	No. of People	Notes
1	Mobilize/Demobilize	5	Construction Barge with piling crane and long arm excavator. Tug boat	Piling Crane: 250 HP	8	Assume piling frame is constructed off site and placed onto barge at contractors' yard
		5		Long Arm Excavator: 315 HP		
		5		Tugboat: 2,000 HP		
2	Sheet Pile Delivery	20	As Activity No. 1	Construction Barge Deck Equipment: 100 HP	As above	Assume sheet piles are delivered onsite via a small barge as needed. Sheet piles will be loaded onto the small barge at the contractors' yard and delivered onsite from the waterside.
		20	Small barge for sheet piles	Sheet pile Barge Deck Equipment: 100 HP		
		20	Tug Boat	Survey Boat: 400 HP		
3	Clearing of seabed of any obstruction prior to pile driving	35	As Activity No. 1	Crew Boat: 400 HP	As above	Any debris will be cleared using the long arm excavator mounted on the construction barge, includes team of four divers
		35	Survey boat		7	
4	Driving of bulkhead wall	250	As Activity No. 3		19	Assumes driving rate of 20 LF per day
		250	Crew Boat		2	
5	Installation of anti-scour rock in front of new bulkhead wall	245	Small barge for storage of rock		4	Long arm excavator on construction barge used to place rock. Overlaps with activity No. 4, finish at probably the same time.
		245	Tug Boat			
6	Survey of installed bulkhead wall	10	Survey boat		3	Survey team

Source:

E-mail: From: Barrera, Baron <baron.barrera@polb.com>, Sent: Thursday, June 6, 2019 1:13 PM, To: Lora Granovsky <lora.granovsky@ilancoenvironmental.com>, Subject: FW: LB Deep Draft Nav Study - Construction Schedule for Pier J and T Sheet Pile Wall.

Duration: 320 working days for Pier T, Berths 134-140

Wharf upgrades apply to Alternative 4 only.

Table H1.10

Offroad Engine Emission Factors - USEPA Standards

	Emission Factor (g/hp-hr)							
	High HP	**PM10**	**PM2.5**	**DPM**	**NOX**	**SOX**	**CO**	**VOC**
Tier 1	50	0.6	0.6	0.6	6.745	0.005552	4.1	
	100	0.6	0.6	0.6	6.9	0.005552	4.1	
	175	0.6	0.6	0.6	6.9	0.004994	4.1	
	300	0.4	0.4	0.4	6.9	0.004994	8.5	1.053
	600	0.4	0.4	0.4	6.9	0.004994	8.5	1.053
	750	0.4	0.4	0.4	6.9	0.004994	8.5	1.053
	>750	0.4	0.4	0.4	6.9	0.004994	8.5	1.053
Tier 2	50	0.45	0.45	0.45	5.32	0.005552	4.1	0.29484
	100	0.3	0.3	0.3	5.32	0.005552	3.7	0.29484
	175	0.22	0.22	0.22	4.655	0.004994	3.7	0.257985
	300	0.15	0.15	0.15	4.655	0.004994	2.6	0.257985
	600	0.15	0.15	0.15	4.56	0.004994	2.6	0.25272
	750	0.15	0.15	0.15	4.56	0.004994	2.6	0.25272
	>750	0.15	0.15	0.15	4.56	0.004994	2.6	0.25272
Tier 3	50	0.45	0.45	0.45	5.32	0.005552	4.1	0.29484
	100	0.3	0.3	0.3	3.325	0.005552	3.7	0.184275
	175	0.22	0.22	0.22	2.85	0.004994	3.7	0.15795
	300	0.15	0.15	0.15	2.85	0.004994	2.6	0.15795
	600	0.15	0.15	0.15	2.85	0.004994	2.6	0.15795
	750	0.15	0.15	0.15	2.85	0.004994	2.6	0.15795
	>750	0.15	0.15	0.15	4.56	0.004994	2.6	0.25272
Tier 4 Interim	50	0.22	0.22	0.22	5.32	0.005552	4.1	0.29484
	75	0.22	0.22	0.22	3.325	0.005552	3.7	0.184275
	175	0.015	0.015	0.015	0.3	0.004994	3.7	0.14742
	750	0.015	0.015	0.015	0.3	0.004994	2.6	0.14742
	>750	0.075	0.075	0.075	2.6	0.004994	2.6	0.3159
Tier 4 Final	50	0.022	0.022	0.022	3.325	0.005552	4.1	0.184275
	75	0.022	0.022	0.022	3.325	0.005552	3.7	0.184275
	175	0.015	0.015	0.015	0.3	0.004994	3.7	0.14742
	750	0.015	0.015	0.015	0.3	0.004994	2.6	0.14742
	>750	0.03	0.03	0.03	2.6	0.004994	2.6	0.3159

Source:

USEPA Engine Standards. DieselNet: https://www.dieselnet.com/standards/us/nonroad.php#tier3

NMHC+NOx Pollutant Fractions (2017 Carl Moyer Program Guidelines, Table D-25):

NOx = 0.95

HC 0.05

SOx is a function of fuel sulfur content and does not change with Tier.

Used for Marine Offroad Equipment: Tier 3

Used for Mitigation: Tier 4 offroad equipment

Table H1.11
Harbor Craft Emission Factors - USEPA Standards

				g/kw-hr											
Engine Displacement	**(kW)**	**EPA Tier**	**MY**	**NMHC+NOx**	**PM10**	**PM2.5**	**DPM**	**NOx**	**SOX**	**CO**	**HC**	**VOC**	**CO2**	**CH4**	**N2O**
Category 1	**HC auxiliary engines**														
>2.5	>37	Tier 1	2004		0.54	0.4806	0.54	17	0.00552	11.4	1.3	1.3689	652	0.026	0.031
<0.9	≥37	Tier 2	2005	7.5	0.4	0.356	0.4	7.125	0.00552	5	0.375	0.394875	652	0.0075	0.031
0.9 < displ < 1.2	75-130	Tier 2	2004	7.2	0.3	0.267	0.3	6.84	0.00552	5	0.36	0.37908	652	0.0072	0.031
1.2 < displ < 2.5	130-560	Tier 2	2004	7.2	0.3	0.267	0.3	6.84	0.00552	5	0.36	0.37908	652	0.0072	0.031
2.5 < displ < 5	>560	Tier 2	2007	7.2	0.2	0.178	0.2	6.84	0.00552	5	0.36	0.37908	652	0.0072	0.031
<0.9	<19	Tier 3	2009	7.5	0.4	0.356	0.4	7.125	0.00552	6.6	0.375	0.394875	652	0.0075	0.031
<0.9	19-75	Tier 3	2009-2013	7.5	0.3	0.267	0.3	7.125	0.00552	5.5	0.375	0.394875	652	0.0075	0.031
<0.9	19-75	Tier 3	2014+	4.7	0.3	0.267	0.3	4.465	0.00552	5.5	0.235	0.247455	652	0.0047	0.031
<0.9	>75	Tier 3	2012+	5.4	0.14	0.1246	0.14	5.13	0.00552	5.5	0.27	0.28431	652	0.0054	0.031
0.9 < displ < 1.2	all	Tier 3	2013+	5.4	0.14	0.1246	0.14	5.13	0.00552	5	0.27	0.28431	652	0.0054	0.031
1.2 < displ < 2.5	<600	Tier 3	2014-2017	5.6	0.11	0.0979	0.11	5.32	0.00552	5	0.28	0.29484	652	0.0056	0.031
1.2 < displ < 2.5	<600	Tier 3	2018+	5.6	0.1	0.089	0.1	5.32	0.00552	5	0.28	0.29484	652	0.0056	0.031
1.2 < displ < 2.5	≥600	Tier 3	2014+	5.6	0.11	0.0979	0.11	5.32	0.00552	5	0.28	0.29484	652	0.0056	0.031
2.5 < displ < 3.5	<600	Tier 3	2013-2017	5.6	0.11	0.0979	0.11	5.32	0.00552	5	0.28	0.29484	652	0.0056	0.031
2.5 < displ < 3.5	<600	Tier 3	2018+	5.6	0.1	0.089	0.1	5.32	0.00552	5	0.28	0.29484	652	0.0056	0.031
2.5 < displ < 3.5	≥600	Tier 3	2013+	5.6	0.11	0.0979	0.11	5.32	0.00552	5	0.28	0.29484	652	0.0056	0.031
3.5 ≤ D < 7	<600	Tier 3	2012-2017	5.8	0.11	0.0979	0.11	5.51	0.00552	5	0.29	0.30537	652	0.0058	0.031
3.5 ≤ D < 7	<600	Tier 3	2018+	5.8	0.1	0.089	0.1	5.51	0.00552	5	0.29	0.30537	652	0.0058	0.031
3.5 ≤ D < 7	≥600	Tier 3	2012+	5.8	0.11	0.0979	0.11	5.51	0.00552	5	0.29	0.30537	652	0.0058	0.031
	600-1400	Tier 4	2017+		0.04	0.0356	0.04	1.8	0.00552	5	0.19	0.20007	652	0.0038	0.031
	1400-2000	Tier 4	2016+		0.04	0.0356	0.04	1.8	0.00552	5	0.19	0.20007	652	0.0038	0.031
	2000-3700	Tier 4	2014+		0.04	0.0356	0.04	1.8	0.00552	5	0.19	0.20007	652	0.0038	0.031
<15.0	>3700	Tier 4	2014-2015		0.12	0.1068	0.12	1.8	0.00552	5	0.19	0.20007	652	0.0038	0.031
15 < displ < 30	>3700	Tier 4	2014-2015		0.25	0.2225	0.25	1.8	0.00552	5	0.19	0.20007	652	0.0038	0.031
all	>3700	Tier 4	2016+		0.06	0.0534	0.06	1.8	0.00552	5	0.19	0.20007	652	0.0038	0.031
Category 2	**HC propulsion engines**														
>2.5	>37	Tier 1	2004		0.54	0.4806	0.54	17	0.00552	11.4	1.3	1.3689	652	0.026	0.031
5.0 ≤ D < 15	all	Tier 2	2007	7.8	0.27	0.2403	0.27	7.41	0.00552	5	0.39	0.41067	652	0.0078	0.031
15 ≤ D < 20	< 3300 kW	Tier 2	2007	8.7	0.5	0.445	0.5	8.265	0.00552	5	0.435	0.458055	652	0.0087	0.031
15 ≤ D < 20	≥ 3300 kW	Tier 2	2007	9.8	0.5	0.445	0.5	9.31	0.00552	5	0.49	0.51597	652	0.0098	0.031
20 ≤ D < 25	all	Tier 2	2007	9.8	0.5	0.445	0.5	9.31	0.00552	5	0.49	0.51597	652	0.0098	0.031
25 ≤ D < 30	all	Tier 2	2007	11	0.5	0.445	0.5	10.45	0.00552	5	0.55	0.57915	652	0.011	0.031
7 ≤ D < 15	<2000	Tier 3	2013+	6.2	0.14	0.1246	0.14	5.89	0.00552	5	0.31	0.32643	652	0.0062	0.031
7 ≤ D < 15	2000-3700	Tier 3	2013+	7.8	0.14	0.1246	0.14	7.41	0.00552	5	0.39	0.41067	652	0.0078	0.031
15 ≤ D < 20	<2000	Tier 3	2014+	7	0.34	0.3026	0.34	6.65	0.00552	5	0.35	0.36855	652	0.007	0.031
20 ≤ D < 25	<2000	Tier 3	2014+	9.8	0.27	0.2403	0.27	9.31	0.00552	5	0.49	0.51597	652	0.0098	0.031
25 ≤ D < 30	<2000	Tier 3	2014+	11	0.27	0.2403	0.27	10.45	0.00552	5	0.55	0.57915	652	0.011	0.031
all	2000-3700	Tier 4	2014		0.04	0.0356	0.04	1.8	0.00552	5	0.19	0.20007	652	0.0038	0.031
<15	>3700	Tier 4	2014		0.12	0.1068	0.12	1.8	0.00552	5	0.19	0.20007	652	0.0038	0.031
15 ≤ D < 30	>3700	Tier 4	2014		0.25	0.2225	0.25	1.8	0.00552	5	0.19	0.20007	652	0.0038	0.031
all	>3700	Tier 4	2016		0.06	0.0534	0.06	1.8	0.00552	5	0.19	0.20007	652	0.0038	0.031
all	1400-2000	Tier 4	2016		0.04	0.0356	0.04	1.8	0.00552	5	0.19	0.20007	652	0.0038	0.031
all	600-1400	Tier 4	2017		0.04	0.0356	0.04	1.8	0.00552	5	0.19	0.20007	652	0.0038	0.031
	600-1400	Tier 4	2017+		0.04	0.0356	0.04	1.8	0.00552	5	0.19	0.20007	652	0.0038	0.031
	1400-2000	Tier 4	2016+		0.04	0.0356	0.04	1.8	0.00552	5	0.19	0.20007	652	0.0038	0.031
	2000-3700	Tier 4	2014+		0.04	0.0356	0.04	1.8	0.00552	5	0.19	0.20007	652	0.0038	0.031
<15.0	>3700	Tier 4	2014-2015		0.12	0.1068	0.12	1.8	0.00552	5	0.19	0.20007	652	0.0038	0.031
15 < displ < 30	>3700	Tier 4	2014-2015		0.25	0.2225	0.25	1.8	0.00552	5	0.19	0.20007	652	0.0038	0.031
all	>3700	Tier 4	2016+		0.06	0.0534	0.06	1.8	0.00552	5	0.19	0.20007	652	0.0038	0.031

Source:

Federal Marine Compression-Ignition Engines - Exhaust Emission Standards Reference Guide, http://epa.gov/OMS/standards/nonroad/marineci.htm

Tier 1 and Tier 2 standards: 40CFR Part 94.8

Tier 3 and Tier 4 standards: 40CFR Part 1042.101

EPA Tier 1 emissions standards for marine engines do not specify restrictions to PM, SOx, CO, or VOC. NOx reflects Marpol Annex VI (17 g/kW-hr). PM10, SOX, CO and VOC emissions factors were obtained from EPA offroad emission engine standards for Tier 1 engines.

EPA Tier 2 and Tier 3 emission standards are reported as NOx+THC. 5% is HC per Carl Moyer Program guidelines. 95% is NOx.

SOx emission factor is based on 15 ppm fuel sulfur content.

PM2.5 is 89% of PM10, per SCAQMD 2006 Final Methodology to Calculate PM2.5 and PM 2.5 Significance Thresholds, Table 5.

CO2 and N20 emission factors are from IVL: Methodology for Calculating Emissions from Ships: Update on Emission Factors, 2004, also summarized in POLA 2009 Emissions Inventory, Appendix B. CH4 is 2% of HC, per IVL study.

Table H1.12

SOx Emission Factor - Harbor Craft

Harbor Craft	0.00552 g/hp-hr	
Dredging Equipment	use OFFROAD BSCF and convert to g SOx /hp-hr	
SOx (gms/hp-hr) = (S content in X/1,000,000) x (MW SO2/ MW S) x BSF =		
Where:		
X = S content in parts per million (ppm)		15 ppm
S MW = Molecular Weight		32
SO2 MW = Molecular Weight		64
BSFC for harbor craft = Brake Specific Fuel Consumption (per CARB 2007 Harbor Craft Methodology)		184 (g/hp-hr)

Table H1.13

Habor Craft Load Factor

Type		Main Engine	Auxiliary Engine
Assist tugboat		0.31	0.43
Commercial fishing		0.27	0.43
Crew boat		0.38	0.32
Excursion		0.42	0.43
Ferry		0.42	0.43
Government		0.51	0.43
Ocean tug		0.68	0.43
Tugboat		0.31	0.43
Workboat	Diveboat	0.38	0.32

Source:
2013 POLB Emissions Inventory, Table 3.4.

Table H1.14

Paved Road Dust Emission Factor Derivation

Emission Source	(sL) Silt Loading (g/m2)	(k) Particle Size Multiplier - PM10 (g/VMT)	(k) Particle Size Multiplier - PM2.5 (g/VMT)	(W) Average Vehicle Weight on Road (tons)	(E) Uncontrolled PM10 Emission Factor (g/VMT)	(E) Uncontrolled PM2.5 Emission Factor (g/VMT)
Onsite Trucks	0.6	1.00	0.25	20.0	**13.34**	**3.34**
Offsite Roadway (all vehicles) - CARB 2016						
Freeway Statewide	0.015	1.00	0.25	2.4	0.05	0.01
Major LA County	0.013	1.00	0.25	2.4	0.05	0.01
Collector LA County	0.013	1.00	0.25	2.4	0.05	0.01
Local LA County	0.135	1.00	0.25	2.4	0.39	0.10

Notes:

1. Emission factors are calculated using CARB's Miscellaneous Process Methodology 7.9, Entrained Road Travel, Paved Road Dust.

November 2016. Available: https://ww3.arb.ca.gov/ei/areasrc/fullpdf/full7-9_2016.pdf. Accessed 7/2019. Because the emissions are primarily used for peak day or peak hour calculations, downward adjustment due to annual precipitation was not made.

2. Emission factors exclude engine exhaust, tire wear, and brake wear, which are accounted for in EMFAC calculations.

3. The equation is: E = k (sL)^0.91 x (W)^1.02

Summary of Daily VMT by Roadway Type

Los Angeles - Long Beach - Santa Ana Metro Area

Metropolitan Area	Interstate/ Other Fwy/ Exprwy	Other Principal Arterial	Minor Arterial	Collector	Local
Daily Vehicle-Miles Travelled (Thousands)	132,796	67,118	49,528	15,304	14,481
Travel Fraction	0.48	0.24	0.18	0.05	0.05

Source: Federal Highway Adminstration. Highway Statistics 2016 - Urbanized Areas - 2016 Miles and Daily Last accessed February 2019. https://www.fhwa.dot.gov/policyinformation/statistics/2016/

Composite Paved Road Dust Emission Factors for Project Trips

	Fraction of Travel by Roadway Type					Composite EF	
Road Type	Interstate/ Other Fwy/ Exprwy	Other Principal Arterial	Minor Arterial	Collector	Local	PM10 (g/VMT)	PM2.5 (g/VMT)
Vehicle Trips in Los Angeles - Long Beach - Santa Ana Metro Area	0.48	0.24	0.18	0.05	0.05	**0.068**	**0.017**

Table H1.15

Material Loading/Handling Dust Emision Factors

PM10 (lb/ton)	0.0560274
PM2.5 (lb/ton)	0.0084841

$EF = (k)(0.0032)[(U/5)^{1.3}]/[(M/2)^{1.4}]$

EF = lb/ton

k = Particle Size Constant (0.35 for PM10 and 0.053 for PM2.5)

U = average wind speed = 2.2 m/s (CalEEMod), 4.9 mph

M = moisture content = 12% (CalEEMod)

Soil density (ton/cyd):	1.26
Truck capacity (cyd)	20
Truck capacity (ton)	25.28

Source: AP-42, p. 13.2.4 & CalEEMod

Table H1.16

Asphalt Paving

VOC (lb/acre)	2.62	(lb/ft2)	6.015E-05

Source: CalEEMod, Appendix A, Section 4.8.

Table H1.17
OFFROAD 2017 Output

OFFROAD2017 (v1.0.1) Emissions Inventory
Region Type: Air District
Region: South Coast AQMD
Calendar Year: 2024
Scenario: All Adopted Rules - Exhaust
Vehicle Classification: OFFROAD2017 Equipment Types
Units: Emissions: tons/day, Fuel Consumption: gallons/year, Activity: hours/year, HP-Hours: HP-hours/year

Region	CalYr	VehClass	MdlYr	HP_Bin	Fuel	HC_tpd	ROG_tpd	TOG_tpd	CO_tpd	NOx_tpd	CO2_tpd	PM10_tpd	PM2_5_tpd	PM_tpd	SOx_tpd	NH3_tpd	Fuel_gpy	Total_Activity_hpy	Total_Population	Horsepower_Hours_hhpy
South Coast	2024	Industrial - Aerial Lifts	Aggregated	25	Diesel	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
South Coast	2024	Industrial - Aerial Lifts	Aggregated	50	Diesel	0.003326937	0.004025594	0.004790789	0.079014703	0.073312641	14.908399	0.000549907	0.000505915	0.000549907	0.000137736	0.00012168	483686.6	591600.15	1911.1402	27291100
South Coast	2024	Industrial - Aerial Lifts	Aggregated	75	Diesel	0.00196584	0.002378667	0.00283081	0.068456702	0.035496583	11.411501	0.000789221	0.000726084	0.000789221	0.000105446	9.31391E-05	370233.6	332424.62	1079.5822	23226784.67
South Coast	2024	Industrial - Aerial Lifts	Aggregated	100	Diesel	0.002124473	0.002570612	0.003059241	0.087821283	0.039766347	14.601892	0.000515682	0.000474427	0.000515682	0.000134938	0.000119179	473742.3	382664.21	1235.6121	29712613.35
South Coast	2024	Industrial - Aerial Lifts	Aggregated	175	Diesel	0.000214867	0.000259989	0.000309409	0.008606927	0.001722874	1.589834	7.29618E-05	6.71248E-05	7.29618E-05	1.46924E-05	1.2976E-05	51580.414	24809.443	80.269691	3236722.847
South Coast	2024	Industrial - Aerial Lifts	Aggregated	300	Diesel	1.20506E-05	1.45812E-05	1.73529E-05	0.000174235	0.000123207	0.095005	1.66541E-06	1.53218E-06	1.66541E-06	8.78006E-07	7.75418E-07	3082.3312	840.96234	2.7057199	193421.3391
South Coast	2024	Industrial - Aerial Lifts	Aggregated	600	Diesel	6.889E-06	8.33569E-06	9.92015E-06	0.000122497	3.36709E-05	0.0674673	1.17545E-06	1.08141E-06	1.17545E-06	6.23562E-07	5.50659E-07	2188.9019	280.32078	0.9019066	137357.1828
South Coast	2024	OFF - ConstMin - Plate Compactors	Aggregated	25	Diesel	0.00057186	0.000680561	0.000823478	0.004319479	0.005156935	0.7074236	0.000201509	0.000185389	0.000201509	1.10081E-05	5.93633E-06	23597.25	119822.2	199.52	958577.6
South Coast	2024	OFF - Light Commercial - Air Compressors	Aggregated	25	Diesel	0.000876803	0.001043468	0.001262597	0.004623625	0.00778996	1.0040399	0.000324279	0.000298337	0.000324279	1.33207E-05	8.40727E-06	33419.4	61002.45	74.88	1218428.4
South Coast	2024	OFF - Light Commercial - Air Compressors	Aggregated	50	Diesel	0.009822428	0.011689501	0.014144297	0.09693465	0.076597813	11.231237	0.002732976	0.002514338	0.002732976	0.000145192	9.4613E-05	376092.35	368463.85	452.64	13633162.45
South Coast	2024	ConstMin - Cranes	Aggregated	25	Diesel	2.0286E-05	2.4546E-05	2.92118E-05	0.000113714	9.66561E-05	0.0116572	7.59123E-06	6.98393E-06	7.59123E-06	1.07168E-07	9.51442E-08	378.20384	913.58918	1.8645734	22839.72944
South Coast	2024	ConstMin - Cranes	Aggregated	50	Diesel	0.000533764	0.000645855	0.000768621	0.00240237	0.001906914	0.1888651	0.000192194	0.000176818	0.000192194	1.73014E-06	1.54149E-06	6127.5216	8886.7971	19.888783	366338.4637
South Coast	2024	ConstMin - Cranes	Aggregated	75	Diesel	0.000150058	0.000181571	0.000216084	0.0006252	0.001360003	0.0724763	0.000128061	0.000117816	0.000128061	6.65577E-07	5.91542E-07	2351.413	2336.9873	6.2152447	156830.8722
South Coast	2024	ConstMin - Cranes	Aggregated	100	Diesel	0.00341141	0.004127807	0.004912431	0.033268294	0.03700243	4.5468204	0.002322333	0.002136547	0.002322333	4.19353E-05	3.71105E-05	147516.58	111966.96	244.88064	9930003.218
South Coast	2024	ConstMin - Cranes	Aggregated	175	Diesel	0.007878513	0.009533001	0.011345059	0.082290973	0.091768248	12.794175	0.004960442	0.004563606	0.004960442	0.000118052	0.000104424	415092.91	188449.19	404.61243	27828778.99
South Coast	2024	ConstMin - Cranes	Aggregated	300	Diesel	0.010227138	0.012374837	0.014727078	0.070919069	0.13264119	22.212489	0.005532029	0.005089467	0.005532029	0.000205059	0.000181295	720659.73	220360.18	456.82048	48391095.85
South Coast	2024	ConstMin - Cranes	Aggregated	600	Diesel	0.013079131	0.015825749	0.018833949	0.126470765	0.160367746	39.707164	0.006453087	0.00593684	0.006453087	0.00036672	0.000324085	1288255.2	235911.53	465.52183	86509887
South Coast	2024	ConstMin - Cranes	Aggregated	750	Diesel	0.000414325	0.000501334	0.000596629	0.003739171	0.005075816	0.683406	0.000251319	0.000231213	0.000251319	6.306E-06	5.57787E-06	22172.354	2334.8086	5.5937202	1489529.811
South Coast	2024	ConstMin - Cranes	Aggregated	9999	Diesel	0.001949465	0.002358853	0.00280723	0.020123424	0.028121534	2.1690511	0.00124691	0.001147157	0.00124691	1.99955E-05	1.77035E-05	70372.473	5039.9912	9.9443915	4725395.503
South Coast	2024	ConstMin - Bore/Drill Rigs	Aggregated	25	Diesel	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
South Coast	2024	ConstMin - Bore/Drill Rigs	Aggregated	50	Diesel	0.00051222	0.000619786	0.000737597	0.004409124	0.004234062	0.6033835	0.000223061	0.000205216	0.000223061	5.56321E-06	4.92474E-06	19576.114	17120.573	47.013303	664158.3093
South Coast	2024	ConstMin - Bore/Drill Rigs	Aggregated	75	Diesel	0.000263062	0.000318305	0.000378809	0.004716774	0.004728884	0.7420076	0.000228886	0.000210575	0.000228886	6.85234E-06	6.05617E-06	24073.619	12982.677	26.228474	943030.4836
South Coast	2024	ConstMin - Bore/Drill Rigs	Aggregated	100	Diesel	0.000793599	0.000960255	0.001142782	0.019037587	0.011339025	3.029392	0.000420387	0.000386756	0.000420387	2.79844E-05	2.47255E-05	98285.289	45684.545	117.28582	3828325.49
South Coast	2024	ConstMin - Bore/Drill Rigs	Aggregated	175	Diesel	0.000864172	0.001045648	0.001244408	0.024581837	0.008641458	4.4183065	0.000395182	0.000363567	0.000395182	4.08235E-05	3.60616E-05	143347.09	36690.577	113.3268	5472037.01
South Coast	2024	ConstMin - Bore/Drill Rigs	Aggregated	300	Diesel	0.001173139	0.001419498	0.00168932	0.012973941	0.013711353	6.437411	0.000444948	0.000409352	0.000444948	5.94819E-05	5.25413E-05	208854.71	38539.793	116.79094	8081075.955
South Coast	2024	ConstMin - Bore/Drill Rigs	Aggregated	600	Diesel	0.001554492	0.001880935	0.002238468	0.018645424	0.014595768	9.9165954	0.00052562	0.00048357	0.00052562	9.16372E-05	8.09379E-05	321733.02	31270.72	92.541974	12510630.99
South Coast	2024	ConstMin - Bore/Drill Rigs	Aggregated	750	Diesel	0.000781732	0.000945895	0.001125694	0.011646979	0.006753384	6.4171702	0.000260066	0.000239261	0.000260066	5.93065E-05	5.23761E-05	208198.02	12460.525	20.784828	7940119.213
South Coast	2024	ConstMin - Bore/Drill Rigs	Aggregated	9999	Diesel	0.000874856	0.001058576	0.001259793	0.0061952	0.024104296	3.295717	0.000556735	0.000512196	0.000556735	3.04443E-05	2.68992E-05	106925.91	2215.243	2.9692612	4121374.97
South Coast	2024	ConstMin - Excavators	Aggregated	25	Diesel	2.61182E-05	3.16031E-05	3.76103E-05	8.87472E-05	6.0281E-05	0.0046697	8.40136E-06	7.72925E-06	8.40136E-06	4.23906E-08	3.81139E-08	151.50483	275.77022	1.1054457	6894.255522
South Coast	2024	ConstMin - Excavators	Aggregated	50	Diesel	0.014301432	0.017304733	0.020594062	0.174964361	0.14597323	24.486123	0.004967812	0.004570387	0.004967812	0.000225957	0.000199852	794425.29	1009598	1349.1965	36148196.64
South Coast	2024	ConstMin - Excavators	Aggregated	75	Diesel	0.000507738	0.000614363	0.000731143	0.003570783	0.005562328	0.459396	0.000486584	0.000447657	0.000486584	4.23211E-06	3.74953E-06	14904.596	10331.373	17.687131	754837.4229
South Coast	2024	ConstMin - Excavators	Aggregated	100	Diesel	0.010208364	0.01235212	0.014700044	0.205672734	0.129200323	31.273571	0.005594634	0.005147063	0.005594634	0.000288833	0.000255251	1014636.6	633591.45	954.55236	51613820.79
South Coast	2024	ConstMin - Excavators	Aggregated	175	Diesel	0.018032642	0.021819497	0.025967005	0.391556344	0.169853816	67.036141	0.008413443	0.007740368	0.008413443	0.000619241	0.00054714	2174913.8	753439.12	1245.2846	110081748.9
South Coast	2024	ConstMin - Excavators	Aggregated	300	Diesel	0.018874332	0.022837941	0.027179038	0.179374516	0.183938627	85.411425	0.006010834	0.005529967	0.006010834	0.000789105	0.000697117	2771079.6	640988.81	1072.835	140136243.1
South Coast	2024	ConstMin - Excavators	Aggregated	600	Diesel	0.028770215	0.03481196	0.041429109	0.301095489	0.23734104	151.63337	0.008158568	0.007505882	0.008158568	0.001401063	0.001237611	4919577.8	738096.09	1125.3437	249471503.6
South Coast	2024	ConstMin - Excavators	Aggregated	750	Diesel	0.00057652	0.000697589	0.000830189	0.005593627	0.007306292	1.8945769	0.000289998	0.000266798	0.000289998	1.7499E-05	1.54633E-05	61467.46	5041.3638	8.8435656	3094568.773
South Coast	2024	ConstMin - Excavators	Aggregated	9999	Diesel	0.000527283	0.000638013	0.000759288	0.007852624	0.0186676	4.2238993	0.000168585	0.000155098	0.000168585	3.90362E-05	3.44749E-05	137039.76	5756.9455	8.2908427	6862542.808
South Coast	2024	Industrial - Forklifts	Aggregated	25	Diesel	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
South Coast	2024	Industrial - Forklifts	Aggregated	50	Diesel	0.009766457	0.011817413	0.014063699	0.086864408	0.06895685	10.033952	0.003465042	0.003187838	0.003465042	9.24759E-05	8.18958E-05	325540.51	663567.5	885.96181	28152589.38
South Coast	2024	Industrial - Forklifts	Aggregated	75	Diesel	0.001763312	0.002133608	0.002539169	0.007030789	0.016791477	0.6530002	0.001308283	0.00120362	0.001308283	5.98441E-06	5.3297E-06	21185.873	28130.245	62.969187	2050942.214
South Coast	2024	Industrial - Forklifts	Aggregated	100	Diesel	0.054981773	0.066527946	0.079173754	0.824370118	0.627377742	120.20099	0.03587931	0.033008965	0.03587931	0.001109668	0.000981064	3899788.7	4558134.9	5848.8124	375713959.6
South Coast	2024	Industrial - Forklifts	Aggregated	175	Diesel	0.013475249	0.016305051	0.019404358	0.229756629	0.135380414	38.198857	0.006967114	0.006409745	0.006967114	0.000352763	0.000311774	1239319.9	844249.57	1101.2286	119291770.4
South Coast	2024	Industrial - Forklifts	Aggregated	300	Diesel	0.002488849	0.003011508	0.003583943	0.019027699	0.024884209	8.3200432	0.000939482	0.000864323	0.000939482	7.68483E-05	6.79071E-05	269934.64	123583.15	161.08397	25946815.34
South Coast	2024	Industrial - Forklifts	Aggregated	600	Diesel	0.000771931	0.000934036	0.00111158	0.004956592	0.007541408	2.1019464	0.000285909	0.000263036	0.000285909	1.94104E-05	1.71558E-05	68195.337	18394.169	24.894795	6519863.032
South Coast	2024	Industrial - Forklifts	Aggregated	9999	Diesel	2.78196E-05	3.36617E-05	4.00602E-05	0.000325499	0.000760618	0.1663868	7.03585E-06	6.47298E-06	7.03585E-06	1.53749E-06	1.35803E-06	5398.2354	590.32449	0.7321998	519485.5481
South Coast	2024	OFF - Light Commercial - Generator Sets	Aggregated	25	Diesel	0.02121002	0.025241677	0.030542429	0.133197229	0.202293488	26.255631	0.00834676	0.007679019	0.00834676	0.000366459	0.000219883	874047.25	1437665.7	4258.77	20672851.75
South Coast	2024	OFF - Light Commercial - Generator Sets	Aggregated	50	Diesel	0.018458294	0.021966895	0.026579943	0.208124013	0.1965088	31.085386	0.006015189	0.005533974	0.006015189	0.000401856	0.000260655	1036118.2	741690.95	2197.08	24475801.35
South Coast	2024	ConstMin - Rubber Tired Loaders	Aggregated	25	Diesel	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
South Coast	2024	ConstMin - Rubber Tired Loaders	Aggregated	50	Diesel	0.002718664	0.003289583	0.003914876	0.019523559	0.014568556	1.9122025	0.000933331	0.000858665	0.000933331	1.75977E-05	1.56071E-05	62039.305	71581.408	81.429742	2967204
South Coast	2024	ConstMin - Rubber Tired Loaders	Aggregated	75	Diesel	0.000208588	0.000252391	0.000300366	0.000865126	0.00195542	0.0993576	0.000175097	0.000161089	0.000175097	9.12353E-07	8.10944E-07	3223.5495	2345.2452	4.4016077	174427.6092
South Coast	2024	ConstMin - Rubber Tired Loaders	Aggregated	100	Diesel	0.02867256	0.034693798	0.041288487	0.339598613	0.291967625	46.383324	0.019201809	0.017665664	0.019201809	0.000427977	0.000378574	1504855.9	943929.68	1000.8155	81118397.57
South Coast	2024	ConstMin - Rubber Tired Loaders	Aggregated	175	Diesel	0.043073681	0.052119154	0.0620261	0.6912983	0.399254028	110.47658	0.021380367	0.019669938	0.021380367	0.001020119	0.000901695	3584291	1281985.7	1333.6871	192101453
South Coast	2024	ConstMin - Rubber Tired Loaders	Aggregated	300	Diesel	0.050310658	0.060875896	0.072447347	0.368737462	0.562927377	166.21495	0.018666486	0.017173167	0.018666486	0.00153523	0.001356624	5392660.8	1371060	1252.8076	288830495.4
South Coast	2024	ConstMin - Rubber Tired Loaders	Aggregated	600	Diesel	0.069419209	0.083997243	0.099963662	0.5161172	0.687779611	201.47439	0.026029491	0.023947132	0.026029491	0.001860648	0.001644407	6536614.8	1056605.6	1067.3899	350564257.6
South Coast	2024	ConstMin - Rubber Tired Loaders	Aggregated	750	Diesel	0.005914509	0.007156556	0.008516893	0.055872518	0.047384456	19.107969	0.001715892	0.00157862	0.001715892	0.000176485	0.000155957	619937.03	51273.308	51.168689	33237564.36
South Coast	2024	ConstMin - Rubber Tired Loaders	Aggregated	9999	Diesel	0.004770226	0.005771973	0.006869125	0.031649189	0.101131032	14.314569	0.002096418	0.001928705	0.002096418	0.000132202	0.000116834	464420.43	25882.558	21.457837	24784347.74
South Coast	2024	OFF - ConstMin - Cement and Mortar Mixers	Aggregated	25	Diesel	0.00083898	0.000998456	0.001208131	0.005871732	0.007576109	1.0280532	0.000295881	0.000272211	0.000295881	1.54066E-05	8.61663E-06	34251.6	103638.1	345.19	1069574.1
South Coast	2024	ConstMin - Pavers	Aggregated	25	Diesel	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
South Coast	2024	ConstMin - Pavers	Aggregated	50	Diesel	0.000894062	0.001081815	0.00128745	0.005641957	0.004784583	0.6708561	0.000317712	0.000292295	0.000317712	6.17558E-06	5.47544E-06	21765.186	23489.024	64.727137	909960.9803
South Coast	2024	ConstMin - Pavers	Aggregated	75	Diesel	0.001142034	0.001381861	0.001644529	0.006000588	0.010371064	0.776833	0.001000061	0.000920056	0.001000061	7.14795E-06	6.34041E-06	25203.491	16531.624	46.387781	1181453.775
South Coast	2024	ConstMin - Pavers	Aggregated	100	Diesel	0.002211828	0.002676311	0.003185032	0.036988361	0.029262745	5.6880144	0.001560137	0.001435326	0.001560137	5.25222E-05	4.64248E-05	184541.36	106751.56	265.92065	8614366.98
South Coast	2024	ConstMin - Pavers	Aggregated	175	Diesel	0.002721805	0.003293384	0.003919399	0.050529022	0.031072553	8.863986	0.001478319	0.001360053	0.001478319	8.18703E-05	7.23467E-05	287582.26	84677.461	214.67834	13361041.79
South Coast	2024	ConstMin - Pavers	Aggregated	300	Diesel	0.001409079	0.001704986	0.002029074	0.013215103	0.019379495	6.9182465	0.000627429	0.000577234	0.000627429	6.39203E-05	5.64658E-05	224454.89	47355.571	103.02403	10434925.44
South Coast	2024	ConstMin - Pavers	Aggregated	600	Diesel	0.000204541	0.000247495	0.000294539	0.002353635	0.002360001	1.2732926	6.63257E-05	6.10196E-05	6.63257E-05	1.17661E-05	1.03924E-05	41310.576	5094.9923	11.327249	1923521.386
South Coast	2024	ConstMin - Pavers	Aggregated	750	Diesel	2.37991E-05	2.87969E-05	3.42707E-05	0.000465306	0.000128362	0.2594833	4.41859E-06	4.0651E-06	4.41859E-06	2.39834E-06	2.11787E-06	8418.6504	522.48251	1.0787856	391861.8823
South Coast	2024	OFF - Light Commercial - Pumps	Aggregated	25	Diesel	0.011601955	0.013807285	0.016706815	0.071496026	0.10368016	13.478816	0.004414417	0.004061264	0.004414417	0.000192725	0.000112954	448997.45	965687.8	2399.3	10612929.8
South Coast	2024	OFF - Light Commercial - Pumps	Aggregated	50	Diesel	0.011890183	0.0141503	0.017121863	0.127856018	0.116552114	18.193843	0.003744271	0.00344473	0.003744271	0.000235201	0.000152688	606943.9	387177.4	961.89	14325563.8

Table H1.17
OFFROAD 2017 Output

OFFROAD2017 (v1.0.1) Emissions Inventory
Region Type: Air District
Region: South Coast AQMD
Calendar Year: 2024
Scenario: All Adopted Rules - Exhaust
Vehicle Classification: OFFROAD2017 Equipment Types
Units: Emissions: tons/day, Fuel Consumption: gallons/year, Activity: hours/year, HP-Hours: HP-hours/year

Region	CalYr	VehClass	MdlYr	HP_Bin	Fuel	HC_tpd	ROG_tpd	TOG_tpd	CO_tpd	NOx_tpd	CO2_tpd	PM10_tpd	PM2_5_tpd	PM_tpd	SOx_tpd	NH3_tpd	Fuel_gpy	Total_Activity_hpy	Total_Population	Horsepower_Hours_hhpy
South Coast	2024	ConstMin - Rollers	Aggregated	25	Diesel	1.23124E-05	1.4898E-05	1.77299E-05	4.09387E-05	2.81896E-05	0.0021541	3.87551E-06	3.56547E-06	3.87551E-06	1.95467E-08	1.75818E-08	69.888498	129.65933	0.5548322	3241.483206
South Coast	2024	ConstMin - Rollers	Aggregated	50	Diesel	0.011992489	0.014510912	0.017269184	0.098438392	0.0895041	13.770478	0.00450214	0.004141969	0.00450214	0.000126955	0.000112393	446767.98	579437.17	1636.2003	20710298.11
South Coast	2024	ConstMin - Rollers	Aggregated	75	Diesel	0.000421644	0.00051019	0.000607168	0.001676968	0.004108178	0.1440202	0.000292348	0.00026896	0.000292348	1.31889E-06	1.17547E-06	4672.576	3397.0744	14.425638	240816.2704
South Coast	2024	ConstMin - Rollers	Aggregated	100	Diesel	0.008695146	0.010521127	0.012521011	0.138388178	0.11129523	21.378227	0.005815078	0.005349871	0.005815078	0.000197391	0.000174486	693593.04	409397.38	1206.2053	35725253.04
South Coast	2024	ConstMin - Rollers	Aggregated	175	Diesel	0.004923844	0.005957852	0.007090336	0.122822641	0.055812137	22.25171	0.002550065	0.00234606	0.002550065	0.00020558	0.000181615	721932.22	258909.58	705.74662	37231225.07
South Coast	2024	ConstMin - Rollers	Aggregated	300	Diesel	0.001262148	0.001527199	0.001817493	0.010840604	0.01678491	3.7610907	0.000644822	0.000593237	0.000644822	3.47353E-05	3.06975E-05	122024.44	28939.962	91.547321	6285112.896
South Coast	2024	ConstMin - Rollers	Aggregated	600	Diesel	0.000458011	0.000554193	0.000659535	0.005551711	0.005668297	2.0783996	0.000192721	0.000177303	0.000192721	1.92021E-05	1.69636E-05	67431.385	9829.4737	31.625438	3457290.353
South Coast	2024	OFF - ConstMin - Concrete/Industrial Saws	Aggregated	25	Diesel	2.77468E-05	3.3021E-05	3.99554E-05	0.000136373	0.000252486	0.0331201	9.43423E-06	8.6795E-06	9.43423E-06	4.20231E-07	2.74549E-07	1091.35	1460	2.47	26280
South Coast	2024	OFF - ConstMin - Concrete/Industrial Saws	Aggregated	50	Diesel	0.000357428	0.000425369	0.000514696	0.003966817	0.003389996	0.5205313	0.000106107	9.76183E-05	0.000106107	6.72917E-06	4.37259E-06	17381.3	12574.25	21.69	414950.25
South Coast	2024	ConstMin - Sweepers/Scrubbers	Aggregated	25	Diesel	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
South Coast	2024	ConstMin - Sweepers/Scrubbers	Aggregated	50	Diesel	0.006662172	0.008061228	0.009593528	0.05406046	0.044072078	6.3492579	0.0025773	0.002371116	0.0025773	5.85022E-05	5.18218E-05	205994.68	220674.69	305.16729	7861115.123
South Coast	2024	ConstMin - Sweepers/Scrubbers	Aggregated	75	Diesel	0.001452469	0.001757487	0.002091555	0.008058636	0.012884958	0.9662441	0.001160007	0.001067206	0.001160007	8.88983E-06	7.88635E-06	31348.724	18620.121	37.808336	1339585.937
South Coast	2024	ConstMin - Sweepers/Scrubbers	Aggregated	100	Diesel	0.003624851	0.004386069	0.005219785	0.060272849	0.044447771	8.8467446	0.002327824	0.002141598	0.002327824	8.16838E-05	7.22059E-05	287022.89	154842.87	210.64644	12174024.85
South Coast	2024	ConstMin - Sweepers/Scrubbers	Aggregated	175	Diesel	0.001017612	0.00123131	0.001465361	0.014956776	0.010422026	2.4477513	0.000495738	0.000456079	0.000495738	2.26001E-05	1.99782E-05	79414.597	21078.906	28.626312	3369090.779
South Coast	2024	ConstMin - Sweepers/Scrubbers	Aggregated	300	Diesel	0.000432949	0.000523869	0.000623447	0.003152671	0.005546099	1.4699861	0.000178266	0.000164005	0.000178266	1.35778E-05	1.19978E-05	47692.079	9648.3328	12.962858	2023292.245
South Coast	2024	ConstMin - Sweepers/Scrubbers	Aggregated	600	Diesel	2.29474E-05	2.77664E-05	3.30443E-05	0.000366227	0.000100205	0.1985199	3.56024E-06	3.27542E-06	3.56024E-06	1.83473E-06	1.62029E-06	6440.7599	828.00972	1.0802382	273243.2084
South Coast	2024	ConstMin - Sweepers/Scrubbers	Aggregated	9999	Diesel	2.27293E-05	2.75024E-05	3.27301E-05	0.000455952	0.00109877	0.255068	8.77137E-06	8.06966E-06	8.77137E-06	2.35755E-06	2.08183E-06	8275.4006	414.00486	0.5401191	351076.1223
South Coast	2024	ConstMin - Off-Highway Trucks	Aggregated	25	Diesel	0.000128867	0.000155929	0.000185568	0.000546659	0.000360918	0.0371849	4.04906E-05	3.72513E-05	4.04906E-05	3.39926E-07	3.03498E-07	1206.4216	2198.4654	1.6210636	54961.63618
South Coast	2024	ConstMin - Off-Highway Trucks	Aggregated	50	Diesel	0.000791984	0.0009583	0.001140456	0.008510279	0.006412569	0.944039	0.000285524	0.000262682	0.000285524	8.70435E-06	7.70512E-06	30628.306	48486.833	29.179145	1406479.035
South Coast	2024	ConstMin - Off-Highway Trucks	Aggregated	75	Diesel	0.000119463	0.00014455	0.000172027	0.002441878	0.001010142	0.3278079	1.57444E-05	1.44848E-05	1.57444E-05	3.02716E-06	2.67552E-06	10635.365	7435.1319	4.8631908	536120.823
South Coast	2024	ConstMin - Off-Highway Trucks	Aggregated	100	Diesel	0.000367415	0.000444572	0.000529077	0.004878728	0.003805187	0.6478043	0.000249476	0.000229518	0.000249476	5.97825E-06	5.28729E-06	21017.297	12066.305	9.1860271	1061262.052
South Coast	2024	ConstMin - Off-Highway Trucks	Aggregated	175	Diesel	0.008357059	0.010112041	0.012034165	0.147215904	0.067944933	23.215059	0.003228043	0.002969799	0.003228043	0.000214384	0.000189478	753187.01	242050.29	168.59062	38211388.35
South Coast	2024	ConstMin - Off-Highway Trucks	Aggregated	300	Diesel	0.015129065	0.018306168	0.021785853	0.114997517	0.123528153	47.238543	0.004959633	0.004562862	0.004959633	0.00043629	0.000385555	1532602.5	370015.88	284.76684	77867725.97
South Coast	2024	ConstMin - Off-Highway Trucks	Aggregated	600	Diesel	0.058236141	0.07046573	0.083860042	0.459017571	0.474739913	202.75199	0.017019359	0.01565781	0.017019359	0.001872796	0.001654835	6578065.1	884662.62	634.37623	333092899.3
South Coast	2024	ConstMin - Off-Highway Trucks	Aggregated	750	Diesel	0.027894111	0.033751875	0.04016752	0.215852461	0.269766929	68.782433	0.010317412	0.009492019	0.010317412	0.000635091	0.000561393	2231570.3	170543.34	136.7097	113065982.5
South Coast	2024	ConstMin - Off-Highway Trucks	Aggregated	9999	Diesel	0.036383424	0.044023943	0.05239213	0.277142358	0.743397735	121.84398	0.013918208	0.012804751	0.013918208	0.001125417	0.000994474	3953093.8	157171.97	108.61126	199864257.2
South Coast	2024	Portable Equipment - Non-Rental Generator	Aggregated	9999	Diesel	0.054834837	0.066350153	0.078962166	0.364390609	0.860047669	173.40668	0.022422232	0.020628453	0.022422232	0.001601586	0.001415322	5625988.8	287460.91	209.54657	355674068.2
South Coast	2024	ConstMin - Other Construction Equipment	Aggregated	175	Diesel	0.003873866	0.004687378	0.005578367	0.05614685	0.045236761	9.3493624	0.0023471	0.002159332	0.0023471	8.63233E-05	7.63082E-05	303329.77	93141.719	220.48396	14171966.91
South Coast	2024	ConstMin - Other Construction Equipment	Aggregated	300	Diesel	0.004011354	0.004853739	0.00577635	0.030878801	0.051786757	12.214429	0.002006795	0.001846252	0.002006795	0.000112808	9.96925E-05	396283.68	84034.967	201.66216	18414850.18
South Coast	2024	ConstMin - Other Construction Equipment	Aggregated	600	Diesel	0.01221304	0.014777778	0.017586777	0.118138309	0.141507367	47.820916	0.005305875	0.004881405	0.005305875	0.000441762	0.000390308	1551496.9	188946.41	411.92856	72164310.34
South Coast	2024	ConstMin - Other Construction Equipment	Aggregated	750	Diesel	0.002402639	0.002907193	0.0034598	0.018556932	0.030189068	8.9145077	0.001049856	0.000965868	0.001049856	0.000082347	0.000072759	289221.38	21884.983	44.634557	13442495.18
South Coast	2024	ConstMin - Other Construction Equipment	Aggregated	9999	Diesel	0.000651657	0.000788505	0.000938386	0.005748044	0.016643808	3.0263327	0.000306163	0.00028167	0.000306163	2.79604E-05	2.47005E-05	98186.033	4977.8299	10.217549	4572752.526

Table H1.18
Onroad Vehicles Emission Factors

	Year	Vehicle Type	Units	PM10 brake wear	PM10 tire wear	PM2.5 brake wear	PM2.5 tire wear	PM10	PM2.5	DPM	NOX	SOX	CO	HC	VOC	CO2	CH4	N2O
Onsite Transit																		
	2024	Construction Trucks	g/mi					0.0138088	0.0132114	0.01380879	7.1482981	0.0222671	0.8332295		0.0954593	2356.9337	0.0044338	0.3704772
	2024	Worker Vehicles	g/mi					0.0094329	0.0086791	0.000157774	0.0773779	0.0062548	1.2481561		0.0622942	632.26873	0.0159141	0.0087178
	2025	Construction Trucks	g/mi					0.0125616	0.0120182	0.012561611	7.2105688	0.0220306	0.8408242		0.0902488	2331.8994	0.0041918	0.3665421
	2025	Worker Vehicles	g/mi					0.009093	0.0083658	0.000134133	0.0698737	0.0060653	1.1723031		0.0552776	613.11787	0.0142835	0.008216
	2026	Construction Trucks	g/mi					0.0114689	0.0109728	0.011468947	7.2869609	0.0218538	0.8488409		0.0855193	2313.1788	0.0039721	0.3635995
	2026	Worker Vehicles	g/mi					0.0087032	0.0080066	0.000111355	0.0637728	0.0058973	1.1099064		0.0494789	596.14033	0.0129276	0.0078087
Offsite Transit																		
	2024	Construction Trucks	g/mi	0.13034	0.012	0.05586	0.003	0.0100878	0.0096514	0.010087792	1.4591341	0.0086835	0.0838267		0.0115988	919.13301	0.0005387	0.1444749
	2024	Worker Vehicles	g/mi	0.03675	0.008	0.01575	0.002	0.0016106	0.0014829	5.21621E-05	0.0419133	0.0026543	0.6905881		0.0107865	268.3068	0.002754	0.0047139
	2025	Construction Trucks	g/mi	0.13034	0.012	0.05586	0.003	0.0099871	0.0095551	0.009987136	1.446922	0.0085844	0.0832898		0.0110903	908.64595	0.0005151	0.1428265
	2025	Worker Vehicles	g/mi	0.03675	0.008	0.01575	0.002	0.0015419	0.0014195	4.56363E-05	0.0376355	0.0025626	0.6460573		0.0094866	259.03839	0.0024539	0.004419
	2026	Construction Trucks	g/mi	0.13034	0.012	0.05586	0.003	0.00992	0.0094909	0.009920032	1.4390438	0.008509	0.0828843		0.0106317	900.66095	0.0004938	0.1415714
	2026	Worker Vehicles	g/mi	0.03675	0.008	0.01575	0.002	0.0014682	0.0013515	3.93525E-05	0.0342168	0.0024832	0.6098724		0.0084219	251.01696	0.0022067	0.0041838

Source: EMFAC2017
Notes: Refer to Table H1.19 for onsite and offsite transit vehicles speeds and worker vehicle fleet mix.

Table H1.19

EMFAC2017 Output Onsite Transit Fleet Mix Exhaust

EMFAC2017 (v1.0.2) Emission Rates
Region Type: Air District
Region: SOUTH COAST AQMD
Calendar Year: 2024, 2025, 2026
Season: Annual
Vehicle Classification: EMFAC2011 Categories
Units: miles/day for VMT, g/mile for RUNEX, PMBW and PMTW

Region	CalYr	VehClass	MdlYr	Speed	Fuel	VMT	ROG_RUNEX	TOG_RUNEX	CO_RUNEX	NOx_RUNEX	SOx_RUNEX	CO2_RUNEX	CH4_RUNEX	PM10_RUNEX	PM2_5_RUNEX	N2O_RUNEX	DPM
SOUTH COAST	2024	LDA	Aggregated	5	GAS	720460.97	0.0470391	0.0686394	1.05892149	0.0546265	0.0058733	593.51674	0.01285	0.0090214	0.0082949	0.0068814	0
SOUTH COAST	2024	LDA	Aggregated	5	DSL	7337.2646	0.1570907	0.1788373	3.091287246	0.1141596	0.0045594	482.29097	0.007297	0.018095	0.0173122	0.0758094	0.018095
SOUTH COAST	2024	LDT1	Aggregated	5	GAS	81952.175	0.1245176	0.1816814	2.038238071	0.1624728	0.0068432	691.52653	0.029136	0.0120593	0.0110882	0.0127061	0
SOUTH COAST	2024	LDT1	Aggregated	5	DSL	23.045112	0.7094762	0.8076915	3.723673086	0.7190657	0.0097987	1036.5024	0.032954	0.4710287	0.4506522	0.1629237	0.4710287
SOUTH COAST	2024	LDT2	Aggregated	5	GAS	247273.33	0.0816633	0.1191576	1.473764265	0.1137081	0.0072224	729.84822	0.020747	0.0094428	0.0086823	0.009991	0
SOUTH COAST	2024	LDT2	Aggregated	5	DSL	2002.5419	0.257779	0.2934642	2.356618059	0.1521124	0.0060967	644.90278	0.011973	0.0117186	0.0112117	0.1013697	0.0117186
SOUTH COAST	2024	T6 instate c	Aggregated	5	DSL	517.83259	0.0954593	0.1086731	0.833229494	7.1482981	0.0222671	2356.9337	0.004434	0.0138088	0.0132114	0.3704772	0.0138088
SOUTH COAST	2025	LDA	Aggregated	5	GAS	719865.83	0.041315	0.0602867	0.998863317	0.049705	0.005702	576.20675	0.011485	0.0087325	0.0080292	0.0065106	0
SOUTH COAST	2025	LDA	Aggregated	5	DSL	7572.0712	0.1468369	0.167164	3.043218836	0.102991	0.0044332	468.94706	0.00682	0.0150433	0.0143925	0.0737119	0.0150433
SOUTH COAST	2025	LDT1	Aggregated	5	GAS	83153.597	0.1087688	0.1587152	1.84570184	0.1435799	0.0066594	672.95289	0.025701	0.0113458	0.0104321	0.0116068	0
SOUTH COAST	2025	LDT1	Aggregated	5	DSL	21.61003	0.6745385	0.7679173	3.643948927	0.6755583	0.009606	1016.1174	0.031331	0.4350876	0.4162659	0.1597195	0.4350876
SOUTH COAST	2025	LDT2	Aggregated	5	GAS	248475.98	0.0732723	0.1069188	1.381806608	0.1018897	0.0069694	704.27494	0.018816	0.0091508	0.0084138	0.0092515	0
SOUTH COAST	2025	LDT2	Aggregated	5	DSL	2096.776	0.2581362	0.2938709	2.403328973	0.1513147	0.0059232	626.55562	0.01199	0.0108116	0.0103439	0.0984858	0.0108116
SOUTH COAST	2025	T6 instate c	Aggregated	5	DSL	513.877	0.0902488	0.1027414	0.840824192	7.2105688	0.0220306	2331.8994	0.004192	0.0125616	0.0120182	0.3665421	0.0125616
SOUTH COAST	2026	LDA	Aggregated	5	GAS	718112.77	0.0366883	0.0535355	0.950427358	0.0458416	0.0055499	560.82858	0.010369	0.0083858	0.0077104	0.0062177	0
SOUTH COAST	2026	LDA	Aggregated	5	DSL	7761.4934	0.137457	0.1564857	3.000891738	0.0931671	0.0043236	457.35359	0.006385	0.0120555	0.011534	0.0718896	0.0120555
SOUTH COAST	2026	LDT1	Aggregated	5	GAS	84093.411	0.0954301	0.1392514	1.681728688	0.1276488	0.0064961	656.44567	0.022784	0.0106604	0.0098018	0.0106829	0
SOUTH COAST	2026	LDT1	Aggregated	5	DSL	19.63734	0.6135771	0.6985168	3.546443567	0.6100648	0.0093765	991.84897	0.028499	0.3720013	0.3559087	0.1559048	0.3720013
SOUTH COAST	2026	LDT2	Aggregated	5	GAS	249304.65	0.0662088	0.0966117	1.30564874	0.0921561	0.0067457	681.67186	0.017184	0.0088093	0.0080998	0.0086447	0
SOUTH COAST	2026	LDT2	Aggregated	5	DSL	2177.4535	0.2589294	0.2947739	2.447840667	0.1510853	0.005777	611.08714	0.012027	0.0104381	0.0099865	0.0960544	0.0104381
SOUTH COAST	2026	T6 instate c	Aggregated	5	DSL	512.39198	0.0855193	0.0973572	0.848840877	7.2869609	0.0218538	2313.1788	0.003972	0.0114689	0.0109728	0.3635995	0.0114689

Table H1.20

EMFAC2017 Output Offsite Transit Fleet Mix Exhaust

EMFAC2017 (v1.0.2) Emission Rates

Region Type: Air District

Region: SOUTH COAST AQMD

Calendar Year: 2024, 2025, 2026

Season: Annual

Vehicle Classification: EMFAC2011 Categories

Units: miles/day for VMT, trips/day for Trips, g/mile for RUNEX, PMBW and PMTW, g/trip for STREX, HTSK and RUNLS, g/vehicle/day for IDLEX, RESTL and DIURN

Region	Calendar Year	Vehicle Category	Model Year	Speed	Fuel	Population	VMT	Trips	ROG_RUNEX	ROG_IDLEX	ROG_STREX	ROG_HOTSOAK	ROG_RUNLOSS	ROG_RESTLOSS	ROG_DIURN	TOG_RUNEX	TOG_IDLEX	TOG_STREX	TOG_HOTSOAK	TOG_RUNLOSS	TOG_RESTLOSS	TOG_DIURN
SOUTH COA	2024	LDA	Aggregated	Aggregated	GAS	6543321.5	247047080	30912773	0.0082219	0	0.1888817	0.0900536	0.1997274	0.2074037	0.2191751	0.0119974	0	0.2068017	0.0900536	0.1997274	0.2074037	0.2191751
SOUTH COA	2024	LDA	Aggregated	Aggregated	DSL	63999.088	2508733.2	304606.89	0.0145786	0	0	0	0	0	0	0.0165967	0	0	0	0	0	0
SOUTH COA	2024	LDA	Aggregated	Aggregated	ELEC	172307.13	7265020	857849.63	0	0	0	0.004888	0	0.0079037	0.023477	0	0	0	0.004888	0	0.0079037	0.023477
SOUTH COA	2024	LDT1	Aggregated	Aggregated	GAS	758038.32	27517267	3506784.4	0.0241292	0	0.2935381	0.1753748	0.6117487	0.4403211	0.5238993	0.0352054	0	0.3213871	0.1753748	0.6117487	0.4403211	0.5238993
SOUTH COA	2024	LDT1	Aggregated	Aggregated	DSL	328.77854	7657.7325	1149.5715	0.1708218	0	0	0	0	0	0	0.1944693	0	0	0	0	0	0
SOUTH COA	2024	LDT1	Aggregated	Aggregated	ELEC	8873.8766	385871.85	44565.445	0	0	0	0.004888	0	0.0078613	0.0233652	0	0	0	0.004888	0	0.0078613	0.0233652
SOUTH COA	2024	LDT2	Aggregated	Aggregated	GAS	2256847	83361536	10593017	0.0149087	0	0.2669594	0.1136523	0.3879008	0.3356143	0.332401	0.0217534	0	0.2922868	0.1136523	0.3879008	0.3356143	0.332401
SOUTH COA	2024	LDT2	Aggregated	Aggregated	DSL	16402.997	669969.53	80362.135	0.020122	0	0	0	0	0	0	0.0229076	0	0	0	0	0	0
SOUTH COA	2024	LDT2	Aggregated	Aggregated	ELEC	34685.637	1081895.4	174560.97	0	0	0	0.004888	0	0.0078852	0.0234323	0	0	0	0.004888	0	0.0078852	0.0234323
SOUTH COA	2024	T6 instate co	Aggregated	Aggregated	DSL	4467.8956	291328.11	20199.182	0.0115988	0.0497707	0	0	0	0	0	0.0132043	0.0566602	0	0	0	0	0
SOUTH COA	2025	LDA	Aggregated	Aggregated	GAS	6623932.9	247134863	31282323	0.0072078	0	0.1730799	0.0857858	0.1949939	0.1971446	0.2069079	0.0105176	0	0.1895006	0.0857858	0.1949939	0.1971446	0.2069079
SOUTH COA	2025	LDA	Aggregated	Aggregated	DSL	66922.32	2593390.4	318755.57	0.0131775	0	0	0	0	0	0	0.0150017	0	0	0	0	0	0
SOUTH COA	2025	LDA	Aggregated	Aggregated	ELEC	200007.11	8588255.8	994212.63	0	0	0	0.004888	0	0.0079137	0.0235063	0	0	0	0.004888	0	0.0079137	0.0235063
SOUTH COA	2025	LDT1	Aggregated	Aggregated	GAS	778181.88	27926963	3602142.6	0.0209762	0	0.2647065	0.1625491	0.5727636	0.4114373	0.4829739	0.0306084	0	0.2898203	0.1625491	0.5727636	0.4114373	0.4829739
SOUTH COA	2025	LDT1	Aggregated	Aggregated	DSL	306.69855	7182.2408	1077.0936	0.1589987	0	0	0	0	0	0	0.1810095	0	0	0	0	0	0
SOUTH COA	2025	LDT1	Aggregated	Aggregated	ELEC	10974.675	485559.29	55032.388	0	0	0	0.004888	0	0.0078683	0.0233853	0	0	0	0.004888	0	0.0078683	0.0233853
SOUTH COA	2025	LDT2	Aggregated	Aggregated	GAS	2295149.4	83832765	10772144	0.0133343	0	0.2461323	0.1083691	0.376717	0.3261566	0.3205227	0.0194574	0	0.2694839	0.1083691	0.376717	0.3261566	0.3205227
SOUTH COA	2025	LDT2	Aggregated	Aggregated	DSL	17587.778	702822.89	85874.295	0.0198868	0	0	0	0	0	0	0.0226398	0	0	0	0	0	0
SOUTH COA	2025	LDT2	Aggregated	Aggregated	ELEC	41917.383	1280277.3	210324.6	0	0	0	0.004888	0	0.0078902	0.0234468	0	0	0	0.004888	0	0.0078902	0.0234468
SOUTH COA	2025	T6 instate co	Aggregated	Aggregated	DSL	4547.4396	289102.73	20558.798	0.0110903	0.0496598	0	0	0	0	0	0.0126254	0.0565339	0	0	0	0	0
SOUTH COA	2026	LDA	Aggregated	Aggregated	GAS	6704944.2	246806990	31652207	0.006388	0	0.1593916	0.0819021	0.1906985	0.187688	0.1957856	0.0093213	0	0.1745138	0.0819021	0.1906985	0.187688	0.1957856
SOUTH COA	2026	LDA	Aggregated	Aggregated	DSL	69486.663	2662198.2	331542.63	0.0118584	0	0	0	0	0	0	0.0135	0	0	0	0	0	0
SOUTH COA	2026	LDA	Aggregated	Aggregated	ELEC	226692.73	9539586.4	1124278.2	0	0	0	0.004888	0	0.0079235	0.0235345	0	0	0	0.004888	0	0.0079235	0.0235345
SOUTH COA	2026	LDT1	Aggregated	Aggregated	GAS	797971.55	28250579	3694973.3	0.0183022	0	0.2394362	0.1509449	0.5377018	0.3845134	0.4455651	0.0267065	0	0.2621525	0.1509449	0.5377018	0.3845134	0.4455651
SOUTH COA	2026	LDT1	Aggregated	Aggregated	DSL	270.69602	6522.8307	971.57155	0.1391271	0	0	0	0	0	0	0.1583869	0	0	0	0	0	0
SOUTH COA	2026	LDT1	Aggregated	Aggregated	ELEC	13055.319	564811.17	65291.34	0	0	0	0.004888	0	0.0078739	0.0234014	0	0	0	0.004888	0	0.0078739	0.0234014
SOUTH COA	2026	LDT2	Aggregated	Aggregated	GAS	2335277.2	84175951	10957538	0.012009	0	0.2278263	0.1034755	0.3655973	0.3166753	0.3090774	0.0175236	0	0.2494411	0.1034755	0.3655973	0.3166753	0.3090774
SOUTH COA	2026	LDT2	Aggregated	Aggregated	DSL	18735.824	731082.45	91136.642	0.0198152	0	0	0	0	0	0	0.0225583	0	0	0	0	0	0
SOUTH COA	2026	LDT2	Aggregated	Aggregated	ELEC	48997.68	1464375.6	244977.96	0	0	0	0.004888	0	0.0078949	0.0234608	0	0	0	0.004888	0	0.0078949	0.0234608
SOUTH COA	2026	T6 instate co	Aggregated	Aggregated	DSL	4614.6301	288267.27	20862.563	0.0106317	0.0495653	0	0	0	0	0	0.0121033	0.0564263	0	0	0	0	0

Table H1.20

EMFAC2017 Output Offsite Transit Fleet Mix Exhaust

EMFAC2017 (v1.0.2) Emission Rates

Region Type: Air District

Region: SOUTH COAST AQMD

Calendar Year: 2024, 2025, 2026

Season: Annual

Vehicle Classification: EMFAC2011 Categories

Units: miles/day for VMT, trips/day for Trips, g/mile for RUNEX, PMBW an

Region	Calendar Year	Vehicle Category	Model Year	Speed	Fuel	CO_RUNEX	CO_IDLEX	CO_STREX	NOx_RUNEX	NOx_IDLEX	NOx_STREX	CO2_RUNEX	CO2_IDLEX	CO2_STREX	CH4_RUNEX	CH4_IDLEX	CH4_STREX	PM10_RUNEX	PM10_IDLEX	PM10_STREX	PM10_PMTW	PM10_PMBW	PM2_5_RUNEX
SOUTH COA	2024	LDA	Aggregated	Aggregated	GAS	0.6170464	0	2.0207049	0.0309611	0	0.1642574	258.07942	0	51.791051	0.0022311	0	0.0436026	0.0015408	0	0.0017461	0.008	0.03675	0.0014167
SOUTH COA	2024	LDA	Aggregated	Aggregated	DSL	0.2478206	0	0	0.0491271	0	0	199.32668	0	0	0.0006771	0	0	0.0059574	0	0	0.008	0.03675	0.0056997
SOUTH COA	2024	LDA	Aggregated	Aggregated	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.008	0.03675	0
SOUTH COA	2024	LDT1	Aggregated	Aggregated	GAS	1.1388644	0	2.1397201	0.0881606	0	0.2238707	301.4961	0	60.692708	0.0055697	0	0.0603888	0.002162	0	0.0023056	0.008	0.03675	0.0019879
SOUTH COA	2024	LDT1	Aggregated	Aggregated	DSL	1.0129839	0	0	0.9123372	0	0	439.67457	0	0	0.0079343	0	0	0.1275098	0	0	0.008	0.03675	0.1219938
SOUTH COA	2024	LDT1	Aggregated	Aggregated	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.008	0.03675	0
SOUTH COA	2024	LDT2	Aggregated	Aggregated	GAS	0.8502923	0	2.5178682	0.0632094	0	0.2371036	317.80192	0	65.105601	0.0037395	0	0.0589011	0.0016344	0	0.0017692	0.008	0.03675	0.0015027
SOUTH COA	2024	LDT2	Aggregated	Aggregated	DSL	0.1813322	0	0	0.0405709	0	0	271.56232	0	0	0.0009346	0	0	0.0050299	0	0	0.008	0.03675	0.0048123
SOUTH COA	2024	LDT2	Aggregated	Aggregated	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.008	0.03675	0
SOUTH COA	2024	T6 instate co	Aggregated	Aggregated	DSL	0.0838267	2.065668	0	1.4591341	2.9858499	2.608719	919.13301	611.50258	0	0.0005387	0.0023117	0	0.0100878	0.0010908	0	0.012	0.13034	0.0096514
SOUTH COA	2025	LDA	Aggregated	Aggregated	GAS	0.5828174	0	1.9420882	0.0281874	0	0.1548852	250.52752	0	50.2837	0.0019906	0	0.0404113	0.0014892	0	0.0016933	0.008	0.03675	0.0013692
SOUTH COA	2025	LDA	Aggregated	Aggregated	DSL	0.23993	0	0	0.0413241	0	0	193.81353	0	0	0.0006121	0	0	0.0050812	0	0	0.008	0.03675	0.0048614
SOUTH COA	2025	LDA	Aggregated	Aggregated	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.008	0.03675	0
SOUTH COA	2025	LDT1	Aggregated	Aggregated	GAS	1.0361128	0	2.0545514	0.0777812	0	0.2079147	293.35819	0	59.006598	0.0048877	0	0.0552078	0.0020231	0	0.0021721	0.008	0.03675	0.0018602
SOUTH COA	2025	LDT1	Aggregated	Aggregated	DSL	0.9514419	0	0	0.8441278	0	0	430.90778	0	0	0.0073852	0	0	0.1178524	0	0	0.008	0.03675	0.1127542
SOUTH COA	2025	LDT1	Aggregated	Aggregated	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.008	0.03675	0
SOUTH COA	2025	LDT2	Aggregated	Aggregated	GAS	0.7987576	0	2.4329096	0.0565713	0	0.2188839	306.65172	0	62.854964	0.0033811	0	0.0548503	0.0015807	0	0.0017244	0.008	0.03675	0.0014534
SOUTH COA	2025	LDT2	Aggregated	Aggregated	DSL	0.1833707	0	0	0.0385982	0	0	263.81093	0	0	0.0009237	0	0	0.0048189	0	0	0.008	0.03675	0.0046105
SOUTH COA	2025	LDT2	Aggregated	Aggregated	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.008	0.03675	0
SOUTH COA	2025	T6 instate co	Aggregated	Aggregated	DSL	0.0832898	2.0686502	0	1.446922	2.9691191	2.614563	908.64595	606.79401	0	0.0005151	0.0023066	0	0.0099871	0.0010229	0	0.012	0.13034	0.0095551
SOUTH COA	2026	LDA	Aggregated	Aggregated	GAS	0.5551503	0	1.8711474	0.026021	0	0.1470536	243.80237	0	48.911179	0.0017939	0	0.0376081	0.0014287	0	0.001636	0.008	0.03675	0.0013136
SOUTH COA	2026	LDA	Aggregated	Aggregated	DSL	0.2328975	0	0	0.0343627	0	0	189.00964	0	0	0.0005508	0	0	0.0042255	0	0	0.008	0.03675	0.0040427
SOUTH COA	2026	LDA	Aggregated	Aggregated	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.008	0.03675	0
SOUTH COA	2026	LDT1	Aggregated	Aggregated	GAS	0.9485731	0	1.9744754	0.0691259	0	0.1943035	286.11364	0	57.468364	0.004308	0	0.0506358	0.001893	0	0.0020461	0.008	0.03675	0.0017405
SOUTH COA	2026	LDT1	Aggregated	Aggregated	DSL	0.8707018	0	0	0.7424044	0	0	420.343	0	0	0.0064622	0	0	0.1007983	0	0	0.008	0.03675	0.0964378
SOUTH COA	2026	LDT1	Aggregated	Aggregated	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.008	0.03675	0
SOUTH COA	2026	LDT2	Aggregated	Aggregated	GAS	0.7560499	0	2.3573407	0.0511453	0	0.2035334	296.78376	0	60.814875	0.0030782	0	0.0512609	0.0015198	0	0.001672	0.008	0.03675	0.0013974
SOUTH COA	2026	LDT2	Aggregated	Aggregated	DSL	0.1858674	0	0	0.0375382	0	0	257.27608	0	0	0.0009204	0	0	0.0047493	0	0	0.008	0.03675	0.0045438
SOUTH COA	2026	LDT2	Aggregated	Aggregated	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.008	0.03675	0
SOUTH COA	2026	T6 instate co	Aggregated	Aggregated	DSL	0.0828843	2.0712518	0	1.4390438	2.9545035	2.6200331	900.66095	602.4448	0	0.0004938	0.0023022	0	0.00992	0.0009645	0	0.012	0.13034	0.0094909

Table H1.20

EMFAC2017 Output Offsite Transit Fleet Mix Exhaust

EMFAC2017 (v1.0.2) Emission Rates

Region Type: Air District

Region: SOUTH COAST AQMD

Calendar Year: 2024, 2025, 2026

Season: Annual

Vehicle Classification: EMFAC2011 Categories

Units: miles/day for VMT, trips/day for Trips, g/mile for RUNEX, PMBW an

Region	Calendar Year	Vehicle Category	Model Year	Speed	Fuel	PM2_5_IDLEX	PM2_5_STREX	PM2_5_PMTW	PM2_5_PMBW	SOx_RUNEX	SOx_IDLEX	SOx_STREX	N2O_RUNEX	N2O_IDLEX	N2O_STREX
SOUTH COA	2024	LDA	Aggregated	Aggregated	GAS	0	0.0016055	0.002	0.01575	0.0025539	0	0.0005125	0.0039333	0	0.0237369
SOUTH COA	2024	LDA	Aggregated	Aggregated	DSL	0	0	0.002	0.01575	0.0018844	0	0	0.0313314	0	0
SOUTH COA	2024	LDA	Aggregated	Aggregated	ELEC	0	0	0.002	0.01575	0	0	0	0	0	0
SOUTH COA	2024	LDT1	Aggregated	Aggregated	GAS	0	0.0021199	0.002	0.01575	0.0029835	0	0.0006006	0.0070454	0	0.0264144
SOUTH COA	2024	LDT1	Aggregated	Aggregated	DSL	0	0	0.002	0.01575	0.0041565	0	0	0.0691107	0	0
SOUTH COA	2024	LDT1	Aggregated	Aggregated	ELEC	0	0	0.002	0.01575	0	0	0	0	0	0
SOUTH COA	2024	LDT2	Aggregated	Aggregated	GAS	0	0.0016267	0.002	0.01575	0.0031449	0	0.0006443	0.0056392	0	0.0288227
SOUTH COA	2024	LDT2	Aggregated	Aggregated	DSL	0	0	0.002	0.01575	0.0025672	0	0	0.0426858	0	0
SOUTH COA	2024	LDT2	Aggregated	Aggregated	ELEC	0	0	0.002	0.01575	0	0	0	0	0	0
SOUTH COA	2024	T6 instate cc	Aggregated	Aggregated	DSL	0.0010436	0	0.003	0.05586	0.0086835	0.0057772	0	0.1444749	0.0961197	0
SOUTH COA	2025	LDA	Aggregated	Aggregated	GAS	0	0.0015569	0.002	0.01575	0.0024792	0	0.0004976	0.0037231	0	0.0227572
SOUTH COA	2025	LDA	Aggregated	Aggregated	DSL	0	0	0.002	0.01575	0.0018322	0	0	0.0304648	0	0
SOUTH COA	2025	LDA	Aggregated	Aggregated	ELEC	0	0	0.002	0.01575	0	0	0	0	0	0
SOUTH COA	2025	LDT1	Aggregated	Aggregated	GAS	0	0.0019972	0.002	0.01575	0.002903	0	0.0005839	0.0064378	0	0.0252484
SOUTH COA	2025	LDT1	Aggregated	Aggregated	DSL	0	0	0.002	0.01575	0.0040736	0	0	0.0677327	0	0
SOUTH COA	2025	LDT1	Aggregated	Aggregated	ELEC	0	0	0.002	0.01575	0	0	0	0	0	0
SOUTH COA	2025	LDT2	Aggregated	Aggregated	GAS	0	0.0015855	0.002	0.01575	0.0030346	0	0.000622	0.0052221	0	0.0273272
SOUTH COA	2025	LDT2	Aggregated	Aggregated	DSL	0	0	0.002	0.01575	0.002494	0	0	0.0414674	0	0
SOUTH COA	2025	LDT2	Aggregated	Aggregated	ELEC	0	0	0.002	0.01575	0	0	0	0	0	0
SOUTH COA	2025	T6 instate cc	Aggregated	Aggregated	DSL	0.0009786	0	0.003	0.05586	0.0085844	0.0057327	0	0.1428265	0.0953796	0
SOUTH COA	2026	LDA	Aggregated	Aggregated	GAS	0	0.0015042	0.002	0.01575	0.0024126	0	0.000484	0.0035575	0	0.0219275
SOUTH COA	2026	LDA	Aggregated	Aggregated	DSL	0	0	0.002	0.01575	0.0017868	0	0	0.0297097	0	0
SOUTH COA	2026	LDA	Aggregated	Aggregated	ELEC	0	0	0.002	0.01575	0	0	0	0	0	0
SOUTH COA	2026	LDT1	Aggregated	Aggregated	GAS	0	0.0018813	0.002	0.01575	0.0028313	0	0.0005687	0.0059312	0	0.0242542
SOUTH COA	2026	LDT1	Aggregated	Aggregated	DSL	0	0	0.002	0.01575	0.0039738	0	0	0.0660721	0	0
SOUTH COA	2026	LDT1	Aggregated	Aggregated	ELEC	0	0	0.002	0.01575	0	0	0	0	0	0
SOUTH COA	2026	LDT2	Aggregated	Aggregated	GAS	0	0.0015373	0.002	0.01575	0.0029369	0	0.0006018	0.0048815	0	0.0260461
SOUTH COA	2026	LDT2	Aggregated	Aggregated	DSL	0	0	0.002	0.01575	0.0024322	0	0	0.0404402	0	0
SOUTH COA	2026	LDT2	Aggregated	Aggregated	ELEC	0	0	0.002	0.01575	0	0	0	0	0	0
SOUTH COA	2026	T6 instate cc	Aggregated	Aggregated	DSL	0.0009228	0	0.003	0.05586	0.008509	0.0056916	0	0.1415714	0.0946959	0

Table H1.21

Vehicle Idling Exhaust Onsite Fleet Mix

EMFAC2011 Vehicle Category used in calculations	CY	EMFAC2007 Vehicle Category	Fuel_Type	air_basin	season	HC (g/hr-veh)	CO (g/hr-veh)	NOX (g/hr-veh)	PM10 (g/hr-veh)	PM2.5 (g/hr-veh)	CO2 (g/hr-veh)	CO2 (with Pavley+LCFS) (g/hr-veh)	TOG (g/hr-veh)	ROG (g/hr-veh)	Sox (g/hr-veh)
T6	2024	HHDT	D	SC	a	5.7674343	41.174525	39.594888	0.1098485	0.1010606	7034.4313	6330.9882	8.31491	7.3038788	0.0671118
MDV	2024	MHDT	D	SC	a	1.6687434	24.958118	40.456694	0.0924351	0.0850403	7631.5418	6868.3876	2.4058274	2.1132967	0.0728085
T6	2025	HHDT	D	SC	a	5.7741329	41.226754	39.487118	0.1095804	0.100814	7034.5905	6331.1314	8.3245674	7.3123619	0.0671133
MDV	2025	MHDT	D	SC	a	1.6722817	25.016612	40.203586	0.0921005	0.0847325	7632.6786	6869.4107	2.4109285	2.1177775	0.0728193
T6	2026	HHDT	D	SC	a	5.7806792	41.277289	39.381355	0.1093443	0.1005968	7034.7179	6331.2461	8.3340052	7.3206522	0.0671145
MDV	2026	MHDT	D	SC	a	1.6757603	25.073503	39.955666	0.0917989	0.084455	7633.684	6870.3156	2.4159437	2.1221829	0.0728289

Source:

EMFAC2011 Idling Emission Rates - Idling rates for combined model year: HD_Idle_ER worksheet

Table H1.22

Construction Equipment Load Factors

Equipment	CalEEMod HP	CalEEMod LF
Aerial Lifts	63	0.31
Air Compressors	78	0.48
Bore/Drill Rigs	221	0.5
Cement and Mortar Mixers	9	0.56
Concrete/Industrial Saws	81	0.73
Cranes	231	0.29
Crawler Tractors	212	0.43
Crushing/Proc. Equipment	85	0.78
Dumpers/Tenders	16	0.38
Excavators	158	0.38
Forklifts	89	0.2
Generator Sets	84	0.74
Graders	187	0.41
Off-Highway Tractors	124	0.44
Off-Highway Trucks	402	0.38
Other Construction Equipment	172	0.42
Other General Industrial Equipment	88	0.34
Other Material Handling Equipment	168	0.4
Pavers	130	0.42
Paving Equipment	132	0.36
Plate Compactors	8	0.43
Pressure Washers	13	0.3
Pumps	84	0.74
Rollers	80	0.38
Rough Terrain Forklifts	100	0.4
Rubber Tired Dozers	247	0.4
Rubber Tired Loaders	203	0.36
Scrapers	367	0.48
Signal Boards	6	0.82
Skid Steer Loaders	65	0.37
Surfacing Equipment	263	0.3
Sweepers/Scrubbers	64	0.46
Tractors/Loaders/Backhoes	97	0.37
Trenchers	78	0.5
Welders	46	0.45

Source:

CalEEMod, Appendix D.

Table H1.23

GHG Emission Factors

	CO2 (lb CO2/MWhr)	CH4 (lb CO2/GWhr)	N2O (lb CO2/GWhr)
Electricity generation	527.9	33	4

Source:
2019 Climate Registry Default Emission Factors, Table 3.1, Default Factors for Calculating Emissions from Grid Electricity by eGrid Subregion. CAMX subregion.

Table H1.24

Global Warming Potentials (GWP)

CO2	CH4	N2O
1	25	298

Source:
IPCC 2007. Intergovernmental Panel on Climate Change. 4th Assessment Report, Climate Change 2007: The Physical Science Basis, Chapter 2, Table 2.14. June, 4th Assessment Report was chosen to maintain consistency with the U.S. EPA, Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2015, April 2017.

Table H1.25

SOx Emission Factor - Offroad Construction Equipment

Offroad Construction Equipment less	0.005552064	g/hp-hr
Offroad Construction Equipment grea	0.004994136	g/hp-hr
SOx (gms/hp-hr) = (S content in X/1,000,000) x (MW SO2/ MW S) x BSF =		
Where:		
X = S content in parts per million (ppm)	15	ppm
S MW = Molecular Weight	32	
SO2 MW = Molecular Weight	64	
BSFC for offroad construction equipment less than 100 hp (per CARB OFFROAD 2017 Diesel Emission Factors excel spreadsheet)	0.408	(lb/hp-hr)
BSFC for offroad construction equipment greater than 100 hp (per CARB OFFROAD 2017 Diesel Emission Factors excel spreadsheet)	0.367	(lb/hp-hr)
BSFC for offroad construction equipment less than 100 hp	185.0688	(g/hp-hr)
BSFC for offroad construction equipment greater than 100 hp	166.4712	(g/hp-hr)

Table H1.26

Alternative 2 Emissions by Task

							Unmitigated Emissions										
							Peak Day										
							PM10	PM2.5	DPM	NOX	SOX	CO	VOC	CO2	CH4	N2O	CO2e
Task ID		**Construction Element/Equipment**	**Source Type 1**	**Source Type 2**	**Onsite/Offsite**	**Days Total**	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(tonnes/day)	(tonnes/day)	(tonnes/day)	(tonnes/day)
1	**Electrical Substation Construction at Pier J (mitigation only)**																
1		**Off-Road Equipment**															
1		Caterpillar 320 excavator	Offroad Construction Equipment		onsite	20	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1		Small asphalt roller	Offroad Construction Equipment		onsite	26	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1		Water truck	Offroad Construction Equipment		onsite	20	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1		Forklift	Offroad Construction Equipment		onsite	22	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1		Mobile crane (35 ton)	Offroad Construction Equipment		onsite	2	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1		**On-Road Vehicles**															
1		Haul trucks	Onroad Construction Vehicles		onsite	5	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1		Supply trucks	Onroad Construction Vehicles		onsite	5	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1		Haul trucks	Onroad Construction Vehicles		offsite	5	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1		Supply trucks	Onroad Construction Vehicles		offsite	5	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1		Workers	Onroad Construction Vehicles		offsite	60	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1		**Fugitive Dust**															
1		Soil handling	Fugitive Emissions		onsite	20	n/a	n/a									
1		Asphalting	Fugitive Emissions		onsite												
2	**Pier J Breakwater Construction**																
2		**Marine Activities**															
2		Pier J Breakwater Tugboat propulsion engine	Marine Equipment		onsite	54	5.81	5.17	5.81	108.18	0.06	58.10	6.00	3.44	0.00	0.00	3.4864
2		Pier J Breakwater Tugboat auxiliary engine	Marine Equipment		onsite	54	1.06	0.94	1.06	18.86	0.01	13.23	1.05	0.78	0.00	0.00	0.7941
2		Pier J Breakwater Crew boat propulsion engine	Marine Equipment		onsite	54	0.41	0.36	0.41	8.02	0.00	4.06	0.44	0.24	0.00	0.00	0.2437
2		Pier J Breakwater Crew boat auxiliary engine	Marine Equipment		onsite	54	0.03	0.03	0.03	0.60	0.00	0.42	0.03	0.02	0.00	0.00	0.0253
2		Pier J Breakwater Survey boat propulsion engine	Marine Equipment		onsite	54	0.36	0.32	0.36	7.16	0.00	3.62	0.40	0.21	0.00	0.00	0.2174
2		**Off-Road Equipment**															
2		Piling crane	Offroad Construction Equipment		onsite	54	0.21	0.19	0.21	5.00	0.01	2.67	0.47	0.38	0.00	0.00	0.3800
2		Long arm excavator	Offroad Construction Equipment		onsite	54	0.08	0.07	0.08	2.19	0.01	2.78	0.32	0.63	0.00	0.00	0.6340
2		**On-Road Vehicles**															
2		Delivery Trucks	Onroad Construction Vehicles		onsite	5	0.15	0.04	0.00	0.08	0.00	0.01	0.00	0.01	0.00	0.00	0.0123
2		Delivery Trucks	Onroad Construction Vehicles		offsite	5	0.49	0.19	0.02	3.22	0.02	0.18	0.03	0.92	0.00	0.00	0.9622
2		Workers	Onroad Construction Vehicles		offsite	54	0.16	0.05	0.00	0.06	0.00	0.96	0.01	0.17	0.00	0.00	0.1700

Table H1.26

Alternative 2 Emissions by Task

				Unmitigated Emissions										
				Total										
				PM10	PM2.5	DPM	NOX	SOX	CO	VOC	CO2	CH4	N2O	CO2e
Task ID		**Construction Element/Equipment**	**Source Type 1**	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(tonnes)	(tonnes)	(tonnes)	(tonnes)
1	**Electrical Substation Construction at Pier J (mitigation only)**													
1		**Off-Road Equipment**												
1		Caterpillar 320 excavator	Offroad Construction Equipment	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1		Small asphalt roller	Offroad Construction Equipment	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1		Water truck	Offroad Construction Equipment	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1		Forklift	Offroad Construction Equipment	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1		Mobile crane (35 ton)	Offroad Construction Equipment	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1		**On-Road Vehicles**												
1		Haul trucks	Onroad Construction Vehicles	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1		Supply trucks	Onroad Construction Vehicles	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1		Haul trucks	Onroad Construction Vehicles	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1		Supply trucks	Onroad Construction Vehicles	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1		Workers	Onroad Construction Vehicles	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1		**Fugitive Dust**												
1		Soil handling	Fugitive Emissions	n/a	n/a									
1		Asphalting	Fugitive Emissions											
2	**Pier J Breakwater Construction**													
2		**Marine Activities**												
2		Pier J Breakwater Tugboat propulsion engine	Marine Equipment	313.73	279.22	313.73	5841.59	3.46	3137.27	323.75	185.57	0.00	0.01	188.27
2		Pier J Breakwater Tugboat auxiliary engine	Marine Equipment	57.17	50.88	57.17	1018.30	0.79	714.59	56.44	42.27	0.00	0.00	42.88
2		Pier J Breakwater Crew boat propulsion engine	Marine Equipment	21.93	19.52	21.93	433.28	0.24	219.27	24.01	12.97	0.00	0.00	13.16
2		Pier J Breakwater Crew boat auxiliary engine	Marine Equipment	1.82	1.62	1.82	32.38	0.03	22.73	1.79	1.34	0.00	0.00	1.36
2		Pier J Breakwater Survey boat propulsion engine	Marine Equipment	19.57	17.41	19.57	386.62	0.22	195.66	21.43	11.57	0.00	0.00	11.74
2		**Off-Road Equipment**												
2		Piling crane	Offroad Construction Equipment	11.27	10.36	11.27	270.12	0.42	144.43	25.20	20.52	0.00	0.00	20.52
2		Long arm excavator	Offroad Construction Equipment	4.06	3.74	4.06	118.13	0.70	149.87	17.33	34.23	0.00	0.00	34.23
2		**On-Road Vehicles**												
2		Delivery Trucks	Onroad Construction Vehicles	0.74	0.18	0.00	0.39	0.00	0.05	0.01	0.06	0.00	0.00	0.06
2		Delivery Trucks	Onroad Construction Vehicles	2.43	0.94	0.11	16.08	0.10	0.92	0.13	4.60	0.00	0.00	4.81
2		Workers	Onroad Construction Vehicles	8.58	2.72	0.00	3.14	0.20	51.79	0.81	9.13	0.00	0.00	9.18

Table H1.26

Alternative 2 Emissions by Task

				Mitigated										
				Peak Day										
				PM10	PM2.5	DPM	NOX	SOX	CO	VOC	CO2	CH4	N2O	CO2e
Task ID		**Construction Element/Equipment**	**Source Type 1**	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(tonnes/day)	(tonnes/day)	(tonnes/day)	(tonnes/day)
1	**Electrical Substation Construction at Pier J (mitigation only)**													
1		**Off-Road Equipment**												
1		Caterpillar 320 excavator	Offroad Construction Equipment	0.02	0.02	0.02	0.33	0.01	1.23	0.16	0.26	0.00	0.00	0.2648
1		Small asphalt roller	Offroad Construction Equipment	0.00	0.00	0.00	0.74	0.00	0.91	0.04	0.06	0.00	0.00	0.0581
1		Water truck	Offroad Construction Equipment	0.03	0.03	0.03	0.60	0.01	2.59	0.30	0.00	0.00	0.00	0.0000
1		Forklift	Offroad Construction Equipment	0.00	0.00	0.00	0.15	0.00	0.16	0.01	0.00	0.00	0.00	0.0000
1		Mobile crane (35 ton)	Offroad Construction Equipment	0.02	0.02	0.02	0.43	0.01	2.41	0.21	0.00	0.00	0.00	0.0000
1		**On-Road Vehicles**												
1		Haul trucks	Onroad Construction Vehicles	0.09	0.02	0.00	0.05	0.00	0.01	0.00	0.01	0.00	0.00	0.0074
1		Supply trucks	Onroad Construction Vehicles	0.21	0.05	0.00	0.11	0.00	0.01	0.00	0.02	0.00	0.00	0.0173
1		Haul trucks	Onroad Construction Vehicles	0.02	0.01	0.00	0.11	0.00	0.01	0.00	0.03	0.00	0.00	0.0318
1		Supply trucks	Onroad Construction Vehicles	0.07	0.03	0.00	0.45	0.00	0.03	0.00	0.13	0.00	0.00	0.1347
1		Workers	Onroad Construction Vehicles	0.15	0.05	0.00	0.06	0.00	0.91	0.01	0.16	0.00	0.00	0.1619
1		**Fugitive Dust**												
1		Soil handling	Fugitive Emissions	2.01	0.30									
1		Asphalting	Fugitive Emissions											
2	**Pier J Breakwater Construction**													
2		**Marine Activities**												
2		Pier J Breakwater Tugboat propulsion engine	Marine Equipment	3.95	3.52	3.95	77.27	0.06	58.10	4.28	3.44	0.00	0.00	3.4860
2		Pier J Breakwater Tugboat auxiliary engine	Marine Equipment	0.37	0.33	0.37	13.58	0.01	14.56	0.75	0.78	0.00	0.00	0.7940
2		Pier J Breakwater Crew boat propulsion engine	Marine Equipment	0.28	0.25	0.28	5.40	0.00	4.06	0.30	0.24	0.00	0.00	0.2436
2		Pier J Breakwater Crew boat auxiliary engine	Marine Equipment	0.01	0.01	0.01	0.43	0.00	0.46	0.02	0.02	0.00	0.00	0.0253
2		Pier J Breakwater Survey boat propulsion engine	Marine Equipment	0.25	0.22	0.25	4.82	0.00	3.62	0.27	0.21	0.00	0.00	0.2174
2		**Off-Road Equipment**												
2		Piling crane	Offroad Construction Equipment	0.02	0.02	0.02	0.48	0.01	2.67	0.24	0.38	0.00	0.00	0.3800
2		Long arm excavator	Offroad Construction Equipment	0.04	0.04	0.04	0.79	0.01	2.78	0.32	0.63	0.00	0.00	0.6340
2		**On-Road Vehicles**												
2		Delivery Trucks	Onroad Construction Vehicles	0.15	0.04	0.00	0.08	0.00	0.01	0.00	0.01	0.00	0.00	0.0123
2		Delivery Trucks	Onroad Construction Vehicles	0.49	0.19	0.02	3.22	0.02	0.18	0.03	0.92	0.00	0.00	0.9622
2		Workers	Onroad Construction Vehicles	0.16	0.05	0.00	0.06	0.00	0.96	0.01	0.17	0.00	0.00	0.1700

Table H1.26

Alternative 2 Emissions by Task

				Mitigated Emissions										
				Total										
				PM10	PM2.5	DPM	NOX	SOX	CO	VOC	CO2	CH4	N2O	CO2e
Task ID		**Construction Element/Equipment**	**Source Type 1**	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(tonnes)	(tonnes)
1	**Electrical Substation Construction at Pier J (mitigation only)**													
1		**Off-Road Equipment**												
1		Caterpillar 320 excavator	Offroad Construction Equipment	0.33	0.33	0.33	6.59	0.11	24.52	3.12	5.30	0.00	0.00	5.30
1		Small asphalt roller	Offroad Construction Equipment	0.13	0.13	0.13	19.12	0.03	23.58	1.06	1.51	0.00	0.00	1.51
1		Water truck	Offroad Construction Equipment	0.60	0.60	0.60	12.06	0.20	51.75	5.93	0.00	0.00	0.00	0.00
1		Forklift	Offroad Construction Equipment	0.02	0.02	0.02	3.23	0.01	3.59	0.18	0.00	0.00	0.00	0.00
1		Mobile crane (35 ton)	Offroad Construction Equipment	0.04	0.04	0.04	0.87	0.01	4.83	0.43	0.00	0.00	0.00	0.00
1		**On-Road Vehicles**												
1		Haul trucks	Onroad Construction Vehicles	0.44	0.11	0.00	0.24	0.00	0.03	0.00	0.04	0.00	0.00	0.04
1		Supply trucks	Onroad Construction Vehicles	1.03	0.26	0.00	0.55	0.00	0.06	0.01	0.08	0.00	0.00	0.09
1		Haul trucks	Onroad Construction Vehicles	0.08	0.03	0.00	0.53	0.00	0.03	0.00	0.15	0.00	0.00	0.16
1		Supply trucks	Onroad Construction Vehicles	0.34	0.13	0.02	2.25	0.01	0.13	0.02	0.64	0.00	0.00	0.67
1		Workers	Onroad Construction Vehicles	9.08	2.88	0.00	3.33	0.21	54.81	0.86	9.66	0.00	0.00	9.71
1		**Fugitive Dust**												
1		Soil handling	Fugitive Emissions	40.12	6.07									
1		Asphalting	Fugitive Emissions											
2	**Pier J Breakwater Construction**													
2		**Marine Activities**												
2		Pier J Breakwater Tugboat propulsion engine	Marine Equipment	213.33	189.87	213.33	4172.56	3.46	3137.27	231.25	185.57	0.00	0.01	188.25
2		Pier J Breakwater Tugboat auxiliary engine	Marine Equipment	20.01	17.81	20.01	733.17	0.79	786.05	40.63	42.27	0.00	0.00	42.88
2		Pier J Breakwater Crew boat propulsion engine	Marine Equipment	14.91	13.27	14.91	291.63	0.24	219.27	16.16	12.97	0.00	0.00	13.16
2		Pier J Breakwater Crew boat auxiliary engine	Marine Equipment	0.64	0.57	0.64	23.32	0.03	25.00	1.29	1.34	0.00	0.00	1.36
2		Pier J Breakwater Survey boat propulsion engine	Marine Equipment	13.30	11.84	13.30	260.22	0.22	195.66	14.42	11.57	0.00	0.00	11.74
2		**Off-Road Equipment**												
2		Piling crane	Offroad Construction Equipment	1.29	1.29	1.29	25.89	0.42	144.43	12.72	20.52	0.00	0.00	20.52
2		Long arm excavator	Offroad Construction Equipment	2.14	2.14	2.14	42.75	0.70	149.87	17.33	34.23	0.00	0.00	34.23
2		**On-Road Vehicles**												
2		Delivery Trucks	Onroad Construction Vehicles	0.74	0.18	0.00	0.39	0.00	0.05	0.01	0.06	0.00	0.00	0.06
2		Delivery Trucks	Onroad Construction Vehicles	2.43	0.94	0.11	16.08	0.10	0.92	0.13	4.60	0.00	0.00	4.81
2		Workers	Onroad Construction Vehicles	8.58	2.72	0.00	3.14	0.20	51.79	0.81	9.13	0.00	0.00	9.18

Table H1.26

Alternative 2 Emissions by Task

							Unmitigated Emissions										
							Peak Day										
							PM10	PM2.5	DPM	NOX	SOX	CO	VOC	CO2	CH4	N2O	CO2e
Task ID		**Construction Element/Equipment**	**Source Type 1**	**Source Type 2**	**Onsite/Off site**	**Days Total**	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(tonnes/day)	(tonnes/day)	(tonnes/day)	(tonnes/day)
3 Approach Channel (hopper dredge 1,144,000 CY)																	
3		**Marine Hopper Dredge**															
3		Hopper propulsion engine	Marine Equipment	dredging	onsite	66	26.63	23.70	26.63	495.89	0.29	266.32	27.48	15.75	0.00	0.00	15.9819
3		Hopper propulsion engine	Marine Equipment	transit	offsite	66	50.31	44.77	50.31	936.68	0.56	503.05	51.91	29.76	0.00	0.00	30.1880
3		Hopper auxiliary engine	Marine Equipment	disposal	near shore	66	0.22	0.20	0.22	5.06	0.00	3.70	0.28	0.22	0.00	0.00	0.2219
3		Hopper Crew boat propulsion engine	Marine Equipment	support	onsite	66	0.41	0.36	0.41	8.02	0.00	4.06	0.44	0.24	0.00	0.00	0.2437
3		Hopper Crew boat auxiliary engine	Marine Equipment	support	onsite	66	0.03	0.03	0.03	0.60	0.00	0.42	0.03	0.02	0.00	0.00	0.0253
3		Hopper Survey boat propulsion engine	Marine Equipment	dredging	onsite	66	1.45	1.29	1.45	28.64	0.02	14.49	1.59	0.86	0.00	0.00	0.8697
4 Main Channel Widening (clam shell dredge 1,065,000 CY)																	
4		**Marine Clamshell Dredge**															
4		Clamshell Dredge hoist	Marine Equipment	dredging	onsite	178	4.37	4.37	4.37	132.70	0.15	75.66	7.35	5.79	0.00	0.00	5.7854
4		Clamshell Dredge generator	Marine Equipment	dredging	onsite	178	3.27	3.27	3.27	99.52	0.11	56.75	5.52	3.20	0.00	0.00	3.1964
4		Clamshell Barge dump scow	Marine Equipment	disposal	near shore	178	0.05	0.05	0.05	0.88	0.00	0.80	0.05	0.04	0.00	0.00	0.0382
4		Clamshell Tugboat propulsion engine	Marine Equipment	dredging	onsite	178	0.61	0.54	0.61	11.39	0.01	6.12	0.63	0.36	0.00	0.00	0.3670
4		Clamshell Tugboat auxiliary engine	Marine Equipment	dredging	onsite	178	0.09	0.08	0.09	1.57	0.00	1.10	0.09	0.07	0.00	0.00	0.0662
4		Clamshell Tugboat propulsion engine	Marine Equipment	transit	offsite	178	11.01	9.80	11.01	204.97	0.12	110.08	11.36	6.51	0.00	0.00	6.6058
4		Clamshell Tugboat auxiliary engine	Marine Equipment	transit	offsite	178	1.59	1.41	1.59	28.29	0.02	19.85	1.57	1.17	0.00	0.00	1.1911
4		Clamshell Crew boat propulsion engine	Marine Equipment	support	onsite	178	0.41	0.36	0.41	8.02	0.00	4.06	0.44	0.24	0.00	0.00	0.2437
4		Clamshell Crew boat auxiliary engine	Marine Equipment	support	onsite	178	0.03	0.03	0.03	0.60	0.00	0.42	0.03	0.02	0.00	0.00	0.0253
4		Clamshell Survey boat propulsion engine	Marine Equipment	dredging	onsite	178	0.36	0.32	0.36	7.16	0.00	3.62	0.40	0.21	0.00	0.00	0.2174
5 West Basin (clam shell dredge 501,000 CY)																	
5		**Marine Clamshell Dredge**															
5		Clamshell Dredge hoist	Marine Equipment	dredging	onsite	84	4.37	4.37	4.37	132.70	0.15	75.66	7.35	5.79	0.00	0.00	5.7854
5		Clamshell Dredge generator	Marine Equipment	dredging	onsite	84	3.27	3.27	3.27	99.52	0.11	56.75	5.52	3.20	0.00	0.00	3.1964
5		Clamshell Barge dump scow	Marine Equipment	disposal	near shore	84	0.05	0.05	0.05	0.88	0.00	0.80	0.05	0.04	0.00	0.00	0.0382
5		Clamshell Tugboat propulsion engine	Marine Equipment	dredging	onsite	84	0.61	0.54	0.61	11.39	0.01	6.12	0.63	0.36	0.00	0.00	0.3670
5		Clamshell Tugboat auxiliary engine	Marine Equipment	dredging	onsite	84	0.09	0.08	0.09	1.57	0.00	1.10	0.09	0.07	0.00	0.00	0.0662
5		Clamshell Tugboat propulsion engine	Marine Equipment	transit	offsite	84	11.01	9.80	11.01	204.97	0.12	110.08	11.36	6.51	0.00	0.00	6.6058
5		Clamshell Tugboat auxiliary engine	Marine Equipment	transit	offsite	84	1.59	1.41	1.59	28.29	0.02	19.85	1.57	1.17	0.00	0.00	1.1911
5		Clamshell Crew boat propulsion engine	Marine Equipment	support	onsite	84	0.41	0.36	0.41	8.02	0.00	4.06	0.44	0.24	0.00	0.00	0.2437
5		Clamshell Crew boat auxiliary engine	Marine Equipment	support	onsite	84	0.03	0.03	0.03	0.60	0.00	0.42	0.03	0.02	0.00	0.00	0.0253
5		Clamshell Survey boat propulsion engine	Marine Equipment	dredging	onsite	84	0.36	0.32	0.36	7.16	0.00	3.62	0.40	0.21	0.00	0.00	0.2174

Table H1.26

Alternative 2 Emissions by Task

				Unmitigated Emissions										
				Total										
				PM10	PM2.5	DPM	NOX	SOX	CO	VOC	CO2	CH4	N2O	CO2e
Task ID		**Construction Element/Equipment**	**Source Type 1**	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(tonnes)	(tonnes)	(tonnes)	(tonnes)
3 Approach Channel (hopper dredge 1,144,000 CY)														
3		**Marine Hopper Dredge**												
3		Hopper propulsion engine	Marine Equipment	1757.72	1564.37	1757.72	32728.77	19.41	17577.21	1813.86	1039.68	0.02	0.05	1054.80
3		Hopper propulsion engine	Marine Equipment	3320.14	2954.92	3320.14	61821.01	36.65	33201.40	3426.19	1963.84	0.03	0.09	1992.41
3		Hopper auxiliary engine	Marine Equipment	14.65	13.04	14.65	333.97	0.27	244.13	18.51	14.44	0.00	0.00	14.65
3		Hopper Crew boat propulsion engine	Marine Equipment	26.80	23.85	26.80	529.56	0.30	268.00	29.35	15.85	0.00	0.00	16.08
3		Hopper Crew boat auxiliary engine	Marine Equipment	2.22	1.98	2.22	39.58	0.03	27.78	2.19	1.64	0.00	0.00	1.67
3		Hopper Survey boat propulsion engine	Marine Equipment	95.65	85.13	95.65	1890.14	1.06	956.55	104.75	56.58	0.00	0.00	57.40
4 Main Channel Widening (clam shell dredge 1,065,000 CY)														
4		**Marine Clamshell Dredge**												
4		Clamshell Dredge hoist	Marine Equipment	776.98	776.98	776.98	23620.32	25.87	13467.72	1309.06	1029.80	0.00	0.00	1029.80
4		Clamshell Dredge generator	Marine Equipment	582.74	582.74	582.74	17715.24	19.40	10100.79	981.80	568.97	0.00	0.00	568.97
4		Clamshell Barge dump scow	Marine Equipment	8.24	8.24	8.24	156.57	0.27	142.84	8.68	6.80	0.00	0.00	6.80
4		Clamshell Tugboat propulsion engine	Marine Equipment	108.86	96.88	108.86	2026.91	1.20	1088.56	112.33	64.39	0.00	0.00	65.32
4		Clamshell Tugboat auxiliary engine	Marine Equipment	15.70	13.98	15.70	279.72	0.22	196.29	15.50	11.61	0.00	0.00	11.78
4		Clamshell Tugboat propulsion engine	Marine Equipment	1959.42	1743.88	1959.42	36484.31	21.63	19594.15	2022.00	1158.98	0.02	0.06	1175.84
4		Clamshell Tugboat auxiliary engine	Marine Equipment	282.66	251.57	282.66	5034.91	3.90	3533.27	279.04	208.99	0.00	0.01	212.01
4		Clamshell Crew boat propulsion engine	Marine Equipment	72.28	64.33	72.28	1428.22	0.80	722.78	79.15	42.75	0.00	0.00	43.38
4		Clamshell Crew boat auxiliary engine	Marine Equipment	5.99	5.33	5.99	106.75	0.08	74.91	5.92	4.43	0.00	0.00	4.50
4		Clamshell Survey boat propulsion engine	Marine Equipment	64.49	57.40	64.49	1274.41	0.71	644.94	70.63	38.15	0.00	0.00	38.70
5 West Basin (clam shell dredge 501,000 CY)														
5		**Marine Clamshell Dredge**												
5		Clamshell Dredge hoist	Marine Equipment	366.67	366.67	366.67	11146.67	12.21	6355.56	617.76	485.97	0.00	0.00	485.97
5		Clamshell Dredge generator	Marine Equipment	275.00	275.00	275.00	8360.00	9.16	4766.67	463.32	268.50	0.00	0.00	268.50
5		Clamshell Barge dump scow	Marine Equipment	3.89	3.89	3.89	73.89	0.13	67.41	4.10	3.21	0.00	0.00	3.21
5		Clamshell Tugboat propulsion engine	Marine Equipment	51.37	45.72	51.37	956.52	0.57	513.70	53.01	30.39	0.00	0.00	30.83
5		Clamshell Tugboat auxiliary engine	Marine Equipment	7.41	6.60	7.41	132.00	0.10	92.63	7.32	5.48	0.00	0.00	5.56
5		Clamshell Tugboat propulsion engine	Marine Equipment	924.67	822.95	924.67	17217.32	10.21	9246.68	954.20	546.94	0.01	0.03	554.89
5		Clamshell Tugboat auxiliary engine	Marine Equipment	133.39	118.72	133.39	2376.02	1.84	1667.38	131.68	98.62	0.00	0.00	100.05
5		Clamshell Crew boat propulsion engine	Marine Equipment	34.11	30.36	34.11	673.99	0.38	341.09	37.35	20.18	0.00	0.00	20.47
5		Clamshell Crew boat auxiliary engine	Marine Equipment	2.83	2.52	2.83	50.38	0.04	35.35	2.79	2.09	0.00	0.00	2.12
5		Clamshell Survey boat propulsion engine	Marine Equipment	30.44	27.09	30.44	601.41	0.34	304.36	33.33	18.00	0.00	0.00	18.26

Table H1.26

Alternative 2 Emissions by Task

Task ID		Construction Element/Equipment	Source Type 1	Mitigated Peak Day PM10 (lb/day)	PM2.5 (lb/day)	DPM (lb/day)	NOX (lb/day)	SOX (lb/day)	CO (lb/day)	VOC (lb/day)	CO2 (tonnes/day)	CH4 (tonnes/day)	N2O (tonnes/day)	CO2e (tonnes/day)
3 Approach Channel (hopper dredge 1,144,000 CY)														
3		**Marine Hopper Dredge**												
3		Hopper propulsion engine	Marine Equipment	26.63	23.70	26.63	495.89	0.29	266.32	27.48	15.75	0.00	0.00	15.9819
3		Hopper propulsion engine	Marine Equipment	50.31	44.77	50.31	936.68	0.56	503.05	51.91	29.76	0.00	0.00	30.1880
3		Hopper auxiliary engine	Marine Equipment	0.22	0.20	0.22	5.06	0.00	3.70	0.28	0.22	0.00	0.00	0.2219
3		Hopper Crew boat propulsion engine	Marine Equipment	0.28	0.25	0.28	5.40	0.00	4.06	0.30	0.24	0.00	0.00	0.2436
3		Hopper Crew boat auxiliary engine	Marine Equipment	0.01	0.01	0.01	0.43	0.00	0.46	0.02	0.02	0.00	0.00	0.0253
3		Hopper Survey boat propulsion engine	Marine Equipment	0.99	0.88	0.99	19.28	0.02	14.49	1.07	0.86	0.00	0.00	0.8696
4 Main Channel Widening (clam shell dredge 1,065,000 CY)														
4		**Marine Clamshell Dredge**												
4		Clamshell Dredge hoist	Marine Equipment	0.44	0.44	0.44	13.27	0.01	7.57	0.74	0.58	0.00	0.00	0.5785
4		Clamshell Dredge generator	Marine Equipment	0.33	0.33	0.33	9.95	0.01	5.67	0.55	0.32	0.00	0.00	0.3196
4		Clamshell Barge dump scow	Marine Equipment	0.05	0.05	0.05	0.88	0.00	0.80	0.05	0.04	0.00	0.00	0.0382
4		Clamshell Tugboat propulsion engine	Marine Equipment	0.42	0.37	0.42	8.13	0.01	6.12	0.45	0.36	0.00	0.00	0.3670
4		Clamshell Tugboat auxiliary engine	Marine Equipment	0.03	0.03	0.03	1.13	0.00	1.21	0.06	0.07	0.00	0.00	0.0662
4		Clamshell Tugboat propulsion engine	Marine Equipment	7.49	6.66	7.49	146.41	0.12	110.08	8.11	6.51	0.00	0.00	6.6051
4		Clamshell Tugboat auxiliary engine	Marine Equipment	0.56	0.49	0.56	20.37	0.02	21.83	1.13	1.17	0.00	0.00	1.1910
4		Clamshell Crew boat propulsion engine	Marine Equipment	0.28	0.25	0.28	5.40	0.00	4.06	0.30	0.24	0.00	0.00	0.2436
4		Clamshell Crew boat auxiliary engine	Marine Equipment	0.01	0.01	0.01	0.43	0.00	0.46	0.02	0.02	0.00	0.00	0.0253
4		Clamshell Survey boat propulsion engine	Marine Equipment	0.25	0.22	0.25	4.82	0.00	3.62	0.27	0.21	0.00	0.00	0.2174
5 West Basin (clam shell dredge 501,000 CY)														
5		**Marine Clamshell Dredge**												
5		Clamshell Dredge hoist	Marine Equipment	0.44	0.44	0.44	13.27	0.01	7.57	0.74	0.58	0.00	0.00	0.5785
5		Clamshell Dredge generator	Marine Equipment	0.33	0.33	0.33	9.95	0.01	5.67	0.55	0.32	0.00	0.00	0.3196
5		Clamshell Barge dump scow	Marine Equipment	0.05	0.05	0.05	0.88	0.00	0.80	0.05	0.04	0.00	0.00	0.0382
5		Clamshell Tugboat propulsion engine	Marine Equipment	0.42	0.37	0.42	8.13	0.01	6.12	0.45	0.36	0.00	0.00	0.3670
5		Clamshell Tugboat auxiliary engine	Marine Equipment	0.03	0.03	0.03	1.13	0.00	1.21	0.06	0.07	0.00	0.00	0.0662
5		Clamshell Tugboat propulsion engine	Marine Equipment	7.49	6.66	7.49	146.41	0.12	110.08	8.11	6.51	0.00	0.00	6.6051
5		Clamshell Tugboat auxiliary engine	Marine Equipment	0.56	0.49	0.56	20.37	0.02	21.83	1.13	1.17	0.00	0.00	1.1910
5		Clamshell Crew boat propulsion engine	Marine Equipment	0.28	0.25	0.28	5.40	0.00	4.06	0.30	0.24	0.00	0.00	0.2436
5		Clamshell Crew boat auxiliary engine	Marine Equipment	0.01	0.01	0.01	0.43	0.00	0.46	0.02	0.02	0.00	0.00	0.0253
5		Clamshell Survey boat propulsion engine	Marine Equipment	0.25	0.22	0.25	4.82	0.00	3.62	0.27	0.21	0.00	0.00	0.2174

Note: clamshell dredge would be electric with mitigation; assume 90 percent reduction in diesel exhaust emissions.

Table H1.26

Alternative 2 Emissions by Task

				Mitigated Emissions										
				Total										
				PM10	PM2.5	DPM	NOX	SOX	CO	VOC	CO2	CH4	N2O	CO2e
Task ID		**Construction Element/Equipment**	**Source Type 1**	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(tonnes)	(tonnes)
3 Approach Channel (hopper dredge 1,144,000 CY)														
3		**Marine Hopper Dredge**												
3		Hopper propulsion engine	Marine Equipment	1757.72	1564.37	1757.72	32728.77	19.41	17577.21	1813.86	1039.68	0.02	0.05	1054.80
3		Hopper propulsion engine	Marine Equipment	3320.14	2954.92	3320.14	61821.01	36.65	33201.40	3426.19	1963.84	0.03	0.09	1992.41
3		Hopper auxiliary engine	Marine Equipment	14.65	13.04	14.65	333.97	0.27	244.13	18.51	14.44	0.00	0.00	14.65
3		Hopper Crew boat propulsion engine	Marine Equipment	18.22	16.22	18.22	356.44	0.30	268.00	19.75	15.85	0.00	0.00	16.08
3		Hopper Crew boat auxiliary engine	Marine Equipment	0.78	0.69	0.78	28.50	0.03	30.55	1.58	1.64	0.00	0.00	1.67
3		Hopper Survey boat propulsion engine	Marine Equipment	65.05	57.89	65.05	1272.21	1.06	956.55	70.51	56.58	0.00	0.00	57.40
4 Main Channel Widening (clam shell dredge 1,065,000 CY)														
4		**Marine Clamshell Dredge**												
4		Clamshell Dredge hoist	Marine Equipment	77.70	77.70	77.70	2362.03	2.59	1346.77	130.91	102.98	0.00	0.00	102.98
4		Clamshell Dredge generator	Marine Equipment	58.27	58.27	58.27	1771.52	1.94	1010.08	98.18	56.90	0.00	0.00	56.90
4		Clamshell Barge dump scow	Marine Equipment	8.24	8.24	8.24	156.57	0.27	142.84	8.68	6.80	0.00	0.00	6.80
4		Clamshell Tugboat propulsion engine	Marine Equipment	74.02	65.88	74.02	1447.79	1.20	1088.56	80.24	64.39	0.00	0.00	65.32
4		Clamshell Tugboat auxiliary engine	Marine Equipment	5.50	4.89	5.50	201.40	0.22	215.92	11.16	11.61	0.00	0.00	11.78
4		Clamshell Tugboat propulsion engine	Marine Equipment	1332.40	1185.84	1332.40	26060.22	21.63	19594.15	1444.28	1158.98	0.01	0.06	1175.72
4		Clamshell Tugboat auxiliary engine	Marine Equipment	98.93	88.05	98.93	3625.13	3.90	3886.59	200.91	208.99	0.00	0.01	212.00
4		Clamshell Crew boat propulsion engine	Marine Equipment	49.15	43.74	49.15	961.30	0.80	722.78	53.28	42.75	0.00	0.00	43.37
4		Clamshell Crew boat auxiliary engine	Marine Equipment	2.10	1.87	2.10	76.86	0.08	82.40	4.26	4.43	0.00	0.00	4.49
4		Clamshell Survey boat propulsion engine	Marine Equipment	43.86	39.03	43.86	857.78	0.71	644.94	47.54	38.15	0.00	0.00	38.70
5 West Basin (clam shell dredge 501,000 CY)														
5		**Marine Clamshell Dredge**												
5		Clamshell Dredge hoist	Marine Equipment	36.67	36.67	36.67	1114.67	1.22	635.56	61.78	48.60	0.00	0.00	48.60
5		Clamshell Dredge generator	Marine Equipment	27.50	27.50	27.50	836.00	0.92	476.67	46.33	26.85	0.00	0.00	26.85
5		Clamshell Barge dump scow	Marine Equipment	3.89	3.89	3.89	73.89	0.13	67.41	4.10	3.21	0.00	0.00	3.21
5		Clamshell Tugboat propulsion engine	Marine Equipment	34.93	31.09	34.93	683.23	0.57	513.70	37.87	30.39	0.00	0.00	30.82
5		Clamshell Tugboat auxiliary engine	Marine Equipment	2.59	2.31	2.59	95.04	0.10	101.90	5.27	5.48	0.00	0.00	5.56
5		Clamshell Tugboat propulsion engine	Marine Equipment	628.77	559.61	628.77	12298.08	10.21	9246.68	681.57	546.94	0.01	0.03	554.83
5		Clamshell Tugboat auxiliary engine	Marine Equipment	46.69	41.55	46.69	1710.74	1.84	1834.12	94.81	98.62	0.00	0.00	100.04
5		Clamshell Crew boat propulsion engine	Marine Equipment	23.19	20.64	23.19	453.65	0.38	341.09	25.14	20.18	0.00	0.00	20.47
5		Clamshell Crew boat auxiliary engine	Marine Equipment	0.99	0.88	0.99	36.27	0.04	38.89	2.01	2.09	0.00	0.00	2.12
5		Clamshell Survey boat propulsion engine	Marine Equipment	20.70	18.42	20.70	404.79	0.34	304.36	22.43	18.00	0.00	0.00	18.26

Note: clamshell dredge would be electric with mitigation; assume 90 percent reduction in diesel exhaust emissions.

Table H1.26

Alternative 2 Emissions by Task

							Unmitigated Emissions										
							Peak Day										
							PM10	PM2.5	DPM	NOX	SOX	CO	VOC	CO2	CH4	N2O	CO2e
Task ID		**Construction Element/Equipment**	**Source Type 1**	**Source Type 2**	**Onsite/Offsite**	**Days Total**	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(tonnes/day)	(tonnes/day)	(tonnes/day)	(tonnes/day)
6	**Pier J Basin (clam shell dredge 202,000 CY)**																
6		**Marine Clamshell Dredge**															
6		Clamshell Dredge hoist	Marine Equipment	dredging	onsite	34	4.37	4.37	4.37	132.70	0.15	75.66	7.35	5.79	0.00	0.00	5.7854
6		Clamshell Dredge generator	Marine Equipment	dredging	onsite	34	3.27	3.27	3.27	99.52	0.11	56.75	5.52	3.20	0.00	0.00	3.1964
6		Clamshell Barge dump scow	Marine Equipment	disposal	offsite	34	0.05	0.05	0.05	0.88	0.00	0.80	0.05	0.04	0.00	0.00	0.0382
6		Clamshell Tugboat propulsion engine	Marine Equipment	dredging	onsite	34	0.61	0.54	0.61	11.39	0.01	6.12	0.63	0.36	0.00	0.00	0.3670
6		Clamshell Tugboat auxiliary engine	Marine Equipment	dredging	onsite	34	0.09	0.08	0.09	1.57	0.00	1.10	0.09	0.07	0.00	0.00	0.0662
6		Clamshell Tugboat propulsion engine	Marine Equipment	transit	offsite	34	11.01	9.80	11.01	204.97	0.12	110.08	11.36	6.51	0.00	0.00	6.6058
6		Clamshell Tugboat auxiliary engine	Marine Equipment	transit	offsite	34	1.59	1.41	1.59	28.29	0.02	19.85	1.57	1.17	0.00	0.00	1.1911
6		Clamshell Crew boat propulsion engine	Marine Equipment	support	onsite	34	0.41	0.36	0.41	8.02	0.00	4.06	0.44	0.24	0.00	0.00	0.2437
6		Clamshell Crew boat auxiliary engine	Marine Equipment	support	onsite	34	0.03	0.03	0.03	0.60	0.00	0.42	0.03	0.02	0.00	0.00	0.0253
6		Clamshell Survey boat propulsion engine	Marine Equipment	dredging	onsite	34	0.36	0.32	0.36	7.16	0.00	3.62	0.40	0.21	0.00	0.00	0.2174
7	**Pier J Approach (clam shell dredge 270,000 CY)**																
7		**Marine Clamshell Dredge**															
7		Clamshell Dredge hoist	Marine Equipment	dredging	onsite	45	4.37	4.37	4.37	132.70	0.15	75.66	7.35	5.79	0.00	0.00	5.7854
7		Clamshell Dredge generator	Marine Equipment	dredging	onsite	45	3.27	3.27	3.27	99.52	0.11	56.75	5.52	3.20	0.00	0.00	3.1964
7		Clamshell Barge dump scow	Marine Equipment	disposal	offsite	45	0.05	0.05	0.05	0.88	0.00	0.80	0.05	0.04	0.00	0.00	0.0382
7		Clamshell Tugboat propulsion engine	Marine Equipment	dredging	onsite	45	0.61	0.54	0.61	11.39	0.01	6.12	0.63	0.36	0.00	0.00	0.3670
7		Clamshell Tugboat auxiliary engine	Marine Equipment	dredging	onsite	45	0.09	0.08	0.09	1.57	0.00	1.10	0.09	0.07	0.00	0.00	0.0662
7		Clamshell Tugboat propulsion engine	Marine Equipment	transit	offsite	45	11.01	9.80	11.01	204.97	0.12	110.08	11.36	6.51	0.00	0.00	6.6058
7		Clamshell Tugboat auxiliary engine	Marine Equipment	transit	offsite	45	1.59	1.41	1.59	28.29	0.02	19.85	1.57	1.17	0.00	0.00	1.1911
7		Clamshell Crew boat propulsion engine	Marine Equipment	support	onsite	45	0.41	0.36	0.41	8.02	0.00	4.06	0.44	0.24	0.00	0.00	0.2437
7		Clamshell Crew boat auxiliary engine	Marine Equipment	support	onsite	45	0.03	0.03	0.03	0.60	0.00	0.42	0.03	0.02	0.00	0.00	0.0253
7		Clamshell Survey boat propulsion engine	Marine Equipment	dredging	onsite	45	0.36	0.32	0.36	7.16	0.00	3.62	0.40	0.21	0.00	0.00	0.2174
8	**Pier J Approach (clam shell dredge 1,699,000 CY)**																
8		**Marine Clamshell Dredge**															
8		Clamshell Dredge hoist	Marine Equipment	dredging	onsite	283	4.37	4.37	4.37	132.70	0.15	75.66	7.35	5.79	0.00	0.00	5.7854
8		Clamshell Dredge generator	Marine Equipment	dredging	onsite	283	3.27	3.27	3.27	99.52	0.11	56.75	5.52	3.20	0.00	0.00	3.1964
8		Clamshell Barge dump scow	Marine Equipment	disposal	offsite	283	0.05	0.05	0.05	0.88	0.00	0.80	0.05	0.04	0.00	0.00	0.0382
8		Clamshell Tugboat propulsion engine	Marine Equipment	dredging	onsite	283	0.61	0.54	0.61	11.39	0.01	6.12	0.63	0.36	0.00	0.00	0.3670
8		Clamshell Tugboat auxiliary engine	Marine Equipment	dredging	onsite	283	0.09	0.08	0.09	1.57	0.00	1.10	0.09	0.07	0.00	0.00	0.0662
8		Clamshell Tugboat propulsion engine	Marine Equipment	transit	offsite	283	11.01	9.80	11.01	204.97	0.12	110.08	11.36	6.51	0.00	0.00	6.6058
8		Clamshell Tugboat auxiliary engine	Marine Equipment	transit	offsite	283	1.59	1.41	1.59	28.29	0.02	19.85	1.57	1.17	0.00	0.00	1.1911
8		Clamshell Crew boat propulsion engine	Marine Equipment	support	onsite	283	0.41	0.36	0.41	8.02	0.00	4.06	0.44	0.24	0.00	0.00	0.2437
8		Clamshell Crew boat auxiliary engine	Marine Equipment	support	onsite	283	0.03	0.03	0.03	0.60	0.00	0.42	0.03	0.02	0.00	0.00	0.0253
8		Clamshell Survey boat propulsion engine	Marine Equipment	dredging	onsite	283	0.36	0.32	0.36	7.16	0.00	3.62	0.40	0.21	0.00	0.00	0.2174

Table H1.26

Alternative 2 Emissions by Task

				Unmitigated Emissions										
				Total										
				PM10	PM2.5	DPM	NOX	SOX	CO	VOC	CO2	CH4	N2O	CO2e
Task ID		**Construction Element/Equipment**	**Source Type 1**	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(tonnes)	(tonnes)	(tonnes)	(tonnes)
6 Pier J Basin (clam shell dredge 202,000 CY)														
6		**Marine Clamshell Dredge**												
6		Clamshell Dredge hoist	Marine Equipment	148.41	148.41	148.41	4511.75	4.94	2572.49	250.05	196.70	0.00	0.00	196.70
6		Clamshell Dredge generator	Marine Equipment	111.31	111.31	111.31	3383.81	3.71	1929.37	187.53	108.68	0.00	0.00	108.68
6		Clamshell Barge dump scow	Marine Equipment	1.57	1.57	1.57	29.91	0.05	27.28	1.66	1.30	0.00	0.00	1.30
6		Clamshell Tugboat propulsion engine	Marine Equipment	20.79	18.51	20.79	387.16	0.23	207.93	21.46	12.30	0.00	0.00	12.48
6		Clamshell Tugboat auxiliary engine	Marine Equipment	3.00	2.67	3.00	53.43	0.04	37.49	2.96	2.22	0.00	0.00	2.25
6		Clamshell Tugboat propulsion engine	Marine Equipment	374.27	333.10	374.27	6968.91	4.13	3742.70	386.22	221.38	0.00	0.01	224.60
6		Clamshell Tugboat auxiliary engine	Marine Equipment	53.99	48.05	53.99	961.72	0.75	674.89	53.30	39.92	0.00	0.00	40.50
6		Clamshell Crew boat propulsion engine	Marine Equipment	13.81	12.29	13.81	272.81	0.15	138.06	15.12	8.17	0.00	0.00	8.29
6		Clamshell Crew boat auxiliary engine	Marine Equipment	1.14	1.02	1.14	20.39	0.02	14.31	1.13	0.85	0.00	0.00	0.86
6		Clamshell Survey boat propulsion engine	Marine Equipment	12.32	10.96	12.32	243.43	0.14	123.19	13.49	7.29	0.00	0.00	7.39
7 Pier J Approach (clam shell dredge 270,000 CY)														
7		**Marine Clamshell Dredge**												
7		Clamshell Dredge hoist	Marine Equipment	196.43	196.43	196.43	5971.43	6.54	3404.76	330.94	260.34	0.00	0.00	260.34
7		Clamshell Dredge generator	Marine Equipment	147.32	147.32	147.32	4478.57	4.90	2553.57	248.21	143.84	0.00	0.00	143.84
7		Clamshell Barge dump scow	Marine Equipment	2.08	2.08	2.08	39.58	0.07	36.11	2.19	1.72	0.00	0.00	1.72
7		Clamshell Tugboat propulsion engine	Marine Equipment	27.52	24.49	27.52	512.42	0.30	275.20	28.40	16.28	0.00	0.00	16.51
7		Clamshell Tugboat auxiliary engine	Marine Equipment	3.97	3.53	3.97	70.71	0.05	49.62	3.92	2.94	0.00	0.00	2.98
7		Clamshell Tugboat propulsion engine	Marine Equipment	495.36	440.87	495.36	9223.56	5.47	4953.58	511.18	293.00	0.00	0.01	297.26
7		Clamshell Tugboat auxiliary engine	Marine Equipment	71.46	63.60	71.46	1272.87	0.99	893.24	70.54	52.83	0.00	0.00	53.60
7		Clamshell Crew boat propulsion engine	Marine Equipment	18.27	16.26	18.27	361.07	0.20	182.73	20.01	10.81	0.00	0.00	10.97
7		Clamshell Crew boat auxiliary engine	Marine Equipment	1.52	1.35	1.52	26.99	0.02	18.94	1.50	1.12	0.00	0.00	1.14
7		Clamshell Survey boat propulsion engine	Marine Equipment	16.30	14.51	16.30	322.18	0.18	163.05	17.86	9.64	0.00	0.00	9.78
8 Pier J Approach (clam shell dredge 1,699,000 CY)														
8		**Marine Clamshell Dredge**												
8		Clamshell Dredge hoist	Marine Equipment	1235.32	1235.32	1235.32	37553.65	41.13	21412.17	2081.26	1637.26	0.00	0.00	1637.26
8		Clamshell Dredge generator	Marine Equipment	926.49	926.49	926.49	28165.24	30.85	16059.13	1560.95	904.59	0.00	0.00	904.59
8		Clamshell Barge dump scow	Marine Equipment	13.10	13.10	13.10	248.94	0.44	227.10	13.80	10.82	0.00	0.00	10.82
8		Clamshell Tugboat propulsion engine	Marine Equipment	173.07	154.03	173.07	3222.55	1.91	1730.69	178.60	102.37	0.00	0.00	103.86
8		Clamshell Tugboat auxiliary engine	Marine Equipment	24.97	22.22	24.97	444.72	0.34	312.08	24.65	18.46	0.00	0.00	18.73
8		Clamshell Tugboat propulsion engine	Marine Equipment	3115.25	2772.57	3115.25	58005.95	34.39	31152.50	3214.75	1842.65	0.03	0.09	1869.45
8		Clamshell Tugboat auxiliary engine	Marine Equipment	449.40	399.97	449.40	8004.94	6.20	5617.50	443.64	332.27	0.00	0.02	337.08
8		Clamshell Crew boat propulsion engine	Marine Equipment	114.91	102.27	114.91	2270.71	1.27	1149.14	125.85	67.97	0.00	0.00	68.96
8		Clamshell Crew boat auxiliary engine	Marine Equipment	9.53	8.48	9.53	169.72	0.13	119.10	9.41	7.04	0.00	0.00	7.15
8		Clamshell Survey boat propulsion engine	Marine Equipment	102.54	91.26	102.54	2026.17	1.13	1025.39	112.29	60.65	0.00	0.00	61.53

Table H1.26

Alternative 2 Emissions by Task

				Mitigated Peak Day										
				PM10	PM2.5	DPM	NOX	SOX	CO	VOC	CO2	CH4	N2O	CO2e
Task ID		**Construction Element/Equipment**	**Source Type 1**	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(tonnes/day)	(tonnes/day)	(tonnes/day)	(tonnes/day)
6		**Pier J Basin (clam shell dredge 202,000 CY)**												
6		**Marine Clamshell Dredge**												
6		Clamshell Dredge hoist	Marine Equipment	0.44	0.44	0.44	13.27	0.01	7.57	0.74	0.58	0.00	0.00	0.5785
6		Clamshell Dredge generator	Marine Equipment	0.33	0.33	0.33	9.95	0.01	5.67	0.55	0.32	0.00	0.00	0.3196
6		Clamshell Barge dump scow	Marine Equipment	0.05	0.05	0.05	0.88	0.00	0.80	0.05	0.04	0.00	0.00	0.0382
6		Clamshell Tugboat propulsion engine	Marine Equipment	0.42	0.37	0.42	8.13	0.01	6.12	0.45	0.36	0.00	0.00	0.3670
6		Clamshell Tugboat auxiliary engine	Marine Equipment	0.03	0.03	0.03	1.13	0.00	1.21	0.06	0.07	0.00	0.00	0.0662
6		Clamshell Tugboat propulsion engine	Marine Equipment	7.49	6.66	7.49	146.41	0.12	110.08	8.11	6.51	0.00	0.00	6.6051
6		Clamshell Tugboat auxiliary engine	Marine Equipment	0.56	0.49	0.56	20.37	0.02	21.83	1.13	1.17	0.00	0.00	1.1910
6		Clamshell Crew boat propulsion engine	Marine Equipment	0.28	0.25	0.28	5.40	0.00	4.06	0.30	0.24	0.00	0.00	0.2436
6		Clamshell Crew boat auxiliary engine	Marine Equipment	0.01	0.01	0.01	0.43	0.00	0.46	0.02	0.02	0.00	0.00	0.0253
6		Clamshell Survey boat propulsion engine	Marine Equipment	0.25	0.22	0.25	4.82	0.00	3.62	0.27	0.21	0.00	0.00	0.2174
7		**Pier J Approach (clam shell dredge 270,000 CY)**												
7		**Marine Clamshell Dredge**												
7		Clamshell Dredge hoist	Marine Equipment	0.44	0.44	0.44	13.27	0.01	7.57	0.74	0.58	0.00	0.00	0.5785
7		Clamshell Dredge generator	Marine Equipment	0.33	0.33	0.33	9.95	0.01	5.67	0.55	0.32	0.00	0.00	0.3196
7		Clamshell Barge dump scow	Marine Equipment	0.05	0.05	0.05	0.88	0.00	0.80	0.05	0.04	0.00	0.00	0.0382
7		Clamshell Tugboat propulsion engine	Marine Equipment	0.42	0.37	0.42	8.13	0.01	6.12	0.45	0.36	0.00	0.00	0.3670
7		Clamshell Tugboat auxiliary engine	Marine Equipment	0.03	0.03	0.03	1.13	0.00	1.21	0.06	0.07	0.00	0.00	0.0662
7		Clamshell Tugboat propulsion engine	Marine Equipment	7.49	6.66	7.49	146.41	0.12	110.08	8.11	6.51	0.00	0.00	6.6051
7		Clamshell Tugboat auxiliary engine	Marine Equipment	0.56	0.49	0.56	20.37	0.02	21.83	1.13	1.17	0.00	0.00	1.1910
7		Clamshell Crew boat propulsion engine	Marine Equipment	0.28	0.25	0.28	5.40	0.00	4.06	0.30	0.24	0.00	0.00	0.2436
7		Clamshell Crew boat auxiliary engine	Marine Equipment	0.01	0.01	0.01	0.43	0.00	0.46	0.02	0.02	0.00	0.00	0.0253
7		Clamshell Survey boat propulsion engine	Marine Equipment	0.25	0.22	0.25	4.82	0.00	3.62	0.27	0.21	0.00	0.00	0.2174
8		**Pier J Approach (clam shell dredge 1,699,000 CY)**												
8		**Marine Clamshell Dredge**												
8		Clamshell Dredge hoist	Marine Equipment	0.44	0.44	0.44	13.27	0.01	7.57	0.74	0.58	0.00	0.00	0.5785
8		Clamshell Dredge generator	Marine Equipment	0.33	0.33	0.33	9.95	0.01	5.67	0.55	0.32	0.00	0.00	0.3196
8		Clamshell Barge dump scow	Marine Equipment	0.05	0.05	0.05	0.88	0.00	0.80	0.05	0.04	0.00	0.00	0.0382
8		Clamshell Tugboat propulsion engine	Marine Equipment	0.42	0.37	0.42	8.13	0.01	6.12	0.45	0.36	0.00	0.00	0.3670
8		Clamshell Tugboat auxiliary engine	Marine Equipment	0.03	0.03	0.03	1.13	0.00	1.21	0.06	0.07	0.00	0.00	0.0662
8		Clamshell Tugboat propulsion engine	Marine Equipment	7.49	6.66	7.49	146.41	0.12	110.08	8.11	6.51	0.00	0.00	6.6051
8		Clamshell Tugboat auxiliary engine	Marine Equipment	0.56	0.49	0.56	20.37	0.02	21.83	1.13	1.17	0.00	0.00	1.1910
8		Clamshell Crew boat propulsion engine	Marine Equipment	0.28	0.25	0.28	5.40	0.00	4.06	0.30	0.24	0.00	0.00	0.2436
8		Clamshell Crew boat auxiliary engine	Marine Equipment	0.01	0.01	0.01	0.43	0.00	0.46	0.02	0.02	0.00	0.00	0.0253
8		Clamshell Survey boat propulsion engine	Marine Equipment	0.25	0.22	0.25	4.82	0.00	3.62	0.27	0.21	0.00	0.00	0.2174

Note: clamshell dredge would be electric with mitigation; assume 90 percent reduction in diesel exhaust emissions.

Table H1.26

Alternative 2 Emissions by Task

				Mitigated Emissions										
				Total										
				PM10	PM2.5	DPM	NOX	SOX	CO	VOC	CO2	CH4	N2O	CO2e
Task ID		Construction Element/Equipment	Source Type 1	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(tonnes)	(tonnes)
6 Pier J Basin (clam shell dredge 202,000 CY)														
6		**Marine Clamshell Dredge**												
6		Clamshell Dredge hoist	Marine Equipment	14.84	14.84	14.84	451.17	0.49	257.25	25.00	19.67	0.00	0.00	19.67
6		Clamshell Dredge generator	Marine Equipment	11.13	11.13	11.13	338.38	0.37	192.94	18.75	10.87	0.00	0.00	10.87
6		Clamshell Barge dump scow	Marine Equipment	1.57	1.57	1.57	29.91	0.05	27.28	1.66	1.30	0.00	0.00	1.30
6		Clamshell Tugboat propulsion engine	Marine Equipment	14.14	12.58	14.14	276.54	0.23	207.93	15.33	12.30	0.00	0.00	12.48
6		Clamshell Tugboat auxiliary engine	Marine Equipment	1.05	0.93	1.05	38.47	0.04	41.24	2.13	2.22	0.00	0.00	2.25
6		Clamshell Tugboat propulsion engine	Marine Equipment	254.50	226.51	254.50	4977.80	4.13	3742.70	275.87	221.38	0.00	0.01	224.57
6		Clamshell Tugboat auxiliary engine	Marine Equipment	18.90	16.82	18.90	692.44	0.75	742.38	38.38	39.92	0.00	0.00	40.49
6		Clamshell Crew boat propulsion engine	Marine Equipment	9.39	8.36	9.39	183.62	0.15	138.06	10.18	8.17	0.00	0.00	8.28
6		Clamshell Crew boat auxiliary engine	Marine Equipment	0.40	0.36	0.40	14.68	0.02	15.74	0.81	0.85	0.00	0.00	0.86
6		Clamshell Survey boat propulsion engine	Marine Equipment	8.38	7.46	8.38	163.84	0.14	123.19	9.08	7.29	0.00	0.00	7.39
7 Pier J Approach (clam shell dredge 270,000 CY)														
7		**Marine Clamshell Dredge**												
7		Clamshell Dredge hoist	Marine Equipment	19.64	19.64	19.64	597.14	0.65	340.48	33.09	26.03	0.00	0.00	26.03
7		Clamshell Dredge generator	Marine Equipment	14.73	14.73	14.73	447.86	0.49	255.36	24.82	14.38	0.00	0.00	14.38
7		Clamshell Barge dump scow	Marine Equipment	2.08	2.08	2.08	39.58	0.07	36.11	2.19	1.72	0.00	0.00	1.72
7		Clamshell Tugboat propulsion engine	Marine Equipment	18.71	16.66	18.71	366.01	0.30	275.20	20.28	16.28	0.00	0.00	16.51
7		Clamshell Tugboat auxiliary engine	Marine Equipment	1.39	1.24	1.39	50.91	0.05	54.59	2.82	2.94	0.00	0.00	2.98
7		Clamshell Tugboat propulsion engine	Marine Equipment	336.84	299.79	336.84	6588.26	5.47	4953.58	365.13	293.00	0.00	0.01	297.23
7		Clamshell Tugboat auxiliary engine	Marine Equipment	25.01	22.26	25.01	916.47	0.99	982.57	50.79	52.83	0.00	0.00	53.59
7		Clamshell Crew boat propulsion engine	Marine Equipment	12.43	11.06	12.43	243.03	0.20	182.73	13.47	10.81	0.00	0.00	10.96
7		Clamshell Crew boat auxiliary engine	Marine Equipment	0.53	0.47	0.53	19.43	0.02	20.83	1.08	1.12	0.00	0.00	1.14
7		Clamshell Survey boat propulsion engine	Marine Equipment	11.09	9.87	11.09	216.85	0.18	163.05	12.02	9.64	0.00	0.00	9.78
8 Pier J Approach (clam shell dredge 1,699,000 CY)														
8		**Marine Clamshell Dredge**												
8		Clamshell Dredge hoist	Marine Equipment	123.53	123.53	123.53	3755.37	4.11	2141.22	208.13	163.73	0.00	0.00	163.73
8		Clamshell Dredge generator	Marine Equipment	92.65	92.65	92.65	2816.52	3.08	1605.91	156.09	90.46	0.00	0.00	90.46
8		Clamshell Barge dump scow	Marine Equipment	13.10	13.10	13.10	248.94	0.44	227.10	13.80	10.82	0.00	0.00	10.82
8		Clamshell Tugboat propulsion engine	Marine Equipment	117.69	104.74	117.69	2301.82	1.91	1730.69	127.57	102.37	0.00	0.00	103.85
8		Clamshell Tugboat auxiliary engine	Marine Equipment	8.74	7.78	8.74	320.20	0.34	343.29	17.75	18.46	0.00	0.00	18.72
8		Clamshell Tugboat propulsion engine	Marine Equipment	2118.37	1885.35	2118.37	41432.82	34.39	31152.50	2296.25	1842.65	0.02	0.09	1869.26
8		Clamshell Tugboat auxiliary engine	Marine Equipment	157.29	139.99	157.29	5763.55	6.20	6179.25	319.42	332.27	0.00	0.02	337.05
8		Clamshell Crew boat propulsion engine	Marine Equipment	78.14	69.55	78.14	1528.36	1.27	1149.14	84.70	67.97	0.00	0.00	68.95
8		Clamshell Crew boat auxiliary engine	Marine Equipment	3.33	2.97	3.33	122.20	0.13	131.01	6.77	7.04	0.00	0.00	7.15
8		Clamshell Survey boat propulsion engine	Marine Equipment	69.73	62.06	69.73	1363.77	1.13	1025.39	75.58	60.65	0.00	0.00	61.53

Note: clamshell dredge would be electric with mitigation; assume 90 percent reduction in diesel exhaust emissions.

Table H1.27
Alternative 3 Emissions by Task

							Unmitigated Emissions										
							Peak Day										
							PM10	PM2.5	DPM	NOX	SOX	CO	VOC	CO2	CH4	N2O	CO2e
Task ID		**Construction Element/Equipment**	**Source Type 1**	**Source Type 2**	**Onsite/Offsite**	**Days Total**	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(tonnes/day)	(tonnes/day)	(tonnes/day)	(tonnes/day)
1	**Electrical Substation Construction at Pier J (mitigation only)**																
1		**Off-Road Equipment**															
1		Caterpillar 320 excavator	Offroad Construction Equipment		onsite	20.00	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1		Small asphalt roller	Offroad Construction Equipment		onsite	26.00	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1		Water truck	Offroad Construction Equipment		onsite	20.00	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1		Forklift	Offroad Construction Equipment		onsite	22.00	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1		Mobile crane (35 ton)	Offroad Construction Equipment		onsite	2.00	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1		**On-Road Vehicles**															
1		Haul trucks	Onroad Construction Vehicles		onsite	5.00	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1		Supply trucks	Onroad Construction Vehicles		onsite	5.00	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1		Haul trucks	Onroad Construction Vehicles		offsite	5.00	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1		Supply trucks	Onroad Construction Vehicles		offsite	5.00	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1		Workers	Onroad Construction Vehicles		offsite	60.00	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1		Fugitive Dust															
1		Soil handling	Fugitive Emissions		onsite	20.00	n/a	n/a									
1		Asphalting	Fugitive Emissions		onsite												
2	**Pier J Breakwater Construction**																
2		**Marine Activities**															
2		Pier J Breakwater Tugboat propulsion	Marine Equipment	Pier J Breakwater Construction	onsite	54.00	5.81	5.17	5.81	108.18	0.06	58.10	6.00	3.44	0.0001	0.00	3.49
2		Pier J Breakwater Tugboat auxiliary	Marine Equipment	Pier J Breakwater Construction	onsite	54.00	1.06	0.94	1.06	18.86	0.01	13.23	1.05	0.78	0.0000	0.00	0.79
2		Pier J Breakwater Crew boat propulsion engine	Marine Equipment	Pier J Breakwater Construction	onsite	54.00	0.41	0.36	0.41	8.02	0.00	4.06	0.44	0.24	0.0000	0.00	0.24
2		Pier J Breakwater Crew boat auxiliary engine	Marine Equipment	Pier J Breakwater Construction	onsite	54.00	0.03	0.03	0.03	0.60	0.00	0.42	0.03	0.02	0.0000	0.00	0.03
2		Pier J Breakwater Survey boat propulsion engine	Marine Equipment	Pier J Breakwater Construction	onsite	54.00	0.36	0.32	0.36	7.16	0.00	3.62	0.40	0.21	0.0000	0.00	0.22
2		**Off-Road Equipment**															
2		Piling crane	Offroad Construction Equipment		onsite	54.00	0.21	0.19	0.21	5.00	0.01	2.67	0.47	0.38	0.0000	0.00	0.38
2		Long arm excavator	Offroad Construction Equipment		onsite	54.00	0.08	0.07	0.08	2.19	0.01	2.78	0.32	0.63	0.0000	0.00	0.63
2		**On-Road Vehicles**															
2		Delivery Trucks	Onroad Construction Vehicles		onsite	5.00	0.15	0.04	0.00	0.08	0.00	0.01	0.00	0.01	0.0000	0.00	0.01
2		Delivery Trucks	Onroad Construction Vehicles		offsite	5.00	0.49	0.19	0.02	3.22	0.02	0.18	0.03	0.92	0.0000	0.00	0.96
2		Workers	Onroad Construction Vehicles		offsite	54.00	0.16	0.05	0.00	0.06	0.00	0.96	0.01	0.17	0.0000	0.00	0.17

Table H1.27
Alternative 3 Emissions by Task

				Unmitigated Emissions										
				Total										
				PM10	PM2.5	DPM	NOX	SOX	CO	VOC	CO2	CH4	N2O	CO2e
Task ID		**Construction Element/Equipment**	**Source Type 1**	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(tonnes)	(tonnes)	(tonnes)	(tonnes)
1 Electrical Substation Construction at Pier J (mitigation only)														
1		**Off-Road Equipment**												
1		Caterpillar 320 excavator	Offroad Construction Equipment	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1		Small asphalt roller	Offroad Construction Equipment	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1		Water truck	Offroad Construction Equipment	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1		Forklift	Offroad Construction Equipment	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1		Mobile crane (35 ton)	Offroad Construction Equipment	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1		**On-Road Vehicles**												
1		Haul trucks	Onroad Construction Vehicles	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1		Supply trucks	Onroad Construction Vehicles	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1		Haul trucks	Onroad Construction Vehicles	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1		Supply trucks	Onroad Construction Vehicles	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1		Workers	Onroad Construction Vehicles	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1		Fugitive Dust												
1		Soil handling	Fugitive Emissions	n/a	n/a									
1		Asphalting	Fugitive Emissions											
2 Pier J Breakwater Construction														
2		**Marine Activities**												
2		Pier J Breakwater Tugboat propulsion	Marine Equipment	313.73	279.22	313.73	5841.59	3.46	3137.27	323.75	185.57	0.00	0.01	188.27
2		Pier J Breakwater Tugboat auxiliary	Marine Equipment	57.17	50.88	57.17	1018.30	0.79	714.59	56.44	42.27	0.00	0.00	42.88
2		Pier J Breakwater Crew boat propulsion engine	Marine Equipment	21.93	19.52	21.93	433.28	0.24	219.27	24.01	12.97	0.00	0.00	13.16
2		Pier J Breakwater Crew boat auxiliary engine	Marine Equipment	1.82	1.62	1.82	32.38	0.03	22.73	1.79	1.34	0.00	0.00	1.36
2		Pier J Breakwater Survey boat propulsion engine	Marine Equipment	19.57	17.41	19.57	386.62	0.22	195.66	21.43	11.57	0.00	0.00	11.74
2		**Off-Road Equipment**												
2		Piling crane	Offroad Construction Equipment	11.27	10.36	11.27	270.12	0.42	144.43	25.20	20.52	0.00	0.00	20.52
2		Long arm excavator	Offroad Construction Equipment	4.06	3.74	4.06	118.13	0.70	149.87	17.33	34.23	0.00	0.00	34.23
2		**On-Road Vehicles**												
2		Delivery Trucks	Onroad Construction Vehicles	0.74	0.18	0.00	0.39	0.00	0.05	0.01	0.06	0.00	0.00	0.06
2		Delivery Trucks	Onroad Construction Vehicles	2.43	0.94	0.11	16.08	0.10	0.92	0.13	4.60	0.00	0.00	4.81
2		Workers	Onroad Construction Vehicles	8.58	2.72	0.00	3.14	0.20	51.79	0.81	9.13	0.00	0.00	9.18

Table H1.27
Alternative 3 Emissions by Task

				Mitigated Peak Day										
				PM10	PM2.5	DPM	NOX	SOX	CO	VOC	CO2	CH4	N2O	CO2e
Task ID		**Construction Element/Equipment**	**Source Type 1**	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(tonnes/day)	(tonnes/day)	(tonnes/day)	(tonnes/day)
1	**Electrical Substation Construction at Pier J (mitigation only)**													
1		**Off-Road Equipment**												
1		Caterpillar 320 excavator	Offroad Construction Equipment	0.02	0.02	0.02	0.33	0.01	1.23	0.1561	0.26	0.00	0.00	0.26
1		Small asphalt roller	Offroad Construction Equipment	0.00	0.00	0.00	0.74	0.00	0.91	0.0408	0.06	0.00	0.00	0.06
1		Water truck	Offroad Construction Equipment	0.03	0.03	0.03	0.60	0.01	2.59	0.2964	0.00	0.00	0.00	0.00
1		Forklift	Offroad Construction Equipment	0.00	0.00	0.00	0.15	0.00	0.16	0.0081	0.00	0.00	0.00	0.00
1		Mobile crane (35 ton)	Offroad Construction Equipment	0.02	0.02	0.02	0.43	0.01	2.41	0.2126	0.00	0.00	0.00	0.00
1		**On-Road Vehicles**												
1		Haul trucks	Onroad Construction Vehicles	0.09	0.02	0.00	0.05	0.00	0.01	0.0006	0.01	0.00	0.00	0.01
1		Supply trucks	Onroad Construction Vehicles	0.21	0.05	0.00	0.11	0.00	0.01	0.0015	0.02	0.00	0.00	0.02
1		Haul trucks	Onroad Construction Vehicles	0.02	0.01	0.00	0.11	0.00	0.01	0.0008	0.03	0.00	0.00	0.03
1		Supply trucks	Onroad Construction Vehicles	0.07	0.03	0.00	0.45	0.00	0.03	0.0036	0.13	0.00	0.00	0.13
1		Workers	Onroad Construction Vehicles	0.15	0.05	0.00	0.06	0.00	0.91	0.0143	0.16	0.00	0.00	0.16
1		Fugitive Dust												
1		Soil handling	Fugitive Emissions	2.01	0.30									
1		Asphalting	Fugitive Emissions											
2	**Pier J Breakwater Construction**													
2		**Marine Activities**												
2		Pier J Breakwater Tugboat propulsion	Marine Equipment	3.95	3.52	3.95	77.27	0.06	58.10	4.2824	3.44	0.00	0.00	3.49
2		Pier J Breakwater Tugboat auxiliary	Marine Equipment	0.37	0.33	0.37	13.58	0.01	14.56	0.7525	0.78	0.00	0.00	0.79
2		Pier J Breakwater Crew boat propulsion engine	Marine Equipment	0.28	0.25	0.28	5.40	0.00	4.06	0.2993	0.24	0.00	0.00	0.24
2		Pier J Breakwater Crew boat auxiliary engine	Marine Equipment	0.01	0.01	0.01	0.43	0.00	0.46	0.0239	0.02	0.00	0.00	0.03
2		Pier J Breakwater Survey boat propulsion engine	Marine Equipment	0.25	0.22	0.25	4.82	0.00	3.62	0.2671	0.21	0.00	0.00	0.22
2		**Off-Road Equipment**												
2		Piling crane	Offroad Construction Equipment	0.02	0.02	0.02	0.48	0.01	2.67	0.2356	0.38	0.00	0.00	0.38
2		Long arm excavator	Offroad Construction Equipment	0.04	0.04	0.04	0.79	0.01	2.78	0.3209	0.63	0.00	0.00	0.63
2		**On-Road Vehicles**												
2		Delivery Trucks	Onroad Construction Vehicles	0.15	0.04	0.00	0.08	0.00	0.01	0.0011	0.01	0.00	0.00	0.01
2		Delivery Trucks	Onroad Construction Vehicles	0.49	0.19	0.02	3.22	0.02	0.18	0.0256	0.92	0.00	0.00	0.96
2		Workers	Onroad Construction Vehicles	0.16	0.05	0.00	0.06	0.00	0.96	0.0150	0.17	0.00	0.00	0.17

Table H1.27
Alternative 3 Emissions by Task

				Mitigated Emissions										
				Total										
				PM10	PM2.5	DPM	NOX	SOX	CO	VOC	CO2	CH4	N2O	CO2e
Task ID		**Construction Element/Equipment**	**Source Type 1**	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(tonnes)	(tonnes)
1 Electrical Substation Construction at Pier J (mitigation only)														
1		**Off-Road Equipment**												
1		Caterpillar 320 excavator	Offroad Construction Equipment	0.33	0.33	0.33	6.59	0.11	24.52	3.12	5.30	0.00	0.00	5.30
1		Small asphalt roller	Offroad Construction Equipment	0.13	0.13	0.13	19.12	0.03	23.58	1.06	1.511223352	0	0	1.511223352
1		Water truck	Offroad Construction Equipment	0.60	0.60	0.60	12.06	0.20	51.75	5.93	0	0	0	0
1		Forklift	Offroad Construction Equipment	0.02	0.02	0.02	3.23	0.01	3.59	0.18	0	0	0	0
1		Mobile crane (35 ton)	Offroad Construction Equipment	0.04	0.04	0.04	0.87	0.01	4.83	0.43	0	0	0	0
1		**On-Road Vehicles**												
1		Haul trucks	Onroad Construction Vehicles	0.44	0.11	0.00	0.24	0.00	0.03	0.00	0.035354006	6.65075E-08	5.55716E-06	0.037011702
1		Supply trucks	Onroad Construction Vehicles	1.03	0.26	0.00	0.55	0.00	0.06	0.01	0.082492681	1.55184E-07	1.29667E-05	0.086360637
1		Haul trucks	Onroad Construction Vehicles	0.08	0.03	0.00	0.53	0.00	0.03	0.00	0.151656946	8.88911E-08	2.38384E-05	0.158763
1		Supply trucks	Onroad Construction Vehicles	0.34	0.13	0.02	2.25	0.01	0.13	0.02	0.643393105	3.77114E-07	0.000101132	0.673539999
1		Workers	Onroad Construction Vehicles	9.08	2.88	0.00	3.33	0.21	54.81	0.86	9.659044664	9.91447E-05	0.0001697	9.712093981
1		Fugitive Dust												
1		Soil handling	Fugitive Emissions	40.12	6.07									
1		Asphalting	Fugitive Emissions											
2 Pier J Breakwater Construction														
2		**Marine Activities**												
2		Pier J Breakwater Tugboat propulsion	Marine Equipment	213.33	189.87	213.33	4172.56	3.46	3137.27	231.25	185.57	0.00	0.01	188.25
2		Pier J Breakwater Tugboat auxiliary	Marine Equipment	20.01	17.81	20.01	733.17	0.79	786.05	40.63	42.27	0.00	0.00	42.88
2		Pier J Breakwater Crew boat propulsion engine	Marine Equipment	14.91	13.27	14.91	291.63	0.24	219.27	16.16	12.97	0.00	0.00	13.16
2		Pier J Breakwater Crew boat auxiliary engine	Marine Equipment	0.64	0.57	0.64	23.32	0.03	25.00	1.29	1.34	0.00	0.00	1.36
2		Pier J Breakwater Survey boat propulsion engine	Marine Equipment	13.30	11.84	13.30	260.22	0.22	195.66	14.42	11.57	0.00	0.00	11.74
2		**Off-Road Equipment**												
2		Piling crane	Offroad Construction Equipment	1.29	1.29	1.29	25.89	0.42	144.43	12.72	20.52	0.00	0.00	20.52
2		Long arm excavator	Offroad Construction Equipment	2.14	2.14	2.14	42.75	0.70	149.87	17.33	34.23	0.00	0.00	34.23
2		**On-Road Vehicles**												
2		Delivery Trucks	Onroad Construction Vehicles	0.74	0.18	0.00	0.39	0.00	0.05	0.01	0.058923344	1.10846E-07	9.26193E-06	0.06168617
2		Delivery Trucks	Onroad Construction Vehicles	2.43	0.94	0.11	16.08	0.10	0.92	0.13	4.595665034	2.69367E-06	0.000722375	4.81099999
2		Workers	Onroad Construction Vehicles	8.58	2.72	0.00	3.14	0.20	51.79	0.81	9.127797208	9.36918E-05	0.000160367	9.177928812

Table H1.27
Alternative 3 Emissions by Task

							Unmitigated Emissions										
							Peak Day										
							PM10	PM2.5	DPM	NOX	SOX	CO	VOC	CO2	CH4	N2O	CO2e
Task ID		**Construction Element/Equipment**	**Source Type 1**	**Source Type 2**	**Onsite/Off site**	**Days Total**	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(tonnes/da y)	(tonnes/day)	(tonnes/day)	(tonnes/da y)
3 Approach Channel (hopper dredge 2,600,000 CY)																	
3		**Marine Hopper Dredge**															
3		Hopper propulsion engine	Marine Equipment	dredging	onsite	150.00	26.63	23.70	26.63	495.89	0.29	266.32	27.48	15.75	0.0002	0.00	15.98
3		Hopper propulsion engine	Marine Equipment	transit	offsite	150.00	50.31	44.77	50.31	936.68	0.56	503.05	51.91	29.76	0.0004	0.00	30.19
3		Hopper auxiliary engine	Marine Equipment	disposal	near shore	150.00	0.22	0.20	0.22	5.06	0.00	3.70	0.28	0.22	0.0000	0.00	0.22
3		Crew boat propulsion engine	Marine Equipment	support	onsite	150.00	0.41	0.36	0.41	8.02	0.00	4.06	0.44	0.24	0.0000	0.00	0.24
3		Crew boat auxiliary engine	Marine Equipment	support	onsite	150.00	0.03	0.03	0.03	0.60	0.00	0.42	0.03	0.02	0.0000	0.00	0.03
3		Survey boat propulsion engine	Marine Equipment	dredging	onsite	150.00	1.45	1.29	1.45	28.64	0.02	14.49	1.59	0.86	0.0000	0.00	0.87
4 Main Channel Widening (clam shell dredge 1,065,000 CY)																	
4		**Marine Clamshell Dredge**															
4		Clamshell Dredge hoist	Marine Equipment	dredging	onsite	177.00	4.37	4.37	4.37	132.70	0.15	75.66	7.35	5.79	0.0000	0.00	5.79
4		Clamshell Dredge generator	Marine Equipment	dredging	onsite	177.00	3.27	3.27	3.27	99.52	0.11	56.75	5.52	3.20	0.0000	0.00	3.20
4		Clamshell Barge dump scow	Marine Equipment	disposal	near shore	177.00	0.05	0.05	0.05	0.88	0.00	0.80	0.05	0.04	0.0000	0.00	0.04
4		Clamshell Tugboat propulsion engine	Marine Equipment	dredging	onsite	177.00	0.61	0.54	0.61	11.39	0.01	6.12	0.63	0.36	0.0000	0.00	0.37
4		Clamshell Tugboat auxiliary engine	Marine Equipment	dredging	onsite	177.00	0.09	0.08	0.09	1.57	0.00	1.10	0.09	0.07	0.0000	0.00	0.07
4		Clamshell Tugboat propulsion engine	Marine Equipment	transit	offsite	177.00	11.01	9.80	11.01	204.97	0.12	110.08	11.36	6.51	0.0001	0.00	6.61
4		Clamshell Tugboat auxiliary engine	Marine Equipment	transit	offsite	177.00	1.59	1.41	1.59	28.29	0.02	19.85	1.57	1.17	0.00	0.00	1.19
4		Clamshell Crew boat propulsion engine	Marine Equipment	support	onsite	177	0.4060579	0.3613915	0.4060579	8.0237043	0.0044829	4.0605791	0.4446821	0.240181	3.83111E-06	1.14196E-05	0.2436798
4		Clamshell Crew boat auxiliary engine	Marine Equipment	support	onsite	177.0000	0.0336683	0.0300	0.0336683	0.5997163	0.0004646	0.4208535	0.0332369	0.0248933	2.86349E-07	1.18357E-06	0.0252531
4		Clamshell Survey boat propulsion engine	Marine Equipment	dredging	onsite	177.00	0.36	0.32	0.36	7.16	0.00	3.62	0.40	0.21	0.0000	0.00	0.22

Table H1.27
Alternative 3 Emissions by Task

				Unmitigated Emissions										
				Total										
				PM10	PM2.5	DPM	NOX	SOX	CO	VOC	CO2	CH4	N2O	CO2e
Task ID		**Construction Element/Equipment**	**Source Type 1**	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(tonnes)	(tonnes)	(tonnes)	(tonnes)
3 Approach Channel (hopper dredge 2,600,000 CY)														
3		**Marine Hopper Dredge**												
3		Hopper propulsion engine	Marine Equipment	3994.82	3555.39	3994.82	74383.56	44.10	39948.21	4122.42	2362.91	0.04	0.11	2397.28
3		Hopper propulsion engine	Marine Equipment	7545.77	6715.74	7545.77	140502.28	83.31	75457.73	7786.78	4463.28	0.07	0.21	4528.20
3		Hopper auxiliary engine	Marine Equipment	33.29	29.63	33.29	759.02	0.61	554.84	42.07	32.82	0.00	0.00	33.29
3		Crew boat propulsion engine	Marine Equipment	60.91	54.21	60.91	1203.56	0.67	609.09	66.70	36.03	0.00	0.00	36.55
3		Crew boat auxiliary engine	Marine Equipment	5.05	4.49	5.05	89.96	0.07	63.13	4.99	3.73	0.00	0.00	3.79
3		Survey boat propulsion engine	Marine Equipment	217.40	193.48	217.40	4295.77	2.40	2173.97	238.08	128.59	0.00	0.01	130.46
4 Main Channel Widening (clam shell dredge 1,065,000 CY)														
4		**Marine Clamshell Dredge**												
4		Clamshell Dredge hoist	Marine Equipment	772.62	772.62	772.62	23487.62	25.72	13392.06	1301.71	1024.01	0.00	0.00	1024.01
4		Clamshell Dredge generator	Marine Equipment	579.46	579.46	579.46	17615.71	19.29	10044.05	976.28	565.77	0.00	0.00	565.77
4		Clamshell Barge dump scow	Marine Equipment	8.19	8.19	8.19	155.69	0.27	142.04	8.63	6.77	0.00	0.00	6.77
4		Clamshell Tugboat propulsion engine	Marine Equipment	108.24	96.34	108.24	2015.52	1.20	1082.45	111.70	64.03	0.00	0.00	64.96
4		Clamshell Tugboat auxiliary engine	Marine Equipment	15.62	13.90	15.62	278.15	0.22	195.19	15.42	11.55	0.00	0.00	11.71
4		Clamshell Tugboat propulsion engine	Marine Equipment	1948.41	1734.08	1948.41	36279.34	21.51	19484.07	2010.64	1152.47	0.02	0.05	1169.23
4		Clamshell Tugboat auxiliary engine	Marine Equipment	281.07	250.16	281.07	5006.62	3.88	3513.42	277.47	207.82	0.00	0.01	210.82
4		Clamshell Crew boat propulsion engine	Marine Equipment	71.87225	63.966303	71.87225	1420.19566	0.7934696	718.7225	78.708739	42.512033	0.000678106	0.002021278	43.131327
4		Clamshell Crew boat auxiliary engine	Marine Equipment	5.9592862	5.3037647	5.9592862	106.149785	0.0822381	74.49	5.8829328	4.4061055	0.00	0.000209493	4.4698014
4		Clamshell Survey boat propulsion engine	Marine Equipment	64.13	57.08	64.13	1267.25	0.71	641.32	70.23	37.93	0.00	0.00	38.49

Table H1.27
Alternative 3 Emissions by Task

				Mitigated										
				Peak Day										
				PM10	PM2.5	DPM	NOX	SOX	CO	VOC	CO2	CH4	N2O	CO2e
Task ID		**Construction Element/Equipment**	**Source Type 1**	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(tonnes/day)	(tonnes/day)	(tonnes/day)	(tonnes/day)
3 Approach Channel (hopper dredge 2,600,000 CY)														
3		**Marine Hopper Dredge**												
3		Hopper propulsion engine	Marine Equipment	26.63	23.70	26.63	495.89	0.29	266.32	27.4828	15.75	0.00	0.00	15.98
3		Hopper propulsion engine	Marine Equipment	50.31	44.77	50.31	936.68	0.56	503.05	51.9119	29.76	0.00	0.00	30.19
3		Hopper auxiliary engine	Marine Equipment	0.22	0.20	0.22	5.06	0.00	3.70	0.2804	0.22	0.00	0.00	0.22
3		Crew boat propulsion engine	Marine Equipment	0.28	0.25	0.28	5.40	0.00	4.06	0.2993	0.24	0.00	0.00	0.24
3		Crew boat auxiliary engine	Marine Equipment	0.01	0.01	0.01	0.43	0.00	0.46	0.0239	0.02	0.00	0.00	0.03
3		Survey boat propulsion engine	Marine Equipment	0.99	0.88	0.99	19.28	0.02	14.49	1.0683	0.86	0.00	0.00	0.87
4 Main Channel Widening (clam shell dredge 1,065,000 CY)														
4		**Marine Clamshell Dredge**												
4		Clamshell Dredge hoist	Marine Equipment	0.44	0.44	0.44	13.27	0.01	7.57	0.7354	0.58	0.00	0.00	0.58
4		Clamshell Dredge generator	Marine Equipment	0.33	0.33	0.33	9.95	0.01	5.67	0.5516	0.32	0.00	0.00	0.32
4		Clamshell Barge dump scow	Marine Equipment	0.05	0.05	0.05	0.88	0.00	0.80	0.0488	0.04	0.00	0.00	0.04
4		Clamshell Tugboat propulsion engine	Marine Equipment	0.42	0.37	0.42	8.13	0.01	6.12	0.4508	0.36	0.00	0.00	0.37
4		Clamshell Tugboat auxiliary engine	Marine Equipment	0.03	0.03	0.03	1.13	0.00	1.21	0.0627	0.07	0.00	0.00	0.07
4		Clamshell Tugboat propulsion engine	Marine Equipment	7.49	6.66	7.49	146.41	0.12	110.08	8.1140	6.51	0.00	0.00	6.61
4		Clamshell Tugboat auxiliary engine	Marine Equipment	0.56	0.49	0.56	20.37	0.02	21.83	1.13	1.17	0.00	0.00	1.19
4		Clamshell Crew boat propulsion engine	Marine Equipment	0.2761194	0.2457462	0.2761194	5.4005702	0.0044829	4.0605791	0.2993053	0.240181	2.57863E-06	1.14196E-05	0.2436485
4		Clamshell Crew boat auxiliary engine	Marine Equipment	0.0117839	0.0104877	0.0117839	0.4317957	0.0004646	0.4629389	0.0239306	0.0248933	2.06171E-07	1.18357E-06	0.0252511
4		Clamshell Survey boat propulsion engine	Marine Equipment	0.25	0.22	0.25	4.82	0.00	3.62	0.2671	0.21	0.00	0.00	0.22

Note: clamshell dredge would be electric with mitigation; assume 90 percent reduction in diesel exhaust emissions.

Table H1.27
Alternative 3 Emissions by Task

				Mitigated Emissions										
				Total										
				PM10	PM2.5	DPM	NOX	SOX	CO	VOC	CO2	CH4	N2O	CO2e
Task ID		**Construction Element/Equipment**	**Source Type 1**	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(tonnes)	(tonnes)
3 Approach Channel (hopper dredge 2,600,000 CY)														
3		**Marine Hopper Dredge**												
3		Hopper propulsion engine	Marine Equipment	3994.82	3555.39	3994.82	74383.56	44.10	39948.21	4122.42	2362.91	0.04	0.11	2397.28
3		Hopper propulsion engine	Marine Equipment	7545.77	6715.74	7545.77	140502.28	83.31	75457.73	7786.78	4463.282182	0.067086143	0.212211269	4528.198294
3		Hopper auxiliary engine	Marine Equipment	33.29	29.63	33.29	759.02	0.61	554.84	42.07	32.81825134	0.00036241	0.001560377	33.29230393
3		Crew boat propulsion engine	Marine Equipment	41.42	36.86	41.42	810.09	0.67	609.09	44.90	36.02714702	0.000386795	0.001712947	36.54727515
3		Crew boat auxiliary engine	Marine Equipment	1.77	1.57	1.77	64.77	0.07	69.44	3.59	3.733987708	3.09257E-05	0.000177536	3.787666645
3		Survey boat propulsion engine	Marine Equipment	147.83	131.57	147.83	2891.38	2.40	2173.97	160.24	128.5892017	0.001380559	0.006113904	130.445659
4 Main Channel Widening (clam shell dredge 1,065,000 CY)														
4		**Marine Clamshell Dredge**												
4		Clamshell Dredge hoist	Marine Equipment	77.26	77.26	77.26	2348.76	2.57	1339.21	130.17	102.4011648	0	0	102.4011648
4		Clamshell Dredge generator	Marine Equipment	57.95	57.95	57.95	1761.57	1.93	1004.40	97.63	56.57711647	0	0	56.57711647
4		Clamshell Barge dump scow	Marine Equipment	8.19	8.19	8.19	155.69	0.27	142.04	8.63	6.766310242	0	0	6.766310242
4		Clamshell Tugboat propulsion engine	Marine Equipment	73.61	65.51	73.61	1439.66	1.20	1082.45	79.79	64.02622048	0.000687398	0.003044191	64.95057449
4		Clamshell Tugboat auxiliary engine	Marine Equipment	5.47	4.86	5.47	200.26	0.22	214.71	11.10	11.54537331	9.56212E-05	0.000548936	11.7113469
4		Clamshell Tugboat propulsion engine	Marine Equipment	1324.92	1179.18	1324.92	25913.82	21.51	19484.07	1436.17	1152.471969	0.012373165	0.054795446	1169.110341
4		Clamshell Tugboat auxiliary engine	Marine Equipment	98.38	87.55	98.38	3604.77	3.88	3864.76	199.78	207.8167195	0.001721181	0.009880856	210.8042442
4		Clamshell Crew boat propulsion engine	Marine Equipment	48.87313	43.497086	48.87313	955.900927	0.7934696	718.7225	52.977036	42.51203349	0.000456418	0.002021278	43.12578467
4		Clamshell Crew boat auxiliary engine	Marine Equipment	2.0857502	1.8563176	2.0857502	76.4278451	0.0822381	81.94	4.2357116	4.406105495	3.64923E-05	0.000209493	4.469446641
4		Clamshell Survey boat propulsion engine	Marine Equipment	43.61	38.81	43.61	852.96	0.71	641.32	47.27	37.93	0.00	0.00	38.48

Note: clamshell dredge would be electric with mitigation; assume 90 percent reduction in diesel exhaust emissions.

Table H1.27
Alternative 3 Emissions by Task

							Unmitigated Emissions										
							Peak Day										
							PM10	PM2.5	DPM	NOX	SOX	CO	VOC	CO2	CH4	N2O	CO2e
Task ID		**Construction Element/Equipment**	**Source Type 1**	**Source Type 2**	**Onsite/Off site**	**Days Total**	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(tonnes/da y)	(tonnes/day)	(tonnes/day)	(tonnes/da y)
5	**West Basin (clam shell dredge 717,000 CY)**																
5		**Marine Clamshell Dredge**															
5		Clamshell Dredge hoist	Marine Equipment	dredging	onsite	120.00	4.37	4.37	4.37	132.70	0.15	75.66	7.35	5.79	0.0000	0.00	5.79
5		Clamshell Dredge generator	Marine Equipment	dredging	onsite	120.00	3.27	3.27	3.27	99.52	0.11	56.75	5.52	3.20	0.0000	0.00	3.20
5		Clamshell Barge dump scow	Marine Equipment	disposal	near shore	120.00	0.05	0.05	0.05	0.88	0.00	0.80	0.05	0.04	0.0000	0.00	0.04
5		Clamshell Tugboat propulsion engine	Marine Equipment	dredging	onsite	120.00	0.61	0.54	0.61	11.39	0.01	6.12	0.63	0.36	0.0000	0.00	0.37
5		Clamshell Tugboat auxiliary engine	Marine Equipment	dredging	onsite	120.00	0.09	0.08	0.09	1.57	0.00	1.10	0.09	0.07	0.0000	0.00	0.07
5		Clamshell Tugboat propulsion engine	Marine Equipment	transit	offsite	120.00	11.01	9.80	11.01	204.97	0.12	110.08	11.36	6.51	0.0001	0.00	6.61
5		Clamshell Tugboat auxiliary engine	Marine Equipment	transit	offsite	120.00	1.59	1.41	1.59	28.29	0.02	19.85	1.57	1.17	0.00	0.00	1.19
5		Clamshell Crew boat propulsion engine	Marine Equipment	support	onsite	120	0.4060579	0.3613915	0.4060579	8.0237043	0.0044829	4.0605791	0.4446821	0.240181	3.83111E-06	1.14196E-05	0.2436798
5		Clamshell Crew boat auxiliary engine	Marine Equipment	support	onsite	120.0000	0.0336683	0.0300	0.0336683	0.5997163	0.0004646	0.4208535	0.0332369	0.0248933	2.86349E-07	1.18357E-06	0.0252531
5		Clamshell Survey boat propulsion engine	Marine Equipment	dredging	onsite	120.00	0.36	0.32	0.36	7.16	0.00	3.62	0.40	0.21	0.0000	0.00	0.22
6	**Pier J Basin (clam shell dredge 258,000 CY)**																
6		**Marine Clamshell Dredge**															
6		Clamshell Dredge hoist	Marine Equipment	dredging	onsite	43.00	4.37	4.37	4.37	132.70	0.15	75.66	7.35	5.79	0.0000	0.00	5.79
6		Clamshell Dredge generator	Marine Equipment	dredging	onsite	43.00	3.27	3.27	3.27	99.52	0.11	56.75	5.52	3.20	0.0000	0.00	3.20
6		Clamshell Barge dump scow	Marine Equipment	disposal	offsite	43.00	0.05	0.05	0.05	0.88	0.00	0.80	0.05	0.04	0.0000	0.00	0.04
6		Clamshell Tugboat propulsion engine	Marine Equipment	dredging	onsite	43.00	0.61	0.54	0.61	11.39	0.01	6.12	0.63	0.36	0.0000	0.00	0.37
6		Clamshell Tugboat auxiliary engine	Marine Equipment	dredging	onsite	43.00	0.09	0.08	0.09	1.57	0.00	1.10	0.09	0.07	0.0000	0.00	0.07
6		Clamshell Tugboat propulsion engine	Marine Equipment	transit	offsite	43.00	11.01	9.80	11.01	204.97	0.12	110.08	11.36	6.51	0.0001	0.00	6.61
6		Clamshell Tugboat auxiliary engine	Marine Equipment	transit	offsite	43.00	1.59	1.41	1.59	28.29	0.02	19.85	1.57	1.17	0.0000	0.00	1.19
6		Clamshell Crew boat propulsion engine	Marine Equipment	support	onsite	43	0.4060579	0.3613915	0.4060579	8.0237043	0.0044829	4.0605791	0.4446821	0.240181	3.83111E-06	1.14196E-05	0.2436798
6		Clamshell Crew boat auxiliary engine	Marine Equipment	support	onsite	43.0000	0.0336683	0.0300	0.0336683	0.5997163	0.0004646	0.4208535	0.0332369	0.0248933	2.86349E-07	1.18357E-06	0.0252531
6		Clamshell Survey boat propulsion engine	Marine Equipment	dredging	onsite	43.00	0.36	0.32	0.36	7.16	0.00	3.62	0.40	0.21	0.0000	0.00	0.22

Table H1.27
Alternative 3 Emissions by Task

				Unmitigated Emissions										
				Total										
				PM10	PM2.5	DPM	NOX	SOX	CO	VOC	CO2	CH4	N2O	CO2e
Task ID		**Construction Element/Equipment**	**Source Type 1**	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(tonnes)	(tonnes)	(tonnes)	(tonnes)
5 West Basin (clam shell dredge 717,000 CY)														
5		**Marine Clamshell Dredge**												
5		Clamshell Dredge hoist	Marine Equipment	523.81	523.81	523.81	15923.81	17.44	9079.37	882.51	694.25	0.00	0.00	694.25
5		Clamshell Dredge generator	Marine Equipment	392.86	392.86	392.86	11942.86	13.08	6809.52	661.89	383.57	0.00	0.00	383.57
5		Clamshell Barge dump scow	Marine Equipment	5.56	5.56	5.56	105.56	0.18	96.30	5.85	4.59	0.00	0.00	4.59
5		Clamshell Tugboat propulsion engine	Marine Equipment	73.39	65.31	73.39	1366.45	0.81	733.86	75.73	43.41	0.00	0.00	44.04
5		Clamshell Tugboat auxiliary engine	Marine Equipment	10.59	9.42	10.59	188.57	0.15	132.33	10.45	7.83	0.00	0.00	7.94
5		Clamshell Tugboat propulsion engine	Marine Equipment	1320.95	1175.65	1320.95	24596.16	14.58	13209.54	1363.15	781.34	0.01	0.04	792.70
5		Clamshell Tugboat auxiliary engine	Marine Equipment	190.56	169.60	190.56	3394.32	2.63	2381.98	188.12	140.89	0.00	0.01	142.93
5		Clamshell Crew boat propulsion engine	Marine Equipment	48.726949	43.366985	48.726949	962.844517	0.5379455	487.26949	53.361857	28.821718	0.000459733	0.001370358	29.241578
5		Clamshell Crew boat auxiliary engine	Marine Equipment	4.040194	3.5957727	4.040194	71.9659558	0.0557547	50.50	3.988429	2.9871902	0.00	0.0001	3.0303738
5		Clamshell Survey boat propulsion engine	Marine Equipment	43.48	38.70	43.48	859.15	0.48	434.79	47.62	25.72	0.00	0.00	26.09
6 Pier J Basin (clam shell dredge 258,000 CY)														
6		**Marine Clamshell Dredge**												
6		Clamshell Dredge hoist	Marine Equipment	187.70	187.70	187.70	5706.03	6.25	3253.44	316.23	248.77	0.00	0.00	248.77
6		Clamshell Dredge generator	Marine Equipment	140.77	140.77	140.77	4279.52	4.69	2440.08	237.18	137.45	0.00	0.00	137.45
6		Clamshell Barge dump scow	Marine Equipment	1.99	1.99	1.99	37.82	0.07	34.51	2.10	1.64	0.00	0.00	1.64
6		Clamshell Tugboat propulsion engine	Marine Equipment	26.30	23.40	26.30	489.65	0.29	262.97	27.14	15.55	0.00	0.00	15.78
6		Clamshell Tugboat auxiliary engine	Marine Equipment	3.79	3.38	3.79	67.57	0.05	47.42	3.74	2.80	0.00	0.00	2.85
6		Clamshell Tugboat propulsion engine	Marine Equipment	473.34	421.27	473.34	8813.63	5.23	4733.42	488.46	279.98	0.00	0.01	284.05
6		Clamshell Tugboat auxiliary engine	Marine Equipment	68.28	60.77	68.28	1216.30	0.94	853.54	67.41	50.49	0.00	0.00	51.22
6		Clamshell Crew boat propulsion engine	Marine Equipment	17.46049	15.539836	17.46049	345.019285	0.1927638	174.6049	19.121332	10.327782	0.000164738	0.000491045	10.478232
6		Clamshell Crew boat auxiliary engine	Marine Equipment	1.4477362	1.2884852	1.4477362	25.7878008	0.0199788	18.10	1.4291871	1.0704098	0.00	0.0001	1.085884
6		Clamshell Survey boat propulsion engine	Marine Equipment	15.58	13.87	15.58	307.86	0.17	155.80	17.06	9.22	0.00	0.00	9.35

Table H1.27
Alternative 3 Emissions by Task

				Mitigated										
				Peak Day										
				PM10	PM2.5	DPM	NOX	SOX	CO	VOC	CO2	CH4	N2O	CO2e
Task ID		**Construction Element/Equipment**	**Source Type 1**	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(tonnes/day)	(tonnes/day)	(tonnes/day)	(tonnes/day)
5	**West Basin (clam shell dredge 717,000 CY)**													
5		**Marine Clamshell Dredge**												
5		Clamshell Dredge hoist	Marine Equipment	0.44	0.44	0.44	13.27	0.01	7.57	0.7354	0.58	0.00	0.00	0.58
5		Clamshell Dredge generator	Marine Equipment	0.33	0.33	0.33	9.95	0.01	5.67	0.5516	0.32	0.00	0.00	0.32
5		Clamshell Barge dump scow	Marine Equipment	0.05	0.05	0.05	0.88	0.00	0.80	0.0488	0.04	0.00	0.00	0.04
5		Clamshell Tugboat propulsion engine	Marine Equipment	0.42	0.37	0.42	8.13	0.01	6.12	0.4508	0.36	0.00	0.00	0.37
5		Clamshell Tugboat auxiliary engine	Marine Equipment	0.03	0.03	0.03	1.13	0.00	1.21	0.0627	0.07	0.00	0.00	0.07
5		Clamshell Tugboat propulsion engine	Marine Equipment	7.49	6.66	7.49	146.41	0.12	110.08	8.1140	6.51	0.00	0.00	6.61
5		Clamshell Tugboat auxiliary engine	Marine Equipment	0.56	0.49	0.56	20.37	0.02	21.83	1.13	1.17	0.00	0.00	1.19
5		Clamshell Crew boat propulsion engine	Marine Equipment	0.2761194	0.2457462	0.2761194	5.4005702	0.0044829	4.0605791	0.2993053	0.240181	2.57863E-06	1.14196E-05	0.2436485
5		Clamshell Crew boat auxiliary engine	Marine Equipment	0.0117839	0.0104877	0.0117839	0.4317957	0.0004646	0.4629389	0.0239306	0.0248933	2.06171E-07	1.18357E-06	0.0252511
5		Clamshell Survey boat propulsion engine	Marine Equipment	0.25	0.22	0.25	4.82	0.00	3.62	0.2671	0.21	0.00	0.00	0.22
6	**Pier J Basin (clam shell dredge 258,000 CY)**													
6		**Marine Clamshell Dredge**												
6		Clamshell Dredge hoist	Marine Equipment	0.44	0.44	0.44	13.27	0.01	7.57	0.7354	0.58	0.00	0.00	0.58
6		Clamshell Dredge generator	Marine Equipment	0.33	0.33	0.33	9.95	0.01	5.67	0.5516	0.32	0.00	0.00	0.32
6		Clamshell Barge dump scow	Marine Equipment	0.05	0.05	0.05	0.88	0.00	0.80	0.0488	0.04	0.00	0.00	0.04
6		Clamshell Tugboat propulsion engine	Marine Equipment	0.42	0.37	0.42	8.13	0.01	6.12	0.4508	0.36	0.00	0.00	0.37
6		Clamshell Tugboat auxiliary engine	Marine Equipment	0.03	0.03	0.03	1.13	0.00	1.21	0.0627	0.07	0.00	0.00	0.07
6		Clamshell Tugboat propulsion engine	Marine Equipment	7.49	6.66	7.49	146.41	0.12	110.08	8.1140	6.51	0.00	0.00	6.61
6		Clamshell Tugboat auxiliary engine	Marine Equipment	0.56	0.49	0.56	20.37	0.02	21.83	1.1287	1.17	0.00	0.00	1.19
6		Clamshell Crew boat propulsion engine	Marine Equipment	0.2761194	0.2457462	0.2761194	5.4005702	0.0044829	4.0605791	0.2993053	0.240181	2.57863E-06	1.14196E-05	0.2436485
6		Clamshell Crew boat auxiliary engine	Marine Equipment	0.0117839	0.0104877	0.0117839	0.4317957	0.0004646	0.4629389	0.0239306	0.0248933	2.06171E-07	1.18357E-06	0.0252511
6		Clamshell Survey boat propulsion engine	Marine Equipment	0.25	0.22	0.25	4.82	0.00	3.62	0.2671	0.21	0.00	0.00	0.22

Note: clamshell dredge would be electric with mitigation; assume 90 percent reduction in diesel exhaust emissions.

Table H1.27
Alternative 3 Emissions by Task

				Mitigated Emissions										
				Total										
				PM10	PM2.5	DPM	NOX	SOX	CO	VOC	CO2	CH4	N2O	CO2e
Task ID		**Construction Element/Equipment**	**Source Type 1**	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(tonnes)	(tonnes)
5 West Basin (clam shell dredge 717,000 CY)														
5		**Marine Clamshell Dredge**												
5		Clamshell Dredge hoist	Marine Equipment	52.38	52.38	52.38	1592.38	1.74	907.94	88.25	69.42451853	0	0	69.42451853
5		Clamshell Dredge generator	Marine Equipment	39.29	39.29	39.29	1194.29	1.31	680.95	66.19	38.3573671	0	0	38.3573671
5		Clamshell Barge dump scow	Marine Equipment	5.56	5.56	5.56	105.56	0.18	96.30	5.85	4.587328978	0	0	4.587328978
5		Clamshell Tugboat propulsion engine	Marine Equipment	49.90	44.41	49.90	976.04	0.81	733.86	54.09	43.4076071	0.000466033	0.002063859	44.03428779
5		Clamshell Tugboat auxiliary engine	Marine Equipment	3.71	3.30	3.71	135.77	0.15	145.57	7.52	7.827371733	6.48279E-05	0.00037216	7.939896204
5		Clamshell Tugboat propulsion engine	Marine Equipment	898.25	799.44	898.25	17568.69	14.58	13209.54	973.68	781.3369279	0.008388587	0.037149455	792.6171802
5		Clamshell Tugboat auxiliary engine	Marine Equipment	66.70	59.36	66.70	2443.91	2.63	2620.18	135.44	140.8926912	0.001166903	0.006698886	142.9181317
5		Clamshell Crew boat propulsion engine	Marine Equipment	33.134326	29.48955	33.134326	648.068425	0.5379455	487.26949	35.916634	28.82171762	0.000309436	0.001370358	29.23782012
5		Clamshell Crew boat auxiliary engine	Marine Equipment	1.4140679	1.2585204	1.4140679	51.82	0.0557547	55.552668	2.87	2.987190166	2.47405E-05	0.000142029	3.030133316
5		Clamshell Survey boat propulsion engine	Marine Equipment	29.57	26.31	29.57	578.28	0.48	434.79	32.05	25.72	0.00	0.00	26.09
6 Pier J Basin (clam shell dredge 258,000 CY)														
6		**Marine Clamshell Dredge**												
6		Clamshell Dredge hoist	Marine Equipment	18.77	18.77	18.77	570.60	0.62	325.34	31.62	24.87711914	0	0	24.87711914
6		Clamshell Dredge generator	Marine Equipment	14.08	14.08	14.08	427.95	0.47	244.01	23.72	13.74472321	0	0	13.74472321
6		Clamshell Barge dump scow	Marine Equipment	1.99	1.99	1.99	37.82	0.07	34.51	2.10	1.643792884	0	0	1.643792884
6		Clamshell Tugboat propulsion engine	Marine Equipment	17.88	15.91	17.88	349.75	0.29	262.97	19.38	15.55439255	0.000166995	0.000739549	15.77895312
6		Clamshell Tugboat auxiliary engine	Marine Equipment	1.33	1.18	1.33	48.65	0.05	52.16	2.70	2.804808204	2.323E-05	0.000133357	2.845129473
6		Clamshell Tugboat propulsion engine	Marine Equipment	321.87	286.47	321.87	6295.45	5.23	4733.42	348.90	279.9790658	0.00300591	0.013311888	284.0211562
6		Clamshell Tugboat auxiliary engine	Marine Equipment	23.90	21.27	23.90	875.73	0.94	938.90	48.53	50.48654767	0.00041814	0.002400434	51.21233051
6		Clamshell Crew boat propulsion engine	Marine Equipment	11.873133	10.567089	11.873133	232.224519	0.1927638	174.6049	12.870127	10.32778215	0.000110881	0.000491045	10.47688554
6		Clamshell Crew boat auxiliary engine	Marine Equipment	0.5067077	0.4509698	0.5067077	18.57	0.0199788	19.906373	1.03	1.07040981	8.86536E-06	5.08937E-05	1.085797771
6		Clamshell Survey boat propulsion engine	Marine Equipment	10.59	9.43	10.59	207.22	0.17	155.80	11.48	9.22	0.00	0.00	9.35

Note: clamshell dredge would be electric with mitigation; assume 90 percent reduction in diesel exhaust emissions.

Table H1.27
Alternative 3 Emissions by Task

							Unmitigated Emissions										
							Peak Day										
							PM10	PM2.5	DPM	NOX	SOX	CO	VOC	CO2	CH4	N2O	CO2e
Task ID		**Construction Element/Equipment**	**Source Type 1**	**Source Type 2**	**Onsite/Offsite**	**Days Total**	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(tonnes/day)	(tonnes/day)	(tonnes/day)	(tonnes/day)
7 Pier J Basin (clam shell dredge 46,000 CY)																	
7		**Marine Clamshell Dredge**															
7		Clamshell Dredge hoist	Marine Equipment	dredging	onsite	8.00	4.37	4.37	4.37	132.70	0.15	75.66	7.35	5.79	0.0000	0.00	5.79
7		Clamshell Dredge generator	Marine Equipment	dredging	onsite	8.00	3.27	3.27	3.27	99.52	0.11	56.75	5.52	3.20	0.0000	0.00	3.20
7		Clamshell Barge dump scow	Marine Equipment	disposal	offsite	8.00	0.05	0.05	0.05	0.88	0.00	0.80	0.05	0.04	0.0000	0.00	0.04
7		Clamshell Tugboat propulsion engine	Marine Equipment	dredging	onsite	8.00	0.61	0.54	0.61	11.39	0.01	6.12	0.63	0.36	0.0000	0.00	0.37
7		Clamshell Tugboat auxiliary engine	Marine Equipment	dredging	onsite	8.00	0.09	0.08	0.09	1.57	0.00	1.10	0.09	0.07	0.0000	0.00	0.07
7		Clamshell Tugboat propulsion engine	Marine Equipment	transit	offsite	8.00	11.01	9.80	11.01	204.97	0.12	110.08	11.36	6.51	0.0001	0.00	6.61
7		Clamshell Tugboat auxiliary engine	Marine Equipment	transit	offsite	8.00	1.59	1.41	1.59	28.29	0.02	19.85	1.57	1.17	0.0000	0.00	1.19
7		Clamshell Crew boat propulsion engine	Marine Equipment	support	onsite	8	0.4060579	0.3613915	0.4060579	8.0237043	0.0044829	4.0605791	0.4446821	0.240181	3.83111E-06	1.14196E-05	0.2436798
7		Clamshell Crew boat auxiliary engine	Marine Equipment	support	onsite	8.0000	0.0336683	0.0300	0.0336683	0.5997163	0.0004646	0.4208535	0.0332369	0.0248933	2.86349E-07	1.18357E-06	0.0252531
7		Clamshell Survey boat propulsion engine	Marine Equipment	dredging	onsite	8.00	0.36	0.32	0.36	7.16	0.00	3.62	0.40	0.21	0.0000	0.00	0.22
8 Pier J Approach (clam shell dredge 1,994,000 CY)																	
8		**Marine Clamshell Dredge**															
8		Clamshell Dredge hoist	Marine Equipment	dredging	onsite	332.00	4.37	4.37	4.37	132.70	0.15	75.66	7.35	5.79	0.0000	0.00	5.79
8		Clamshell Dredge generator	Marine Equipment	dredging	onsite	332.00	3.27	3.27	3.27	99.52	0.11	56.75	5.52	3.20	0.0000	0.00	3.20
8		Clamshell Barge dump scow	Marine Equipment	disposal	offsite	332.00	0.05	0.05	0.05	0.88	0.00	0.80	0.05	0.04	0.0000	0.00	0.04
8		Clamshell Tugboat propulsion engine	Marine Equipment	dredging	onsite	332.00	0.61	0.54	0.61	11.39	0.01	6.12	0.63	0.36	0.0000	0.00	0.37
8		Clamshell Tugboat auxiliary engine	Marine Equipment	dredging	onsite	332.00	0.09	0.08	0.09	1.57	0.00	1.10	0.09	0.07	0.0000	0.00	0.07
8		Clamshell Tugboat propulsion engine	Marine Equipment	transit	offsite	332.00	11.01	9.80	11.01	204.97	0.12	110.08	11.36	6.51	0.0001	0.00	6.61
8		Clamshell Tugboat auxiliary engine	Marine Equipment	transit	offsite	332.00	1.59	1.41	1.59	28.29	0.02	19.85	1.57	1.17	0.0000	0.00	1.19
8		Clamshell Crew boat propulsion engine	Marine Equipment	support	onsite	332	0.4060579	0.3613915	0.4060579	8.0237043	0.0044829	4.0605791	0.4446821	0.240181	3.83111E-06	1.14196E-05	0.2436798
8		Clamshell Crew boat auxiliary engine	Marine Equipment	support	onsite	332	0.0336683	0.0299648	0.0336683	0.5997163	0.0004646	0.4208535	0.0332369	0.0248933	2.86349E-07	1.18357E-06	0.0252531
8		Clamshell Survey boat propulsion engine	Marine Equipment	dredging	onsite	332	0.3623286	0.3224725	0.3623286	7.1596131	0.0040001	3.623286	0.3967933	0.2143153	3.41853E-06	1.01898E-05	0.2174374

Table H1.27
Alternative 3 Emissions by Task

				Unmitigated Emissions										
				Total										
				PM10	PM2.5	DPM	NOX	SOX	CO	VOC	CO2	CH4	N2O	CO2e
Task ID		**Construction Element/Equipment**	**Source Type 1**	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(tonnes)	(tonnes)	(tonnes)	(tonnes)
7 Pier J Basin (clam shell dredge 46,000 CY)														
7		**Marine Clamshell Dredge**												
7		Clamshell Dredge hoist	Marine Equipment	34.92	34.92	34.92	1061.59	1.16	605.29	58.83	46.28	0.00	0.00	46.28
7		Clamshell Dredge generator	Marine Equipment	26.19	26.19	26.19	796.19	0.87	453.97	44.13	25.57	0.00	0.00	25.57
7		Clamshell Barge dump scow	Marine Equipment	0.37	0.37	0.37	7.04	0.01	6.42	0.39	0.31	0.00	0.00	0.31
7		Clamshell Tugboat propulsion engine	Marine Equipment	4.89	4.35	4.89	91.10	0.05	48.92	5.05	2.89	0.00	0.00	2.94
7		Clamshell Tugboat auxiliary engine	Marine Equipment	0.71	0.63	0.71	12.57	0.01	8.82	0.70	0.52	0.00	0.00	0.53
7		Clamshell Tugboat propulsion engine	Marine Equipment	88.06	78.38	88.06	1639.74	0.97	880.64	90.88	52.09	0.00	0.00	52.85
7		Clamshell Tugboat auxiliary engine	Marine Equipment	12.70	11.31	12.70	226.29	0.18	158.80	12.54	9.39	0.00	0.00	9.53
7		Clamshell Crew boat propulsion engine	Marine Equipment	3.2484633	2.8911323	3.2484633	64.1896345	0.035863	32.484633	3.5574571	1.9214478	3.06489E-05	9.13572E-05	1.9494385
7		Clamshell Crew boat auxiliary engine	Marine Equipment	0.2693463	0.24	0.2693463	4.79773039	0.003717	3.37	0.2658953	0.199146	0.00	0.0000	0.2020249
7		Clamshell Survey boat propulsion engine	Marine Equipment	2.90	2.58	2.90	57.28	0.03	28.99	3.17	1.71	0.00	0.00	1.74
8 Pier J Approach (clam shell dredge 1,994,000 CY)														
8		**Marine Clamshell Dredge**												
8		Clamshell Dredge hoist	Marine Equipment	1449.21	1449.21	1449.21	44055.87	48.25	25119.58	2441.62	1920.75	0.00	0.00	1920.75
8		Clamshell Dredge generator	Marine Equipment	1086.90	1086.90	1086.90	33041.90	36.19	18839.68	1831.22	1061.22	0.00	0.00	1061.22
8		Clamshell Barge dump scow	Marine Equipment	15.37	15.37	15.37	292.04	0.51	266.42	16.19	12.69	0.00	0.00	12.69
8		Clamshell Tugboat propulsion engine	Marine Equipment	203.04	180.70	203.04	3780.52	2.24	2030.36	209.52	120.09	0.00	0.01	121.84
8		Clamshell Tugboat auxiliary engine	Marine Equipment	29.29	26.07	29.29	521.72	0.40	366.12	28.91	21.66	0.00	0.00	21.97
8		Clamshell Tugboat propulsion engine	Marine Equipment	3654.64	3252.63	3654.64	68049.39	40.35	36546.40	3771.37	2161.70	0.03	0.10	2193.14
8		Clamshell Tugboat auxiliary engine	Marine Equipment	527.21	469.22	527.21	9390.95	7.28	6590.14	520.46	389.80	0.00	0.02	395.44
8		Clamshell Crew boat propulsion engine	Marine Equipment	134.81123	119.98199	134.81123	2663.86983	1.4883159	1348.1123	147.63447	79.740085	0.001271928	0.003791323	80.901698
8		Clamshell Crew boat auxiliary engine	Marine Equipment	11.17787	9.9483044	11.17787	199.105811	0.1542546	139.72338	11.034654	8.2645595	9.50678E-05	0.000392947	8.3840343
8		Clamshell Survey boat propulsion engine	Marine Equipment	120.29309	107.06085	120.29309	2376.99154	1.3280358	1202.9309	131.73537	71.152692	0.001134951	0.003383027	72.189207

Table H1.27
Alternative 3 Emissions by Task

				Mitigated										
				Peak Day										
				PM10	PM2.5	DPM	NOX	SOX	CO	VOC	CO2	CH4	N2O	CO2e
Task ID		**Construction Element/Equipment**	**Source Type 1**	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(tonnes/day)	(tonnes/day)	(tonnes/day)	(tonnes/day)
7 Pier J Basin (clam shell dredge 46,000 CY)														
7		**Marine Clamshell Dredge**												
7		Clamshell Dredge hoist	Marine Equipment	0.44	0.44	0.44	13.27	0.01	7.57	0.7354	0.58	0.00	0.00	0.58
7		Clamshell Dredge generator	Marine Equipment	0.33	0.33	0.33	9.95	0.01	5.67	0.5516	0.32	0.00	0.00	0.32
7		Clamshell Barge dump scow	Marine Equipment	0.05	0.05	0.05	0.88	0.00	0.80	0.0488	0.04	0.00	0.00	0.04
7		Clamshell Tugboat propulsion engine	Marine Equipment	0.42	0.37	0.42	8.13	0.01	6.12	0.4508	0.36	0.00	0.00	0.37
7		Clamshell Tugboat auxiliary engine	Marine Equipment	0.03	0.03	0.03	1.13	0.00	1.21	0.0627	0.07	0.00	0.00	0.07
7		Clamshell Tugboat propulsion engine	Marine Equipment	7.49	6.66	7.49	146.41	0.12	110.08	8.1140	6.51	0.00	0.00	6.61
7		Clamshell Tugboat auxiliary engine	Marine Equipment	0.56	0.49	0.56	20.37	0.02	21.83	1.1287	1.17	0.00	0.00	1.19
7		Clamshell Crew boat propulsion engine	Marine Equipment	0.2761194	0.2457462	0.2761194	5.4005702	0.0044829	4.0605791	0.2993053	0.240181	2.57863E-06	1.14196E-05	0.2436485
7		Clamshell Crew boat auxiliary engine	Marine Equipment	0.0117839	0.0104877	0.0117839	0.4317957	0.0004646	0.4629389	0.0239306	0.0248933	2.06171E-07	1.18357E-06	0.0252511
7		Clamshell Survey boat propulsion engine	Marine Equipment	0.25	0.22	0.25	4.82	0.00	3.62	0.2671	0.21	0.00	0.00	0.22
8 Pier J Approach (clam shell dredge 1,994,000 CY)														
8		**Marine Clamshell Dredge**												
8		Clamshell Dredge hoist	Marine Equipment	0.44	0.44	0.44	13.27	0.01	7.57	0.7354	0.58	0.00	0.00	0.58
8		Clamshell Dredge generator	Marine Equipment	0.33	0.33	0.33	9.95	0.01	5.67	0.5516	0.32	0.00	0.00	0.32
8		Clamshell Barge dump scow	Marine Equipment	0.05	0.05	0.05	0.88	0.00	0.80	0.0488	0.04	0.00	0.00	0.04
8		Clamshell Tugboat propulsion engine	Marine Equipment	0.42	0.37	0.42	8.13	0.01	6.12	0.4508	0.36	0.00	0.00	0.37
8		Clamshell Tugboat auxiliary engine	Marine Equipment	0.03	0.03	0.03	1.13	0.00	1.21	0.0627	0.07	0.00	0.00	0.07
8		Clamshell Tugboat propulsion engine	Marine Equipment	7.49	6.66	7.49	146.41	0.12	110.08	8.1140	6.51	0.00	0.00	6.61
8		Clamshell Tugboat auxiliary engine	Marine Equipment	0.56	0.49	0.5558	20.37	0.02	21.83	1.13	1.17	0.00	0.00	1.19
8		Clamshell Crew boat propulsion engine	Marine Equipment	0.2761194	0.2457462	0.2761194	5.4005702	0.0044829	4.0605791	0.2993053	0.240181	2.57863E-06	1.14196E-05	0.2436485
8		Clamshell Crew boat auxiliary engine	Marine Equipment	0.0117839	0.0104877	0.0117839	0.4317957	0.0004646	0.4629389	0.0239306	0.0248933	2.06171E-07	1.18357E-06	0.0252511
8		Clamshell Survey boat propulsion engine	Marine Equipment	0.2463834	0.2192813	0.2463834	4.8189703	0.0040001	3.623286	0.2670724	0.2143153	2.30093E-06	1.01898E-05	0.2174094

Note: clamshell dredge would be electric with mitigation; assume 90 percent reduction in diesel exhaust emissions.

Table H1.27
Alternative 3 Emissions by Task

				Mitigated Emissions										
				Total										
				PM10	PM2.5	DPM	NOX	SOX	CO	VOC	CO2	CH4	N2O	CO2e
Task ID		**Construction Element/Equipment**	**Source Type 1**	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(tonnes)	(tonnes)
7 Pier J Basin (clam shell dredge 46,000 CY)														
7		**Marine Clamshell Dredge**												
7		Clamshell Dredge hoist	Marine Equipment	3.49	3.49	3.49	106.16	0.12	60.53	5.88	4.628301236	0	0	4.628301236
7		Clamshell Dredge generator	Marine Equipment	2.62	2.62	2.62	79.62	0.09	45.40	4.41	2.557157807	0	0	2.557157807
7		Clamshell Barge dump scow	Marine Equipment	0.37	0.37	0.37	7.04	0.01	6.42	0.39	0.305821932	0	0	0.305821932
7		Clamshell Tugboat propulsion engine	Marine Equipment	3.33	2.96	3.33	65.07	0.05	48.92	3.61	2.893840474	3.10688E-05	0.000137591	2.935619186
7		Clamshell Tugboat auxiliary engine	Marine Equipment	0.25	0.22	0.25	9.05	0.01	9.70	0.50	0.521824782	4.32186E-06	2.48107E-05	0.529326414
7		Clamshell Tugboat propulsion engine	Marine Equipment	59.88	53.30	59.88	1171.25	0.97	880.64	64.91	52.08912852	0.000559239	0.00247663	52.84114534
7		Clamshell Tugboat auxiliary engine	Marine Equipment	4.45	3.96	4.45	162.93	0.18	174.68	9.03	9.392846079	7.77935E-05	0.000446592	9.527875445
7		Clamshell Crew boat propulsion engine	Marine Equipment	2.208955	1.96597	2.208955	43.2045617	0.035863	32.484633	2.3944423	1.921447841	2.0629E-05	9.13572E-05	1.949188008
7		Clamshell Crew boat auxiliary engine	Marine Equipment	0.0942712	0.0839014	0.0942712	3.45	0.003717	3.7035112	0.19	0.199146011	1.64937E-06	9.4686E-06	0.202008888
7		Clamshell Survey boat propulsion engine	Marine Equipment	1.97	1.75	1.97	38.55	0.03	28.99	2.14	1.71	0.00	0.00	1.74
8 Pier J Approach (clam shell dredge 1,994,000 CY)														
8		**Marine Clamshell Dredge**												
8		Clamshell Dredge hoist	Marine Equipment	144.92	144.92	144.92	4405.59	4.83	2511.96	244.16	192.0745013	0	0	192.0745013
8		Clamshell Dredge generator	Marine Equipment	108.69	108.69	108.69	3304.19	3.62	1883.97	183.12	106.122049	0	0	106.122049
8		Clamshell Barge dump scow	Marine Equipment	15.37	15.37	15.37	292.04	0.51	266.42	16.19	12.69161017	0	0	12.69161017
8		Clamshell Tugboat propulsion engine	Marine Equipment	138.06	122.88	138.06	2700.37	2.24	2030.36	149.66	120.0943797	0.001289357	0.005710009	121.8281962
8		Clamshell Tugboat auxiliary engine	Marine Equipment	10.25	9.12	10.25	375.64	0.40	402.73	20.82	21.65572846	0.000179357	0.001029644	21.96704616
8		Clamshell Tugboat propulsion engine	Marine Equipment	2485.15	2211.79	2485.15	48606.71	40.35	36546.40	2693.83	2161.698834	0.023208423	0.102780159	2192.907532
8		Clamshell Tugboat auxiliary engine	Marine Equipment	184.52	164.23	184.52	6761.48	7.28	7249.15	374.73	389.8031123	0.003228431	0.018533584	395.4068309
8		Clamshell Crew boat propulsion engine	Marine Equipment	91.671634	81.587754	91.671634	1792.98931	1.4883159	1348.1123	99.369355	79.74008541	0.000856105	0.003791323	80.89130232
8		Clamshell Crew boat auxiliary engine	Marine Equipment	3.9122545	3.4819065	3.9122545	143.356184	0.1542546	153.69571	7.9449506	8.26455946	6.84488E-05	0.000392947	8.38336884
8		Clamshell Survey boat propulsion engine	Marine Equipment	81.799304	72.801381	81.799304	1599.89815	1.3280358	1202.9309	88.66804	71.1526916	0.000763909	0.003383027	72.1799313

Note: clamshell dredge would be electric with mitigation; assume 90 percent reduction in diesel exhaust emissions.

Table H1.27
Alternative 3 Emissions by Task

							Unmitigated Emissions										
							Peak Day										
							PM10	PM2.5	DPM	NOX	SOX	CO	VOC	CO2	CH4	N2O	CO2e
Task ID		**Construction Element/Equipment**	**Source Type 1**	**Source Type 2**	**Onsite/Offsite**	**Days Total**	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(tonnes/day)	(tonnes/day)	(tonnes/day)	(tonnes/day)
9	**Pier J Approach (clam shell dredge 679,000 CY)**																
9		**Marine Clamshell Dredge**															
9		Clamshell Dredge hoist	Marine Equipment	dredging	onsite	113	4.3650794	4.3650794	4.3650794	132.69841	0.145332	75.661376	7.3542857	5.7853765	0	0	5.7853765
9		Clamshell Dredge generator	Marine Equipment	dredging	onsite	113	3.2738095	3.2738095	3.2738095	99.52381	0.108999	56.746032	5.5157143	3.1964473	0	0	3.1964473
9		Clamshell Barge dump scow	Marine Equipment	disposal	offsite	113	0.0462963	0.0462963	0.0462963	0.8796296	0.0015414	0.8024691	0.04875	0.0382277	0	0	0.0382277
9		Clamshell Tugboat propulsion engine	Marine Equipment	dredging	onsite	113	0.6115528	0.544282	0.6115528	11.387113	0.0067515	6.115528	0.6310858	0.3617301	5.43705E-06	1.71988E-05	0.3669912
9		Clamshell Tugboat auxiliary engine	Marine Equipment	dredging	onsite	113	0.0882214	0.0785171	0.0882214	1.5714441	0.0012175	1.1027678	0.0870911	0.0652281	7.50323E-07	3.10134E-06	0.0661711
9		Clamshell Tugboat propulsion engine	Marine Equipment	transit	offsite	113	11.00795	9.7970759	11.00795	204.96804	0.1215278	110.0795	11.359544	6.5111411	9.78668E-05	0.000309579	6.6058422
9		Clamshell Tugboat auxiliary engine	Marine Equipment	transit	offsite	113	1.5879856	1.4133072	1.5879856	28.285994	0.0219142	19.84982	1.5676396	1.1741058	1.35058E-05	5.5824E-05	1.191079
9		Clamshell Crew boat propulsion engine	Marine Equipment	support	onsite	113	0.4060579	0.3613915	0.4060579	8.0237043	0.0044829	4.0605791	0.4446821	0.240181	3.83111E-06	1.14196E-05	0.2436798
9		Clamshell Crew boat auxiliary engine	Marine Equipment	support	onsite	113	0.0336683	0.0299648	0.0336683	0.5997163	0.0004646	0.4208535	0.0332369	0.0248933	2.86349E-07	1.18357E-06	0.0252531
9		Clamshell Survey boat propulsion engine	Marine Equipment	dredging	onsite	113	0.3623286	0.3224725	0.3623286	7.1596131	0.0040001	3.623286	0.3967933	0.2143153	3.41853E-06	1.01898E-05	0.2174374

Table H1.27
Alternative 3 Emissions by Task

				Unmitigated Emissions										
				Total										
				PM10	PM2.5	DPM	NOX	SOX	CO	VOC	CO2	CH4	N2O	CO2e
Task ID		**Construction Element/Equipment**	**Source Type 1**	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(tonnes)	(tonnes)	(tonnes)	(tonnes)
9 Pier J Approach (clam shell dredge 679,000 CY)														
9		**Marine Clamshell Dredge**												
9		Clamshell Dredge hoist	Marine Equipment	493.25397	493.25397	493.25397	14994.9206	16.422516	8549.7354	831.03429	653.74755	0	0	653.74755
9		Clamshell Dredge generator	Marine Equipment	369.94048	369.94048	369.94048	11246.1905	12.316887	6412.3016	623.27571	361.19854	0	0	361.19854
9		Clamshell Barge dump scow	Marine Equipment	5.2314815	5.2314815	5.2314815	99.3981481	0.1741782	90.679012	5.50875	4.3197348	0	0	4.3197348
9		Clamshell Tugboat propulsion engine	Marine Equipment	69.105467	61.503866	69.105467	1286.74379	0.7629244	691.05467	71.312696	40.875497	0.000614386	0.001943467	41.470009
9		Clamshell Tugboat auxiliary engine	Marine Equipment	9.9690209	8.8724286	9.9690209	177.573185	0.1375725	124.61276	9.8412928	7.370775	8.47865E-05	0.000350451	7.4773291
9		Clamshell Tugboat propulsion engine	Marine Equipment	1243.8984	1107.0696	1243.8984	23161.3883	13.732638	12438.984	1283.6285	735.75894	0.011058953	0.034982404	746.46017
9		Clamshell Tugboat auxiliary engine	Marine Equipment	179.44238	159.70371	179.44238	3196.31733	2.4763048	2243.0297	177.14327	132.67395	0.001526157	0.006308117	134.59192
9		Clamshell Crew boat propulsion engine	Marine Equipment	45.884544	40.837244	45.884544	906.678587	0.5065654	458.84544	50.249082	27.140451	0.000432915	0.00129042	27.535819
9		Clamshell Crew boat auxiliary engine	Marine Equipment	3.804516	3.3860193	3.804516	67.7679417	0.0525023	47.55645	3.7557707	2.8129374	3.23574E-05	0.000133744	2.853602
9		Clamshell Survey boat propulsion engine	Marine Equipment	40.943131	36.439387	40.943131	809.036278	0.4520122	409.43131	44.837642	24.217633	0.000386294	0.001151452	24.570423

Table H1.27
Alternative 3 Emissions by Task

				Mitigated										
				Peak Day										
				PM10	PM2.5	DPM	NOX	SOX	CO	VOC	CO2	CH4	N2O	CO2e
Task ID		**Construction Element/Equipment**	**Source Type 1**	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(tonnes/day)	(tonnes/day)	(tonnes/day)	(tonnes/day)
9	**Pier J Approach (clam shell dredge 679,000 CY)**													
9		**Marine Clamshell Dredge**												
9		Clamshell Dredge hoist	Marine Equipment	0.4365079	0.4365079	0.4365079	13.269841	0.0145332	7.5661376	0.7354286	0.5785377	0	0	0.5785377
9		Clamshell Dredge generator	Marine Equipment	0.327381	0.327381	0.327381	9.952381	0.0108999	5.6746032	0.5515714	0.3196447	0	0	0.3196447
9		Clamshell Barge dump scow	Marine Equipment	0.0462963	0.0462963	0.0462963	0.8796296	0.0015414	0.8024691	0.04875	0.0382277	0	0	0.0382277
9		Clamshell Tugboat propulsion engine	Marine Equipment	0.4158559	0.3701118	0.4158559	8.1336523	0.0067515	6.115528	0.4507756	0.3617301	3.8836E-06	1.71988E-05	0.3669524
9		Clamshell Tugboat auxiliary engine	Marine Equipment	0.0308775	0.027481	0.0308775	1.1314398	0.0012175	1.2130446	0.0627056	0.0652281	5.40233E-07	3.10134E-06	0.0661658
9		Clamshell Tugboat propulsion engine	Marine Equipment	7.4854063	6.6620116	7.4854063	146.40574	0.1215278	110.0795	8.1139603	6.5111411	6.99049E-05	0.000309579	6.6051432
9		Clamshell Tugboat auxiliary engine	Marine Equipment	0.555795	0.4946575	0.555795	20.365916	0.0219142	21.834802	1.1287005	1.1741058	9.72419E-06	5.5824E-05	1.1909844
9		Clamshell Crew boat propulsion engine	Marine Equipment	0.2761194	0.2457462	0.2761194	5.4005702	0.0044829	4.0605791	0.2993053	0.240181	2.57863E-06	1.14196E-05	0.2436485
9		Clamshell Crew boat auxiliary engine	Marine Equipment	0.0117839	0.0104877	0.0117839	0.4317957	0.0004646	0.4629389	0.0239306	0.0248933	2.06171E-07	1.18357E-06	0.0252511
9		Clamshell Survey boat propulsion engine	Marine Equipment	0.2463834	0.2192813	0.2463834	4.8189703	0.0040001	3.623286	0.2670724	0.2143153	2.30093E-06	1.01898E-05	0.2174094

Note: clamshell dredge would be electric with mitigation; assume 90 percent reduction in diesel exhaust emissions.

Table H1.27
Alternative 3 Emissions by Task

				Mitigated Emissions										
				Total										
				PM10	PM2.5	DPM	NOX	SOX	CO	VOC	CO2	CH4	N2O	CO2e
Task ID		**Construction Element/Equipment**	**Source Type 1**	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(tonnes)	(tonnes)
9 Pier J Approach (clam shell dredge 679,000 CY)														
9		**Marine Clamshell Dredge**												
9		Clamshell Dredge hoist	Marine Equipment	49.325397	49.325397	49.325397	1499.49206	1.6422516	854.97354	83.103429	65.37475495	0	0	65.37475495
9		Clamshell Dredge generator	Marine Equipment	36.994048	36.994048	36.994048	1124.61905	1.2316887	641.23016	62.327571	36.11985402	0	0	36.11985402
9		Clamshell Barge dump scow	Marine Equipment	5.2314815	5.2314815	5.2314815	99.3981481	0.1741782	90.679012	5.50875	4.319734787	0	0	4.319734787
9		Clamshell Tugboat propulsion engine	Marine Equipment	46.991718	41.822629	46.991718	919.10271	0.7629244	691.05467	50.93764	40.87549669	0.000438847	0.001943467	41.465621
9		Clamshell Tugboat auxiliary engine	Marine Equipment	3.4891573	3.10535	3.4891573	127.852693	0.1375725	137.07404	7.0857308	7.370775048	6.10463E-05	0.000350451	7.476735592
9		Clamshell Tugboat propulsion engine	Marine Equipment	845.85092	752.80731	845.85092	16543.8488	13.732638	12438.984	916.87751	735.7589404	0.007899252	0.034982404	746.381178
9		Clamshell Tugboat auxiliary engine	Marine Equipment	62.804832	55.8963	62.804832	2301.34848	2.4763048	2467.3327	127.54316	132.6739509	0.001098833	0.006308117	134.5812407
9		Clamshell Crew boat propulsion engine	Marine Equipment	31.20149	27.769326	31.20149	610.264434	0.5065654	458.84544	33.821497	27.14045076	0.000291385	0.00129042	27.53228061
9		Clamshell Crew boat auxiliary engine	Marine Equipment	1.3315806	1.1851067	1.3315806	48.7929181	0.0525023	52.312095	2.7041549	2.812937407	2.32973E-05	0.000133744	2.853375539
9		Clamshell Survey boat propulsion engine	Marine Equipment	27.841329	24.778783	27.841329	544.543649	0.4520122	409.43131	30.179182	24.21763298	0.000260005	0.001151452	24.56726578

Note: clamshell dredge would be electric with mitigation; assume 90 percent reduction in diesel exhaust emissions.

Table H1.28
Alternative 4 Emissions by Task

							Unmitigated Emissions										
							Peak Day										
							PM10	PM2.5	DPM	NOX	SOX	CO	VOC	CO2	CH4	N2O	CO2e
Task ID		**Construction Element/Equipment**	**Source Type 1**	**Source Type 2**	**Onsite/Offsite**	**Days Total**	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(tonnes/day)	(tonnes/day)	(tonnes/day)	(tonnes/day)
1	**Electrical Substation Construction at Pier J (mitigation only)**																
1		**Off-Road Equipment**															
1		Caterpillar 320 excavator	Offroad Construction Equipment		onsite	20	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1		Small asphalt roller	Offroad Construction Equipment		onsite	26	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1		Water truck	Offroad Construction Equipment		onsite	20	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1		Forklift	Offroad Construction Equipment		onsite	22	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1		Mobile crane (35 ton)	Offroad Construction Equipment		onsite	2	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1		On-Road Vehicles															
1		Haul trucks	Onroad Construction Vehicles		onsite	5	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1		Supply trucks	Onroad Construction Vehicles		onsite	5	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1		Haul trucks	Onroad Construction Vehicles		offsite	5	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1		Supply trucks	Onroad Construction Vehicles		offsite	5	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1		Workers	Onroad Construction Vehicles		offsite	60	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1		Fugitive Dust															
1		Soil handling	Fugitive Emissions		onsite	20	n/a	n/a									
1		Asphalting	Fugitive Emissions		onsite												
2	**Pier J Breakwater Construction**																
2		**Marine Activities**															
2		Pier J Breakwater Construction Tugboat propulsion engine	Marine Equipment		onsite	54	5.810	5.171	5.810	108.178	0.064	58.098	5.995	3.436	0.000	0.000	3.486
2		Pier J Breakwater ConstructionTugboat auxiliary engine	Marine Equipment		onsite	54	1.059	0.942	1.059	18.857	0.015	13.233	1.045	0.783	0.000	0.000	0.794
2		Pier J Breakwater Construction Crew boat propulsion engine	Marine Equipment		onsite	54	0.406	0.361	0.406	8.024	0.004	4.061	0.445	0.240	0.000	0.000	0.244
2		Pier J Breakwater Construction Crew boat auxiliary engine	Marine Equipment		onsite	54	0.034	0.030	0.034	0.600	0.000	0.421	0.033	0.025	0.000	0.000	0.025
2		Pier J Breakwater Construction Survey boat propulsion engine	Marine Equipment		onsite	54	0.362	0.322	0.362	7.160	0.004	3.623	0.397	0.214	0.000	0.000	0.217
2		**Off-Road Equipment**															
2		Piling crane	Offroad Construction Equipment		onsite	54	0.209	0.192	0.209	5.002	0.008	2.675	0.467	0.380	0.000	0.000	0.380
2		Long arm excavator	Offroad Construction Equipment		onsite	54	0.075	0.069	0.075	2.188	0.013	2.775	0.321	0.634	0.000	0.000	0.634
2		On-Road Vehicles															
2		Delivery Trucks	Onroad Construction Vehicles		onsite	5	0.147	0.037	0.000	0.079	0.000	0.009	0.001	0.012	0.000	0.000	0.012
2		Delivery Trucks	Onroad Construction Vehicles		offsite	5	0.486	0.189	0.022	3.217	0.019	0.185	0.026	0.919	0.000	0.000	0.962
2		Workers	Onroad Construction Vehicles		offsite	54	0.159	0.050	0.000	0.058	0.004	0.959	0.015	0.169	0.000	0.000	0.170

Table H1.28
Alternative 4 Emissions by Task

				Unmitigated Emissions										
				Total										
				PM10	PM2.5	DPM	NOX	SOX	CO	VOC	CO2	CH4	N2O	CO2e
Task ID		**Construction Element/Equipment**	**Source Type 1**	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(tonnes)	(tonnes)	(tonnes)	(tonnes)
1	**Electrical Substation Construction at Pier J (mitigation only)**													
1		**Off-Road Equipment**												
1		Caterpillar 320 excavator	Offroad Construction Equipment	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1		Small asphalt roller	Offroad Construction Equipment	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1		Water truck	Offroad Construction Equipment	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1		Forklift	Offroad Construction Equipment	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1		Mobile crane (35 ton)	Offroad Construction Equipment	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1		On-Road Vehicles												
1		Haul trucks	Onroad Construction Vehicles	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1		Supply trucks	Onroad Construction Vehicles	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1		Haul trucks	Onroad Construction Vehicles	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1		Supply trucks	Onroad Construction Vehicles	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1		Workers	Onroad Construction Vehicles	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1		Fugitive Dust												
1		Soil handling	Fugitive Emissions	n/a	n/a									
1		Asphalting	Fugitive Emissions											
2	**Pier J Breakwater Construction**													
2		**Marine Activities**												
2		Pier J Breakwater Construction Tugboat propulsion engine	Marine Equipment	313.727	279.217	313.727	5841.589	3.464	3137.266	323.747	185.568	0.003	0.009	188.267
2		Pier J Breakwater ConstructionTugboat auxiliary engine	Marine Equipment	57.167	50.879	57.167	1018.296	0.789	714.594	56.435	42.268	0.000	0.002	42.879
2		Pier J Breakwater Construction Crew boat propulsion engine	Marine Equipment	21.927	19.515	21.927	433.280	0.242	219.271	24.013	12.970	0.000	0.001	13.159
2		Pier J Breakwater Construction Crew boat auxiliary engine	Marine Equipment	1.818	1.618	1.818	32.385	0.025	22.726	1.795	1.344	0.000	0.000	1.364
2		Pier J Breakwater Construction Survey boat propulsion engine	Marine Equipment	19.566	17.414	19.566	386.619	0.216	195.657	21.427	11.573	0.000	0.001	11.742
2		**Off-Road Equipment**												
2		Piling crane	Offroad Construction Equipment	11.266	10.365	11.266	270.124	0.418	144.427	25.201	20.519	0.000	0.000	20.519
2		Long arm excavator	Offroad Construction Equipment	4.061	3.736	4.061	118.133	0.697	149.866	17.327	34.235	0.000	0.000	34.235
2		On-Road Vehicles												
2		Delivery Trucks	Onroad Construction Vehicles	0.736	0.185	0.001	0.394	0.001	0.046	0.005	0.059	0.000	0.000	0.062
2		Delivery Trucks	Onroad Construction Vehicles	2.431	0.943	0.111	16.084	0.096	0.924	0.128	4.596	0.000	0.001	4.811
2		Workers	Onroad Construction Vehicles	8.583	2.719	0.000	3.143	0.199	51.794	0.809	9.128	0.000	0.000	9.178

Table H1.28
Alternative 4 Emissions by Task

				Mitigated										
				Peak Day										
				PM10	PM2.5	DPM	NOX	SOX	CO	VOC	CO2	CH4	N2O	CO2e
Task ID		**Construction Element/Equipment**	**Source Type 1**	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(tonnes/day)	(tonnes/day)	(tonnes/day)	(tonnes/day)
1	**Electrical Substation Construction at Pier J (mitigation only)**													
1		**Off-Road Equipment**												
1		Caterpillar 320 excavator	Offroad Construction Equipment	0.016	0.016	0.016	0.330	0.005	1.226	0.156	0.265	0.000	0.000	0.265
1		Small asphalt roller	Offroad Construction Equipment	0.005	0.005	0.005	0.735	0.001	0.907	0.041	0.058	0.000	0.000	0.058
1		Water truck	Offroad Construction Equipment	0.030	0.030	0.030	0.603	0.010	2.587	0.296	0.482	0.000	0.000	0.482
1		Forklift	Offroad Construction Equipment	0.001	0.001	0.001	0.147	0.000	0.163	0.008	0.012	0.000	0.000	0.012
1		Mobile crane (35 ton)	Offroad Construction Equipment	0.022	0.022	0.022	0.433	0.007	2.414	0.213	0.343	0.000	0.000	0.343
1		On-Road Vehicles												
1		Haul trucks	Onroad Construction Vehicles	0.088	0.022	0.000	0.047	0.000	0.006	0.001	0.007	0.000	0.000	0.007
1		Supply trucks	Onroad Construction Vehicles	0.206	0.052	0.000	0.110	0.000	0.013	0.001	0.016	0.000	0.000	0.017
1		Haul trucks	Onroad Construction Vehicles	0.016	0.006	0.001	0.113	0.002	0.006	0.004	0.030	0.000	0.000	0.032
1		Supply trucks	Onroad Construction Vehicles	0.068	0.026	0.003	0.514	0.019	0.026	0.038	0.129	0.000	0.000	0.135
1		Workers	Onroad Construction Vehicles	0.151	0.048	0.000	0.055	0.004	0.913	0.014	0.161	0.000	0.000	0.162
1		Fugitive Dust												
1		Soil handling	Fugitive Emissions	2.006	0.304									
1		Asphalting	Fugitive Emissions											
2	**Pier J Breakwater Construction**													
2		**Marine Activities**												
2		Pier J Breakwater Construction Tugboat propulsion engine	Marine Equipment	3.951	3.516	3.951	77.270	0.064	58.098	4.282	3.436	0.000	0.000	3.486
2		Pier J Breakwater ConstructionTugboat auxiliary engine	Marine Equipment	0.371	0.330	0.371	13.577	0.015	14.557	0.752	0.783	0.000	0.000	0.794
2		Pier J Breakwater Construction Crew boat propulsion engine	Marine Equipment	0.276	0.246	0.276	5.401	0.004	4.061	0.299	0.240	0.000	0.000	0.244
2		Pier J Breakwater Construction Crew boat auxiliary engine	Marine Equipment	0.012	0.010	0.012	0.432	0.000	0.463	0.024	0.025	0.000	0.000	0.025
2		Pier J Breakwater Construction Survey boat propulsion engine	Marine Equipment	0.246	0.219	0.246	4.819	0.004	3.623	0.267	0.214	0.000	0.000	0.217
2		**Off-Road Equipment**												
2		Piling crane	Offroad Construction Equipment	0.024	0.024	0.024	0.479	0.008	2.675	0.236	0.380	0.000	0.000	0.380
2		Long arm excavator	Offroad Construction Equipment	0.040	0.040	0.040	0.792	0.013	2.775	0.321	0.634	0.000	0.000	0.634
2		On-Road Vehicles												
2		Delivery Trucks	Onroad Construction Vehicles	0.147	0.037	0.000	0.079	0.000	0.009	0.001	0.012	0.000	0.000	0.012
2		Delivery Trucks	Onroad Construction Vehicles	0.486	0.189	0.022	3.541	0.101	0.185	0.199	0.919	0.000	0.000	0.962
2		Workers	Onroad Construction Vehicles	0.159	0.050	0.000	0.058	0.004	0.959	0.015	0.169	0.000	0.000	0.170

Table H1.28
Alternative 4 Emissions by Task

				Mitigated Emissions										
				Total										
				PM10	PM2.5	DPM	NOX	SOX	CO	VOC	CO2	CH4	N2O	CO2e
Task ID		**Construction Element/Equipment**	**Source Type 1**	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(tonnes)	(tonnes)
1	**Electrical Substation Construction at Pier J (mitigation only)**													
1		**Off-Road Equipment**												
1		Caterpillar 320 excavator	Offroad Construction Equipment	0.330	0.330	0.330	6.595	0.108	24.518	3.122	5.296	0.000	0.000	5.296
1		Small asphalt roller	Offroad Construction Equipment	0.127	0.127	0.127	19.120	0.031	23.576	1.060	1.511	0.000	0.000	1.511
1		Water truck	Offroad Construction Equipment	0.603	0.603	0.603	12.063	0.196	51.747	5.928	9.642	0.000	0.000	9.642
1		Forklift	Offroad Construction Equipment	0.021	0.021	0.021	3.225	0.005	3.589	0.179	0.260	0.000	0.000	0.260
1		Mobile crane (35 ton)	Offroad Construction Equipment	0.043	0.043	0.043	0.865	0.014	4.827	0.425	0.686	0.000	0.000	0.686
1		On-Road Vehicles												
1		Haul trucks	Onroad Construction Vehicles	0.442	0.111	0.000	0.236	0.001	0.028	0.003	0.035	0.000	0.000	0.037
1		Supply trucks	Onroad Construction Vehicles	1.030	0.258	0.001	0.552	0.002	0.064	0.007	0.082	0.000	0.000	0.086
1		Haul trucks	Onroad Construction Vehicles	0.080	0.031	0.004	0.563	0.011	0.031	0.021	0.152	0.000	0.000	0.159
1		Supply trucks	Onroad Construction Vehicles	0.340	0.132	0.016	2.570	0.093	0.130	0.188	0.643	0.000	0.000	0.674
1		Workers	Onroad Construction Vehicles	9.083	2.877	0.000	3.326	0.211	54.809	0.856	9.659	0.000	0.000	9.712
1		Fugitive Dust												
1		Soil handling	Fugitive Emissions	40.118	6.075									
1		Asphalting	Fugitive Emissions											
2	**Pier J Breakwater Construction**													
2		**Marine Activities**												
2		Pier J Breakwater Construction Tugboat propulsion engine	Marine Equipment	213.334	189.867	213.334	4172.564	3.464	3137.266	231.248	185.568	0.002	0.009	188.247
2		Pier J Breakwater ConstructionTugboat auxiliary engine	Marine Equipment	20.009	17.808	20.009	733.173	0.789	786.053	40.633	42.268	0.000	0.002	42.875
2		Pier J Breakwater Construction Crew boat propulsion engine	Marine Equipment	14.910	13.270	14.910	291.631	0.242	219.271	16.162	12.970	0.000	0.001	13.157
2		Pier J Breakwater Construction Crew boat auxiliary engine	Marine Equipment	0.636	0.566	0.636	23.317	0.025	24.999	1.292	1.344	0.000	0.000	1.364
2		Pier J Breakwater Construction Survey boat propulsion engine	Marine Equipment	13.305	11.841	13.305	260.224	0.216	195.657	14.422	11.573	0.000	0.001	11.740
2		**Off-Road Equipment**												
2		Piling crane	Offroad Construction Equipment	1.295	1.295	1.295	25.893	0.418	144.427	12.724	20.519	0.000	0.000	20.519
2		Long arm excavator	Offroad Construction Equipment	2.138	2.138	2.138	42.750	0.697	149.866	17.327	34.235	0.000	0.000	34.235
2		On-Road Vehicles												
2		Delivery Trucks	Onroad Construction Vehicles	0.736	0.185	0.001	0.394	0.001	0.046	0.005	0.059	0.000	0.000	0.062
2		Delivery Trucks	Onroad Construction Vehicles	2.431	0.943	0.111	17.707	0.503	0.926	0.996	4.596	0.000	0.001	4.811
2		Workers	Onroad Construction Vehicles	8.583	2.719	0.000	3.143	0.199	51.794	0.809	9.128	0.000	0.000	9.178

Table H1.28
Alternative 4 Emissions by Task

							Unmitigated Emissions										
							Peak Day										
							PM10	PM2.5	DPM	NOX	SOX	CO	VOC	CO2	CH4	N2O	CO2e
Task ID		**Construction Element/Equipment**	**Source Type 1**	**Source Type 2**	**Onsite/Offsite**	**Days Total**	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(tonnes/day)	(tonnes/day)	(tonnes/day)	(tonnes/day)
3	**Pier J Wharf Upgrade**																
3		**Marine Activities**															
3		Pier J Wharf Tugboat propulsion engine	Marine Equipment		onsite	175	6.116	5.443	6.116	113.871	0.068	61.155	6.311	3.617	0.000	0.000	3.670
3		Pier J Wharf Tugboat auxiliary engine	Marine Equipment		onsite	175	0.529	0.471	0.529	9.429	0.007	6.617	0.523	0.391	0.000	0.000	0.397
3		Pier J Wharf Crew boat propulsion engine	Marine Equipment		onsite	175	0.500	0.445	0.500	9.306	0.006	4.998	0.516	0.296	0.000	0.000	0.300
3		Pier J Wharf Crew boat auxiliary engine	Marine Equipment		**onsite**	175	0.034	0.030	0.034	0.600	0.000	0.421	0.033	0.025	0.000	0.000	0.025
3		Pier J Wharf Survey boat propulsion engine	Marine Equipment		onsite	175	0.250	0.222	0.250	4.653	0.003	2.499	0.258	0.148	0.000	0.000	0.150
3		**Off-Road Equipment**															
3		Const Barge - piling crane	Offroad Construction Equipment		onsite	170	0.209	0.192	0.209	5.002	0.008	2.675	0.467	0.380	0.000	0.000	0.380
3		Cong Barge - long arm excavator	Offroad Construction Equipment		onsite	170	0.075	0.069	0.075	2.188	0.013	2.775	0.321	0.634	0.000	0.000	0.634
3		Const barge - deck equipment	Offroad Construction Equipment		onsite	170	0.192	0.177	0.192	2.758	0.004	2.819	0.327	0.181	0.000	0.000	0.181
3		Sheet pile barge - deck equipment	Offroad Construction Equipment		onsite	170	0.192	0.177	0.192	2.758	0.004	2.819	0.327	0.181	0.000	0.000	0.181
3		On-Road Vehicles															
3		Workers	Onroad Construction Vehicles		offsite	175	0.144	0.046	0.000	0.053	0.003	0.868	0.014	0.153	0.000	0.000	0.154
4	**Pier T Wharf Upgrade**																
4		**Marine Activities**															
4		Pier T Wharf Tugboat propulsion engine	Marine Equipment		onsite	320	6.116	5.443	6.116	113.871	0.068	61.155	6.311	3.617	0.000	0.000	3.670
4		Pier T Wharf Tugboat auxiliary engine	Marine Equipment		onsite	320	0.529	0.471	0.529	9.429	0.007	6.617	0.523	0.391	0.000	0.000	0.397
4		Pier T Wharf Crew boat propulsion engine	Marine Equipment		onsite	320	0.500	0.445	0.500	9.306	0.006	4.998	0.516	0.296	0.000	0.000	0.300
4		Pier T Wharf Crew boat auxiliary engine	Marine Equipment		onsite	320	0.034	0.030	0.034	0.600	0.000	0.421	0.033	0.025	0.000	0.000	0.025
4		Pier T Wharf Survey boat propulsion engine	Marine Equipment		onsite	320	0.250	0.222	0.250	4.653	0.003	2.499	0.258	0.148	0.000	0.000	0.150
4		**Off-Road Equipment**															
4		Const Barge - piling crane	Offroad Construction Equipment		onsite	310	0.209	0.192	0.209	5.002	0.008	2.675	0.467	0.380	0.000	0.000	0.380
4		Cong Barge - long arm excavator	Offroad Construction Equipment		onsite	310	0.075	0.069	0.075	2.188	0.013	2.775	0.321	0.634	0.000	0.000	0.634
4		Const barge - deck equipment	Offroad Construction Equipment		onsite	310	0.192	0.177	0.192	2.758	0.004	2.819	0.327	0.181	0.000	0.000	0.181
4		Sheet pile barge - deck equipment	Offroad Construction Equipment		onsite	310	0.192	0.177	0.192	2.758	0.004	2.819	0.327	0.181	0.000	0.000	0.181
4		On-Road Vehicles															
4		Workers	Onroad Construction Vehicles		offsite	320	0.144	0.046	0.000	0.053	0.003	0.868	0.014	0.153	0.000	0.000	0.154

Table H1.28
Alternative 4 Emissions by Task

				Unmitigated Emissions										
				Total										
				PM10	PM2.5	DPM	NOX	SOX	CO	VOC	CO2	CH4	N2O	CO2e
Task ID		**Construction Element/Equipment**	**Source Type 1**	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(tonnes)	(tonnes)	(tonnes)	(tonnes)
3	**Pier J Wharf Upgrade**													
3		**Marine Activities**												
3		Pier J Wharf Tugboat propulsion engine	Marine Equipment	1070.217	952.493	1070.217	19927.448	11.815	10702.174	1104.400	633.028	0.010	0.030	642.235
3		Pier J Wharf Tugboat auxiliary engine	Marine Equipment	92.632	82.443	92.632	1650.016	1.278	1157.906	91.446	68.490	0.001	0.003	69.480
3		Pier J Wharf Crew boat propulsion engine	Marine Equipment	87.459	77.838	87.459	1628.480	0.966	874.586	90.252	51.731	0.001	0.002	52.484
3		Pier J Wharf Crew boat auxiliary engine	Marine Equipment	5.892	5.244	5.892	104.950	0.081	73.649	5.816	4.356	0.000	0.000	4.419
3		Pier J Wharf Survey boat propulsion engine	Marine Equipment	43.729	38.919	43.729	814.240	0.483	437.293	45.126	25.866	0.000	0.001	26.242
3		**Off-Road Equipment**												
3		Const Barge - piling crane	Offroad Construction Equipment	35.467	32.630	35.467	850.389	1.315	454.676	79.338	64.597	0.000	0.000	64.597
3		Cong Barge - long arm excavator	Offroad Construction Equipment	12.784	11.761	12.784	371.901	2.195	471.801	54.548	107.776	0.000	0.000	107.776
3		Const barge - deck equipment	Offroad Construction Equipment	32.705	30.088	32.705	468.878	0.625	479.240	55.642	30.730	0.000	0.000	30.730
3		Sheet pile barge - deck equipment	Offroad Construction Equipment	32.705	30.088	32.705	468.878	0.625	479.240	55.642	30.730	0.000	0.000	30.730
3		On-Road Vehicles												
3		Workers	Onroad Construction Vehicles	25.167	7.972	0.000	9.217	0.584	151.865	2.372	26.764	0.000	0.000	26.911
4	**Pier T Wharf Upgrade**													
4		**Marine Activities**												
4		Pier T Wharf Tugboat propulsion engine	Marine Equipment	1956.969	1741.702	1956.969	36438.762	21.605	19569.690	2019.475	1157.536	0.017	0.055	1174.372
4		Pier T Wharf Tugboat auxiliary engine	Marine Equipment	169.385	150.753	169.385	3017.173	2.338	2117.314	167.215	125.238	0.001	0.006	127.048
4		Pier T Wharf Crew boat propulsion engine	Marine Equipment	159.924	142.333	159.924	2977.791	1.766	1599.243	165.032	94.594	0.001	0.004	95.970
4		Pier T Wharf Crew boat auxiliary engine	Marine Equipment	10.774	9.589	10.774	191.909	0.149	134.673	10.636	7.966	0.000	0.000	8.081
4		Pier T Wharf Survey boat propulsion engine	Marine Equipment	79.962	71.166	79.962	1488.896	0.883	799.622	82.516	47.297	0.001	0.002	47.985
4		**Off-Road Equipment**												
4		Const Barge - piling crane	Offroad Construction Equipment	64.675	59.501	64.675	1550.709	2.397	829.115	144.674	117.794	0.000	0.000	117.794
4		Cong Barge - long arm excavator	Offroad Construction Equipment	23.312	21.447	23.312	678.172	4.003	860.342	99.471	196.533	0.000	0.000	196.533
4		Const barge - deck equipment	Offroad Construction Equipment	59.638	54.867	59.638	855.012	1.140	873.908	101.465	56.037	0.000	0.000	56.037
4		Sheet pile barge - deck equipment	Offroad Construction Equipment	59.638	54.867	59.638	855.012	1.140	873.908	101.465	56.037	0.000	0.000	56.037
4		On-Road Vehicles												
4		Workers	Onroad Construction Vehicles	46.019	14.578	0.000	16.854	1.067	277.697	4.337	48.939	0.001	0.001	49.208

Table H1.28
Alternative 4 Emissions by Task

Task ID		Construction Element/Equipment	Source Type 1	Mitigated Peak Day PM10 (lb/day)	PM2.5 (lb/day)	DPM (lb/day)	NOX (lb/day)	SOX (lb/day)	CO (lb/day)	VOC (lb/day)	CO2 (tonnes/day)	CH4 (tonnes/day)	N2O (tonnes/day)	CO2e (tonnes/day)
3	**Pier J Wharf Upgrade**													
3		**Marine Activities**												
3		Pier J Wharf Tugboat propulsion engine	Marine Equipment	4.159	3.701	4.159	81.337	0.068	61.155	4.508	3.617	0.000	0.000	3.670
3		Pier J Wharf Tugboat auxiliary engine	Marine Equipment	0.185	0.165	0.185	6.789	0.007	7.278	0.376	0.391	0.000	0.000	0.397
3		Pier J Wharf Crew boat propulsion engine	Marine Equipment	0.340	0.302	0.340	6.647	0.006	4.998	0.368	0.296	0.000	0.000	0.300
3		Pier J Wharf Crew boat auxiliary engine	Marine Equipment	0.012	0.010	0.012	0.432	0.000	0.463	0.024	0.025	0.000	0.000	0.025
3		Pier J Wharf Survey boat propulsion engine	Marine Equipment	0.170	0.151	0.170	3.323	0.003	2.499	0.184	0.148	0.000	0.000	0.150
3		**Off-Road Equipment**												
3		Const Barge - piling crane	Offroad Construction Equipment	0.024	0.024	0.024	0.479	0.008	2.675	0.236	0.380	0.000	0.000	0.380
3		Cong Barge - long arm excavator	Offroad Construction Equipment	0.040	0.040	0.040	0.792	0.013	2.775	0.321	0.634	0.000	0.000	0.634
3		Const barge - deck equipment	Offroad Construction Equipment	0.014	0.014	0.014	0.278	0.004	2.819	0.137	0.181	0.000	0.000	0.181
3		Sheet pile barge - deck equipment	Offroad Construction Equipment	0.014	0.014	0.014	0.278	0.004	2.819	0.137	0.181	0.000	0.000	0.181
3		On-Road Vehicles												
3		Workers	Onroad Construction Vehicles	0.144	0.046	0.000	0.053	0.003	0.868	0.014	0.153	0.000	0.000	0.154
4	**Pier T Wharf Upgrade**													
4		**Marine Activities**												
4		Pier T Wharf Tugboat propulsion engine	Marine Equipment	4.159	3.701	4.159	81.337	0.068	61.155	4.508	3.617	0.000	0.000	3.670
4		Pier T Wharf Tugboat auxiliary engine	Marine Equipment	0.185	0.165	0.185	6.789	0.007	7.278	0.376	0.391	0.000	0.000	0.397
4		Pier T Wharf Crew boat propulsion engine	Marine Equipment	0.340	0.302	0.340	6.647	0.006	4.998	0.368	0.296	0.000	0.000	0.300
4		Pier T Wharf Crew boat auxiliary engine	Marine Equipment	0.012	0.010	0.012	0.432	0.000	0.463	0.024	0.025	0.000	0.000	0.025
4		Pier T Wharf Survey boat propulsion engine	Marine Equipment	0.170	0.151	0.170	3.323	0.003	2.499	0.184	0.148	0.000	0.000	0.150
4		**Off-Road Equipment**												
4		Const Barge - piling crane	Offroad Construction Equipment	0.024	0.024	0.024	0.479	0.008	2.675	0.236	0.380	0.000	0.000	0.380
4		Cong Barge - long arm excavator	Offroad Construction Equipment	0.040	0.040	0.040	0.792	0.013	2.775	0.321	0.634	0.000	0.000	0.634
4		Const barge - deck equipment	Offroad Construction Equipment	0.014	0.014	0.014	0.278	0.004	2.819	0.137	0.181	0.000	0.000	0.181
4		Sheet pile barge - deck equipment	Offroad Construction Equipment	0.014	0.014	0.014	0.278	0.004	2.819	0.137	0.181	0.000	0.000	0.181
4		On-Road Vehicles												
4		Workers	Onroad Construction Vehicles	0.144	0.046	0.000	0.053	0.003	0.868	0.014	0.153	0.000	0.000	0.154

Table H1.28
Alternative 4 Emissions by Task

				Mitigated Emissions										
				Total										
				PM10	PM2.5	DPM	NOX	SOX	CO	VOC	CO2	CH4	N2O	CO2e
Task ID		**Construction Element/Equipment**	**Source Type 1**	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(tonnes)	(tonnes)
3	**Pier J Wharf Upgrade**													
3		**Marine Activities**												
3		Pier J Wharf Tugboat propulsion engine	Marine Equipment	727.748	647.696	727.748	14233.892	11.815	10702.174	788.857	633.028	0.007	0.030	642.167
3		Pier J Wharf Tugboat auxiliary engine	Marine Equipment	32.421	28.855	32.421	1188.012	1.278	1273.697	65.841	68.490	0.001	0.003	69.474
3		Pier J Wharf Crew boat propulsion engine	Marine Equipment	59.472	52.930	59.472	1163.200	0.966	874.586	64.466	51.731	0.001	0.002	52.478
3		Pier J Wharf Crew boat auxiliary engine	Marine Equipment	2.062	1.835	2.062	75.564	0.081	81.014	4.188	4.356	0.000	0.000	4.419
3		Pier J Wharf Survey boat propulsion engine	Marine Equipment	29.736	26.465	29.736	581.600	0.483	437.293	32.233	25.866	0.000	0.001	26.239
3		**Off-Road Equipment**												
3		Const Barge - piling crane	Offroad Construction Equipment	4.076	4.076	4.076	81.515	1.315	454.676	40.056	64.597	0.000	0.000	64.597
3		Cong Barge - long arm excavator	Offroad Construction Equipment	6.729	6.729	6.729	134.583	2.195	471.801	54.548	107.776	0.000	0.000	107.776
3		Const barge - deck equipment	Offroad Construction Equipment	2.361	2.361	2.361	47.222	0.625	479.240	23.205	30.730	0.000	0.000	30.730
3		Sheet pile barge - deck equipment	Offroad Construction Equipment	2.361	2.361	2.361	47.222	0.625	479.240	23.205	30.730	0.000	0.000	30.730
3		On-Road Vehicles												
3		Workers	Onroad Construction Vehicles	25.167	7.972	0.000	9.217	0.584	151.865	2.372	26.764	0.000	0.000	26.911
4	**Pier T Wharf Upgrade**													
4		**Marine Activities**												
4		Pier T Wharf Tugboat propulsion engine	Marine Equipment	1330.739	1184.358	1330.739	26027.687	21.605	19569.690	1442.482	1157.536	0.012	0.055	1174.248
4		Pier T Wharf Tugboat auxiliary engine	Marine Equipment	59.285	52.763	59.285	2172.364	2.338	2329.046	120.395	125.238	0.001	0.006	127.038
4		Pier T Wharf Crew boat propulsion engine	Marine Equipment	108.749	96.786	108.749	2126.994	1.766	1599.243	117.880	94.594	0.001	0.004	95.960
4		Pier T Wharf Crew boat auxiliary engine	Marine Equipment	3.771	3.356	3.771	138.175	0.149	148.140	7.658	7.966	0.000	0.000	8.080
4		Pier T Wharf Survey boat propulsion engine	Marine Equipment	54.374	48.393	54.374	1063.497	0.883	799.622	58.940	47.297	0.001	0.002	47.980
4		**Off-Road Equipment**												
4		Const Barge - piling crane	Offroad Construction Equipment	7.432	7.432	7.432	148.644	2.397	829.115	73.044	117.794	0.000	0.000	117.794
4		Cong Barge - long arm excavator	Offroad Construction Equipment	12.271	12.271	12.271	245.417	4.003	860.342	99.471	196.533	0.000	0.000	196.533
4		Const barge - deck equipment	Offroad Construction Equipment	4.306	4.306	4.306	86.111	1.140	873.908	42.315	56.037	0.000	0.000	56.037
4		Sheet pile barge - deck equipment	Offroad Construction Equipment	4.306	4.306	4.306	86.111	1.140	873.908	42.315	56.037	0.000	0.000	56.037
4		On-Road Vehicles												
4		Workers	Onroad Construction Vehicles	46.019	14.578	0.000	16.854	1.067	277.697	4.337	48.939	0.001	0.001	49.208

Table H1.28
Alternative 4 Emissions by Task

							Unmitigated Emissions										
							Peak Day										
							PM10	PM2.5	DPM	NOX	SOX	CO	VOC	CO2	CH4	N2O	CO2e
Task ID		**Construction Element/Equipment**	**Source Type 1**	**Source Type 2**	**Onsite/Offsite**	**Days Total**	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(tonnes/day)	(tonnes/day)	(tonnes/day)	(tonnes/day)
5	**Approach Channel (hopper dredge 5,447,000 CY)**																
5		**Marine Hopper Dredge**															
5		Hopper propulsion engine	Marine Equipment	dredging	onsite	399	26.632	23.703	26.632	495.890	0.294	266.321	27.483	15.753	0.000	0.001	15.982
5		Hopper propulsion engine	Marine Equipment	transit	offsite	399	50.305	44.772	50.305	936.682	0.555	503.052	51.912	29.755	0.000	0.001	30.188
5		Hopper auxiliary engine	Marine Equipment	disposal	offsite	399	0.222	0.198	0.222	5.060	0.004	3.699	0.280	0.219	0.000	0.000	0.222
5		Crew boat propulsion engine	Marine Equipment	support	onsite	399	0.406	0.361	0.406	8.024	0.004	4.061	0.445	0.240	0.000	0.000	0.244
5		Crew boat auxiliary engine	Marine Equipment	support	onsite	399	0.034	0.030	0.034	0.600	0.000	0.421	0.033	0.025	0.000	0.000	0.025
5		Survey boat propulsion engine	Marine Equipment	dredging	onsite	399	1.449	1.290	1.449	28.638	0.016	14.493	1.587	0.857	0.000	0.000	0.870
6	**Main Channel Widening (clam shell dredge 1,065,000 CY)**																
6		**Marine Clamshell Dredge**															
6		Clamshell Dredge hoist	Marine Equipment	dredging	onsite	178	4.365	4.365	4.365	132.698	0.145	75.661	7.354	5.785	0.000	0.000	5.785
6		Clamshell Dredge generator	Marine Equipment	dredging	onsite	178	3.274	3.274	3.274	99.524	0.109	56.746	5.516	3.196	0.000	0.000	3.196
6		Clamshell Barge dump scow	Marine Equipment	disposal	offsite	178	0.046	0.046	0.046	0.880	0.002	0.802	0.049	0.032	0.000	0.000	0.032
6		Clamshell Tugboat propulsion engine	Marine Equipment	dredging	onsite	178	0.612	0.544	0.612	11.387	0.007	6.116	0.631	0.362	0.000	0.000	0.367
6		Clamshell Tugboat auxiliary engine	Marine Equipment	dredging	onsite	178	0.088	0.079	0.088	1.571	0.001	1.103	0.087	0.065	0.000	0.000	0.066
6		Clamshell Tugboat propulsion engine	Marine Equipment	transit	offsite	178	11.008	9.797	11.008	204.968	0.122	110.080	11.360	6.511	0.000	0.000	6.606
6		Clamshell Tugboat auxiliary engine	Marine Equipment	transit	offsite	178	1.588	1.413	1.588	28.286	0.022	19.850	1.568	1.174	0.000	0.000	1.191
6		Clamshell Crew boat propulsion engine	Marine Equipment	support	onsite	178	0.406	0.361	0.406	8.024	0.004	4.061	0.445	0.240	0.000	0.000	0.244
6		Clamshell Crew boat auxiliary engine	Marine Equipment	support	onsite	178	0.034	0.030	0.034	0.600	0.000	0.421	0.033	0.025	0.000	0.000	0.025
6		Clamshell Survey boat propulsion engine	Marine Equipment	dredging	onsite	178	0.362	0.322	0.362	7.160	0.004	3.623	0.397	0.214	0.000	0.000	0.217

Table H1.28
Alternative 4 Emissions by Task

				Unmitigated Emissions										
				Total										
				PM10	PM2.5	DPM	NOX	SOX	CO	VOC	CO2	CH4	N2O	CO2e
Task ID		**Construction Element/Equipment**	**Source Type 1**	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(tonnes)	(tonnes)	(tonnes)	(tonnes)
5	**Approach Channel (hopper dredge 5,447,000 CY)**													
5		**Marine Hopper Dredge**												
5		Hopper propulsion engine	Marine Equipment	10626.223	9457.339	10626.223	197860.275	117.314	106262.232	10965.625	6285.351	0.094	0.299	6376.769
5		Hopper propulsion engine	Marine Equipment	20071.755	17863.862	20071.755	373736.076	221.592	200717.549	20712.847	11872.331	0.178	0.564	12045.007
5		Hopper auxiliary engine	Marine Equipment	88.552	78.811	88.552	2018.982	1.629	1475.864	111.894	87.297	0.001	0.004	88.558
5		Crew boat propulsion engine	Marine Equipment	162.017	144.195	162.017	3201.458	1.789	1620.171	177.428	95.832	0.002	0.005	97.228
5		Crew boat auxiliary engine	Marine Equipment	13.434	11.956	13.434	239.287	0.185	167.921	13.262	9.932	0.000	0.000	10.076
5		Survey boat propulsion engine	Marine Equipment	578.276	514.666	578.276	11426.742	6.384	5782.764	633.282	342.047	0.005	0.016	347.030
6	**Main Channel Widening (clam shell dredge 1,065,000 CY)**													
6		**Marine Clamshell Dredge**												
6		Clamshell Dredge hoist	Marine Equipment	776.984	776.984	776.984	23620.317	25.869	13467.725	1309.063	1029.797	0.000	0.000	1029.797
6		Clamshell Dredge generator	Marine Equipment	582.738	582.738	582.738	17715.238	19.402	10100.794	981.797	568.968	0.000	0.000	568.968
6		Clamshell Barge dump scow	Marine Equipment	8.241	8.241	8.241	156.574	0.274	142.840	8.678	5.631	0.000	0.000	5.631
6		Clamshell Tugboat propulsion engine	Marine Equipment	108.856	96.882	108.856	2026.906	1.202	1088.564	112.333	64.388	0.001	0.003	65.324
6		Clamshell Tugboat auxiliary engine	Marine Equipment	15.703	13.976	15.703	279.717	0.217	196.293	15.502	11.611	0.000	0.001	11.778
6		Clamshell Tugboat propulsion engine	Marine Equipment	1959.415	1743.880	1959.415	36484.311	21.632	19594.152	2021.999	1158.983	0.017	0.055	1175.840
6		Clamshell Tugboat auxiliary engine	Marine Equipment	282.661	251.569	282.661	5034.907	3.901	3533.268	279.040	208.991	0.002	0.010	212.012
6		Clamshell Crew boat propulsion engine	Marine Equipment	72.278	64.328	72.278	1428.219	0.798	722.783	79.153	42.752	0.001	0.002	43.375
6		Clamshell Crew boat auxiliary engine	Marine Equipment	5.993	5.334	5.993	106.750	0.083	74.912	5.916	4.431	0.000	0.000	4.495
6		Clamshell Survey boat propulsion engine	Marine Equipment	64.494	57.400	64.494	1274.411	0.712	644.945	70.629	38.148	0.001	0.002	38.704

Table H1.28
Alternative 4 Emissions by Task

				Mitigated										
				Peak Day										
				PM10	PM2.5	DPM	NOX	SOX	CO	VOC	CO2	CH4	N2O	CO2e
Task ID		**Construction Element/Equipment**	**Source Type 1**	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(tonnes/day)	(tonnes/day)	(tonnes/day)	(tonnes/day)
5	**Approach Channel (hopper dredge 5,447,000 CY)**													
5		**Marine Hopper Dredge**												
5		Hopper propulsion engine	Marine Equipment	26.632	23.703	26.632	495.890	0.294	266.321	27.483	15.753	0.000	0.001	15.982
5		Hopper propulsion engine	Marine Equipment	50.305	44.772	50.305	936.682	0.555	503.052	51.912	29.755	0.000	0.001	30.188
5		Hopper auxiliary engine	Marine Equipment	0.222	0.198	0.222	5.060	0.004	3.699	0.280	0.219	0.000	0.000	0.222
5		Crew boat propulsion engine	Marine Equipment	0.276	0.246	0.276	5.401	0.004	4.061	0.299	0.240	0.000	0.000	0.244
5		Crew boat auxiliary engine	Marine Equipment	0.012	0.010	0.012	0.432	0.000	0.463	0.024	0.025	0.000	0.000	0.025
5		Survey boat propulsion engine	Marine Equipment	0.986	0.877	0.986	19.276	0.016	14.493	1.068	0.857	0.000	0.000	0.870
6	**Main Channel Widening (clam shell dredge 1,065,000 CY)**													
6		**Marine Clamshell Dredge**												
6		Clamshell Dredge hoist	Marine Equipment	0.437	0.437	0.437	13.270	0.015	7.566	0.735	0.579	0.000	0.000	0.579
6		Clamshell Dredge generator	Marine Equipment	0.327	0.327	0.327	9.952	0.011	5.675	0.552	0.320	0.000	0.000	0.320
6		Clamshell Barge dump scow	Marine Equipment	0.046	0.046	0.046	0.880	0.002	0.802	0.049	0.032	0.000	0.000	0.032
6		Clamshell Tugboat propulsion engine	Marine Equipment	0.416	0.370	0.416	8.134	0.007	6.116	0.451	0.362	0.000	0.000	0.367
6		Clamshell Tugboat auxiliary engine	Marine Equipment	0.031	0.027	0.031	1.131	0.001	1.213	0.063	0.065	0.000	0.000	0.066
6		Clamshell Tugboat propulsion engine	Marine Equipment	7.485	6.662	7.485	146.406	0.122	110.080	8.114	6.511	0.000	0.000	6.605
6		Clamshell Tugboat auxiliary engine	Marine Equipment	0.556	0.495	0.556	20.366	0.022	21.835	1.129	1.174	0.000	0.000	1.191
6		Clamshell Crew boat propulsion engine	Marine Equipment	0.276	0.246	0.276	5.401	0.004	4.061	0.299	0.240	0.000	0.000	0.244
6		Clamshell Crew boat auxiliary engine	Marine Equipment	0.012	0.010	0.012	0.432	0.000	0.463	0.024	0.025	0.000	0.000	0.025
6		Clamshell Survey boat propulsion engine	Marine Equipment	0.246	0.219	0.246	4.819	0.004	3.623	0.267	0.214	0.000	0.000	0.217
				Note: clamshell dredge would be electric with mitigation; assume 90 percent reduction in diesel exhaust emissions.										

Table H1.28
Alternative 4 Emissions by Task

				Mitigated Emissions										
				Total										
				PM10	PM2.5	DPM	NOX	SOX	CO	VOC	CO2	CH4	N2O	CO2e
Task ID		**Construction Element/Equipment**	**Source Type 1**	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(tonnes)	(tonnes)
5	**Approach Channel (hopper dredge 5,447,000 CY)**													
5		**Marine Hopper Dredge**												
5		Hopper propulsion engine	Marine Equipment	10626.223	9457.339	10626.223	197860.275	117.314	106262.232	10965.625	6285.351	0.094	0.299	6376.769
5		Hopper propulsion engine	Marine Equipment	20071.755	17863.862	20071.755	373736.076	221.592	200717.549	20712.847	11872.331	0.178	0.564	12045.007
5		Hopper auxiliary engine	Marine Equipment	88.552	78.811	88.552	2018.982	1.629	1475.864	111.894	87.297	0.001	0.004	88.558
5		Crew boat propulsion engine	Marine Equipment	110.172	98.053	110.172	2154.828	1.789	1620.171	119.423	95.832	0.001	0.005	97.216
5		Crew boat auxiliary engine	Marine Equipment	4.702	4.185	4.702	172.286	0.185	184.713	9.548	9.932	0.000	0.000	10.075
5		Survey boat propulsion engine	Marine Equipment	393.228	349.973	393.228	7691.077	6.384	5782.764	426.248	342.047	0.004	0.016	346.985
6	**Main Channel Widening (clam shell dredge 1,065,000 CY)**													
6		**Marine Clamshell Dredge**												
6		Clamshell Dredge hoist	Marine Equipment	77.698	77.698	77.698	2362.032	2.587	1346.772	130.906	102.980	0.000	0.000	102.980
6		Clamshell Dredge generator	Marine Equipment	58.274	58.274	58.274	1771.524	1.940	1010.079	98.180	56.897	0.000	0.000	56.897
6		Clamshell Barge dump scow	Marine Equipment	8.241	8.241	8.241	156.574	0.274	142.840	8.678	5.631	0.000	0.000	5.631
6		Clamshell Tugboat propulsion engine	Marine Equipment	74.022	65.880	74.022	1447.790	1.202	1088.564	80.238	64.388	0.001	0.003	65.318
6		Clamshell Tugboat auxiliary engine	Marine Equipment	5.496	4.892	5.496	201.396	0.217	215.922	11.162	11.611	0.000	0.001	11.778
6		Clamshell Tugboat propulsion engine	Marine Equipment	1332.402	1185.838	1332.402	26060.222	21.632	19594.152	1444.285	1158.983	0.012	0.055	1175.715
6		Clamshell Tugboat auxiliary engine	Marine Equipment	98.932	88.049	98.932	3625.133	3.901	3886.595	200.909	208.991	0.002	0.010	211.995
6		Clamshell Crew boat propulsion engine	Marine Equipment	49.149	43.743	49.149	961.301	0.798	722.783	53.276	42.752	0.000	0.002	43.369
6		Clamshell Crew boat auxiliary engine	Marine Equipment	2.098	1.867	2.098	76.860	0.083	82.403	4.260	4.431	0.000	0.000	4.495
6		Clamshell Survey boat propulsion engine	Marine Equipment	43.856	39.032	43.856	857.777	0.712	644.945	47.539	38.148	0.000	0.002	38.699
				Note: clamshell dredge would be electric with mitigation; assume 90 percent reduction in diesel exhaust emissions.										

Table H1.28
Alternative 4 Emissions by Task

							Unmitigated Emissions										
							Peak Day										
							PM10	PM2.5	DPM	NOX	SOX	CO	VOC	CO2	CH4	N2O	CO2e
Task ID		**Construction Element/Equipment**	**Source Type 1**	**Source Type 2**	**Onsite/Offsite**	**Days Total**	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(tonnes/day)	(tonnes/day)	(tonnes/day)	(tonnes/day)
7	**West Basin (clam shell dredge 975,000 CY)**																
7		**Marine Clamshell Dredge**															
7		Clamshell Dredge hoist	Marine Equipment	dredging	onsite	163	4.365	4.365	4.365	132.698	0.145	75.661	7.354	5.785	0.000	0.000	5.785
7		Clamshell Dredge generator	Marine Equipment	dredging	onsite	163	3.274	3.274	3.274	99.524	0.109	56.746	5.516	3.196	0.000	0.000	3.196
7		Clamshell Barge dump scow	Marine Equipment	disposal	offsite	163	0.046	0.046	0.046	0.880	0.002	0.802	0.049	0.032	0.000	0.000	0.032
7		Clamshell Tugboat propulsion engine	Marine Equipment	dredging	onsite	163	0.612	0.544	0.612	11.387	0.007	6.116	0.631	0.362	0.000	0.000	0.367
7		Clamshell Tugboat auxiliary engine	Marine Equipment	dredging	onsite	163	0.088	0.079	0.088	1.571	0.001	1.103	0.087	0.065	0.000	0.000	0.066
7		Clamshell Tugboat propulsion engine	Marine Equipment	transit	offsite	163	11.008	9.797	11.008	204.968	0.122	110.080	11.360	6.511	0.000	0.000	6.606
7		Clamshell Tugboat auxiliary engine	Marine Equipment	transit	offsite	163	1.588	1.413	1.588	28.286	0.022	19.850	1.568	1.174	0.000	0.000	1.191
7		Clamshell Crew boat propulsion engine	Marine Equipment	support	onsite	163	0.406	0.361	0.406	8.024	0.004	4.061	0.445	0.240	0.000	0.000	0.244
7		Clamshell Crew boat auxiliary engine	Marine Equipment	support	onsite	163	0.034	0.030	0.034	0.600	0.000	0.421	0.033	0.025	0.000	0.000	0.025
7		Clamshell Survey boat propulsion engine	Marine Equipment	dredging	onsite	163	0.362	0.322	0.362	7.160	0.004	3.623	0.397	0.214	0.000	0.000	0.217
8	**West Basin (clam shell dredge 513,000 CY)**																
8		**Marine Clamshell Dredge**															
8		Clamshell Dredge hoist	Marine Equipment	dredging	onsite	86	4.365	4.365	4.365	132.698	0.145	75.661	7.354	5.785	0.000	0.000	5.785
8		Clamshell Dredge generator	Marine Equipment	dredging	onsite	86	3.274	3.274	3.274	99.524	0.109	56.746	5.516	3.196	0.000	0.000	3.196
8		Clamshell Barge dump scow	Marine Equipment	disposal	offsite	86	0.046	0.046	0.046	0.880	0.002	0.802	0.049	0.032	0.000	0.000	0.032
8		Clamshell Tugboat propulsion engine	Marine Equipment	dredging	onsite	86	0.612	0.544	0.612	11.387	0.007	6.116	0.631	0.362	0.000	0.000	0.367
8		Clamshell Tugboat auxiliary engine	Marine Equipment	dredging	onsite	86	0.088	0.079	0.088	1.571	0.001	1.103	0.087	0.065	0.000	0.000	0.066
8		Clamshell Tugboat propulsion engine	Marine Equipment	transit	offsite	86	11.008	9.797	11.008	204.968	0.122	110.080	11.360	6.511	0.000	0.000	6.606
8		Clamshell Tugboat auxiliary engine	Marine Equipment	transit	offsite	86	1.588	1.413	1.588	28.286	0.022	19.850	1.568	1.174	0.000	0.000	1.191
8		Clamshell Crew boat propulsion engine	Marine Equipment	support	onsite	86	0.406	0.361	0.406	8.024	0.004	4.061	0.445	0.240	0.000	0.000	0.244
8		Clamshell Crew boat auxiliary engine	Marine Equipment	support	onsite	86	0.034	0.030	0.034	0.600	0.000	0.421	0.033	0.025	0.000	0.000	0.025
8		Clamshell Survey boat propulsion engine	Marine Equipment	dredging	onsite	86	0.362	0.322	0.362	7.160	0.004	3.623	0.397	0.214	0.000	0.000	0.217

Table H1.28
Alternative 4 Emissions by Task

				Unmitigated Emissions										
				Total										
				PM10	PM2.5	DPM	NOX	SOX	CO	VOC	CO2	CH4	N2O	CO2e
Task ID		**Construction Element/Equipment**	**Source Type 1**	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(tonnes)	(tonnes)	(tonnes)	(tonnes)
7	**West Basin (clam shell dredge 975,000 CY)**													
7		**Marine Clamshell Dredge**												
7		Clamshell Dredge hoist	Marine Equipment	711.508	711.508	711.508	21629.841	23.689	12332.804	1198.749	943.016	0.000	0.000	943.016
7		Clamshell Dredge generator	Marine Equipment	533.631	533.631	533.631	16222.381	17.767	9249.603	899.061	521.021	0.000	0.000	521.021
7		Clamshell Barge dump scow	Marine Equipment	7.546	7.546	7.546	143.380	0.251	130.802	7.946	5.156	0.000	0.000	5.156
7		Clamshell Tugboat propulsion engine	Marine Equipment	99.683	88.718	99.683	1856.099	1.101	996.831	102.867	58.962	0.001	0.003	59.820
7		Clamshell Tugboat auxiliary engine	Marine Equipment	14.380	12.798	14.380	256.145	0.198	179.751	14.196	10.632	0.000	0.001	10.786
7		Clamshell Tugboat propulsion engine	Marine Equipment	1794.296	1596.923	1794.296	33409.790	19.809	17942.959	1851.606	1061.316	0.016	0.050	1076.752
7		Clamshell Tugboat auxiliary engine	Marine Equipment	258.842	230.369	258.842	4610.617	3.572	3235.521	255.525	191.379	0.002	0.009	194.146
7		Clamshell Crew boat propulsion engine	Marine Equipment	66.187	58.907	66.187	1307.864	0.731	661.874	72.483	39.149	0.001	0.002	39.720
7		Clamshell Crew boat auxiliary engine	Marine Equipment	5.488	4.884	5.488	97.754	0.076	68.599	5.418	4.058	0.000	0.000	4.116
7		Clamshell Survey boat propulsion engine	Marine Equipment	59.060	52.563	59.060	1167.017	0.652	590.596	64.677	34.933	0.001	0.002	35.442
8	**West Basin (clam shell dredge 513,000 CY)**													
8		**Marine Clamshell Dredge**												
8		Clamshell Dredge hoist	Marine Equipment	375.397	375.397	375.397	11412.063	12.499	6506.878	632.469	497.542	0.000	0.000	497.542
8		Clamshell Dredge generator	Marine Equipment	281.548	281.548	281.548	8559.048	9.374	4880.159	474.351	274.894	0.000	0.000	274.894
8		Clamshell Barge dump scow	Marine Equipment	3.981	3.981	3.981	75.648	0.133	69.012	4.193	2.720	0.000	0.000	2.720
8		Clamshell Tugboat propulsion engine	Marine Equipment	52.594	46.808	52.594	979.292	0.581	525.935	54.273	31.109	0.000	0.001	31.561
8		Clamshell Tugboat auxiliary engine	Marine Equipment	7.587	6.752	7.587	135.144	0.105	94.838	7.490	5.610	0.000	0.000	5.691
8		Clamshell Tugboat propulsion engine	Marine Equipment	946.684	842.549	946.684	17627.251	10.451	9466.837	976.921	559.958	0.008	0.027	568.102
8		Clamshell Tugboat auxiliary engine	Marine Equipment	136.567	121.544	136.567	2432.595	1.885	1707.085	134.817	100.973	0.001	0.005	102.433
8		Clamshell Crew boat propulsion engine	Marine Equipment	34.921	31.080	34.921	690.039	0.386	349.210	38.243	20.656	0.000	0.001	20.956
8		Clamshell Crew boat auxiliary engine	Marine Equipment	2.895	2.577	2.895	51.576	0.040	36.193	2.858	2.141	0.000	0.000	2.172
8		Clamshell Survey boat propulsion engine	Marine Equipment	31.160	27.733	31.160	615.727	0.344	311.603	34.124	18.431	0.000	0.001	18.700

Table H1.28
Alternative 4 Emissions by Task

				Mitigated										
				Peak Day										
				PM10	PM2.5	DPM	NOX	SOX	CO	VOC	CO2	CH4	N2O	CO2e
Task ID		**Construction Element/Equipment**	**Source Type 1**	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(tonnes/day)	(tonnes/day)	(tonnes/day)	(tonnes/day)
7	**West Basin (clam shell dredge 975,000 CY)**													
7		**Marine Clamshell Dredge**												
7		Clamshell Dredge hoist	Marine Equipment	0.437	0.437	0.437	13.270	0.015	7.566	0.735	0.579	0.000	0.000	0.579
7		Clamshell Dredge generator	Marine Equipment	0.327	0.327	0.327	9.952	0.011	5.675	0.552	0.320	0.000	0.000	0.320
7		Clamshell Barge dump scow	Marine Equipment	0.046	0.046	0.046	0.880	0.002	0.802	0.049	0.032	0.000	0.000	0.032
7		Clamshell Tugboat propulsion engine	Marine Equipment	0.416	0.370	0.416	8.134	0.007	6.116	0.451	0.362	0.000	0.000	0.367
7		Clamshell Tugboat auxiliary engine	Marine Equipment	0.031	0.027	0.031	1.131	0.001	1.213	0.063	0.065	0.000	0.000	0.066
7		Clamshell Tugboat propulsion engine	Marine Equipment	7.485	6.662	7.485	146.406	0.122	110.080	8.114	6.511	0.000	0.000	6.605
7		Clamshell Tugboat auxiliary engine	Marine Equipment	0.556	0.495	0.556	20.366	0.022	21.835	1.129	1.174	0.000	0.000	1.191
7		Clamshell Crew boat propulsion engine	Marine Equipment	0.276	0.246	0.276	5.401	0.004	4.061	0.299	0.240	0.000	0.000	0.244
7		Clamshell Crew boat auxiliary engine	Marine Equipment	0.012	0.010	0.012	0.432	0.000	0.463	0.024	0.025	0.000	0.000	0.025
7		Clamshell Survey boat propulsion engine	Marine Equipment	0.246	0.219	0.246	4.819	0.004	3.623	0.267	0.214	0.000	0.000	0.217
8	**West Basin (clam shell dredge 513,000 CY)**													
8		**Marine Clamshell Dredge**												
8		Clamshell Dredge hoist	Marine Equipment	0.437	0.437	0.437	13.270	0.015	7.566	0.735	0.579	0.000	0.000	0.579
8		Clamshell Dredge generator	Marine Equipment	0.327	0.327	0.327	9.952	0.011	5.675	0.552	0.320	0.000	0.000	0.320
8		Clamshell Barge dump scow	Marine Equipment	0.046	0.046	0.046	0.880	0.002	0.802	0.049	0.032	0.000	0.000	0.032
8		Clamshell Tugboat propulsion engine	Marine Equipment	0.416	0.370	0.416	8.134	0.007	6.116	0.451	0.362	0.000	0.000	0.367
8		Clamshell Tugboat auxiliary engine	Marine Equipment	0.031	0.027	0.031	1.131	0.001	1.213	0.063	0.065	0.000	0.000	0.066
8		Clamshell Tugboat propulsion engine	Marine Equipment	7.485	6.662	7.485	146.406	0.122	110.080	8.114	6.511	0.000	0.000	6.605
8		Clamshell Tugboat auxiliary engine	Marine Equipment	0.556	0.495	0.556	20.366	0.022	21.835	1.129	1.174	0.000	0.000	1.191
8		Clamshell Crew boat propulsion engine	Marine Equipment	0.276	0.246	0.276	5.401	0.004	4.061	0.299	0.240	0.000	0.000	0.244
8		Clamshell Crew boat auxiliary engine	Marine Equipment	0.012	0.010	0.012	0.432	0.000	0.463	0.024	0.025	0.000	0.000	0.025
8		Clamshell Survey boat propulsion engine	Marine Equipment	0.246	0.219	0.246	4.819	0.004	3.623	0.267	0.214	0.000	0.000	0.217
				Note: clamshell dredge would be electric with mitigation; assume 90 percent reduction in diesel exhaust emissions.										

Table H1.28
Alternative 4 Emissions by Task

				Mitigated Emissions										
				Total										
				PM10	PM2.5	DPM	NOX	SOX	CO	VOC	CO2	CH4	N2O	CO2e
Task ID		**Construction Element/Equipment**	**Source Type 1**	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(tonnes)	(tonnes)
7	**West Basin (clam shell dredge 975,000 CY)**													
7		**Marine Clamshell Dredge**												
7		Clamshell Dredge hoist	Marine Equipment	71.151	71.151	71.151	2162.984	2.369	1233.280	119.875	94.302	0.000	0.000	94.302
7		Clamshell Dredge generator	Marine Equipment	53.363	53.363	53.363	1622.238	1.777	924.960	89.906	52.102	0.000	0.000	52.102
7		Clamshell Barge dump scow	Marine Equipment	7.546	7.546	7.546	143.380	0.251	130.802	7.946	5.156	0.000	0.000	5.156
7		Clamshell Tugboat propulsion engine	Marine Equipment	67.785	60.328	67.785	1325.785	1.101	996.831	73.476	58.962	0.001	0.003	59.813
7		Clamshell Tugboat auxiliary engine	Marine Equipment	5.033	4.479	5.033	184.425	0.198	197.726	10.221	10.632	0.000	0.001	10.785
7		Clamshell Tugboat propulsion engine	Marine Equipment	1220.121	1085.908	1220.121	23864.136	19.809	17942.959	1322.576	1061.316	0.011	0.050	1076.638
7		Clamshell Tugboat auxiliary engine	Marine Equipment	90.595	80.629	90.595	3319.644	3.572	3559.073	183.978	191.379	0.002	0.009	194.130
7		Clamshell Crew boat propulsion engine	Marine Equipment	45.007	40.057	45.007	880.293	0.731	661.874	48.787	39.149	0.000	0.002	39.715
7		Clamshell Crew boat auxiliary engine	Marine Equipment	1.921	1.709	1.921	70.383	0.076	75.459	3.901	4.058	0.000	0.000	4.116
7		Clamshell Survey boat propulsion engine	Marine Equipment	40.161	35.743	40.161	785.492	0.652	590.596	43.533	34.933	0.000	0.002	35.438
8	**West Basin (clam shell dredge 513,000 CY)**													
8		**Marine Clamshell Dredge**												
8		Clamshell Dredge hoist	Marine Equipment	37.540	37.540	37.540	1141.206	1.250	650.688	63.247	49.754	0.000	0.000	49.754
8		Clamshell Dredge generator	Marine Equipment	28.155	28.155	28.155	855.905	0.937	488.016	47.435	27.489	0.000	0.000	27.489
8		Clamshell Barge dump scow	Marine Equipment	3.981	3.981	3.981	75.648	0.133	69.012	4.193	2.720	0.000	0.000	2.720
8		Clamshell Tugboat propulsion engine	Marine Equipment	35.764	31.830	35.764	699.494	0.581	525.935	38.767	31.109	0.000	0.001	31.558
8		Clamshell Tugboat auxiliary engine	Marine Equipment	2.655	2.363	2.655	97.304	0.105	104.322	5.393	5.610	0.000	0.000	5.690
8		Clamshell Tugboat propulsion engine	Marine Equipment	643.745	572.933	643.745	12590.894	10.451	9466.837	697.801	559.958	0.006	0.027	568.042
8		Clamshell Tugboat auxiliary engine	Marine Equipment	47.798	42.541	47.798	1751.469	1.885	1877.793	97.068	100.973	0.001	0.005	102.425
8		Clamshell Crew boat propulsion engine	Marine Equipment	23.746	21.134	23.746	464.449	0.386	349.210	25.740	20.656	0.000	0.001	20.954
8		Clamshell Crew boat auxiliary engine	Marine Equipment	1.013	0.902	1.013	37.134	0.040	39.813	2.058	2.141	0.000	0.000	2.172
8		Clamshell Survey boat propulsion engine	Marine Equipment	21.189	18.858	21.189	414.431	0.344	311.603	22.968	18.431	0.000	0.001	18.697
				Note: clamshell dredge would be electric with mitigation; assume 90 percent reduction in diesel exhaust emissions.										

Table H1.28
Alternative 4 Emissions by Task

							Unmitigated Emissions										
							Peak Day										
							PM10	PM2.5	DPM	NOX	SOX	CO	VOC	CO2	CH4	N2O	CO2e
Task ID		**Construction Element/Equipment**	**Source Type 1**	**Source Type 2**	**Onsite/Offsite**	**Days Total**	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(tonnes/day)	(tonnes/day)	(tonnes/day)	(tonnes/day)
9	**Pier T Berths (clam shell dredge Berths T132 to T140, 44,000 CY)**																
9		**Marine Clamshell Dredge**															
9		Clamshell Dredge hoist	Marine Equipment	dredging	onsite	7	4.365	4.365	4.365	132.698	0.145	75.661	7.354	5.785	0.000	0.000	5.785
9		Clamshell Dredge generator	Marine Equipment	dredging	onsite	7	3.274	3.274	3.274	99.524	0.109	56.746	5.516	3.196	0.000	0.000	3.196
9		Clamshell Barge dump scow	Marine Equipment	disposal	offsite	7	0.046	0.046	0.046	0.880	0.002	0.802	0.049	0.032	0.000	0.000	0.032
9		Clamshell Tugboat propulsion engine	Marine Equipment	dredging	onsite	7	0.612	0.544	0.612	11.387	0.007	6.116	0.631	0.362	0.000	0.000	0.367
9		Clamshell Tugboat auxiliary engine	Marine Equipment	dredging	onsite	7	0.088	0.079	0.088	1.571	0.001	1.103	0.087	0.065	0.000	0.000	0.066
9		Clamshell Tugboat propulsion engine	Marine Equipment	transit	offsite	7	11.008	9.797	11.008	204.968	0.122	110.080	11.360	6.511	0.000	0.000	6.606
9		Clamshell Tugboat auxiliary engine	Marine Equipment	transit	offsite	7	1.588	1.413	1.588	28.286	0.022	19.850	1.568	1.174	0.000	0.000	1.191
9		Clamshell Crew boat propulsion engine	Marine Equipment	support	onsite	7	0.406	0.361	0.406	8.024	0.004	4.061	0.445	0.240	0.000	0.000	0.244
9		Clamshell Crew boat auxiliary engine	Marine Equipment	support	onsite	7	0.034	0.030	0.034	0.600	0.000	0.421	0.033	0.025	0.000	0.000	0.025
9		Clamshell Survey boat propulsion engine	Marine Equipment	dredging	onsite	7	0.362	0.322	0.362	7.160	0.004	3.623	0.397	0.214	0.000	0.000	0.217
10	**Pier J Basin (clam shell dredge 408,000 CY)**																
10		**Marine Clamshell Dredge**															
10		Clamshell Dredge hoist	Marine Equipment	dredging	onsite	68	4.365	4.365	4.365	132.698	0.145	75.661	7.354	5.785	0.000	0.000	5.785
10		Clamshell Dredge generator	Marine Equipment	dredging	onsite	68	3.274	3.274	3.274	99.524	0.109	56.746	5.516	3.196	0.000	0.000	3.196
10		Clamshell Barge dump scow	Marine Equipment	disposal	offsite	68	0.046	0.046	0.046	0.880	0.002	0.802	0.049	0.032	0.000	0.000	0.032
10		Clamshell Tugboat propulsion engine	Marine Equipment	dredging	onsite	68	0.612	0.544	0.612	11.387	0.007	6.116	0.631	0.362	0.000	0.000	0.367
10		Clamshell Tugboat auxiliary engine	Marine Equipment	dredging	onsite	68	0.088	0.079	0.088	1.571	0.001	1.103	0.087	0.065	0.000	0.000	0.066
10		Clamshell Tugboat propulsion engine	Marine Equipment	transit	offsite	68	11.008	9.797	11.008	204.968	0.122	110.080	11.360	6.511	0.000	0.000	6.606
10		Clamshell Tugboat auxiliary engine	Marine Equipment	transit	offsite	68	1.588	1.413	1.588	28.286	0.022	19.850	1.568	1.174	0.000	0.000	1.191
10		Clamshell Crew boat propulsion engine	Marine Equipment	support	onsite	68	0.406	0.361	0.406	8.024	0.004	4.061	0.445	0.240	0.000	0.000	0.244
10		Clamshell Crew boat auxiliary engine	Marine Equipment	support	onsite	68	0.034	0.030	0.034	0.600	0.000	0.421	0.033	0.025	0.000	0.000	0.025
10		Clamshell Survey boat propulsion engine	Marine Equipment	dredging	onsite	68	0.362	0.322	0.362	7.160	0.004	3.623	0.397	0.214	0.000	0.000	0.217

Table H1.28
Alternative 4 Emissions by Task

				Unmitigated Emissions										
				Total										
				PM10	PM2.5	DPM	NOX	SOX	CO	VOC	CO2	CH4	N2O	CO2e
Task ID		**Construction Element/Equipment**	**Source Type 1**	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(tonnes)	(tonnes)	(tonnes)	(tonnes)
9	**Pier T Berths (clam shell dredge Berths T132 to T140, 44,000 CY)**													
9		**Marine Clamshell Dredge**												
9		Clamshell Dredge hoist	Marine Equipment	30.556	30.556	30.556	928.889	1.017	529.630	51.480	40.498	0.000	0.000	40.498
9		Clamshell Dredge generator	Marine Equipment	22.917	22.917	22.917	696.667	0.763	397.222	38.610	22.375	0.000	0.000	22.375
9		Clamshell Barge dump scow	Marine Equipment	0.324	0.324	0.324	6.157	0.011	5.617	0.341	0.221	0.000	0.000	0.221
9		Clamshell Tugboat propulsion engine	Marine Equipment	4.281	3.810	4.281	79.710	0.047	42.809	4.418	2.532	0.000	0.000	2.569
9		Clamshell Tugboat auxiliary engine	Marine Equipment	0.618	0.550	0.618	11.000	0.009	7.719	0.610	0.457	0.000	0.000	0.463
9		Clamshell Tugboat propulsion engine	Marine Equipment	77.056	68.580	77.056	1434.776	0.851	770.557	79.517	45.578	0.001	0.002	46.241
9		Clamshell Tugboat auxiliary engine	Marine Equipment	11.116	9.893	11.116	198.002	0.153	138.949	10.973	8.219	0.000	0.000	8.338
9		Clamshell Crew boat propulsion engine	Marine Equipment	2.842	2.530	2.842	56.166	0.031	28.424	3.113	1.681	0.000	0.000	1.706
9		Clamshell Crew boat auxiliary engine	Marine Equipment	0.236	0.210	0.236	4.198	0.003	2.946	0.233	0.174	0.000	0.000	0.177
9		Clamshell Survey boat propulsion engine	Marine Equipment	2.536	2.257	2.536	50.117	0.028	25.363	2.778	1.500	0.000	0.000	1.522
10	**Pier J Basin (clam shell dredge 408,000 CY)**													
10		**Marine Clamshell Dredge**												
10		Clamshell Dredge hoist	Marine Equipment	296.825	296.825	296.825	9023.492	9.883	5144.974	500.091	393.406	0.000	0.000	393.406
10		Clamshell Dredge generator	Marine Equipment	222.619	222.619	222.619	6767.619	7.412	3858.730	375.069	217.358	0.000	0.000	217.358
10		Clamshell Barge dump scow	Marine Equipment	3.148	3.148	3.148	59.815	0.105	54.568	3.315	2.151	0.000	0.000	2.151
10		Clamshell Tugboat propulsion engine	Marine Equipment	41.586	37.011	41.586	774.324	0.459	415.856	42.914	24.598	0.000	0.001	24.955
10		Clamshell Tugboat auxiliary engine	Marine Equipment	5.999	5.339	5.999	106.858	0.083	74.988	5.922	4.436	0.000	0.000	4.500
10		Clamshell Tugboat propulsion engine	Marine Equipment	748.541	666.201	748.541	13937.827	8.264	7485.406	772.449	442.758	0.007	0.021	449.197
10		Clamshell Tugboat auxiliary engine	Marine Equipment	107.983	96.105	107.983	1923.448	1.490	1349.788	106.599	79.839	0.001	0.004	80.993
10		Clamshell Crew boat propulsion engine	Marine Equipment	27.612	24.575	27.612	545.612	0.305	276.119	30.238	16.332	0.000	0.001	16.570
10		Clamshell Crew boat auxiliary engine	Marine Equipment	2.289	2.038	2.289	40.781	0.032	28.618	2.260	1.693	0.000	0.000	1.717
10		Clamshell Survey boat propulsion engine	Marine Equipment	24.638	21.928	24.638	486.854	0.272	246.383	26.982	14.573	0.000	0.001	14.786

Table H1.28
Alternative 4 Emissions by Task

				Mitigated										
				Peak Day										
				PM10	PM2.5	DPM	NOX	SOX	CO	VOC	CO2	CH4	N2O	CO2e
Task ID		**Construction Element/Equipment**	**Source Type 1**	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(tonnes/day)	(tonnes/day)	(tonnes/day)	(tonnes/day)
9	**Pier T Berths (clam shell dredge Berths T132 to T140, 44,000 CY)**													
9		**Marine Clamshell Dredge**												
9		Clamshell Dredge hoist	Marine Equipment	0.437	0.437	0.437	13.270	0.015	7.566	0.735	0.579	0.000	0.000	0.579
9		Clamshell Dredge generator	Marine Equipment	0.327	0.327	0.327	9.952	0.011	5.675	0.552	0.320	0.000	0.000	0.320
9		Clamshell Barge dump scow	Marine Equipment	0.046	0.046	0.046	0.880	0.002	0.802	0.049	0.032	0.000	0.000	0.032
9		Clamshell Tugboat propulsion engine	Marine Equipment	0.416	0.370	0.416	8.134	0.007	6.116	0.451	0.362	0.000	0.000	0.367
9		Clamshell Tugboat auxiliary engine	Marine Equipment	0.031	0.027	0.031	1.131	0.001	1.213	0.063	0.065	0.000	0.000	0.066
9		Clamshell Tugboat propulsion engine	Marine Equipment	7.485	6.662	7.485	146.406	0.122	110.080	8.114	6.511	0.000	0.000	6.605
9		Clamshell Tugboat auxiliary engine	Marine Equipment	0.556	0.495	0.556	20.366	0.022	21.835	1.129	1.174	0.000	0.000	1.191
9		Clamshell Crew boat propulsion engine	Marine Equipment	0.276	0.246	0.276	5.401	0.004	4.061	0.299	0.240	0.000	0.000	0.244
9		Clamshell Crew boat auxiliary engine	Marine Equipment	0.012	0.010	0.012	0.432	0.000	0.463	0.024	0.025	0.000	0.000	0.025
9		Clamshell Survey boat propulsion engine	Marine Equipment	0.246	0.219	0.246	4.819	0.004	3.623	0.267	0.214	0.000	0.000	0.217
10	**Pier J Basin (clam shell dredge 408,000 CY)**													
10		**Marine Clamshell Dredge**												
10		Clamshell Dredge hoist	Marine Equipment	0.437	0.437	0.437	13.270	0.015	7.566	0.735	0.579	0.000	0.000	0.579
10		Clamshell Dredge generator	Marine Equipment	0.327	0.327	0.327	9.952	0.011	5.675	0.552	0.320	0.000	0.000	0.320
10		Clamshell Barge dump scow	Marine Equipment	0.046	0.046	0.046	0.880	0.002	0.802	0.049	0.032	0.000	0.000	0.032
10		Clamshell Tugboat propulsion engine	Marine Equipment	0.416	0.370	0.416	8.134	0.007	6.116	0.451	0.362	0.000	0.000	0.367
10		Clamshell Tugboat auxiliary engine	Marine Equipment	0.031	0.027	0.031	1.131	0.001	1.213	0.063	0.065	0.000	0.000	0.066
10		Clamshell Tugboat propulsion engine	Marine Equipment	7.485	6.662	7.485	146.406	0.122	110.080	8.114	6.511	0.000	0.000	6.605
10		Clamshell Tugboat auxiliary engine	Marine Equipment	0.556	0.495	0.556	20.366	0.022	21.835	1.129	1.174	0.000	0.000	1.191
10		Clamshell Crew boat propulsion engine	Marine Equipment	0.276	0.246	0.276	5.401	0.004	4.061	0.299	0.240	0.000	0.000	0.244
10		Clamshell Crew boat auxiliary engine	Marine Equipment	0.012	0.010	0.012	0.432	0.000	0.463	0.024	0.025	0.000	0.000	0.025
10		Clamshell Survey boat propulsion engine	Marine Equipment	0.246	0.219	0.246	4.819	0.004	3.623	0.267	0.214	0.000	0.000	0.217
				Note: clamshell dredge would be electric with mitigation; assume 90 percent reduction in diesel exhaust emissions.										

Table H1.28
Alternative 4 Emissions by Task

				Mitigated Emissions										
				Total										
				PM10	PM2.5	DPM	NOX	SOX	CO	VOC	CO2	CH4	N2O	CO2e
Task ID		**Construction Element/Equipment**	**Source Type 1**	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(tonnes)	(tonnes)
9	**Pier T Berths (clam shell dredge Berths T132 to T140, 44,000 CY)**													
9		**Marine Clamshell Dredge**												
9		Clamshell Dredge hoist	Marine Equipment	3.056	3.056	3.056	92.889	0.102	52.963	5.148	4.050	0.000	0.000	4.050
9		Clamshell Dredge generator	Marine Equipment	2.292	2.292	2.292	69.667	0.076	39.722	3.861	2.238	0.000	0.000	2.238
9		Clamshell Barge dump scow	Marine Equipment	0.324	0.324	0.324	6.157	0.011	5.617	0.341	0.221	0.000	0.000	0.221
9		Clamshell Tugboat propulsion engine	Marine Equipment	2.911	2.591	2.911	56.936	0.047	42.809	3.155	2.532	0.000	0.000	2.569
9		Clamshell Tugboat auxiliary engine	Marine Equipment	0.216	0.192	0.216	7.920	0.009	8.491	0.439	0.457	0.000	0.000	0.463
9		Clamshell Tugboat propulsion engine	Marine Equipment	52.398	46.634	52.398	1024.840	0.851	770.557	56.798	45.578	0.000	0.002	46.236
9		Clamshell Tugboat auxiliary engine	Marine Equipment	3.891	3.463	3.891	142.561	0.153	152.844	7.901	8.219	0.000	0.000	8.337
9		Clamshell Crew boat propulsion engine	Marine Equipment	1.933	1.720	1.933	37.804	0.031	28.424	2.095	1.681	0.000	0.000	1.706
9		Clamshell Crew boat auxiliary engine	Marine Equipment	0.082	0.073	0.082	3.023	0.003	3.241	0.168	0.174	0.000	0.000	0.177
9		Clamshell Survey boat propulsion engine	Marine Equipment	1.725	1.535	1.725	33.733	0.028	25.363	1.870	1.500	0.000	0.000	1.522
10	**Pier J Basin (clam shell dredge 408,000 CY)**													
10		**Marine Clamshell Dredge**												
10		Clamshell Dredge hoist	Marine Equipment	29.683	29.683	29.683	902.349	0.988	514.497	50.009	39.341	0.000	0.000	39.341
10		Clamshell Dredge generator	Marine Equipment	22.262	22.262	22.262	676.762	0.741	385.873	37.507	21.736	0.000	0.000	21.736
10		Clamshell Barge dump scow	Marine Equipment	3.148	3.148	3.148	59.815	0.105	54.568	3.315	2.151	0.000	0.000	2.151
10		Clamshell Tugboat propulsion engine	Marine Equipment	28.278	25.168	28.278	553.088	0.459	415.856	30.653	24.598	0.000	0.001	24.953
10		Clamshell Tugboat auxiliary engine	Marine Equipment	2.100	1.869	2.100	76.938	0.083	82.487	4.264	4.436	0.000	0.000	4.499
10		Clamshell Tugboat propulsion engine	Marine Equipment	509.008	453.017	509.008	9955.590	8.264	7485.406	551.749	442.758	0.005	0.021	449.150
10		Clamshell Tugboat auxiliary engine	Marine Equipment	37.794	33.637	37.794	1384.882	1.490	1484.767	76.752	79.839	0.001	0.004	80.987
10		Clamshell Crew boat propulsion engine	Marine Equipment	18.776	16.711	18.776	367.239	0.305	276.119	20.353	16.332	0.000	0.001	16.568
10		Clamshell Crew boat auxiliary engine	Marine Equipment	0.801	0.713	0.801	29.362	0.032	31.480	1.627	1.693	0.000	0.000	1.717
10		Clamshell Survey boat propulsion engine	Marine Equipment	16.754	14.911	16.754	327.690	0.272	246.383	18.161	14.573	0.000	0.001	14.784
				Note: clamshell dredge would be electric with mitigation; assume 90 percent reduction in diesel exhaust emissions.										

Table H1.28
Alternative 4 Emissions by Task

							Unmitigated Emissions										
							Peak Day										
							PM10	PM2.5	DPM	NOX	SOX	CO	VOC	CO2	CH4	N2O	CO2e
Task ID		**Construction Element/Equipment**	**Source Type 1**	**Source Type 2**	**Onsite/Offsite**	**Days Total**	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(tonnes/day)	(tonnes/day)	(tonnes/day)	(tonnes/day)
11	**Pier J Approach (clam shell dredge 1,066,000 CY)**																
11		**Marine Clamshell Dredge**															
11		Clamshell Dredge hoist	Marine Equipment	dredging	onsite	178	4.365	4.365	4.365	132.698	0.145	75.661	7.354	5.785	0.000	0.000	5.785
11		Clamshell Dredge generator	Marine Equipment	dredging	onsite	178	3.274	3.274	3.274	99.524	0.109	56.746	5.516	3.196	0.000	0.000	3.196
11		Clamshell Barge dump scow	Marine Equipment	disposal	offsite	178	0.046	0.046	0.046	0.880	0.002	0.802	0.049	0.032	0.000	0.000	0.032
11		Clamshell Tugboat propulsion engine	Marine Equipment	dredging	onsite	178	0.612	0.544	0.612	11.387	0.007	6.116	0.631	0.362	0.000	0.000	0.367
11		Clamshell Tugboat auxiliary engine	Marine Equipment	dredging	onsite	178	0.088	0.079	0.088	1.571	0.001	1.103	0.087	0.065	0.000	0.000	0.066
11		Clamshell Tugboat propulsion engine	Marine Equipment	transit	offsite	178	11.008	9.797	11.008	204.968	0.122	110.080	11.360	6.511	0.000	0.000	6.606
11		Clamshell Tugboat auxiliary engine	Marine Equipment	transit	offsite	178	1.588	1.413	1.588	28.286	0.022	19.850	1.568	1.174	0.000	0.000	1.191
11		Clamshell Crew boat propulsion engine	Marine Equipment	support	onsite	178	0.406	0.361	0.406	8.024	0.004	4.061	0.445	0.240	0.000	0.000	0.244
11		Clamshell Crew boat auxiliary engine	Marine Equipment	support	onsite	178	0.034	0.030	0.034	0.600	0.000	0.421	0.033	0.025	0.000	0.000	0.025
11		Clamshell Survey boat propulsion engine	Marine Equipment	dredging	onsite	178	0.362	0.322	0.362	7.160	0.004	3.623	0.397	0.214	0.000	0.000	0.217
12	**Pier J Approach (clam shell dredge 2,040,000 CY)**																
12		**Marine Clamshell Dredge**															
12		Clamshell Dredge hoist	Marine Equipment	dredging	onsite	340	4.365	4.365	4.365	132.698	0.145	75.661	7.354	5.785	0.000	0.000	5.785
12		Clamshell Dredge generator	Marine Equipment	dredging	onsite	340	3.274	3.274	3.274	99.524	0.109	56.746	5.516	3.196	0.000	0.000	3.196
12		Clamshell Barge dump scow	Marine Equipment	disposal	offsite	340	0.046	0.046	0.046	0.880	0.002	0.802	0.049	0.032	0.000	0.000	0.032
12		Clamshell Tugboat propulsion engine	Marine Equipment	dredging	onsite	340	0.612	0.544	0.612	11.387	0.007	6.116	0.631	0.362	0.000	0.000	0.367
12		Clamshell Tugboat auxiliary engine	Marine Equipment	dredging	onsite	340	0.088	0.079	0.088	1.571	0.001	1.103	0.087	0.065	0.000	0.000	0.066
12		Clamshell Tugboat propulsion engine	Marine Equipment	transit	offsite	340	11.008	9.797	11.008	204.968	0.122	110.080	11.360	6.511	0.000	0.000	6.606
12		Clamshell Tugboat auxiliary engine	Marine Equipment	transit	offsite	340	1.588	1.413	1.588	28.286	0.022	19.850	1.568	1.174	0.000	0.000	1.191
12		Clamshell Crew boat propulsion engine	Marine Equipment	support	onsite	340	0.406	0.361	0.406	8.024	0.004	4.061	0.445	0.240	0.000	0.000	0.244
12		Clamshell Crew boat auxiliary engine	Marine Equipment	support	onsite	340	0.034	0.030	0.034	0.600	0.000	0.421	0.033	0.025	0.000	0.000	0.025
12		Clamshell Survey boat propulsion engine	Marine Equipment	dredging	onsite	340	0.362	0.322	0.362	7.160	0.004	3.623	0.397	0.214	0.000	0.000	0.217

Table H1.28
Alternative 4 Emissions by Task

				Unmitigated Emissions										
				Total										
				PM10	PM2.5	DPM	NOX	SOX	CO	VOC	CO2	CH4	N2O	CO2e
Task ID		**Construction Element/Equipment**	**Source Type 1**	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(tonnes)	(tonnes)	(tonnes)	(tonnes)
11	**Pier J Approach (clam shell dredge 1,066,000 CY)**													
11		**Marine Clamshell Dredge**												
11		Clamshell Dredge hoist	Marine Equipment	776.984	776.984	776.984	23620.317	25.869	13467.725	1309.063	1029.797	0.000	0.000	1029.797
11		Clamshell Dredge generator	Marine Equipment	582.738	582.738	582.738	17715.238	19.402	10100.794	981.797	568.968	0.000	0.000	568.968
11		Clamshell Barge dump scow	Marine Equipment	8.241	8.241	8.241	156.574	0.274	142.840	8.678	5.631	0.000	0.000	5.631
11		Clamshell Tugboat propulsion engine	Marine Equipment	108.856	96.882	108.856	2026.906	1.202	1088.564	112.333	64.388	0.001	0.003	65.324
11		Clamshell Tugboat auxiliary engine	Marine Equipment	15.703	13.976	15.703	279.717	0.217	196.293	15.502	11.611	0.000	0.001	11.778
11		Clamshell Tugboat propulsion engine	Marine Equipment	1959.415	1743.880	1959.415	36484.311	21.632	19594.152	2021.999	1158.983	0.017	0.055	1175.840
11		Clamshell Tugboat auxiliary engine	Marine Equipment	282.661	251.569	282.661	5034.907	3.901	3533.268	279.040	208.991	0.002	0.010	212.012
11		Clamshell Crew boat propulsion engine	Marine Equipment	72.278	64.328	72.278	1428.219	0.798	722.783	79.153	42.752	0.001	0.002	43.375
11		Clamshell Crew boat auxiliary engine	Marine Equipment	5.993	5.334	5.993	106.750	0.083	74.912	5.916	4.431	0.000	0.000	4.495
11		Clamshell Survey boat propulsion engine	Marine Equipment	64.494	57.400	64.494	1274.411	0.712	644.945	70.629	38.148	0.001	0.002	38.704
12	**Pier J Approach (clam shell dredge 2,040,000 CY)**													
12		**Marine Clamshell Dredge**												
12		Clamshell Dredge hoist	Marine Equipment	1484.127	1484.127	1484.127	45117.460	49.413	25724.868	2500.457	1967.028	0.000	0.000	1967.028
12		Clamshell Dredge generator	Marine Equipment	1113.095	1113.095	1113.095	33838.095	37.060	19293.651	1875.343	1086.792	0.000	0.000	1086.792
12		Clamshell Barge dump scow	Marine Equipment	15.741	15.741	15.741	299.074	0.524	272.840	16.575	10.755	0.000	0.000	10.755
12		Clamshell Tugboat propulsion engine	Marine Equipment	207.928	185.056	207.928	3871.618	2.296	2079.280	214.569	122.988	0.002	0.006	124.777
12		Clamshell Tugboat auxiliary engine	Marine Equipment	29.995	26.696	29.995	534.291	0.414	374.941	29.611	22.178	0.000	0.001	22.498
12		Clamshell Tugboat propulsion engine	Marine Equipment	3742.703	3331.006	3742.703	69689.133	41.319	37427.032	3862.245	2213.788	0.033	0.105	2245.986
12		Clamshell Tugboat auxiliary engine	Marine Equipment	539.915	480.524	539.915	9617.238	7.451	6748.939	532.997	399.196	0.005	0.019	404.967
12		Clamshell Crew boat propulsion engine	Marine Equipment	138.060	122.873	138.060	2728.059	1.524	1380.597	151.192	81.662	0.001	0.004	82.851
12		Clamshell Crew boat auxiliary engine	Marine Equipment	11.447	10.188	11.447	203.904	0.158	143.090	11.301	8.464	0.000	0.000	8.586
12		Clamshell Survey boat propulsion engine	Marine Equipment	123.192	109.641	123.192	2434.268	1.360	1231.917	134.910	72.867	0.001	0.003	73.929

Table H1.28
Alternative 4 Emissions by Task

				Mitigated										
				Peak Day										
				PM10	PM2.5	DPM	NOX	SOX	CO	VOC	CO2	CH4	N2O	CO2e
Task ID		**Construction Element/Equipment**	**Source Type 1**	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(tonnes/day)	(tonnes/day)	(tonnes/day)	(tonnes/day)
11	**Pier J Approach (clam shell dredge 1,066,000 CY)**													
11		**Marine Clamshell Dredge**												
11		Clamshell Dredge hoist	Marine Equipment	0.437	0.437	0.437	13.270	0.015	7.566	0.735	0.579	0.000	0.000	0.579
11		Clamshell Dredge generator	Marine Equipment	0.327	0.327	0.327	9.952	0.011	5.675	0.552	0.320	0.000	0.000	0.320
11		Clamshell Barge dump scow	Marine Equipment	0.046	0.046	0.046	0.880	0.002	0.802	0.049	0.032	0.000	0.000	0.032
11		Clamshell Tugboat propulsion engine	Marine Equipment	0.416	0.370	0.416	8.134	0.007	6.116	0.451	0.362	0.000	0.000	0.367
11		Clamshell Tugboat auxiliary engine	Marine Equipment	0.031	0.027	0.031	1.131	0.001	1.213	0.063	0.065	0.000	0.000	0.066
11		Clamshell Tugboat propulsion engine	Marine Equipment	7.485	6.662	7.485	146.406	0.122	110.080	8.114	6.511	0.000	0.000	6.605
11		Clamshell Tugboat auxiliary engine	Marine Equipment	0.556	0.495	0.556	20.366	0.022	21.835	1.129	1.174	0.000	0.000	1.191
11		Clamshell Crew boat propulsion engine	Marine Equipment	0.276	0.246	0.276	5.401	0.004	4.061	0.299	0.240	0.000	0.000	0.244
11		Clamshell Crew boat auxiliary engine	Marine Equipment	0.012	0.010	0.012	0.432	0.000	0.463	0.024	0.025	0.000	0.000	0.025
11		Clamshell Survey boat propulsion engine	Marine Equipment	0.246	0.219	0.246	4.819	0.004	3.623	0.267	0.214	0.000	0.000	0.217
12	**Pier J Approach (clam shell dredge 2,040,000 CY)**													
12		**Marine Clamshell Dredge**												
12		Clamshell Dredge hoist	Marine Equipment	0.437	0.437	0.437	13.270	0.015	7.566	0.735	0.579	0.000	0.000	0.579
12		Clamshell Dredge generator	Marine Equipment	0.327	0.327	0.327	9.952	0.011	5.675	0.552	0.320	0.000	0.000	0.320
12		Clamshell Barge dump scow	Marine Equipment	0.046	0.046	0.046	0.880	0.002	0.802	0.049	0.032	0.000	0.000	0.032
12		Clamshell Tugboat propulsion engine	Marine Equipment	0.416	0.370	0.416	8.134	0.007	6.116	0.451	0.362	0.000	0.000	0.367
12		Clamshell Tugboat auxiliary engine	Marine Equipment	0.031	0.027	0.031	1.131	0.001	1.213	0.063	0.065	0.000	0.000	0.066
12		Clamshell Tugboat propulsion engine	Marine Equipment	7.485	6.662	7.485	146.406	0.122	110.080	8.114	6.511	0.000	0.000	6.605
12		Clamshell Tugboat auxiliary engine	Marine Equipment	0.556	0.495	0.556	20.366	0.022	21.835	1.129	1.174	0.000	0.000	1.191
12		Clamshell Crew boat propulsion engine	Marine Equipment	0.276	0.246	0.276	5.401	0.004	4.061	0.299	0.240	0.000	0.000	0.244
12		Clamshell Crew boat auxiliary engine	Marine Equipment	0.012	0.010	0.012	0.432	0.000	0.463	0.024	0.025	0.000	0.000	0.025
12		Clamshell Survey boat propulsion engine	Marine Equipment	0.246	0.219	0.246	4.819	0.004	3.623	0.267	0.214	0.000	0.000	0.217
				Note: clamshell dredge would be electric with mitigation; assume 90 percent reduction in diesel exhaust emissions.										

Table H1.28
Alternative 4 Emissions by Task

				Mitigated Emissions										
				Total										
				PM10	PM2.5	DPM	NOX	SOX	CO	VOC	CO2	CH4	N2O	CO2e
Task ID		**Construction Element/Equipment**	**Source Type 1**	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(tonnes)	(tonnes)
11	**Pier J Approach (clam shell dredge 1,066,000 CY)**													
11		**Marine Clamshell Dredge**												
11		Clamshell Dredge hoist	Marine Equipment	77.698	77.698	77.698	2362.032	2.587	1346.772	130.906	102.980	0.000	0.000	102.980
11		Clamshell Dredge generator	Marine Equipment	58.274	58.274	58.274	1771.524	1.940	1010.079	98.180	56.897	0.000	0.000	56.897
11		Clamshell Barge dump scow	Marine Equipment	8.241	8.241	8.241	156.574	0.274	142.840	8.678	5.631	0.000	0.000	5.631
11		Clamshell Tugboat propulsion engine	Marine Equipment	74.022	65.880	74.022	1447.790	1.202	1088.564	80.238	64.388	0.001	0.003	65.318
11		Clamshell Tugboat auxiliary engine	Marine Equipment	5.496	4.892	5.496	201.396	0.217	215.922	11.162	11.611	0.000	0.001	11.778
11		Clamshell Tugboat propulsion engine	Marine Equipment	1332.402	1185.838	1332.402	26060.222	21.632	19594.152	1444.285	1158.983	0.012	0.055	1175.715
11		Clamshell Tugboat auxiliary engine	Marine Equipment	98.932	88.049	98.932	3625.133	3.901	3886.595	200.909	208.991	0.002	0.010	211.995
11		Clamshell Crew boat propulsion engine	Marine Equipment	49.149	43.743	49.149	961.301	0.798	722.783	53.276	42.752	0.000	0.002	43.369
11		Clamshell Crew boat auxiliary engine	Marine Equipment	2.098	1.867	2.098	76.860	0.083	82.403	4.260	4.431	0.000	0.000	4.495
11		Clamshell Survey boat propulsion engine	Marine Equipment	43.856	39.032	43.856	857.777	0.712	644.945	47.539	38.148	0.000	0.002	38.699
12	**Pier J Approach (clam shell dredge 2,040,000 CY)**													
12		**Marine Clamshell Dredge**												
12		Clamshell Dredge hoist	Marine Equipment	148.413	148.413	148.413	4511.746	4.941	2572.487	250.046	196.703	0.000	0.000	196.703
12		Clamshell Dredge generator	Marine Equipment	111.310	111.310	111.310	3383.810	3.706	1929.365	187.534	108.679	0.000	0.000	108.679
12		Clamshell Barge dump scow	Marine Equipment	15.741	15.741	15.741	299.074	0.524	272.840	16.575	10.755	0.000	0.000	10.755
12		Clamshell Tugboat propulsion engine	Marine Equipment	141.391	125.838	141.391	2765.442	2.296	2079.280	153.264	122.988	0.001	0.006	124.764
12		Clamshell Tugboat auxiliary engine	Marine Equipment	10.498	9.344	10.498	384.690	0.414	412.435	21.320	22.178	0.000	0.001	22.496
12		Clamshell Tugboat propulsion engine	Marine Equipment	2545.038	2265.084	2545.038	49777.952	41.319	37427.032	2758.747	2213.788	0.024	0.105	2245.749
12		Clamshell Tugboat auxiliary engine	Marine Equipment	188.970	168.184	188.970	6924.411	7.451	7423.833	383.758	399.196	0.003	0.019	404.935
12		Clamshell Crew boat propulsion engine	Marine Equipment	93.881	83.554	93.881	1836.194	1.524	1380.597	101.764	81.662	0.001	0.004	82.840
12		Clamshell Crew boat auxiliary engine	Marine Equipment	4.007	3.566	4.007	146.811	0.158	157.399	8.136	8.464	0.000	0.000	8.585
12		Clamshell Survey boat propulsion engine	Marine Equipment	83.770	74.556	83.770	1638.450	1.360	1231.917	90.805	72.867	0.001	0.003	73.919
				Note: clamshell dredge would be electric with mitigation; assume 90 percent reduction in diesel exhaust emissions.										

Table H1.28
Alternative 4 Emissions by Task

							Unmitigated Emissions										
							Peak Day										
							PM10	PM2.5	DPM	NOX	SOX	CO	VOC	CO2	CH4	N2O	CO2e
Task ID		**Construction Element/Equipment**	**Source Type 1**	**Source Type 2**	**Onsite/Offsite**	**Days Total**	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(tonnes/day)	(tonnes/day)	(tonnes/day)	(tonnes/day)
13	**Pier J Approach (clam shell dredge 297,000 CY)**																
13		**Marine Clamshell Dredge**															
13		Clamshell Dredge hoist	Marine Equipment	dredging	onsite	50	4.365	4.365	4.365	132.698	0.145	75.661	7.354	5.785	0.000	0.000	5.785
13		Clamshell Dredge generator	Marine Equipment	dredging	onsite	50	3.274	3.274	3.274	99.524	0.109	56.746	5.516	3.196	0.000	0.000	3.196
13		Clamshell Barge dump scow	Marine Equipment	disposal	offsite	50	0.046	0.046	0.046	0.880	0.002	0.802	0.049	0.032	0.000	0.000	0.032
13		Clamshell Tugboat propulsion engine	Marine Equipment	dredging	onsite	50	0.612	0.544	0.612	11.387	0.007	6.116	0.631	0.362	0.000	0.000	0.367
13		Clamshell Tugboat auxiliary engine	Marine Equipment	dredging	onsite	50	0.088	0.079	0.088	1.571	0.001	1.103	0.087	0.065	0.000	0.000	0.066
13		Clamshell Tugboat propulsion engine	Marine Equipment	transit	offsite	50	11.008	9.797	11.008	204.968	0.122	110.080	11.360	6.511	0.000	0.000	6.606
13		Clamshell Tugboat auxiliary engine	Marine Equipment	transit	offsite	50	1.588	1.413	1.588	28.286	0.022	19.850	1.568	1.174	0.000	0.000	1.191
13		Clamshell Crew boat propulsion engine	Marine Equipment	support	onsite	50	0.406	0.361	0.406	8.024	0.004	4.061	0.445	0.240	0.000	0.000	0.244
13		Clamshell Crew boat auxiliary engine	Marine Equipment	support	onsite	50	0.034	0.030	0.034	0.600	0.000	0.421	0.033	0.025	0.000	0.000	0.025
13		Clamshell Survey boat propulsion engine	Marine Equipment	dredging	onsite	50	0.362	0.322	0.362	7.160	0.004	3.623	0.397	0.214	0.000	0.000	0.217

Table H1.28
Alternative 4 Emissions by Task

				Unmitigated Emissions										
				Total										
				PM10	PM2.5	DPM	NOX	SOX	CO	VOC	CO2	CH4	N2O	CO2e
Task ID		**Construction Element/Equipment**	**Source Type 1**	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(tonnes)	(tonnes)	(tonnes)	(tonnes)
13	**Pier J Approach (clam shell dredge 297,000 CY)**													
13		**Marine Clamshell Dredge**												
13		Clamshell Dredge hoist	Marine Equipment	218.254	218.254	218.254	6634.921	7.267	3783.069	367.714	289.269	0.000	0.000	289.269
13		Clamshell Dredge generator	Marine Equipment	163.690	163.690	163.690	4976.190	5.450	2837.302	275.786	159.822	0.000	0.000	159.822
13		Clamshell Barge dump scow	Marine Equipment	2.315	2.315	2.315	43.981	0.077	40.123	2.438	1.582	0.000	0.000	1.582
13		Clamshell Tugboat propulsion engine	Marine Equipment	30.578	27.214	30.578	569.356	0.338	305.776	31.554	18.087	0.000	0.001	18.350
13		Clamshell Tugboat auxiliary engine	Marine Equipment	4.411	3.926	4.411	78.572	0.061	55.138	4.355	3.261	0.000	0.000	3.309
13		Clamshell Tugboat propulsion engine	Marine Equipment	550.398	489.854	550.398	10248.402	6.076	5503.975	567.977	325.557	0.005	0.015	330.292
13		Clamshell Tugboat auxiliary engine	Marine Equipment	79.399	70.665	79.399	1414.300	1.096	992.491	78.382	58.705	0.001	0.003	59.554
13		Clamshell Crew boat propulsion engine	Marine Equipment	20.303	18.070	20.303	401.185	0.224	203.029	22.234	12.009	0.000	0.001	12.184
13		Clamshell Crew boat auxiliary engine	Marine Equipment	1.683	1.498	1.683	29.986	0.023	21.043	1.662	1.245	0.000	0.000	1.263
13		Clamshell Survey boat propulsion engine	Marine Equipment	18.116	16.124	18.116	357.981	0.200	181.164	19.840	10.716	0.000	0.001	10.872

Table H1.28
Alternative 4 Emissions by Task

				Mitigated										
				Peak Day										
				PM10	PM2.5	DPM	NOX	SOX	CO	VOC	CO2	CH4	N2O	CO2e
Task ID		**Construction Element/Equipment**	**Source Type 1**	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(tonnes/day)	(tonnes/day)	(tonnes/day)	(tonnes/day)
13	**Pier J Approach (clam shell dredge 297,000 CY)**													
13		**Marine Clamshell Dredge**												
13		Clamshell Dredge hoist	Marine Equipment	0.437	0.437	0.437	13.270	0.015	7.566	0.735	0.579	0.000	0.000	0.579
13		Clamshell Dredge generator	Marine Equipment	0.327	0.327	0.327	9.952	0.011	5.675	0.552	0.320	0.000	0.000	0.320
13		Clamshell Barge dump scow	Marine Equipment	0.046	0.046	0.046	0.880	0.002	0.802	0.049	0.032	0.000	0.000	0.032
13		Clamshell Tugboat propulsion engine	Marine Equipment	0.416	0.370	0.416	8.134	0.007	6.116	0.451	0.362	0.000	0.000	0.367
13		Clamshell Tugboat auxiliary engine	Marine Equipment	0.031	0.027	0.031	1.131	0.001	1.213	0.063	0.065	0.000	0.000	0.066
13		Clamshell Tugboat propulsion engine	Marine Equipment	7.485	6.662	7.485	146.406	0.122	110.080	8.114	6.511	0.000	0.000	6.605
13		Clamshell Tugboat auxiliary engine	Marine Equipment	0.556	0.495	0.556	20.366	0.022	21.835	1.129	1.174	0.000	0.000	1.191
13		Clamshell Crew boat propulsion engine	Marine Equipment	0.276	0.246	0.276	5.401	0.004	4.061	0.299	0.240	0.000	0.000	0.244
13		Clamshell Crew boat auxiliary engine	Marine Equipment	0.012	0.010	0.012	0.432	0.000	0.463	0.024	0.025	0.000	0.000	0.025
13		Clamshell Survey boat propulsion engine	Marine Equipment	0.246	0.219	0.246	4.819	0.004	3.623	0.267	0.214	0.000	0.000	0.217

Note: clamshell dredge would be electric with mitigation; assume 90 percent reduction in diesel exhaust emissions.

Table H1.28
Alternative 4 Emissions by Task

				Mitigated Emissions										
				Total										
				PM10	PM2.5	DPM	NOX	SOX	CO	VOC	CO2	CH4	N2O	CO2e
Task ID		**Construction Element/Equipment**	**Source Type 1**	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(tonnes)	(tonnes)
13	**Pier J Approach (clam shell dredge 297,000 CY)**													
13		**Marine Clamshell Dredge**												
13		Clamshell Dredge hoist	Marine Equipment	21.825	21.825	21.825	663.492	0.727	378.307	36.771	28.927	0.000	0.000	28.927
13		Clamshell Dredge generator	Marine Equipment	16.369	16.369	16.369	497.619	0.545	283.730	27.579	15.982	0.000	0.000	15.982
13		Clamshell Barge dump scow	Marine Equipment	2.315	2.315	2.315	43.981	0.077	40.123	2.438	1.582	0.000	0.000	1.582
13		Clamshell Tugboat propulsion engine	Marine Equipment	20.793	18.506	20.793	406.683	0.338	305.776	22.539	18.087	0.000	0.001	18.348
13		Clamshell Tugboat auxiliary engine	Marine Equipment	1.544	1.374	1.544	56.572	0.061	60.652	3.135	3.261	0.000	0.000	3.308
13		Clamshell Tugboat propulsion engine	Marine Equipment	374.270	333.101	374.270	7320.287	6.076	5503.975	405.698	325.557	0.003	0.015	330.257
13		Clamshell Tugboat auxiliary engine	Marine Equipment	27.790	24.733	27.790	1018.296	1.096	1091.740	56.435	58.705	0.000	0.003	59.549
13		Clamshell Crew boat propulsion engine	Marine Equipment	13.806	12.287	13.806	270.029	0.224	203.029	14.965	12.009	0.000	0.001	12.182
13		Clamshell Crew boat auxiliary engine	Marine Equipment	0.589	0.524	0.589	21.590	0.023	23.147	1.197	1.245	0.000	0.000	1.263
13		Clamshell Survey boat propulsion engine	Marine Equipment	12.319	10.964	12.319	240.949	0.200	181.164	13.354	10.716	0.000	0.001	10.870

Note: clamshell dredge would be electric with mitigation; assume 90 percent reduction in diesel exhaust emissions.

Table H1.29
Alternative 5 Emissions by Task

						Unmitigated Emissions										
						Peak Day										
						PM10	**PM2.5**	**DPM**	**NOX**	**SOX**	**CO**	**VOC**	**CO2**	**CH4**	**N2O**	**CO2e**
Task ID	Construction Element/Equipment	Source Type 1	Source Type 2	Onsite/Off site	Days Total	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(tonnes/day)	(tonnes/day)	(tonnes/day)	(tonnes/day)
1	**Electrical Substation Construction at Pier J (mitigation only)**															
1	**Off-Road Equipment**															
1	Caterpillar 320 excavator	Offroad Construction Equipment		onsite	20	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1	Small asphalt roller	Offroad Construction Equipment		onsite	26	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1	Water truck	Offroad Construction Equipment		onsite	20	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1	Forklift	Offroad Construction Equipment		onsite	22	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1	Mobile crane (35 ton)	Offroad Construction Equipment		onsite	2	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1	On-Road Vehicles															
1	Haul trucks	Onroad Construction Vehicles		onsite	5	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1	Supply trucks	Onroad Construction Vehicles		onsite	5	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1	Haul trucks	Onroad Construction Vehicles		offsite	5	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1	Supply trucks	Onroad Construction Vehicles		offsite	5	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1	Workers	Onroad Construction Vehicles		offsite	60	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1	Fugitive Dust															
1	Soil handling	Fugitive Emissions		onsite	20	n/a	n/a									
1	Asphalting	Fugitive Emissions		onsite												
2	**Pier J Breakwater Construction**															
2	**Marine Activities**															
2	Pier J Breakwater Tugboat propulsion engine	Marine Equipment		onsite	54	5.8097516	5.170679	5.80975164	108.17758	0.0641397	58.097516	5.9953151	3.4364356	5.16519E-05	0.000163389	3.4864167
2	Pier J Breakwater Tugboat auxiliary engine	Marine Equipment		onsite	54	1.0586571	0.9422048	1.05865709	18.857329	0.0146095	13.233214	1.045093	0.7827372	9.00388E-06	3.7216E-05	0.7940526
2	Pier J Breakwater Crew boat propulsion engine	Marine Equipment		onsite	54	0.4060579	0.3613915	0.40605791	8.0237043	0.0044829	4.0605791	0.4446821	0.240181	3.83111E-06	1.14196E-05	0.2436798
2	Pier J Breakwater Crew boat auxiliary engine	Marine Equipment		onsite	54	0.0336683	0.0299648	0.03366828	0.5997163	0.0004646	0.4208535	0.0332369	0.0248933	2.86349E-07	1.18357E-06	0.0252531
2	Pier J Breakwater Survey boat propulsion engine	Marine Equipment		onsite	54	0.3623286	0.3224725	0.3623286	7.1596131	0.0040001	3.623286	0.3967933	0.2143153	3.41853E-06	1.01898E-05	0.2174374
2	Off-Road Equipment															
2	Piling crane	Offroad Construction Equipment		onsite	54	0.208629	0.1919387	0.208629	5.0022874	0.0077334	2.6745656	0.4666913	0.3799798	0	0	0.3799798
2	Long arm excavator	Offroad Construction Equipment		onsite	54	0.0752002	0.0691842	0.07520024	2.1876515	0.0129141	2.7752975	0.3208734	0.6339765	0	0	0.6339765
2	On-Road Vehicles															
2	Delivery Trucks	Onroad Construction Vehicles		onsite	5	0.1472023	0.0369081	0.00015221	0.0787952	0.0002454	0.0091846	0.0010522	0.0117847	2.21692E-08	1.85239E-06	0.0123372
2	Delivery Trucks	Onroad Construction Vehicles		offsite	5	0.3360402	0.1510393	0.0222394	3.216786	0.0191435	0.1848032	0.0255705	0.919133	5.38734E-07	0.000144475	0.9622
2	Workers	Onroad Construction Vehicles		offsite	54	0.0643898	0.0267123	0	0.0582129	0.0036865	0.9591501	0.0149813	0.1690333	1.73503E-06	2.96976E-06	0.1699616
3	**Approach Channel (hopper dredge 2,600,000 CY)**															
3	**Marine Hopper Dredge**															
3	Hopper propulsion engine	Marine Equipment	dredging	onsite	150	26.632138	23.702603	26.6321383	495.89041	0.2940188	266.32138	27.482769	15.752761	0.000236775	0.000748981	15.981876
3	Hopper propulsion engine	Marine Equipment	transit	offsite	150	50.30515	44.771584	50.3051501	936.68189	0.5553689	503.0515	51.911897	29.755215	0.000447241	0.001414742	30.187989
3	Hopper auxiliary engine	Marine Equipment	disposal	near shore	150	0.2219345	0.1975217	0.22193449	5.0601063	0.0040836	3.6989081	0.2804364	0.2187883	2.41607E-06	1.04025E-05	0.2219487
3	Hopper Crew boat propulsion engine	Marine Equipment	support	onsite	150	0.4060579	0.3613915	0.40605791	8.0237043	0.0044829	4.0605791	0.4446821	0.240181	3.83111E-06	1.14196E-05	0.2436798
3	Hopper Crew boat auxiliary engine	Marine Equipment	support	onsite	150	0.0336683	0.0299648	0.03366828	0.5997163	0.0004646	0.4208535	0.0332369	0.0248933	2.86349E-07	1.18357E-06	0.0252531
3	Hopper Survey boat propulsion engine	Marine Equipment	dredging	onsite	150	1.4493144	1.2898898	1.44931439	28.638452	0.0160004	14.493144	1.5871732	0.8572613	1.36741E-05	4.07594E-05	0.8697495

Table H1.29
Alternative 5 Emissions by Task

		Unmitigated Emissions										
		Total										
		PM10	**PM2.5**	**DPM**	**NOX**	**SOX**	**CO**	**VOC**	**CO2**	**CH4**	**N2O**	**CO2e**
Task ID	Construction Element/Equipment	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(tonnes)	(tonnes)	(tonnes)	(tonnes)
1	**Electrical Substation Construction at Pier J (mitigation on**											
1	**Off-Road Equipment**											
1	Caterpillar 320 excavator	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1	Small asphalt roller	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1	Water truck	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1	Forklift	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1	Mobile crane (35 ton)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1	On-Road Vehicles											
1	Haul trucks	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1	Supply trucks	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1	Haul trucks	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1	Supply trucks	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1	Workers	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1	Fugitive Dust											
1	Soil handling	n/a	n/a									
1	Asphalting											
2	**Pier J Breakwater Construction**											
2	**Marine Activities**											
2	Pier J Breakwater Tugboat propulsion engine	313.72659	279.21666	313.72659	5841.5891	3.4635415	3137.2659	323.74702	185.56752	0.002789205	0.008822996	188.2665
2	Pier J Breakwater Tugboat auxiliary engine	57.167483	50.87906	57.167483	1018.2958	0.7889113	714.59353	56.435024	42.267807	0.000486209	0.002009666	42.878843
2	Pier J Breakwater Crew boat propulsion engine	21.927127	19.515143	21.927127	433.28003	0.2420755	219.27127	24.012836	12.969773	0.00020688	0.000616661	13.15871
2	Pier J Breakwater Crew boat auxiliary engine	1.8180873	1.6180977	1.8180873	32.38468	0.0250896	22.726091	1.7947931	1.3442356	1.54628E-05	6.3913E-05	1.3636682
2	Pier J Breakwater Survey boat propulsion engine	19.565744	17.413512	19.565744	386.61911	0.2160058	195.65744	21.426838	11.573028	0.0001846	0.000550251	11.741618
2	Off-Road Equipment											
2	Piling crane	11.265966	10.364689	11.265966	270.12352	0.4176015	144.42654	25.20133	20.518908	0	0	20.518908
2	Long arm excavator	4.0608129	3.7359478	4.0608129	118.13318	0.6973593	149.86606	17.327165	34.234729	0	0	34.234729
2	On-Road Vehicles											
2	Delivery Trucks	0.7360113	0.1845407	0.0007611	0.3939759	0.0012272	0.0459231	0.0052612	0.0589233	1.10846E-07	9.26193E-06	0.0616862
2	Delivery Trucks	1.680201	0.7551964	0.111197	16.08393	0.0957177	0.924016	0.1278527	4.595665	2.69367E-06	0.000722375	4.811
2	Workers	3.4770481	1.4424651	0	3.1434973	0.199072	51.794108	0.8089905	9.1277972	9.36918E-05	0.000160367	9.1779288
3	**Approach Channel (hopper dredge 2,600,000 CY)**											
3	**Marine Hopper Dredge**											
3	Hopper propulsion engine	3994.8207	3555.3905	3994.8207	74383.562	44.102821	39948.207	4122.4153	2362.9141	0.035516193	0.112347143	2397.2814
3	Hopper propulsion engine	7545.7725	6715.7375	7545.7725	140502.28	83.305328	75457.725	7786.7845	4463.2822	0.067086143	0.212211269	4528.1983
3	Hopper auxiliary engine	33.290173	29.628254	33.290173	759.01594	0.6125392	554.83621	42.065462	32.818251	0.00036241	0.001560377	33.292304
3	Hopper Crew boat propulsion engine	60.908687	54.208731	60.908687	1203.5556	0.6724319	609.08687	66.702321	36.027147	0.000574666	0.001712947	36.551972
3	Hopper Crew boat auxiliary engine	5.0502425	4.4947158	5.0502425	89.957445	0.0696933	63.128031	4.9855363	3.7339877	4.29523E-05	0.000177536	3.7879673
3	Hopper Survey boat propulsion engine	217.39716	193.48347	217.39716	4295.7678	2.4000646	2173.9716	238.07598	128.5892	0.002051116	0.006113904	130.46242

Table H1.29
Alternative 5 Emissions by Task

		Mitigated										
		Peak Day										
		PM10	PM2.5	DPM	NOX	SOX	CO	VOC	CO2	CH4	N2O	CO2e
Task ID	Construction Element/Equipment	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(tonnes/day)	(tonnes/day)	(tonnes/day)	(tonnes/day)
1	**Electrical Substation Construction at Pier J (mitigation on**											
1	**Off-Road Equipment**											
1	Caterpillar 320 excavator	0.0164868	0.0164868	0.01648677	0.3297354	0.005393	1.2259134	0.1560831	0.2647818	0	0	0.2647818
1	Small asphalt roller	0.0048656	0.0048656	0.00486561	0.7353704	0.0011814	0.9067725	0.040755	0.058124	0	0	0.058124
1	Water truck	0.0301587	0.0301587	0.03015873	0.6031746	0.0098162	2.5873661	0.2964	0	0	0	0
1	Forklift	0.00097	0.00097	0.00097002	0.1466049	0.0002398	0.1631393	0.008125	0	0	0	0
1	Mobile crane (35 ton)	0.0216349	0.0216349	0.02163492	0.4326984	0.0069786	2.413528	0.212628	0	0	0	0
1	On-Road Vehicles											
1	Haul trucks	0.0883214	0.0221449	9.1328E-05	0.0472771	0.0001473	0.0055108	0.0006313	0.0070708	1.33015E-08	1.11143E-06	0.0074023
1	Supply trucks	0.2060832	0.0516714	0.0002131	0.1103132	0.0003436	0.0128585	0.0014731	0.0164985	3.10369E-08	2.59334E-06	0.0172721
1	Haul trucks	0.0110893	0.0049843	0.0007339	0.1061539	0.0006317	0.0060985	0.0008438	0.0303314	1.77782E-08	4.76767E-06	0.0317526
1	Supply trucks	0.0470456	0.0211455	0.00311352	0.45035	0.0026801	0.0258724	0.0035799	0.1286786	7.54228E-08	2.02265E-05	0.134708
1	Workers	0.0613236	0.0254403	0	0.0554409	0.003511	0.9134763	0.0142679	0.1609841	1.65241E-06	2.82834E-06	0.1618682
1	Fugitive Dust											
1	Soil handling	2.0058916	0.3037493									
1	Asphalting											
2	**Pier J Breakwater Construction**											
2	**Marine Activities**											
2	Pier J Breakwater Tugboat propulsion engine	3.9506311	3.5160617	3.95063112	77.269697	0.0641397	58.097516	4.2823679	3.4364356	3.68942E-05	0.000163389	3.4860478
2	Pier J Breakwater Tugboat auxiliary engine	0.37053	0.3297717	0.37052998	13.577277	0.0146095	14.556535	0.752467	0.7827372	6.48279E-06	3.7216E-05	0.7939896
2	Pier J Breakwater Crew boat propulsion engine	0.2761194	0.2457462	0.27611938	5.4005702	0.0044829	4.0605791	0.2993053	0.240181	2.57863E-06	1.14196E-05	0.2436485
2	Pier J Breakwater Crew boat auxiliary engine	0.0117839	0.0104877	0.0117839	0.4317957	0.0004646	0.4629389	0.0239306	0.0248933	2.06171E-07	1.18357E-06	0.0252511
2	Pier J Breakwater Survey boat propulsion engine	0.2463834	0.2192813	0.24638345	4.8189703	0.0040001	3.623286	0.2670724	0.2143153	2.30093E-06	1.01898E-05	0.2174094
2	Off-Road Equipment											
2	Piling crane	0.0239749	0.0239749	0.02397487	0.4794974	0.0077334	2.6745656	0.235625	0.3799798	0	0	0.3799798
2	Long arm excavator	0.0395833	0.0395833	0.03958333	0.7916667	0.0129141	2.7752975	0.3208734	0.6339765	0	0	0.6339765
2	On-Road Vehicles											
2	Delivery Trucks	0.1472023	0.0369081	0.00015221	0.0787952	0.0002454	0.0091846	0.0010522	0.0117847	2.21692E-08	1.85239E-06	0.0123372
2	Delivery Trucks	0.3360402	0.1510393	0.0222394	3.216786	0.0191435	0.1848032	0.0255705	0.919133	5.38734E-07	0.000144475	0.9622
2	Workers	0.0643898	0.0267123	0	0.0582129	0.0036865	0.9591501	0.0149813	0.1690333	1.73503E-06	2.96976E-06	0.1699616
3	**Approach Channel (hopper dredge 2,600,000 CY)**											
3	**Marine Hopper Dredge**											
3	Hopper propulsion engine	26.632138	23.702603	26.6321383	495.89041	0.2940188	266.32138	27.482769	15.752761	0.000236775	0.000748981	15.981876
3	Hopper propulsion engine	50.30515	44.771584	50.3051501	936.68189	0.5553689	503.0515	51.911897	29.755215	0.000447241	0.001414742	30.187989
3	Hopper auxiliary engine	0.2219345	0.1975217	0.22193449	5.0601063	0.0040836	3.6989081	0.2804364	0.2187883	2.41607E-06	1.04025E-05	0.2219487
3	Hopper Crew boat propulsion engine	0.2761194	0.2457462	0.27611938	5.4005702	0.0044829	4.0605791	0.2993053	0.240181	2.57863E-06	1.14196E-05	0.2436485
3	Hopper Crew boat auxiliary engine	0.0117839	0.0104877	0.0117839	0.4317957	0.0004646	0.4629389	0.0239306	0.0248933	2.06171E-07	1.18357E-06	0.0252511
3	Hopper Survey boat propulsion engine	0.9855338	0.8771251	0.98553378	19.275881	0.0160004	14.493144	1.0682896	0.8572613	9.20373E-06	4.07594E-05	0.8696377

Table H1.29
Alternative 5 Emissions by Task

			Mitigated Emissions										
			Total										
			PM10	PM2.5	DPM	NOX	SOX	CO	VOC	CO2	CH4	N2O	CO2e
Task ID		Construction Element/Equipment	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(tonnes)	(tonnes)
1	**Electrical Substation Construction at Pier J (mitigation on**												
1		**Off-Road Equipment**											
1		Caterpillar 320 excavator	0.3297354	0.3297354	0.3297354	6.594709	0.1078608	24.518268	3.1216628	5.2956351	0	0	5.2956351
1		Small asphalt roller	0.1265058	0.1265058	0.1265058	19.11963	0.0307154	23.576085	1.05963	1.5112234	0	0	1.5112234
1		Water truck	0.6031746	0.6031746	0.6031746	12.063492	0.1963245	51.747323	5.928	0	0	0	0
1		Forklift	0.0213404	0.0213404	0.0213404	3.2253086	0.0052753	3.5890653	0.17875	0	0	0	0
1		Mobile crane (35 ton)	0.0432698	0.0432698	0.0432698	0.8653968	0.0139572	4.827056	0.425256	0	0	0	0
1		On-Road Vehicles											
1		Haul trucks	0.4416068	0.1107244	0.0004566	0.2363855	0.0007363	0.0275539	0.0031567	0.035354	6.65075E-08	5.55716E-06	0.0370117
1		Supply trucks	1.0304159	0.258357	0.0010655	0.5515662	0.0017181	0.0642924	0.0073657	0.0824927	1.55184E-07	1.29667E-05	0.0863606
1		Haul trucks	0.0554466	0.0249215	0.0036695	0.5307697	0.0031587	0.0304925	0.0042191	0.1516569	8.88911E-08	2.38384E-05	0.158763
1		Supply trucks	0.2352281	0.1057275	0.0155676	2.2517502	0.0134005	0.1293622	0.0178994	0.6433931	3.77114E-07	0.000101132	0.67354
1		Workers	3.679416	1.526418	0	3.3264522	0.2106582	54.80858	0.8560746	9.6590447	9.91447E-05	0.0001697	9.712094
1		Fugitive Dust											
1		Soil handling	40.117832	6.074986									
1		Asphalting											
2	**Pier J Breakwater Construction**												
2		**Marine Activities**											
2		Pier J Breakwater Tugboat propulsion engine	213.33408	189.86733	213.33408	4172.5636	3.4635415	3137.2659	231.24787	185.56752	0.001992289	0.008822996	188.24658
2		Pier J Breakwater Tugboat auxiliary engine	20.008619	17.807671	20.008619	733.17297	0.7889113	786.05289	40.633218	42.267807	0.000350071	0.002009666	42.87544
2		Pier J Breakwater Crew boat propulsion engine	14.910446	13.270297	14.910446	291.63079	0.2420755	219.27127	16.162485	12.969773	0.000139246	0.000616661	13.157019
2		Pier J Breakwater Crew boat auxiliary engine	0.6363306	0.5663342	0.6363306	23.31697	0.0250896	24.9987	1.292251	1.3442356	1.11332E-05	6.3913E-05	1.36356
2		Pier J Breakwater Survey boat propulsion engine	13.304706	11.841188	13.304706	260.2244	0.2160058	195.65744	14.42191	11.573028	0.00012425	0.000550251	11.740109
2		Off-Road Equipment											
2		Piling crane	1.2946429	1.2946429	1.2946429	25.892857	0.4176015	144.42654	12.72375	20.518908	0	0	20.518908
2		Long arm excavator	2.1375	2.1375	2.1375	42.75	0.6973593	149.86606	17.327165	34.234729	0	0	34.234729
2		On-Road Vehicles											
2		Delivery Trucks	0.7360113	0.1845407	0.0007611	0.3939759	0.0012272	0.0459231	0.0052612	0.0589233	1.10846E-07	9.26193E-06	0.0616862
2		Delivery Trucks	1.680201	0.7551964	0.111197	16.08393	0.0957177	0.924016	0.1278527	4.595665	2.69367E-06	0.000722375	4.811
2		Workers	3.4770481	1.4424651	0	3.1434973	0.199072	51.794108	0.8089905	9.1277972	9.36918E-05	0.000160367	9.1779288
3	**Approach Channel (hopper dredge 2,600,000 CY)**												
3		**Marine Hopper Dredge**											
3		Hopper propulsion engine	3994.8207	3555.3905	3994.8207	74383.562	44.102821	39948.207	4122.4153	2362.9141	0.035516193	0.112347143	2397.2814
3		Hopper propulsion engine	7545.7725	6715.7375	7545.7725	140502.28	83.305328	75457.725	7786.7845	4463.2822	0.067086143	0.212211269	4528.1983
3		Hopper auxiliary engine	33.290173	29.628254	33.290173	759.01594	0.6125392	554.83621	42.065462	32.818251	0.00036241	0.001560377	33.292304
3		Hopper Crew boat propulsion engine	41.417907	36.861937	41.417907	810.08553	0.6724319	609.08687	44.895793	36.027147	0.000386795	0.001712947	36.547275
3		Hopper Crew boat auxiliary engine	1.7675849	1.5731505	1.7675849	64.76936	0.0696933	69.440835	3.5895861	3.7339877	3.09257E-05	0.000177536	3.7876666
3		Hopper Survey boat propulsion engine	147.83007	131.56876	147.83007	2891.3822	2.4000646	2173.9716	160.24345	128.5892	0.001380559	0.006113904	130.44566

Table H1.29
Alternative 5 Emissions by Task

							Unmitigated Emissions										
							Peak Day										
							PM10	**PM2.5**	**DPM**	**NOX**	**SOX**	**CO**	**VOC**	**CO2**	**CH4**	**N2O**	**CO2e**
Task ID		Construction Element/Equipment	Source Type 1	Source Type 2	Onsite/Off site	Days Total	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(tonnes/day)	(tonnes/day)	(tonnes/day)	(tonnes/day)
4	**Main Channel Widening (clam shell dredge 1,065,000 CY)**																
4		**Marine Clamshell Dredge**															
4		Clamshell Dredge hoist	Marine Equipment	dredging	onsite	177	4.3650794	4.3650794	4.36507937	132.69841	0.145332	75.661376	7.3542857	5.7853765	0	0	5.7853765
4		Clamshell Dredge generator	Marine Equipment	dredging	onsite	177	3.2738095	3.2738095	3.27380952	99.52381	0.108999	56.746032	5.5157143	3.1964473	0	0	3.1964473
4		Clamshell Barge dump scow	Marine Equipment	disposal	offsite	177	0.0462963	0.0462963	0.0462963	0.8796296	0.0015414	0.8024691	0.04875	0.0382277	0	0	0.0382277
4		Clamshell Tugboat propulsion engine	Marine Equipment	dredging	onsite	177	0.6115528	0.544282	0.6115528	11.387113	0.0067515	6.115528	0.6310858	0.3617301	5.43705E-06	1.71988E-05	0.3669912
4		Clamshell Tugboat auxiliary engine	Marine Equipment	dredging	onsite	177	0.0882214	0.0785171	0.08822142	1.5714441	0.0012175	1.1027678	0.0870911	0.0652281	7.50323E-07	3.10134E-06	0.0661711
4		Clamshell Tugboat propulsion engine	Marine Equipment	transit	offsite	177	11.00795	9.7970759	11.0079505	204.96804	0.1215278	110.0795	11.359544	6.5111411	9.78668E-05	0.000309579	6.6058422
4		Clamshell Tugboat auxiliary engine	Marine Equipment	transit	offsite	177	1.5879856	1.4133072	1.58798563	28.285994	0.0219142	19.84982	1.5676396	1.1741058	1.35058E-05	5.5824E-05	1.191079
4		Clamshell Crew boat propulsion engine	Marine Equipment	support	onsite	177	0.4060579	0.3613915	0.40605791	8.0237043	0.0044829	4.0605791	0.4446821	0.240181	3.83111E-06	1.14196E-05	0.2436798
4		Clamshell Crew boat auxiliary engine	Marine Equipment	support	onsite	177	0.0336683	0.0299648	0.03366828	0.5997163	0.0004646	0.4208535	0.0332369	0.0248933	2.86349E-07	1.18357E-06	0.0252531
4		Clamshell Survey boat propulsion engine	Marine Equipment	dredging	onsite	177	0.3623286	0.3224725	0.3623286	7.1596131	0.0040001	3.623286	0.3967933	0.2143153	3.41853E-06	1.01898E-05	0.2174374
5	**West Basin (clam shell dredge 717,000 CY)**																
5		**Marine Clamshell Dredge**															
5		Clamshell Dredge hoist	Marine Equipment	dredging	onsite	120	4.3650794	4.3650794	4.36507937	132.69841	0.145332	75.661376	7.3542857	5.7853765	0	0	5.7853765
5		Clamshell Dredge generator	Marine Equipment	dredging	onsite	120	3.2738095	3.2738095	3.27380952	99.52381	0.108999	56.746032	5.5157143	3.1964473	0	0	3.1964473
5		Clamshell Barge dump scow	Marine Equipment	disposal	offsite	120	0.0462963	0.0462963	0.0462963	0.8796296	0.0015414	0.8024691	0.04875	0.0382277	0	0	0.0382277
5		Clamshell Tugboat propulsion engine	Marine Equipment	dredging	onsite	120	0.6115528	0.544282	0.6115528	11.387113	0.0067515	6.115528	0.6310858	0.3617301	5.43705E-06	1.71988E-05	0.3669912
5		Clamshell Tugboat auxiliary engine	Marine Equipment	dredging	onsite	120	0.0882214	0.0785171	0.08822142	1.5714441	0.0012175	1.1027678	0.0870911	0.0652281	7.50323E-07	3.10134E-06	0.0661711
5		Clamshell Tugboat propulsion engine	Marine Equipment	transit	offsite	120	11.00795	9.7970759	11.0079505	204.96804	0.1215278	110.0795	11.359544	6.5111411	9.78668E-05	0.000309579	6.6058422
5		Clamshell Tugboat auxiliary engine	Marine Equipment	transit	offsite	120	1.5879856	1.4133072	1.58798563	28.285994	0.0219142	19.84982	1.5676396	1.1741058	1.35058E-05	5.5824E-05	1.191079
5		Clamshell Crew boat propulsion engine	Marine Equipment	support	onsite	120	0.4060579	0.3613915	0.40605791	8.0237043	0.0044829	4.0605791	0.4446821	0.240181	3.83111E-06	1.14196E-05	0.2436798
5		Clamshell Crew boat auxiliary engine	Marine Equipment	support	onsite	120	0.0336683	0.0299648	0.03366828	0.5997163	0.0004646	0.4208535	0.0332369	0.0248933	2.86349E-07	1.18357E-06	0.0252531
5		Clamshell Survey boat propulsion engine	Marine Equipment	dredging	onsite	120	0.3623286	0.3224725	0.3623286	7.1596131	0.0040001	3.623286	0.3967933	0.2143153	3.41853E-06	1.01898E-05	0.2174374
6	**Pier J Basin (clam shell dredge 258,000 CY)**																
6		**Marine Clamshell Dredge**															
6		Clamshell Dredge hoist	Marine Equipment	dredging	onsite	43	4.3650794	4.3650794	4.36507937	132.69841	0.145332	75.661376	7.3542857	5.7853765	0	0	5.7853765
6		Clamshell Dredge generator	Marine Equipment	dredging	onsite	43	3.2738095	3.2738095	3.27380952	99.52381	0.108999	56.746032	5.5157143	3.1964473	0	0	3.1964473
6		Clamshell Barge dump scow	Marine Equipment	disposal	offsite	43	0.0462963	0.0462963	0.0462963	0.8796296	0.0015414	0.8024691	0.04875	0.0382277	0	0	0.0382277
6		Clamshell Tugboat propulsion engine	Marine Equipment	dredging	onsite	43	0.6115528	0.544282	0.6115528	11.387113	0.0067515	6.115528	0.6310858	0.3617301	5.43705E-06	1.71988E-05	0.3669912
6		Clamshell Tugboat auxiliary engine	Marine Equipment	dredging	onsite	43	0.0882214	0.0785171	0.08822142	1.5714441	0.0012175	1.1027678	0.0870911	0.0652281	7.50323E-07	3.10134E-06	0.0661711
6		Clamshell Tugboat propulsion engine	Marine Equipment	transit	offsite	43	11.00795	9.7970759	11.0079505	204.96804	0.1215278	110.0795	11.359544	6.5111411	9.78668E-05	0.000309579	6.6058422
6		Clamshell Tugboat auxiliary engine	Marine Equipment	transit	offsite	43	1.5879856	1.4133072	1.58798563	28.285994	0.0219142	19.84982	1.5676396	1.1741058	1.35058E-05	5.5824E-05	1.191079
6		Clamshell Crew boat propulsion engine	Marine Equipment	support	onsite	43	0.4060579	0.3613915	0.40605791	8.0237043	0.0044829	4.0605791	0.4446821	0.240181	3.83111E-06	1.14196E-05	0.2436798
6		Clamshell Crew boat auxiliary engine	Marine Equipment	support	onsite	43	0.0336683	0.0299648	0.03366828	0.5997163	0.0004646	0.4208535	0.0332369	0.0248933	2.86349E-07	1.18357E-06	0.0252531
6		Clamshell Survey boat propulsion engine	Marine Equipment	dredging	onsite	43	0.3623286	0.3224725	0.3623286	7.1596131	0.0040001	3.623286	0.3967933	0.2143153	3.41853E-06	1.01898E-05	0.2174374
7	**Pier J Basin (clam shell dredge 46,000 CY)**																
7		**Marine Clamshell Dredge**															
7		Clamshell Dredge hoist	Marine Equipment	dredging	onsite	8	4.3650794	4.3650794	4.36507937	132.69841	0.145332	75.661376	7.3542857	5.7853765	0	0	5.7853765
7		Clamshell Dredge generator	Marine Equipment	dredging	onsite	8	3.2738095	3.2738095	3.27380952	99.52381	0.108999	56.746032	5.5157143	3.1964473	0	0	3.1964473
7		Clamshell Barge dump scow	Marine Equipment	disposal	offsite	8	0.0462963	0.0462963	0.0462963	0.8796296	0.0015414	0.8024691	0.04875	0.0382277	0	0	0.0382277
7		Clamshell Tugboat propulsion engine	Marine Equipment	dredging	onsite	8	0.6115528	0.544282	0.6115528	11.387113	0.0067515	6.115528	0.6310858	0.3617301	5.43705E-06	1.71988E-05	0.3669912
7		Clamshell Tugboat auxiliary engine	Marine Equipment	dredging	onsite	8	0.0882214	0.0785171	0.08822142	1.5714441	0.0012175	1.1027678	0.0870911	0.0652281	7.50323E-07	3.10134E-06	0.0661711
7		Clamshell Tugboat propulsion engine	Marine Equipment	transit	offsite	8	11.00795	9.7970759	11.0079505	204.96804	0.1215278	110.0795	11.359544	6.5111411	9.78668E-05	0.000309579	6.6058422
7		Clamshell Tugboat auxiliary engine	Marine Equipment	transit	offsite	8	1.5879856	1.4133072	1.58798563	28.285994	0.0219142	19.84982	1.5676396	1.1741058	1.35058E-05	5.5824E-05	1.191079
7		Clamshell Crew boat propulsion engine	Marine Equipment	support	onsite	8	0.4060579	0.3613915	0.40605791	8.0237043	0.0044829	4.0605791	0.4446821	0.240181	3.83111E-06	1.14196E-05	0.2436798
7		Clamshell Crew boat auxiliary engine	Marine Equipment	support	onsite	8	0.0336683	0.0299648	0.03366828	0.5997163	0.0004646	0.4208535	0.0332369	0.0248933	2.86349E-07	1.18357E-06	0.0252531
7		Clamshell Survey boat propulsion engine	Marine Equipment	dredging	onsite	8	0.3623286	0.3224725	0.3623286	7.1596131	0.0040001	3.623286	0.3967933	0.2143153	3.41853E-06	1.01898E-05	0.2174374

Table H1.29
Alternative 5 Emissions by Task

			Unmitigated Emissions										
			Total										
			PM10	**PM2.5**	**DPM**	**NOX**	**SOX**	**CO**	**VOC**	**CO2**	**CH4**	**N2O**	**CO2e**
Task ID		Construction Element/Equipment	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(tonnes)	(tonnes)	(tonnes)	(tonnes)
4	**Main Channel Widening (clam shell dredge 1,065,000 CY)**												
4		**Marine Clamshell Dredge**											
4		Clamshell Dredge hoist	772.61905	772.61905	772.61905	23487.619	25.723764	13392.063	1301.7086	1024.0116	0	0	1024.0116
4		Clamshell Dredge generator	579.46429	579.46429	579.46429	17615.714	19.292823	10044.048	976.28143	565.77116	0	0	565.77116
4		Clamshell Barge dump scow	8.1944444	8.1944444	8.1944444	155.69444	0.2728278	142.03704	8.62875	6.7663102	0	0	6.7663102
4		Clamshell Tugboat propulsion engine	108.24485	96.337913	108.24485	2015.519	1.1950231	1082.4485	111.70219	64.02622	0.000962357	0.003044191	64.957448
4		Clamshell Tugboat auxiliary engine	15.615192	13.897521	15.615192	278.14561	0.2154897	195.1899	15.415122	11.545373	0.000132807	0.000548936	11.712277
4		Clamshell Tugboat propulsion engine	1948.4072	1734.0824	1948.4072	36279.343	21.510416	19484.072	2010.6394	1152.472	0.017322431	0.054795446	1169.2341
4		Clamshell Tugboat auxiliary engine	281.07346	250.15538	281.07346	5006.6209	3.8788137	3513.4182	277.4722	207.81672	0.00239053	0.009880856	210.82098
4		Clamshell Crew boat propulsion engine	71.87225	63.966303	71.87225	1420.1957	0.7934696	718.7225	78.708739	42.512033	0.000678106	0.002021278	43.131327
4		Clamshell Crew boat auxiliary engine	5.9592862	5.3037647	5.9592862	106.14978	0.0822381	74.491077	5.8829328	4.4061055	5.06837E-05	0.000209493	4.4698014
4		Clamshell Survey boat propulsion engine	64.132162	57.077624	64.132162	1267.2515	0.7080191	641.32162	70.232413	37.933814	0.000605079	0.001803602	38.486415
5	**West Basin (clam shell dredge 717,000 CY)**												
5		**Marine Clamshell Dredge**											
5		Clamshell Dredge hoist	523.80952	523.80952	523.80952	15923.81	17.43984	9079.3651	882.51429	694.24519	0	0	694.24519
5		Clamshell Dredge generator	392.85714	392.85714	392.85714	11942.857	13.07988	6809.5238	661.88571	383.57367	0	0	383.57367
5		Clamshell Barge dump scow	5.5555556	5.5555556	5.5555556	105.55556	0.184968	96.296296	5.85	4.587329	0	0	4.587329
5		Clamshell Tugboat propulsion engine	73.386337	65.31384	73.386337	1366.4536	0.8101852	733.86337	75.730296	43.407607	0.000652446	0.002063859	44.038948
5		Clamshell Tugboat auxiliary engine	10.586571	9.4220481	10.586571	188.57329	0.1460947	132.33214	10.45093	7.8273717	9.00388E-05	0.00037216	7.9405265
5		Clamshell Tugboat propulsion engine	1320.9541	1175.6491	1320.9541	24596.165	14.583333	13209.541	1363.1453	781.33693	0.011744021	0.037149455	792.70107
5		Clamshell Tugboat auxiliary engine	190.55828	169.59687	190.55828	3394.3193	2.6297042	2381.9784	188.11675	140.89269	0.001620698	0.006698886	142.92948
5		Clamshell Crew boat propulsion engine	48.726949	43.366985	48.726949	962.84452	0.5379455	487.26949	53.361857	28.821718	0.000459733	0.001370358	29.241578
5		Clamshell Crew boat auxiliary engine	4.040194	3.5957727	4.040194	71.965956	0.0557547	50.502425	3.988429	2.9871902	3.43619E-05	0.000142029	3.0303738
5		Clamshell Survey boat propulsion engine	43.479432	38.696694	43.479432	859.15357	0.4800129	434.79432	47.615195	25.71784	0.000410223	0.001222781	26.092485
6	**Pier J Basin (clam shell dredge 258,000 CY)**												
6		**Marine Clamshell Dredge**											
6		Clamshell Dredge hoist	187.69841	187.69841	187.69841	5706.0317	6.249276	3253.4392	316.23429	248.77119	0	0	248.77119
6		Clamshell Dredge generator	140.77381	140.77381	140.77381	4279.5238	4.686957	2440.0794	237.17571	137.44723	0	0	137.44723
6		Clamshell Barge dump scow	1.9907407	1.9907407	1.9907407	37.824074	0.0662802	34.506173	2.09625	1.6437929	0	0	1.6437929
6		Clamshell Tugboat propulsion engine	26.296771	23.404126	26.296771	489.64587	0.2903163	262.96771	27.136689	15.554393	0.000233793	0.000739549	15.780623
6		Clamshell Tugboat auxiliary engine	3.7935212	3.3762339	3.7935212	67.572097	0.0523506	47.419015	3.7449167	2.8048082	3.22639E-05	0.000133357	2.8453553
6		Clamshell Tugboat propulsion engine	473.34187	421.27426	473.34187	8813.6256	5.2256943	4733.4187	488.46041	279.97907	0.004208274	0.013311888	284.05122
6		Clamshell Tugboat auxiliary engine	68.283382	60.77221	68.283382	1216.2977	0.9423107	853.54228	67.408501	50.486548	0.00058075	0.002400434	51.216396
6		Clamshell Crew boat propulsion engine	17.46049	15.539836	17.46049	345.01929	0.1927638	174.6049	19.121332	10.327782	0.000164738	0.000491045	10.478232
6		Clamshell Crew boat auxiliary engine	1.4477362	1.2884852	1.4477362	25.787801	0.0199788	18.096702	1.4291871	1.0704098	1.2313E-05	5.08937E-05	1.085884
6		Clamshell Survey boat propulsion engine	15.58013	13.866315	15.58013	307.86336	0.1720046	155.8013	17.062112	9.2155595	0.000146997	0.000438163	9.349807
7	**Pier J Basin (clam shell dredge 46,000 CY)**												
7		**Marine Clamshell Dredge**											
7		Clamshell Dredge hoist	34.920635	34.920635	34.920635	1061.5873	1.162656	605.29101	58.834286	46.283012	0	0	46.283012
7		Clamshell Dredge generator	26.190476	26.190476	26.190476	796.19048	0.871992	453.96825	44.125714	25.571578	0	0	25.571578
7		Clamshell Barge dump scow	0.3703704	0.3703704	0.3703704	7.037037	0.0123312	6.4197531	0.39	0.3058219	0	0	0.3058219
7		Clamshell Tugboat propulsion engine	4.8924224	4.354256	4.8924224	91.096906	0.0540123	48.924224	5.0486864	2.8938405	4.34964E-05	0.000137591	2.9359299
7		Clamshell Tugboat auxiliary engine	0.7057714	0.6281365	0.7057714	12.571553	0.0097396	8.8221424	0.6967287	0.5218248	6.00259E-06	2.48107E-05	0.5293684
7		Clamshell Tugboat propulsion engine	88.063604	78.376607	88.063604	1639.7443	0.9722222	880.63604	90.876355	52.089129	0.000782935	0.00247663	52.846738
7		Clamshell Tugboat auxiliary engine	12.703885	11.306458	12.703885	226.28795	0.1753136	158.79856	12.541117	9.3928461	0.000108047	0.000446592	9.5286318
7		Clamshell Crew boat propulsion engine	3.2484633	2.8911323	3.2484633	64.189634	0.035863	32.484633	3.5574571	1.9214478	3.06489E-05	9.13572E-05	1.9494385
7		Clamshell Crew boat auxiliary engine	0.2693463	0.2397182	0.2693463	4.7977304	0.003717	3.3668283	0.2658953	0.199146	2.29079E-06	9.4686E-06	0.2020249
7		Clamshell Survey boat propulsion engine	2.8986288	2.5797796	2.8986288	57.276905	0.0320009	28.986288	3.1743463	1.7145227	2.73482E-05	8.15187E-05	1.739499

Table H1.29
Alternative 5 Emissions by Task

			Mitigated										
			Peak Day										
			PM10	**PM2.5**	**DPM**	**NOX**	**SOX**	**CO**	**VOC**	**CO2**	**CH4**	**N2O**	**CO2e**
Task ID		Construction Element/Equipment	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(tonnes/day)	(tonnes/day)	(tonnes/day)	(tonnes/day)
4	**Main Channel Widening (clam shell dredge 1,065,000 CY)**												
4		**Marine Clamshell Dredge**											
4		Clamshell Dredge hoist	0.4365079	0.4365079	0.43650794	13.269841	0.0145332	7.5661376	0.7354286	0.5785377	0	0	0.5785377
4		Clamshell Dredge generator	0.327381	0.327381	0.32738095	9.952381	0.0108999	5.6746032	0.5515714	0.3196447	0	0	0.3196447
4		Clamshell Barge dump scow	0.0462963	0.0462963	0.0462963	0.8796296	0.0015414	0.8024691	0.04875	0.0382277	0	0	0.0382277
4		Clamshell Tugboat propulsion engine	0.4158559	0.3701118	0.41585591	8.1336523	0.0067515	6.115528	0.4507756	0.3617301	3.8836E-06	1.71988E-05	0.3669524
4		Clamshell Tugboat auxiliary engine	0.0308775	0.027481	0.0308775	1.1314398	0.0012175	1.2130446	0.0627056	0.0652281	5.40233E-07	3.10134E-06	0.0661658
4		Clamshell Tugboat propulsion engine	7.4854063	6.6620116	7.48540633	146.40574	0.1215278	110.0795	8.1139603	6.5111411	6.99049E-05	0.000309579	6.6051432
4		Clamshell Tugboat auxiliary engine	0.555795	0.4946575	0.55579497	20.365916	0.0219142	21.834802	1.1287005	1.1741058	9.72419E-06	5.5824E-05	1.1909844
4		Clamshell Crew boat propulsion engine	0.2761194	0.2457462	0.27611938	5.4005702	0.0044829	4.0605791	0.2993053	0.240181	2.57863E-06	1.14196E-05	0.2436485
4		Clamshell Crew boat auxiliary engine	0.0117839	0.0104877	0.0117839	0.4317957	0.0004646	0.4629389	0.0239306	0.0248933	2.06171E-07	1.18357E-06	0.0252511
4		Clamshell Survey boat propulsion engine	0.2463834	0.2192813	0.24638345	4.8189703	0.0040001	3.623286	0.2670724	0.2143153	2.30093E-06	1.01898E-05	0.2174094
5	**West Basin (clam shell dredge 717,000 CY)**												
5		**Marine Clamshell Dredge**											
5		Clamshell Dredge hoist	0.4365079	0.4365079	0.43650794	13.269841	0.0145332	7.5661376	0.7354286	0.5785377	0	0	0.5785377
5		Clamshell Dredge generator	0.327381	0.327381	0.32738095	9.952381	0.0108999	5.6746032	0.5515714	0.3196447	0	0	0.3196447
5		Clamshell Barge dump scow	0.0462963	0.0462963	0.0462963	0.8796296	0.0015414	0.8024691	0.04875	0.0382277	0	0	0.0382277
5		Clamshell Tugboat propulsion engine	0.4158559	0.3701118	0.41585591	8.1336523	0.0067515	6.115528	0.4507756	0.3617301	3.8836E-06	1.71988E-05	0.3669524
5		Clamshell Tugboat auxiliary engine	0.0308775	0.027481	0.0308775	1.1314398	0.0012175	1.2130446	0.0627056	0.0652281	5.40233E-07	3.10134E-06	0.0661658
5		Clamshell Tugboat propulsion engine	7.4854063	6.6620116	7.48540633	146.40574	0.1215278	110.0795	8.1139603	6.5111411	6.99049E-05	0.000309579	6.6051432
5		Clamshell Tugboat auxiliary engine	0.555795	0.4946575	0.55579497	20.365916	0.0219142	21.834802	1.1287005	1.1741058	9.72419E-06	5.5824E-05	1.1909844
5		Clamshell Crew boat propulsion engine	0.2761194	0.2457462	0.27611938	5.4005702	0.0044829	4.0605791	0.2993053	0.240181	2.57863E-06	1.14196E-05	0.2436485
5		Clamshell Crew boat auxiliary engine	0.0117839	0.0104877	0.0117839	0.4317957	0.0004646	0.4629389	0.0239306	0.0248933	2.06171E-07	1.18357E-06	0.0252511
5		Clamshell Survey boat propulsion engine	0.2463834	0.2192813	0.24638345	4.8189703	0.0040001	3.623286	0.2670724	0.2143153	2.30093E-06	1.01898E-05	0.2174094
6	**Pier J Basin (clam shell dredge 258,000 CY)**												
6		**Marine Clamshell Dredge**											
6		Clamshell Dredge hoist	0.4365079	0.4365079	0.43650794	13.269841	0.0145332	7.5661376	0.7354286	0.5785377	0	0	0.5785377
6		Clamshell Dredge generator	0.327381	0.327381	0.32738095	9.952381	0.0108999	5.6746032	0.5515714	0.3196447	0	0	0.3196447
6		Clamshell Barge dump scow	0.0462963	0.0462963	0.0462963	0.8796296	0.0015414	0.8024691	0.04875	0.0382277	0	0	0.0382277
6		Clamshell Tugboat propulsion engine	0.4158559	0.3701118	0.41585591	8.1336523	0.0067515	6.115528	0.4507756	0.3617301	3.8836E-06	1.71988E-05	0.3669524
6		Clamshell Tugboat auxiliary engine	0.0308775	0.027481	0.0308775	1.1314398	0.0012175	1.2130446	0.0627056	0.0652281	5.40233E-07	3.10134E-06	0.0661658
6		Clamshell Tugboat propulsion engine	7.4854063	6.6620116	7.48540633	146.40574	0.1215278	110.0795	8.1139603	6.5111411	6.99049E-05	0.000309579	6.6051432
6		Clamshell Tugboat auxiliary engine	0.555795	0.4946575	0.55579497	20.365916	0.0219142	21.834802	1.1287005	1.1741058	9.72419E-06	5.5824E-05	1.1909844
6		Clamshell Crew boat propulsion engine	0.2761194	0.2457462	0.27611938	5.4005702	0.0044829	4.0605791	0.2993053	0.240181	2.57863E-06	1.14196E-05	0.2436485
6		Clamshell Crew boat auxiliary engine	0.0117839	0.0104877	0.0117839	0.4317957	0.0004646	0.4629389	0.0239306	0.0248933	2.06171E-07	1.18357E-06	0.0252511
6		Clamshell Survey boat propulsion engine	0.2463834	0.2192813	0.24638345	4.8189703	0.0040001	3.623286	0.2670724	0.2143153	2.30093E-06	1.01898E-05	0.2174094
7	**Pier J Basin (clam shell dredge 46,000 CY)**												
7		**Marine Clamshell Dredge**											
7		Clamshell Dredge hoist	0.4365079	0.4365079	0.43650794	13.269841	0.0145332	7.5661376	0.7354286	0.5785377	0	0	0.5785377
7		Clamshell Dredge generator	0.327381	0.327381	0.32738095	9.952381	0.0108999	5.6746032	0.5515714	0.3196447	0	0	0.3196447
7		Clamshell Barge dump scow	0.0462963	0.0462963	0.0462963	0.8796296	0.0015414	0.8024691	0.04875	0.0382277	0	0	0.0382277
7		Clamshell Tugboat propulsion engine	0.4158559	0.3701118	0.41585591	8.1336523	0.0067515	6.115528	0.4507756	0.3617301	3.8836E-06	1.71988E-05	0.3669524
7		Clamshell Tugboat auxiliary engine	0.0308775	0.027481	0.0308775	1.1314398	0.0012175	1.2130446	0.0627056	0.0652281	5.40233E-07	3.10134E-06	0.0661658
7		Clamshell Tugboat propulsion engine	7.4854063	6.6620116	7.48540633	146.40574	0.1215278	110.0795	8.1139603	6.5111411	6.99049E-05	0.000309579	6.6051432
7		Clamshell Tugboat auxiliary engine	0.555795	0.4946575	0.55579497	20.365916	0.0219142	21.834802	1.1287005	1.1741058	9.72419E-06	5.5824E-05	1.1909844
7		Clamshell Crew boat propulsion engine	0.2761194	0.2457462	0.27611938	5.4005702	0.0044829	4.0605791	0.2993053	0.240181	2.57863E-06	1.14196E-05	0.2436485
7		Clamshell Crew boat auxiliary engine	0.0117839	0.0104877	0.0117839	0.4317957	0.0004646	0.4629389	0.0239306	0.0248933	2.06171E-07	1.18357E-06	0.0252511
7		Clamshell Survey boat propulsion engine	0.2463834	0.2192813	0.24638345	4.8189703	0.0040001	3.623286	0.2670724	0.2143153	2.30093E-06	1.01898E-05	0.2174094
			Note: clamshell dredge would be electric with mitigation; assume 90 percent reduction in diesel exhaust emissions.										

Table H1.29
Alternative 5 Emissions by Task

		Mitigated Emissions										
		Total										
		PM10	**PM2.5**	**DPM**	**NOX**	**SOX**	**CO**	**VOC**	**CO2**	**CH4**	**N2O**	**CO2e**
Task ID	Construction Element/Equipment	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(tonnes)	(tonnes)
4	**Main Channel Widening (clam shell dredge 1,065,000 CY)**											
4	**Marine Clamshell Dredge**											
4	Clamshell Dredge hoist	77.261905	77.261905	77.261905	2348.7619	2.5723764	1339.2063	130.17086	102.40116	0	0	102.40116
4	Clamshell Dredge generator	57.946429	57.946429	57.946429	1761.5714	1.9292823	1004.4048	97.628143	56.577116	0	0	56.577116
4	Clamshell Barge dump scow	8.1944444	8.1944444	8.1944444	155.69444	0.2728278	142.03704	8.62875	6.7663102	0	0	6.7663102
4	Clamshell Tugboat propulsion engine	73.606496	65.509781	73.606496	1439.6565	1.1950231	1082.4485	79.787276	64.02622	0.000687398	0.003044191	64.950574
4	Clamshell Tugboat auxiliary engine	5.4653172	4.8641323	5.4653172	200.26484	0.2154897	214.70889	11.098888	11.545373	9.56212E-05	0.000548936	11.711347
4	Clamshell Tugboat propulsion engine	1324.9169	1179.1761	1324.9169	25913.816	21.510416	19484.072	1436.171	1152.472	0.012373165	0.054795446	1169.1103
4	Clamshell Tugboat auxiliary engine	98.37571	87.554382	98.37571	3604.7671	3.8788137	3864.76	199.77999	207.81672	0.001721181	0.009880856	210.80424
4	Clamshell Crew boat propulsion engine	48.87313	43.497086	48.87313	955.90093	0.7934696	718.7225	52.977036	42.512033	0.000456418	0.002021278	43.125785
4	Clamshell Crew boat auxiliary engine	2.0857502	1.8563176	2.0857502	76.427845	0.0822381	81.940185	4.2357116	4.4061055	3.64923E-05	0.000209493	4.4694466
4	Clamshell Survey boat propulsion engine	43.60987	38.812784	43.60987	852.95775	0.7080191	641.32162	47.271816	37.933814	0.000407265	0.001803602	38.481469
5	**West Basin (clam shell dredge 717,000 CY)**											
5	**Marine Clamshell Dredge**											
5	Clamshell Dredge hoist	52.380952	52.380952	52.380952	1592.381	1.743984	907.93651	88.251429	69.424519	0	0	69.424519
5	Clamshell Dredge generator	39.285714	39.285714	39.285714	1194.2857	1.307988	680.95238	66.188571	38.357367	0	0	38.357367
5	Clamshell Barge dump scow	5.5555556	5.5555556	5.5555556	105.55556	0.184968	96.296296	5.85	4.587329	0	0	4.587329
5	Clamshell Tugboat propulsion engine	49.902709	44.413411	49.902709	976.03828	0.8101852	733.86337	54.093069	43.407607	0.000466033	0.002063859	44.034288
5	Clamshell Tugboat auxiliary engine	3.7052998	3.2977168	3.7052998	135.77277	0.1460947	145.56535	7.5246699	7.8273717	6.48279E-05	0.00037216	7.9398962
5	Clamshell Tugboat propulsion engine	898.24876	799.4414	898.24876	17568.689	14.583333	13209.541	973.67524	781.33693	0.008388587	0.037149455	792.61718
5	Clamshell Tugboat auxiliary engine	66.695396	59.358903	66.695396	2443.9099	2.6297042	2620.1763	135.44406	140.89269	0.001166903	0.006698886	142.91813
5	Clamshell Crew boat propulsion engine	33.134326	29.48955	33.134326	648.06843	0.5379455	487.26949	35.916634	28.821718	0.000309436	0.001370358	29.23782
5	Clamshell Crew boat auxiliary engine	1.4140679	1.2585204	1.4140679	51.815488	0.0557547	55.552668	2.8716689	2.9871902	2.47405E-05	0.000142029	3.0301333
5	Clamshell Survey boat propulsion engine	29.566014	26.313752	29.566014	578.27644	0.4800129	434.79432	32.048689	25.71784	0.000276112	0.001222781	26.089132
6	**Pier J Basin (clam shell dredge 258,000 CY)**											
6	**Marine Clamshell Dredge**											
6	Clamshell Dredge hoist	18.769841	18.769841	18.769841	570.60317	0.6249276	325.34392	31.623429	24.877119	0	0	24.877119
6	Clamshell Dredge generator	14.077381	14.077381	14.077381	427.95238	0.4686957	244.00794	23.717571	13.744723	0	0	13.744723
6	Clamshell Barge dump scow	1.9907407	1.9907407	1.9907407	37.824074	0.0662802	34.506173	2.09625	1.6437929	0	0	1.6437929
6	Clamshell Tugboat propulsion engine	17.881804	15.914806	17.881804	349.74705	0.2903163	262.96771	19.38335	15.554393	0.000166995	0.000739549	15.778953
6	Clamshell Tugboat auxiliary engine	1.3277324	1.1816819	1.3277324	48.65191	0.0523506	52.160917	2.6963401	2.8048082	2.323E-05	0.000133357	2.8451295
6	Clamshell Tugboat propulsion engine	321.87247	286.4665	321.87247	6295.4469	5.2256943	4733.4187	348.90029	279.97907	0.00300591	0.013311888	284.02116
6	Clamshell Tugboat auxiliary engine	23.899184	21.270274	23.899184	875.73438	0.9423107	938.8965	48.534121	50.486548	0.00041814	0.002400434	51.212331
6	Clamshell Crew boat propulsion engine	11.873133	10.567089	11.873133	232.22452	0.1927638	174.6049	12.870127	10.327782	0.000110881	0.000491045	10.476886
6	Clamshell Crew boat auxiliary engine	0.5067077	0.4509698	0.5067077	18.567217	0.0199788	19.906373	1.0290147	1.0704098	8.86536E-06	5.08937E-05	1.0857978
6	Clamshell Survey boat propulsion engine	10.594488	9.4290945	10.594488	207.21572	0.1720046	155.8013	11.484114	9.2155595	9.89401E-05	0.000438163	9.3486056
7	**Pier J Basin (clam shell dredge 46,000 CY)**											
7	**Marine Clamshell Dredge**											
7	Clamshell Dredge hoist	3.4920635	3.4920635	3.4920635	106.15873	0.1162656	60.529101	5.8834286	4.6283012	0	0	4.6283012
7	Clamshell Dredge generator	2.6190476	2.6190476	2.6190476	79.619048	0.0871992	45.396825	4.4125714	2.5571578	0	0	2.5571578
7	Clamshell Barge dump scow	0.3703704	0.3703704	0.3703704	7.037037	0.0123312	6.4197531	0.39	0.3058219	0	0	0.3058219
7	Clamshell Tugboat propulsion engine	3.3268473	2.9608941	3.3268473	65.069218	0.0540123	48.924224	3.6062046	2.8938405	3.10688E-05	0.000137591	2.9356192
7	Clamshell Tugboat auxiliary engine	0.24702	0.2198478	0.24702	9.0515181	0.0097396	9.7043566	0.5016447	0.5218248	4.32186E-06	2.48107E-05	0.5293264
7	Clamshell Tugboat propulsion engine	59.883251	53.296093	59.883251	1171.2459	0.9722222	880.63604	64.911682	52.089129	0.000559239	0.00247663	52.841145
7	Clamshell Tugboat auxiliary engine	4.4463598	3.9572602	4.4463598	162.92733	0.1753136	174.67842	9.0296039	9.3928461	7.77935E-05	0.000446592	9.5278754
7	Clamshell Crew boat propulsion engine	2.208955	1.96597	2.208955	43.204562	0.035863	32.484633	2.3944423	1.9214478	2.0629E-05	9.13572E-05	1.949188
7	Clamshell Crew boat auxiliary engine	0.0942712	0.0839014	0.0942712	3.4543659	0.003717	3.7035112	0.1914446	0.199146	1.64937E-06	9.4686E-06	0.2020089
7	Clamshell Survey boat propulsion engine	1.9710676	1.7542501	1.9710676	38.551763	0.0320009	28.986288	2.1365793	1.7145227	1.84075E-05	8.15187E-05	1.7392755
		Note: clamshell dredge would be electric with mitigation; assume 90 percent reduction in diesel exhaust emissions.										

Table H1.29
Alternative 5 Emissions by Task

							Unmitigated Emissions										
							Peak Day										
							PM10	**PM2.5**	**DPM**	**NOX**	**SOX**	**CO**	**VOC**	**CO2**	**CH4**	**N2O**	**CO2e**
Task ID		Construction Element/Equipment	Source Type 1	Source Type 2	Onsite/Offsite	Days Total	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(tonnes/day)	(tonnes/day)	(tonnes/day)	(tonnes/day)
8	**Pier J Approach (clam shell dredge 1,994,000 CY)**																
8		**Marine Clamshell Dredge**															
8		Clamshell Dredge hoist	Marine Equipment	dredging	onsite	332	4.3650794	4.3650794	4.36507937	132.69841	0.145332	75.661376	7.3542857	5.7853765	0	0	5.7853765
8		Clamshell Dredge generator	Marine Equipment	dredging	onsite	332	3.2738095	3.2738095	3.27380952	99.52381	0.108999	56.746032	5.5157143	3.1964473	0	0	3.1964473
8		Clamshell Barge dump scow	Marine Equipment	disposal	offsite	332	0.0462963	0.0462963	0.0462963	0.8796296	0.0015414	0.8024691	0.04875	0.0382277	0	0	0.0382277
8		Clamshell Tugboat propulsion engine	Marine Equipment	dredging	onsite	332	0.6115528	0.544282	0.6115528	11.387113	0.0067515	6.115528	0.6310858	0.3617301	5.43705E-06	1.71988E-05	0.3669912
8		Clamshell Tugboat auxiliary engine	Marine Equipment	dredging	onsite	332	0.0882214	0.0785171	0.08822142	1.5714441	0.0012175	1.1027678	0.0870911	0.0652281	7.50323E-07	3.10134E-06	0.0661711
8		Clamshell Tugboat propulsion engine	Marine Equipment	transit	offsite	332	11.00795	9.7970759	11.0079505	204.96804	0.1215278	110.0795	11.359544	6.5111411	9.78668E-05	0.000309579	6.6058422
8		Clamshell Tugboat auxiliary engine	Marine Equipment	transit	offsite	332	1.5879856	1.4133072	1.58798563	28.285994	0.0219142	19.84982	1.5676396	1.1741058	1.35058E-05	5.5824E-05	1.191079
8		Clamshell Crew boat propulsion engine	Marine Equipment	support	onsite	332	0.4060579	0.3613915	0.40605791	8.0237043	0.0044829	4.0605791	0.4446821	0.240181	3.83111E-06	1.14196E-05	0.2436798
8		Clamshell Crew boat auxiliary engine	Marine Equipment	support	onsite	332	0.0336683	0.0299648	0.03366828	0.5997163	0.0004646	0.4208535	0.0332369	0.0248933	2.86349E-07	1.18357E-06	0.0252531
8		Clamshell Survey boat propulsion engine	Marine Equipment	dredging	onsite	332	0.3623286	0.3224725	0.3623286	7.1596131	0.0040001	3.623286	0.3967933	0.2143153	3.41853E-06	1.01898E-05	0.2174374
9	**Pier J Approach (clam shell dredge 679,000 CY)**																
9		**Marine Clamshell Dredge**															
9		Clamshell Dredge hoist	Marine Equipment	dredging	onsite	113	4.3650794	4.3650794	4.36507937	132.69841	0.145332	75.661376	7.3542857	5.7853765	0	0	5.7853765
9		Clamshell Dredge generator	Marine Equipment	dredging	onsite	113	3.2738095	3.2738095	3.27380952	99.52381	0.108999	56.746032	5.5157143	3.1964473	0	0	3.1964473
9		Clamshell Barge dump scow	Marine Equipment	disposal	offsite	113	0.0462963	0.0462963	0.0462963	0.8796296	0.0015414	0.8024691	0.04875	0.0382277	0	0	0.0382277
9		Clamshell Tugboat propulsion engine	Marine Equipment	dredging	onsite	113	0.6115528	0.544282	0.6115528	11.387113	0.0067515	6.115528	0.6310858	0.3617301	5.43705E-06	1.71988E-05	0.3669912
9		Clamshell Tugboat auxiliary engine	Marine Equipment	dredging	onsite	113	0.0882214	0.0785171	0.08822142	1.5714441	0.0012175	1.1027678	0.0870911	0.0652281	7.50323E-07	3.10134E-06	0.0661711
9		Clamshell Tugboat propulsion engine	Marine Equipment	transit	offsite	113	11.00795	9.7970759	11.0079505	204.96804	0.1215278	110.0795	11.359544	6.5111411	9.78668E-05	0.000309579	6.6058422
9		Clamshell Tugboat auxiliary engine	Marine Equipment	transit	offsite	113	1.5879856	1.4133072	1.58798563	28.285994	0.0219142	19.84982	1.5676396	1.1741058	1.35058E-05	5.5824E-05	1.191079
9		Clamshell Crew boat propulsion engine	Marine Equipment	support	onsite	113	0.4060579	0.3613915	0.40605791	8.0237043	0.0044829	4.0605791	0.4446821	0.240181	3.83111E-06	1.14196E-05	0.2436798
9		Clamshell Crew boat auxiliary engine	Marine Equipment	support	onsite	113	0.0336683	0.0299648	0.03366828	0.5997163	0.0004646	0.4208535	0.0332369	0.0248933	2.86349E-07	1.18357E-06	0.0252531
9		Clamshell Survey boat propulsion engine	Marine Equipment	dredging	onsite	113	0.3623286	0.3224725	0.3623286	7.1596131	0.0040001	3.623286	0.3967933	0.2143153	3.41853E-06	1.01898E-05	0.2174374
10	**Standby Area (clam shell dredge 921,000 CY)**																
10		**Marine Clamshell Dredge**															
10		Clamshell Dredge hoist	Marine Equipment	dredging	onsite	227	4.3650794	4.3650794	4.36507937	132.69841	0.145332	75.661376	7.3542857	5.7853765	0	0	5.7853765
10		Clamshell Dredge generator	Marine Equipment	dredging	onsite	227	3.2738095	3.2738095	3.27380952	99.52381	0.108999	56.746032	5.5157143	3.1964473	0	0	3.1964473
10		Clamshell Barge dump scow	Marine Equipment	disposal	offsite	227	0.0462963	0.0462963	0.0462963	0.8796296	0.0015414	0.8024691	0.04875	0.0382277	0	0	0.0382277
10		Clamshell Tugboat propulsion engine	Marine Equipment	dredging	onsite	227	0.6115528	0.544282	0.6115528	11.387113	0.0067515	6.115528	0.6310858	0.3617301	5.43705E-06	1.71988E-05	0.3669912
10		Clamshell Tugboat auxiliary engine	Marine Equipment	dredging	onsite	227	0.0882214	0.0785171	0.08822142	1.5714441	0.0012175	1.1027678	0.0870911	0.0652281	7.50323E-07	3.10134E-06	0.0661711
10		Clamshell Tugboat propulsion engine	Marine Equipment	transit	offsite	227	11.00795	9.7970759	11.0079505	204.96804	0.1215278	110.0795	11.359544	6.5111411	9.78668E-05	0.000309579	6.6058422
10		Clamshell Tugboat auxiliary engine	Marine Equipment	transit	offsite	227	1.5879856	1.4133072	1.58798563	28.285994	0.0219142	19.84982	1.5676396	1.1741058	1.35058E-05	5.5824E-05	1.191079
10		Clamshell Crew boat propulsion engine	Marine Equipment	support	onsite	227	0.4060579	0.3613915	0.40605791	8.0237043	0.0044829	4.0605791	0.4446821	0.240181	3.83111E-06	1.14196E-05	0.2436798
10		Clamshell Crew boat auxiliary engine	Marine Equipment	support	onsite	227	0.0336683	0.0299648	0.03366828	0.5997163	0.0004646	0.4208535	0.0332369	0.0248933	2.86349E-07	1.18357E-06	0.0252531
10		Clamshell Survey boat propulsion engine	Marine Equipment	dredging	onsite	227	0.3623286	0.3224725	0.3623286	7.1596131	0.0040001	3.623286	0.3967933	0.2143153	3.41853E-06	1.01898E-05	0.2174374
11	**Standby Area (clam shell dredge 118,000 CY)**																
11		**Marine Clamshell Dredge**															
11		Clamshell Dredge hoist	Marine Equipment	dredging	onsite	54	4.3650794	4.3650794	4.36507937	132.69841	0.145332	75.661376	7.3542857	5.7853765	0	0	5.7853765
11		Clamshell Dredge generator	Marine Equipment	dredging	onsite	54	3.2738095	3.2738095	3.27380952	99.52381	0.108999	56.746032	5.5157143	3.1964473	0	0	3.1964473
11		Clamshell Barge dump scow	Marine Equipment	disposal	offsite	54	0.0462963	0.0462963	0.0462963	0.8796296	0.0015414	0.8024691	0.04875	0.0382277	0	0	0.0382277
11		Clamshell Tugboat propulsion engine	Marine Equipment	dredging	onsite	54	0.6115528	0.544282	0.6115528	11.387113	0.0067515	6.115528	0.6310858	0.3617301	5.43705E-06	1.71988E-05	0.3669912
11		Clamshell Tugboat auxiliary engine	Marine Equipment	dredging	onsite	54	0.0882214	0.0785171	0.08822142	1.5714441	0.0012175	1.1027678	0.0870911	0.0652281	7.50323E-07	3.10134E-06	0.0661711
11		Clamshell Tugboat propulsion engine	Marine Equipment	transit	offsite	54	11.00795	9.7970759	11.0079505	204.96804	0.1215278	110.0795	11.359544	6.5111411	9.78668E-05	0.000309579	6.6058422
11		Clamshell Tugboat auxiliary engine	Marine Equipment	transit	offsite	54	1.5879856	1.4133072	1.58798563	28.285994	0.0219142	19.84982	1.5676396	1.1741058	1.35058E-05	5.5824E-05	1.191079
11		Clamshell Crew boat propulsion engine	Marine Equipment	support	onsite	54	0.4060579	0.3613915	0.40605791	8.0237043	0.0044829	4.0605791	0.4446821	0.240181	3.83111E-06	1.14196E-05	0.2436798
11		Clamshell Crew boat auxiliary engine	Marine Equipment	support	onsite	54	0.0336683	0.0299648	0.03366828	0.5997163	0.0004646	0.4208535	0.0332369	0.0248933	2.86349E-07	1.18357E-06	0.0252531
11		Clamshell Survey boat propulsion engine	Marine Equipment	dredging	onsite	54	0.3623286	0.3224725	0.3623286	7.1596131	0.0040001	3.623286	0.3967933	0.2143153	3.41853E-06	1.01898E-05	0.2174374

Table H1.29

Alternative 5 Emissions by Task

		Unmitigated Emissions										
		Total										
		PM10	**PM2.5**	**DPM**	**NOX**	**SOX**	**CO**	**VOC**	**CO2**	**CH4**	**N2O**	**CO2e**
Task ID	Construction Element/Equipment	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(tonnes)	(tonnes)	(tonnes)	(tonnes)
8	**Pier J Approach (clam shell dredge 1,994,000 CY)**											
8	**Marine Clamshell Dredge**											
8	Clamshell Dredge hoist	1449.2063	1449.2063	1449.2063	44055.873	48.250224	25119.577	2441.6229	1920.745	0	0	1920.745
8	Clamshell Dredge generator	1086.9048	1086.9048	1086.9048	33041.905	36.187668	18839.683	1831.2171	1061.2205	0	0	1061.2205
8	Clamshell Barge dump scow	15.37037	15.37037	15.37037	292.03704	0.5117448	266.41975	16.185	12.69161	0	0	12.69161
8	Clamshell Tugboat propulsion engine	203.03553	180.70162	203.03553	3780.5216	2.2415123	2030.3553	209.52049	120.09438	0.0018051	0.005710009	121.84109
8	Clamshell Tugboat auxiliary engine	29.289513	26.067666	29.289513	521.71945	0.4041953	366.11891	28.914241	21.655728	0.000249107	0.001029644	21.96879
8	Clamshell Tugboat propulsion engine	3654.6396	3252.6292	3654.6396	68049.389	40.347221	36546.396	3771.3687	2161.6988	0.032491792	0.102780159	2193.1396
8	Clamshell Tugboat auxiliary engine	527.21123	469.21799	527.21123	9390.95	7.275515	6590.1404	520.45634	389.80311	0.004483932	0.018533584	395.43822
8	Clamshell Crew boat propulsion engine	134.81123	119.98199	134.81123	2663.8698	1.4883159	1348.1123	147.63447	79.740085	0.001271928	0.003791323	80.901698
8	Clamshell Crew boat auxiliary engine	11.17787	9.9483044	11.17787	199.10581	0.1542546	139.72338	11.034654	8.2645595	9.50678E-05	0.000392947	8.3840343
8	Clamshell Survey boat propulsion engine	120.29309	107.06085	120.29309	2376.9915	1.3280358	1202.9309	131.73537	71.152692	0.001134951	0.003383027	72.189207
9	**Pier J Approach (clam shell dredge 679,000 CY)**											
9	**Marine Clamshell Dredge**											
9	Clamshell Dredge hoist	493.25397	493.25397	493.25397	14994.921	16.422516	8549.7354	831.03429	653.74755	0	0	653.74755
9	Clamshell Dredge generator	369.94048	369.94048	369.94048	11246.19	12.316887	6412.3016	623.27571	361.19854	0	0	361.19854
9	Clamshell Barge dump scow	5.2314815	5.2314815	5.2314815	99.398148	0.1741782	90.679012	5.50875	4.3197348	0	0	4.3197348
9	Clamshell Tugboat propulsion engine	69.105467	61.503866	69.105467	1286.7438	0.7629244	691.05467	71.312696	40.875497	0.000614386	0.001943467	41.470009
9	Clamshell Tugboat auxiliary engine	9.9690209	8.8724286	9.9690209	177.57318	0.1375725	124.61276	9.8412928	7.370775	8.47865E-05	0.000350451	7.4773291
9	Clamshell Tugboat propulsion engine	1243.8984	1107.0696	1243.8984	23161.388	13.732638	12438.984	1283.6285	735.75894	0.011058953	0.034982404	746.46017
9	Clamshell Tugboat auxiliary engine	179.44238	159.70371	179.44238	3196.3173	2.4763048	2243.0297	177.14327	132.67395	0.001526157	0.006308117	134.59192
9	Clamshell Crew boat propulsion engine	45.884544	40.837244	45.884544	906.67859	0.5065654	458.84544	50.249082	27.140451	0.000432915	0.00129042	27.535819
9	Clamshell Crew boat auxiliary engine	3.804516	3.3860193	3.804516	67.767942	0.0525023	47.55645	3.7557707	2.8129374	3.23574E-05	0.000133744	2.853602
9	Clamshell Survey boat propulsion engine	40.943131	36.439387	40.943131	809.03628	0.4520122	409.43131	44.837642	24.217633	0.000386294	0.001151452	24.570423
10	**Standby Area (clam shell dredge 921,000 CY)**											
10	**Marine Clamshell Dredge**											
10	Clamshell Dredge hoist	990.87302	990.87302	990.87302	30122.54	32.990364	17175.132	1669.4229	1313.2805	0	0	1313.2805
10	Clamshell Dredge generator	743.15476	743.15476	743.15476	22591.905	24.742773	12881.349	1252.0671	725.59353	0	0	725.59353
10	Clamshell Barge dump scow	10.509259	10.509259	10.509259	199.67593	0.3498978	182.16049	11.06625	8.6776973	0	0	8.6776973
10	Clamshell Tugboat propulsion engine	138.82249	123.55201	138.82249	2584.8747	1.5326003	1388.2249	143.25648	82.112723	0.00123421	0.003904133	83.30701
10	Clamshell Tugboat auxiliary engine	20.026263	17.823374	20.026263	356.71781	0.2763624	250.32829	19.769677	14.806778	0.000170323	0.000704003	15.020829
10	Clamshell Tugboat propulsion engine	2498.8048	2223.9362	2498.8048	46527.745	27.586805	24988.048	2578.6166	1478.029	0.022215774	0.070274386	1499.5262
10	Clamshell Tugboat auxiliary engine	360.47274	320.82074	360.47274	6420.9206	4.9745238	4505.9092	355.85418	266.52201	0.003065821	0.012672059	270.37493
10	Clamshell Crew boat propulsion engine	92.175146	82.03588	92.175146	1821.3809	1.0176136	921.75146	100.94285	54.521082	0.000869661	0.00259226	55.315318
10	Clamshell Crew boat auxiliary engine	7.6427003	6.8020033	7.6427003	136.1356	0.1054693	95.533754	7.5447782	5.6507681	6.50012E-05	0.000268671	5.7324572
10	Clamshell Survey boat propulsion engine	82.248592	73.201246	82.248592	1625.2322	0.9080245	822.48592	90.072078	48.649581	0.000776006	0.002313094	49.358283
11	**Standby Area (clam shell dredge 118,000 CY)**											
11	**Marine Clamshell Dredge**											
11	Clamshell Dredge hoist	235.71429	235.71429	235.71429	7165.7143	7.847928	4085.7143	397.13143	312.41033	0	0	312.41033
11	Clamshell Dredge generator	176.78571	176.78571	176.78571	5374.2857	5.885946	3064.2857	297.84857	172.60815	0	0	172.60815
11	Clamshell Barge dump scow	2.5	2.5	2.5	47.5	0.0832356	43.333333	2.6325	2.064298	0	0	2.064298
11	Clamshell Tugboat propulsion engine	33.023851	29.391228	33.023851	614.90411	0.3645833	330.23851	34.078633	19.533423	0.000293601	0.000928736	19.817527
11	Clamshell Tugboat auxiliary engine	4.7639569	4.2399216	4.7639569	84.857982	0.0657426	59.549461	4.7029187	3.5223173	4.05175E-05	0.000167472	3.5732369
11	Clamshell Tugboat propulsion engine	594.42933	529.0421	594.42933	11068.274	6.5624998	5944.2933	613.4154	351.60162	0.00528481	0.016717255	356.71548
11	Clamshell Tugboat auxiliary engine	85.751224	76.318589	85.751224	1527.4437	1.1833669	1071.8903	84.652537	63.401711	0.000729314	0.003014499	64.318264
11	Clamshell Crew boat propulsion engine	21.927127	19.515143	21.927127	433.28003	0.2420755	219.27127	24.012836	12.969773	0.00020688	0.000616661	13.15871
11	Clamshell Crew boat auxiliary engine	1.8180873	1.6180977	1.8180873	32.38468	0.0250896	22.726091	1.7947931	1.3442356	1.54628E-05	6.3913E-05	1.3636682
11	Clamshell Survey boat propulsion engine	19.565744	17.413512	19.565744	386.61911	0.2160058	195.65744	21.426838	11.573028	0.0001846	0.000550251	11.741618

Table H1.29
Alternative 5 Emissions by Task

			Mitigated										
			Peak Day										
			PM10	**PM2.5**	**DPM**	**NOX**	**SOX**	**CO**	**VOC**	**CO2**	**CH4**	**N2O**	**CO2e**
Task ID		Construction Element/Equipment	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(tonnes/day)	(tonnes/day)	(tonnes/day)	(tonnes/day)
8	**Pier J Approach (clam shell dredge 1,994,000 CY)**												
8		**Marine Clamshell Dredge**											
8		Clamshell Dredge hoist	0.4365079	0.4365079	0.43650794	13.269841	0.0145332	7.5661376	0.7354286	0.5785377	0	0	0.5785377
8		Clamshell Dredge generator	0.327381	0.327381	0.32738095	9.952381	0.0108999	5.6746032	0.5515714	0.3196447	0	0	0.3196447
8		Clamshell Barge dump scow	0.0462963	0.0462963	0.0462963	0.8796296	0.0015414	0.8024691	0.04875	0.0382277	0	0	0.0382277
8		Clamshell Tugboat propulsion engine	0.4158559	0.3701118	0.41585591	8.1336523	0.0067515	6.115528	0.4507756	0.3617301	3.8836E-06	1.71988E-05	0.3669524
8		Clamshell Tugboat auxiliary engine	0.0308775	0.027481	0.0308775	1.1314398	0.0012175	1.2130446	0.0627056	0.0652281	5.40233E-07	3.10134E-06	0.0661658
8		Clamshell Tugboat propulsion engine	7.4854063	6.6620116	7.48540633	146.40574	0.1215278	110.0795	8.1139603	6.5111411	6.99049E-05	0.000309579	6.6051432
8		Clamshell Tugboat auxiliary engine	0.555795	0.4946575	0.55579497	20.365916	0.0219142	21.834802	1.1287005	1.1741058	9.72419E-06	5.5824E-05	1.1909844
8		Clamshell Crew boat propulsion engine	0.2761194	0.2457462	0.27611938	5.4005702	0.0044829	4.0605791	0.2993053	0.240181	2.57863E-06	1.14196E-05	0.2436485
8		Clamshell Crew boat auxiliary engine	0.0117839	0.0104877	0.0117839	0.4317957	0.0004646	0.4629389	0.0239306	0.0248933	2.06171E-07	1.18357E-06	0.0252511
8		Clamshell Survey boat propulsion engine	0.2463834	0.2192813	0.24638345	4.8189703	0.0040001	3.623286	0.2670724	0.2143153	2.30093E-06	1.01898E-05	0.2174094
9	**Pier J Approach (clam shell dredge 679,000 CY)**												
9		**Marine Clamshell Dredge**											
9		Clamshell Dredge hoist	0.4365079	0.4365079	0.43650794	13.269841	0.0145332	7.5661376	0.7354286	0.5785377	0	0	0.5785377
9		Clamshell Dredge generator	0.327381	0.327381	0.32738095	9.952381	0.0108999	5.6746032	0.5515714	0.3196447	0	0	0.3196447
9		Clamshell Barge dump scow	0.0462963	0.0462963	0.0462963	0.8796296	0.0015414	0.8024691	0.04875	0.0382277	0	0	0.0382277
9		Clamshell Tugboat propulsion engine	0.4158559	0.3701118	0.41585591	8.1336523	0.0067515	6.115528	0.4507756	0.3617301	3.8836E-06	1.71988E-05	0.3669524
9		Clamshell Tugboat auxiliary engine	0.0308775	0.027481	0.0308775	1.1314398	0.0012175	1.2130446	0.0627056	0.0652281	5.40233E-07	3.10134E-06	0.0661658
9		Clamshell Tugboat propulsion engine	7.4854063	6.6620116	7.48540633	146.40574	0.1215278	110.0795	8.1139603	6.5111411	6.99049E-05	0.000309579	6.6051432
9		Clamshell Tugboat auxiliary engine	0.555795	0.4946575	0.55579497	20.365916	0.0219142	21.834802	1.1287005	1.1741058	9.72419E-06	5.5824E-05	1.1909844
9		Clamshell Crew boat propulsion engine	0.2761194	0.2457462	0.27611938	5.4005702	0.0044829	4.0605791	0.2993053	0.240181	2.57863E-06	1.14196E-05	0.2436485
9		Clamshell Crew boat auxiliary engine	0.0117839	0.0104877	0.0117839	0.4317957	0.0004646	0.4629389	0.0239306	0.0248933	2.06171E-07	1.18357E-06	0.0252511
9		Clamshell Survey boat propulsion engine	0.2463834	0.2192813	0.24638345	4.8189703	0.0040001	3.623286	0.2670724	0.2143153	2.30093E-06	1.01898E-05	0.2174094
10	**Standby Area (clam shell dredge 921,000 CY)**												
10		**Marine Clamshell Dredge**											
10		Clamshell Dredge hoist	0.4365079	0.4365079	0.43650794	13.269841	0.0145332	7.5661376	0.7354286	0.5785377	0	0	0.5785377
10		Clamshell Dredge generator	0.327381	0.327381	0.32738095	9.952381	0.0108999	5.6746032	0.5515714	0.3196447	0	0	0.3196447
10		Clamshell Barge dump scow	0.0462963	0.0462963	0.0462963	0.8796296	0.0015414	0.8024691	0.04875	0.0382277	0	0	0.0382277
10		Clamshell Tugboat propulsion engine	0.4158559	0.3701118	0.41585591	8.1336523	0.0067515	6.115528	0.4507756	0.3617301	3.8836E-06	1.71988E-05	0.3669524
10		Clamshell Tugboat auxiliary engine	0.0308775	0.027481	0.0308775	1.1314398	0.0012175	1.2130446	0.0627056	0.0652281	5.40233E-07	3.10134E-06	0.0661658
10		Clamshell Tugboat propulsion engine	7.4854063	6.6620116	7.48540633	146.40574	0.1215278	110.0795	8.1139603	6.5111411	6.99049E-05	0.000309579	6.6051432
10		Clamshell Tugboat auxiliary engine	0.555795	0.4946575	0.55579497	20.365916	0.0219142	21.834802	1.1287005	1.1741058	9.72419E-06	5.5824E-05	1.1909844
10		Clamshell Crew boat propulsion engine	0.2761194	0.2457462	0.27611938	5.4005702	0.0044829	4.0605791	0.2993053	0.240181	2.57863E-06	1.14196E-05	0.2436485
10		Clamshell Crew boat auxiliary engine	0.0117839	0.0104877	0.0117839	0.4317957	0.0004646	0.4629389	0.0239306	0.0248933	2.06171E-07	1.18357E-06	0.0252511
10		Clamshell Survey boat propulsion engine	0.2463834	0.2192813	0.24638345	4.8189703	0.0040001	3.623286	0.2670724	0.2143153	2.30093E-06	1.01898E-05	0.2174094
11	**Standby Area (clam shell dredge 118,000 CY)**												
11		**Marine Clamshell Dredge**											
11		Clamshell Dredge hoist	0.4365079	0.4365079	0.43650794	13.269841	0.0145332	7.5661376	0.7354286	0.5785377	0	0	0.5785377
11		Clamshell Dredge generator	0.327381	0.327381	0.32738095	9.952381	0.0108999	5.6746032	0.5515714	0.3196447	0	0	0.3196447
11		Clamshell Barge dump scow	0.0462963	0.0462963	0.0462963	0.8796296	0.0015414	0.8024691	0.04875	0.0382277	0	0	0.0382277
11		Clamshell Tugboat propulsion engine	0.4158559	0.3701118	0.41585591	8.1336523	0.0067515	6.115528	0.4507756	0.3617301	3.8836E-06	1.71988E-05	0.3669524
11		Clamshell Tugboat auxiliary engine	0.0308775	0.027481	0.0308775	1.1314398	0.0012175	1.2130446	0.0627056	0.0652281	5.40233E-07	3.10134E-06	0.0661658
11		Clamshell Tugboat propulsion engine	7.4854063	6.6620116	7.48540633	146.40574	0.1215278	110.0795	8.1139603	6.5111411	6.99049E-05	0.000309579	6.6051432
11		Clamshell Tugboat auxiliary engine	0.555795	0.4946575	0.55579497	20.365916	0.0219142	21.834802	1.1287005	1.1741058	9.72419E-06	5.5824E-05	1.1909844
11		Clamshell Crew boat propulsion engine	0.2761194	0.2457462	0.27611938	5.4005702	0.0044829	4.0605791	0.2993053	0.240181	2.57863E-06	1.14196E-05	0.2436485
11		Clamshell Crew boat auxiliary engine	0.0117839	0.0104877	0.0117839	0.4317957	0.0004646	0.4629389	0.0239306	0.0248933	2.06171E-07	1.18357E-06	0.0252511
11		Clamshell Survey boat propulsion engine	0.2463834	0.2192813	0.24638345	4.8189703	0.0040001	3.623286	0.2670724	0.2143153	2.30093E-06	1.01898E-05	0.2174094

Note: clamshell dredge would be electric with mitigation; assume 90 percent reduction in diesel exhaust emissions.

Table H1.29
Alternative 5 Emissions by Task

		Mitigated Emissions										
		Total										
		PM10	PM2.5	DPM	NOX	SOX	CO	VOC	CO2	CH4	N2O	CO2e
Task ID	Construction Element/Equipment	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(tonnes)	(tonnes)
8	**Pier J Approach (clam shell dredge 1,994,000 CY)**											
8	**Marine Clamshell Dredge**											
8	Clamshell Dredge hoist	144.92063	144.92063	144.92063	4405.5873	4.8250224	2511.9577	244.16229	192.0745	0	0	192.0745
8	Clamshell Dredge generator	108.69048	108.69048	108.69048	3304.1905	3.6187668	1883.9683	183.12171	106.12205	0	0	106.12205
8	Clamshell Barge dump scow	15.37037	15.37037	15.37037	292.03704	0.5117448	266.41975	16.185	12.69161	0	0	12.69161
8	Clamshell Tugboat propulsion engine	138.06416	122.8771	138.06416	2700.3726	2.2415123	2030.3553	149.65749	120.09438	0.001289357	0.005710009	121.8282
8	Clamshell Tugboat auxiliary engine	10.251329	9.1236832	10.251329	375.638	0.4041953	402.7308	20.818253	21.655728	0.000179357	0.001029644	21.967046
8	Clamshell Tugboat propulsion engine	2485.1549	2211.7879	2485.1549	48606.706	40.347221	36546.396	2693.8348	2161.6988	0.023208423	0.102780159	2192.9075
8	Clamshell Tugboat auxiliary engine	184.52393	164.2263	184.52393	6761.484	7.275515	7249.1544	374.72856	389.80311	0.003228431	0.018533584	395.40683
8	Clamshell Crew boat propulsion engine	91.671634	81.587754	91.671634	1792.9893	1.4883159	1348.1123	99.369355	79.740085	0.000856105	0.003791323	80.891302
8	Clamshell Crew boat auxiliary engine	3.9122545	3.4819065	3.9122545	143.35618	0.1542546	153.69571	7.9449506	8.2645595	6.84488E-05	0.000392947	8.3833688
8	Clamshell Survey boat propulsion engine	81.799304	72.801381	81.799304	1599.8982	1.3280358	1202.9309	88.66804	71.152692	0.000763909	0.003383027	72.179931
9	**Pier J Approach (clam shell dredge 679,000 CY)**											
9	**Marine Clamshell Dredge**											
9	Clamshell Dredge hoist	49.325397	49.325397	49.325397	1499.4921	1.6422516	854.97354	83.103429	65.374755	0	0	65.374755
9	Clamshell Dredge generator	36.994048	36.994048	36.994048	1124.619	1.2316887	641.23016	62.327571	36.119854	0	0	36.119854
9	Clamshell Barge dump scow	5.2314815	5.2314815	5.2314815	99.398148	0.1741782	90.679012	5.50875	4.3197348	0	0	4.3197348
9	Clamshell Tugboat propulsion engine	46.991718	41.822629	46.991718	919.10271	0.7629244	691.05467	50.93764	40.875497	0.000438847	0.001943467	41.465621
9	Clamshell Tugboat auxiliary engine	3.4891573	3.10535	3.4891573	127.85269	0.1375725	137.07404	7.0857308	7.370775	6.10463E-05	0.000350451	7.4767356
9	Clamshell Tugboat propulsion engine	845.85092	752.80731	845.85092	16543.849	13.732638	12438.984	916.87751	735.75894	0.007899252	0.034982404	746.38118
9	Clamshell Tugboat auxiliary engine	62.804832	55.8963	62.804832	2301.3485	2.4763048	2467.3327	127.54316	132.67395	0.001098833	0.006308117	134.58124
9	Clamshell Crew boat propulsion engine	31.20149	27.769326	31.20149	610.26443	0.5065654	458.84544	33.821497	27.140451	0.000291385	0.00129042	27.532281
9	Clamshell Crew boat auxiliary engine	1.3315806	1.1851067	1.3315806	48.792918	0.0525023	52.312095	2.7041549	2.8129374	2.32973E-05	0.000133744	2.8533755
9	Clamshell Survey boat propulsion engine	27.841329	24.778783	27.841329	544.54365	0.4520122	409.43131	30.179182	24.217633	0.000260005	0.001151452	24.567266
10	**Standby Area (clam shell dredge 921,000 CY)**											
10	**Marine Clamshell Dredge**											
10	Clamshell Dredge hoist	99.087302	99.087302	99.087302	3012.254	3.2990364	1717.5132	166.94229	131.32805	0	0	131.32805
10	Clamshell Dredge generator	74.315476	74.315476	74.315476	2259.1905	2.4742773	1288.1349	125.20671	72.559353	0	0	72.559353
10	Clamshell Barge dump scow	10.509259	10.509259	10.509259	199.67593	0.3498978	182.16049	11.06625	8.6776973	0	0	8.6776973
10	Clamshell Tugboat propulsion engine	94.399291	84.015369	94.399291	1846.3391	1.5326003	1388.2249	102.32605	82.112723	0.000881578	0.003904133	83.298194
10	Clamshell Tugboat auxiliary engine	7.0091921	6.238181	7.0091921	256.83683	0.2763624	275.36112	14.234167	14.806778	0.000122633	0.000704003	15.019637
10	Clamshell Tugboat propulsion engine	1699.1872	1512.2766	1699.1872	33234.103	27.586805	24988.048	1841.869	1478.029	0.01586841	0.070274386	1499.3675
10	Clamshell Tugboat auxiliary engine	126.16546	112.28726	126.16546	4623.0629	4.9745238	4956.5002	256.21501	266.52201	0.002207391	0.012672059	270.35347
10	Clamshell Crew boat propulsion engine	62.679099	55.784398	62.679099	1225.9294	1.0176136	921.75146	67.9423	54.521082	0.000585349	0.00259226	55.30821
10	Clamshell Crew boat auxiliary engine	2.6749451	2.3807012	2.6749451	98.017632	0.1054693	105.08713	5.4322403	5.6507681	4.68008E-05	0.000268671	5.7320022
10	Clamshell Survey boat propulsion engine	55.929042	49.776848	55.929042	1093.9063	0.9080245	822.48592	60.625437	48.649581	0.000522311	0.002313094	49.351941
11	**Standby Area (clam shell dredge 118,000 CY)**											
11	**Marine Clamshell Dredge**											
11	Clamshell Dredge hoist	23.571429	23.571429	23.571429	716.57143	0.7847928	408.57143	39.713143	31.241033	0	0	31.241033
11	Clamshell Dredge generator	17.678571	17.678571	17.678571	537.42857	0.5885946	306.42857	29.784857	17.260815	0	0	17.260815
11	Clamshell Barge dump scow	2.5	2.5	2.5	47.5	0.0832356	43.333333	2.6325	2.064298	0	0	2.064298
11	Clamshell Tugboat propulsion engine	22.456219	19.986035	22.456219	439.21722	0.3645833	330.23851	24.341881	19.533423	0.000209715	0.000928736	19.81543
11	Clamshell Tugboat auxiliary engine	1.6673849	1.4839726	1.6673849	61.097747	0.0657426	65.504407	3.3861015	3.5223173	2.91726E-05	0.000167472	3.5729533
11	Clamshell Tugboat propulsion engine	404.21194	359.74863	404.21194	7905.91	6.5624998	5944.2933	438.15386	351.60162	0.003774864	0.016717255	356.67773
11	Clamshell Tugboat auxiliary engine	30.012928	26.711506	30.012928	1099.7594	1.1833669	1179.0793	60.949826	63.401711	0.000525106	0.003014499	64.313159
11	Clamshell Crew boat propulsion engine	14.910446	13.270297	14.910446	291.63079	0.2420755	219.27127	16.162485	12.969773	0.000139246	0.000616661	13.157019
11	Clamshell Crew boat auxiliary engine	0.6363306	0.5663342	0.6363306	23.31697	0.0250896	24.9987	1.292251	1.3442356	1.11332E-05	6.3913E-05	1.36356
11	Clamshell Survey boat propulsion engine	13.304706	11.841188	13.304706	260.2244	0.2160058	195.65744	14.42191	11.573028	0.00012425	0.000550251	11.740109

Note: clamshell dredge would be electric with mitigation; assume 90 percent reduction in diesel exhaust emissions.

Appendix H2. Criteria Pollutant Dispersion Modeling Analysis

H2.1 Introduction

This appendix describes the methods and results of the air dispersion modeling performed to evaluate ground-level concentrations of criteria pollutants resulting from construction activities of All Action Alternatives. The Action Alternatives are described in detail in Section 4 (Plan Formulation). The No Action Alternative is also described in detail in Section 4 (Plan Formulation), is assessed qualitatively in Sections 5.5 (Air Quality Environmental Consequences) and 5.6 (Greenhouse Gas Environmental Consequences) of the DEIS/DEIR, and therefore is not included in this appendix. Implementation of the No Action and Action Alternatives would not result in operational activities and would therefore not result in operational impacts.

The air dispersion modeling was performed using the U.S. Environmental Protection Agency's (USEPA) AERMOD Modeling System, version 18081 (USEPA 2019a), which was the most recent version available at the time of the analysis. The following pollutants and averaging times were modeled:

- Nitrogen dioxide (NO_2) - 1-hour and annual
- Carbon monoxide (CO) - 1-hour and 8-hour
- Sulfur dioxide (SO_2) - 1-hour and 24-hour
- Particulate matter less than 10 microns in diameter (PM_{10}) - 24-hour and annual
- Particulate matter less than 2.5 microns in diameter ($PM_{2.5}$) - 24-hour

For CEQA impacts, the predicted ground-level concentrations were compared to applicable South Coast Air Quality Management District (SCAQMD) ambient air quality thresholds (SCAQMD 2019a) and the federal 1-hour NO_2 standard (USEPA 2019b) to determine their significance. SCAQMD also has ambient air quality thresholds for sulfate and lead; however, these pollutants were not modeled because impacts from the Action Alternatives would be well below the thresholds due to the low sulfur and lead levels in modern diesel fuel used in marine and other diesel equipment. The predicted ground-level concentrations were compared to the national ambient air quality standards (NAAQS) to determine their significance under NEPA.

H2.2 Development of Emission Scenarios

Construction Emissions

The dispersion modeling analysis included emissions from the following construction sources:

- Marine sources (i.e., diesel engine exhaust from hopper dredge, clamshell dredge, tugboats, crew boats, and survey boats)
- Off-road construction equipment (diesel engine exhaust)
- On-road vehicles driving and idling onsite (diesel engine exhaust)
- Onsite fugitive dust

These construction sources are further described in Section 5.5 of the EIS/EIR. Construction emissions used in the modeling analysis were calculated using the methods described in Appendix H1. The approach to developing the emissions for the various averaging times required for the dispersion modeling analysis is described in the following paragraphs.

Annual emissions were calculated for each year of construction based on the proposed construction schedule and the number of workdays anticipated for each construction activity. Peak daily (i.e., 24-hour) emissions were calculated for each year of construction based on the construction schedule and the anticipated daily hours of operation for each construction activity and equipment type. The peak daily emissions represent the highest emissions that would occur from the various combinations of overlapping construction activities during each year of construction. Peak 8-hour and 1-hour emission rates were scaled from the peak daily emission rates in proportion to the number of operating hours for each activity or equipment type. For example, equipment that would operate 8 hours per day would have scaling factors of 1.0 (8-hr averaging time/8 hours operation per day) for peak 8-hour and 0.125 (1-hr averaging time/8 hours operation per day) for peak 1-hour emissions (applied to the peak daily emission rates). Equipment that would operate 4 hours per day would have scaling factors of 1.0 (i.e., all emissions) for peak 8-hour and 0.25 (1-hr averaging time/4 hours operation per day) for peak 1-hour emissions. This approach conservatively assumes that all equipment that operates on the peak day would also operate during the peak 8-hour and 1-hour periods.

The construction schedule and activity assumptions were developed by USACE, the Port, and the Port's engineering consultant, AECom, and are presented in Appendix H1 tables.

For the annual averaging period, the analysis year producing the highest total construction emissions within the modeling domain was selected for modeling. Specifically, the construction period when hopper dredging and clamshell dredging would occur in the same year would produce the highest emissions. For Action Alternatives 2, 3, and 5, this construction period would occur in 2025; for Action Alternative 4, this construction period would occur in 2026.

For short-term averaging periods (24-hour, 8-hour, 1-hour), the combination of overlapping construction tasks, described in Appendix H1, that would produce the highest concentrations was selected for modeling. The following three combinations were considered and evaluated via AERMOD test runs:

- Combination 1: Overlap of construction Task 1 (Electrical Substation Construction, mitigated scenario only), Task 2 (Pier J Breakwater Construction), Task 3 (Pier J Wharf Upgrade), and Task 4 (Pier T Wharf Upgrade)
- Combination 2: Overlap of construction Task 5 (Approach Channel Dredging) and Task 6 (Main Channel Widening)
- Combination 3: Construction Task 7 (Dredging of West Basin). This task would not overlap with other construction tasks but was chosen for consideration because dredging in the West Basin would be closest to land-receptors.

AERMOD test runs showed that for all Action Alternatives, the highest short-term concentrations would occur for Combination 2, during overlap of construction Task 5 (Approach Channel Dredging) and Task 6 (Main Channel Widening). Therefore, Combination 2 was selected for modeling.

The schedule and equipment utilization assumed in this analysis are anticipated to result in conservatively high emission estimates because assumptions reflect an accelerated schedule and the earliest foreseeable construction years. Postponement of construction activities from the assumed schedule would likely result in lower impacts as increasingly stringent regulatory requirements are implemented compared to those assumed in the analysis years. The anticipated construction schedule and equipment utilization for each Action Alternative are included in Appendix H1.

H2.3 Dispersion Model Selection and Inputs

Model Selection

AERMOD version 18081 (USEPA 2019a) was used to perform the dispersion modeling for the air quality impact analysis. The AERMOD model was selected for the following reasons:

- AERMOD is a USEPA regulatory default model for dispersion modeling;
- General acceptance by the modeling community and regulatory agencies of its ability to provide reasonable results for large industrial complexes with multiple emission sources;
- Ability of the model to handle the various physical characteristics of Project emission sources, including “point,” “area,” and “volume” source types.

Temporal Distribution

Construction emission sources were modeled with diurnal emission patterns that reflect the daily cycle of activity associated with the Action Alternatives. The diurnal emission patterns assumed in AERMOD are shown in Table H2.1.

Table H2.1. Temporal Distribution of Emissions in AERMOD

Source Category	Time Period	Hours per Day
Hopper dredge	12am-12am	24
Clamshell dredge	12am-12am	24
Tugboats	12am-12am	24
Off-road construction equipment	7am-3pm	8
Crew boats	6am-6pm	12
Construction trucks	7am-3pm	8
Fugitive dust	7am-3pm	8

Emission Source Representation

AERMOD simulated all construction emissions as a collection of line and polygon-area sources. Polygon area sources simulate emissions emanating from a flat, non-rectangular, area with no thermal buoyancy or velocity (plume rise) associated with the emissions. Polygon area sources were used to model all dredging activities, harbor craft activities during dredging activities, on-site truck emissions, and land-side on-site fugitive dust. Line sources simulate emissions from volume sources moving along a path based on a start-point, end-point, and the path width with no thermal buoyancy or velocity (plume rise) associated with the emissions. Line sources were used to model hopper dredge and tugboat activities during transit to off-shore disposal locations.

Table H2.2 provides the source parameters used in AERMOD for the polygon-area and line sources. The initial vertical dimensions for polygon-area and line sources were determined based on USEPA guidance (USEPA 2019c).

All emission sources were positioned by using the Universal Transverse Mercator 13 coordinate system (NAD-83) referenced to topographic data obtained from the United States Geological Survey (USGS).

Figure H2.1 shows the locations of the construction sources modeled in AERMOD. The figure depicts the sources used to model annual concentrations. For short-term concentrations (1-hour, 8-hour, and 24-hour averages), the AERMOD sources associated with dredging activities were condensed into reasonable daily work areas conservatively located closest to on-land receptors. For example, the Approach Channel Dredging task ("J" in the figure) was condensed into a 200 meter by 100 meter rectangular source at the far northern end of the dredging area for the short-term modeling.

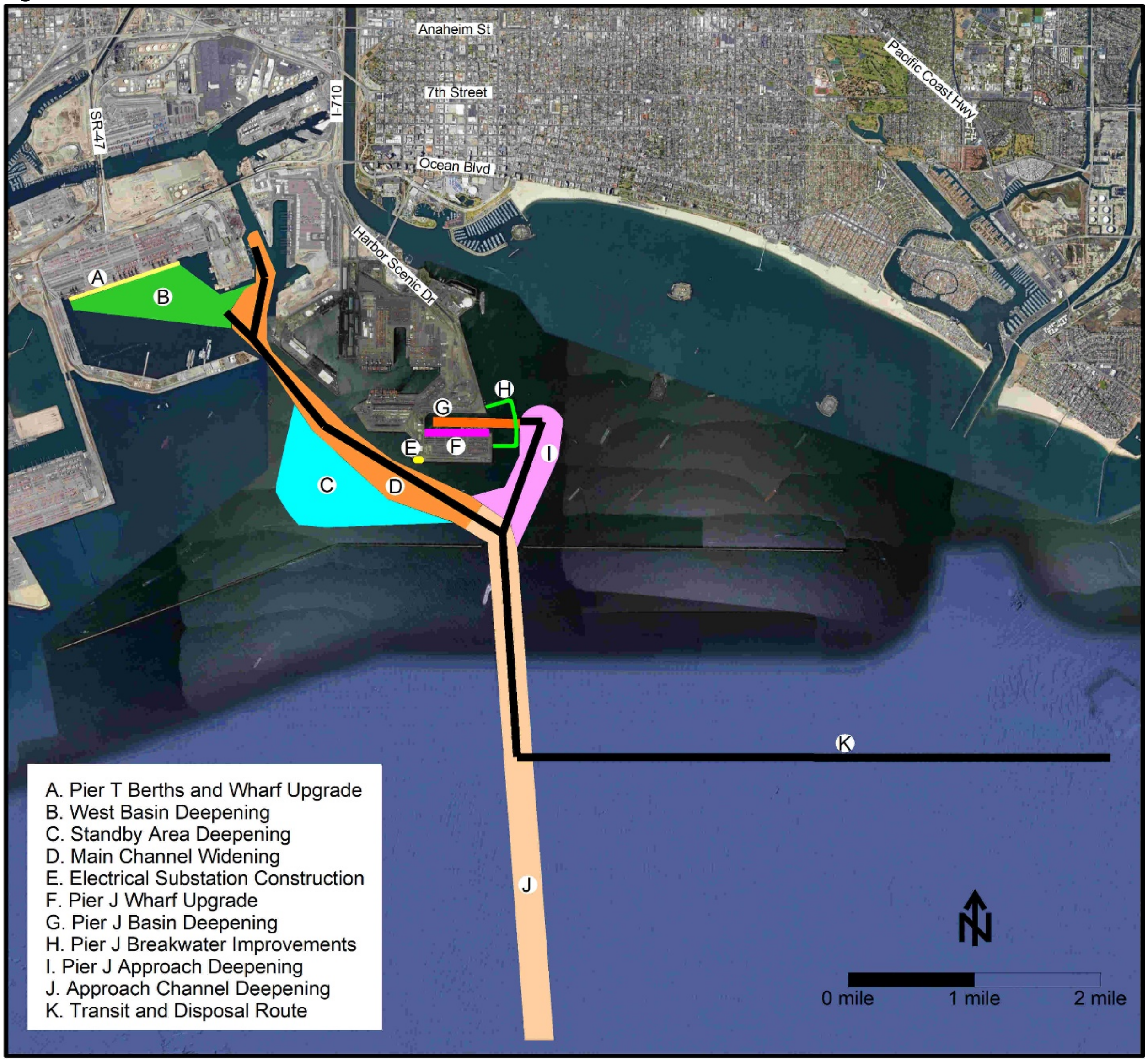
Table H2.2. Source Parameters in AERMOD

Source Category	Source Type	Source Height (m)	Vertical Dispersion Coefficient σ_z (m) [h]	Line Source Width (m)
Hopper dredge – transit [a]	Line	21.29	4.95	100
Hopper dredge – dredging [a]	Poly-area	21.29	4.95	n/a
Clamshell dredge [b]	Poly-area	24.23	5.64	n/a
Tugboats – transit [c]	Line	15.2	3.5	100
Tugboats – dredging [c]	Poly-area	15.2	3.5	n/a
Off-road construction equipment [d]	Poly-area	4.6	1.1	n/a
Crew boats [e]	Poly-area	15.2	3.5	n/a
Construction trucks [f]	Poly-area	4.6	1.1	n/a
Fugitive dust [g]	Poly-area	1.0	0.2	n/a

Notes:

a. Release height (69'10") provided by Dutra Group (dredging contractor) for Stuyvesant hopper dredge (email from Dutra to iLanco 7/26/19). Width assumed to be 100 meters (approximately 50% of channel width).
b. Release height (79'6") provided by Dutra Group (dredging contractor) for Stuyvesant hopper dredge (email from Dutra to iLanco 7/26/19).
c. Source height (50') is from the Pier S Marine Terminal + Back Channel Improvements Project FEIS/FEIR (November 2012), Appendix B, Page A-2-7; and the Middle Harbor Redevelopment Project FEIS/FEIR (April 2009), Appendix A-2, Page A-2-6. Width assumed to be 100 meters (approximately 50% of channel width).
d. Source height (15') is from the Pier S Marine Terminal + Back Channel Improvements Project FEIS/FEIR (November 2012), Appendix B, Page A-2-5; and the Middle Harbor Redevelopment Project FEIS/FEIR (April 2009), Appendix A-2, Page A-2-4.
e. Source height is assumed to be similar to tugboats and therefore was set to 50'.
f. Source height (15') is from the Pier S Marine Terminal + Back Channel Improvements Project FEIS/FEIR (November 2012), Appendix B, Page A-2-8; and the Middle Harbor Redevelopment Project FEIS/FEIR (April 2009), Appendix A-2, Page A-2-7.
g. Fugitive dust source height is set close to ground-level, at a nominal 1 meter.
h. Vertical dispersion coefficient was calculated by dividing the source height (assumed to be representative of the vertical dimension) by 4.3 in accordance with USEPA AERMOD guidelines (USEPA, 2019c).

Figure H2.1. Construction Sources Modeled in AERMOD



Meteorological Data

Meteorological data recorded at the POLB Gull Park monitoring station was selected to simulate meteorological conditions within the dispersion modeling domain because of its proximity to the dredging areas and affected terminals. The AERMOD sources for the construction modeling are located in the Middle Harbor, Outer Harbor, and Beyond the Breakwater meteorological zones as defined in Figure I-3 of the San Pedro Bay Ports' "Sphere of Influence" analysis (POLB and POLA 2010). According to the analysis, the four meteorological stations representative of those meteorological zones are Liberty Hill Plaza, Terminal Island Treatment Plant, Berth 47, and Gull Park. Figure I-3 of the analysis shows that the Gull Park station is the most centrally located station relative to the AERMOD sources. Therefore, meteorological data from the Gull Park station were selected for the AERMOD modeling.

The Gull Park meteorological data set was processed for use in AERMOD in 2018 (Leidos 2018) using the most recent available USEPA guidance (USEPA 2015; USEPA 2016). The SCAQMD provided additional input and guidance on the overall methodology, dataset choice, physical parameter characterization, and seasonality/precipitation parameters. The processing was accomplished using USEPA's AERMET processor (Version 16216) and pre-processor programs AERMINUTE (Version 15272) and AERSURFACE (Version 13016). Consistent with USEPA’s *Guideline on Air Quality Models* (USEPA 2017), the data set consists of hourly readings over a period of five calendar years. The five most recent available years meeting USEPA’s data completeness requirements for wind speed, wind direction, and temperature were selected. For Gull Park, the selected years were 2011, 2012, 2013, 2015, and 2016. Year 2014 was not selected because it did not meet the data completeness requirement. Per USEPA guidance (USEPA 2017), the five selected years of data do not have to be consecutive.

Modeling Approach

Standard control parameters were used in AERMOD, including stack-tip downwash, non-screening mode, non-flat terrain, and sequential meteorological data check. Use of these options follows the USEPA modeling guidance (USEPA 2017). Source and receptor elevations were determined using USEPA’s AERMAP terrain preprocessor (version 18081) with 1 arcsecond national elevation dataset (NED) files. As recommended by SCAQMD (SCAQMD 2019b), all sources were modeled with urban dispersion coefficients. An urban population of 9,818,605 representative of the Los Angeles County was used in AERMOD.

Consistent with USEPA AERMOD Guidance (USEPA 2019), the conversion of nitrogen oxide (NOx) to NO_2 in ambient air was simulated in AERMOD using the Ambient Ratio Method (ARM2). The ARM2 option applies an ambient ratio to the 1-hr modeled NOx concentrations based on a formula derived empirically from ambient monitored ratios of NO_2/NOx. The default upper and lower limits on the ambient ratio applied to the modeled NOx concentration are 0.9 and 0.5, respectively.

For each combination of pollutant and averaging time except for the federal 1-hour NO_2 concentration, the highest concentration of all modeled off-site receptors is reported in the results tables at the end of this appendix. To be consistent with the federal 1-hour NO_2 standard, the federal 1-hour NO_2 concentration is the 98th percentile (8th highest) of the annual distribution of the daily maximum 1-hour concentrations, averaged over all five years of meteorological data.

The CEQA significance thresholds for ambient concentrations are presented in Section 12.2.3 of the EIS/EIR. The NO_2 and CO thresholds are absolute concentration thresholds, meaning that the modeled concentrations are added to the background concentrations for the Project vicinity, and the resulting total concentrations are compared to the thresholds (SCAQMD 2011, USEPA 2019b). The PM_{10} and $PM_{2.5}$ thresholds are incremental concentration thresholds, meaning that the modeled concentrations are compared directly to the thresholds without adding the background concentrations (SCAQMD 2011).

The NEPA significance thresholds for ambient concentrations are the NAAQS, as presented in Section 5.5.1 of the EIS/EIR. Therefore, all of the thresholds are absolute concentration thresholds, meaning that the modeled concentrations are added to the background concentrations near the project area, and the resulting total concentrations are compared to the thresholds.

Table H2.3 presents the background concentrations used in the dispersion modeling. The background concentrations were derived from the monitored concentrations near the project area over the last 3 calendar years (2016, 2017, and 2018) of available data. Because it is the most representative site, the POLB Gull Park monitoring station was used for all pollutants except for $PM_{2.5}$. POLB's Superblock station was used for the $PM_{2.5}$ background concentration because the Gull Park station has no Federal Reference Method (FRM) $PM_{2.5}$ monitor (POLB 2016; POLB 2017; POLB 2018). The Superblock station is located about 2 miles north of the construction site, in a commercial/industrial area adjacent to the Port.

Table H2.3. Background Concentrations

Pollutant	Averaging Period	Monitored Concentration [a,i,j]			Background Concentration [c]	
		2016	2017	2018	(ppm)	(ug/m^3) [d]
NO_2 (ppm)	1-Hour State	0.086	0.096	0.083	0.096	181
	1-Hour Federal [b]	--	--	--	0.075	141
	Annual	0.018	0.018	0.017	0.018	34
CO (ppm)	1-Hour	2.0	2.1	1.9	2.1	2,411
	8-Hour	1.7	1.7	1.5	1.7	1,952
SO_2 (ppm)	1-Hour State	0.012	0.012	0.011	0.012	32
	1-Hour Federal [e]	--	--	--	0.009	24
	24-Hour	0.003	0.005	0.004	0.005	13
PM_{10} (ug/m3)	24-Hour Federal [f]	51.2	66.4	48.6	--	66.4
$PM_{2.5}$ (ug/m3)	24-Hour Federal [g]	--	--	--	--	27.2
	Annual Federal [h]	8.7	9.3	9.5	--	9.2

ppm = parts per million; ug/m3 = micrograms per cubic meter.

Notes:

a. All reported values represent the highest recorded concentration during the year unless otherwise noted.

b. The background concentration reported for the federal 1-hour NO_2 standard represents the three-year average (2016-2018) of the 98th percentile of the annual distribution of daily maximum 1-hour average concentrations.

c. The background concentrations for 1-hour federal NO_2, 1-hour federal SO_2, 24-hour federal $PM_{2.5}$, and annual federal $PM_{2.5}$ are three-year averages. The background concentrations for all other pollutants or averaging periods are the maximum of the concentrations for the 3 reported years.

d. The concentration in micrograms per cubic meter (ug/m3) is calculated as follows: ug/m3 = ppm x MW / 0.0244. The molecular weights (MW) are 28.01 for CO, 46.0055 for NO_2, and 64.066 for SO_2.

e. The background concentration reported for the federal 1-hour SO_2 standard represents the three-year average (2016-2018) of the 99th percentile of the annual distribution of daily maximum 1-hour average concentrations.

f. The 24-hour federal PM_{10} concentration reported for each year is the 2nd highest concentration during the year. The background concentration is the highest of the 2nd highest concentrations.

g. The background concentration reported for the federal 24-hour $PM_{2.5}$ standard represents the three-year average (2016-2018) of the 98th percentile of the annual distribution of 24-hour average concentrations.

h. The background concentration reported for the federal annual $PM_{2.5}$ concentration is the three-year average of the annual mean concentrations.

i. The concentrations in this table were recorded at POLB's Gull Park monitoring station except for $PM_{2.5}$, which was recorded at POLB's Superblock station because the Gull Park station has no Federal Reference Method (FRM) $PM_{2.5}$ monitor.

j. Source: Air Quality Monitoring Program at the Port of Long Beach. Annual Summary Reports. Calendar Years 2016, 2017, and 2018 (POLB 2016; POLB 2017; POLB 2018).

Receptor Locations

Cartesian coordinate receptor grids were used to provide adequate spatial coverage surrounding the Project area to assess ground-level pollution concentrations, identify the extent of significant impacts, and identify maximum-impact locations. Receptors over water were not considered in determining the maximum receptor locations because any human exposure would be brief and transient. The following receptor spacing was used in the modeling:

- Receptors positioned every 50 m along the site boundary, which, for this project, is considered to be the shoreline.

- Receptor grid starting at the site boundary and extending outwards to 500 m, with receptors spaced 50 m apart;
- Receptor grid starting at 500 m and extending outwards to 1 kilometer (km), with receptors placed 100 m apart; and
- Receptor grid starting at 1 km and extending outwards to 5 km, with receptors placed 250 meters (m) apart.

H2.4 Predicted Air Quality Impacts

Table H2.4 presents the maximum offsite pollutant concentrations for the CEQA analysis associated with all unmitigated Action Alternatives. This table presents the highest modeled concentrations on land. Concentrations at all other modeled on-land receptors would be less than the displayed values.

Table H2.4. Maximum Pollutant Concentrations for CEQA, Prior to Mitigation – Action Alternatives

Pollutant	Averaging Time	Maximum Modeled Project Concentration (ug/m3)	Background Concentration (ug/m3)	Total Concentration (ug/m3)	Significance Threshold (ug/m3)	Concentration Above Threshold?
Alternative 2						
NO_2	1-Hour State	173.2	181.0	354	339	**Yes**
	1-Hour Federal	133.0	141.4	274	188	**Yes**
	Annual	2.0	33.9	36	57	No
SO_2	1-Hour State	0.4	31.5	32	655	No
	1-Hour Federal	0.4	23.6	24	196	No
	24-Hour State	0.05	13.1	13	105	No
CO	1-Hour	197.1	2,410.7	2,608	23,000	No
	8-Hour	57.9	1,951.5	2,009	10,000	No
PM_{10}	24-Hour	1.9	n/a	1.9	10.4	No
	Annual	0.1	n/a	0.1	1.0	No
$PM_{2.5}$	24-Hour	1.7	n/a	1.7	10.4	No
Alternative 3						
NO_2	1-Hour State	173.2	181.0	354	339	**Yes**
	1-Hour Federal	133.0	141.4	274	188	**Yes**
	Annual	2.3	33.9	36	57	No
SO_2	1-Hour State	0.4	31.5	32	655	No
	1-Hour Federal	0.4	23.6	24	196	No
	24-Hour State	0.05	13.1	13	105	No
CO	1-Hour	197.1	2,410.7	2,608	23,000	No

Pollutant	Averaging Time	Maximum Modeled Project Concentration (ug/m3)	Background Concentration (ug/m3)	Total Concentration (ug/m3)	Significance Threshold (ug/m3)	Concentration Above Threshold?
	8-Hour	57.9	1,951.5	2,009	10,000	No
PM_{10}	24-Hour	1.9	n/a	1.9	10.4	No
	Annual	0.1	n/a	0.1	1.0	No
$PM_{2.5}$	24-Hour	1.7	n/a	1.7	10.4	No
Alternative 4						
NO_2	1-Hour State	173.2	181.0	354	339	**Yes**
	1-Hour Federal	133.0	141.4	274	188	**Yes**
	Annual	3.0	33.9	37	57	No
SO_2	1-Hour State	0.4	31.5	32	655	No
	1-Hour Federal	0.4	23.6	24	196	No
	24-Hour State	0.05	13.1	13	105	No
CO	1-Hour	197.1	2,410.7	2,608	23,000	No
	8-Hour	57.9	1,951.5	2,009	10,000	No
PM_{10}	24-Hour	1.9	n/a	1.9	10.4	No
	Annual	0.2	n/a	0.2	1.0	No
$PM_{2.5}$	24-Hour	1.7	n/a	1.7	10.4	No
Alternative 5						
NO_2	1-Hour State	173.2	181.0	354	339	**Yes**
	1-Hour Federal	133.0	141.4	274	188	**Yes**
	Annual	2.3	33.9	36	57	No
SO_2	1-Hour State	0.4	31.5	32	655	No
	1-Hour Federal	0.4	23.6	24	196	No
	24-Hour State	0.05	13.1	13	105	No
CO	1-Hour	197.1	2,410.7	2,608	23,000	No
	8-Hour	57.9	1,951.5	2,009	10,000	No
PM_{10}	24-Hour	1.9	n/a	1.9	10.4	No
	Annual	0.1	n/a	0.1	1.0	No
$PM_{2.5}$	24-Hour	1.7	n/a	1.7	10.4	No

Table H2.5 presents the maximum offsite pollutant concentrations for the NEPA analysis associated with all unmitigated Action Alternatives. This table presents the highest modeled concentrations on land. Concentrations at all other modeled on-land receptors would be less than the displayed values.

Table H2.5. Maximum Pollutant Concentrations for NEPA, Prior to Mitigation – Action Alternatives

Pollutant	Averaging Time	Maximum Modeled Project Concentration (ug/m3)	Background Concentration (ug/m3)	Total Concentration (ug/m3)	NAAQS (ug/m3)	Concentration Exceeds NAAQS?
Alternative 2						
NO_2	1-Hour	133.0	141.4	274	188	**Yes**
	Annual	2.0	33.9	36	100	No
SO_2	1-Hour	0.4	23.6	24	196	No
CO	1-Hour	197.1	2,410.7	2,608	40,000	No
	8-Hour	57.9	1,951.5	2,009	10,000	No
PM_{10}	24-Hour	1.9	66.4	68	150	No
$PM_{2.5}$	24-Hour	1.7	27.2	29	35	No
	Annual	0.09	9.2	9.3	12.0	No
Alternative 3						
NO_2	1-Hour	133.0	141.4	274	188	**Yes**
	Annual	2.3	33.9	36	100	No
SO_2	1-Hour	0.4	23.6	24	196	No
CO	1-Hour	197.1	2,410.7	2,608	40,000	No
	8-Hour	57.9	1,951.5	2,009	10,000	No
PM_{10}	24-Hour	1.9	66.4	68	150	No
$PM_{2.5}$	24-Hour	1.7	27.2	29	35	No
	Annual	0.1	9.2	9.3	12.0	No
Alternative 4						
NO_2	1-Hour	133.0	141.4	274	188	**Yes**
	Annual	3.0	33.9	37	100	No
SO_2	1-Hour	0.4	23.6	24	196	No
CO	1-Hour	197.1	2,410.7	2,608	40,000	No
	8-Hour	57.9	1,951.5	2,009	10,000	No
PM_{10}	24-Hour	1.9	66.4	68	150	No
$PM_{2.5}$	24-Hour	1.7	27.2	29	35	No
	Annual	0.1	9.2	9.3	12.0	No
Alternative 5						
NO_2	1-Hour	133.0	141.4	274	188	**Yes**
	Annual	2.3	33.9	36	100	No
SO_2	1-Hour	0.4	23.6	24	196	No
CO	1-Hour	197.1	2,410.7	2,608	40,000	No
	8-Hour	57.9	1,951.5	2,009	10,000	No
PM_{10}	24-Hour	1.9	66.4	68	150	No
$PM_{2.5}$	24-Hour	1.7	27.2	29	35	No
	Annual	0.1	9.2	9.3	12.0	No

Figure H2.2 shows the areas where the modeled 1-hour federal NO_2 concentration (presented in both Tables H2.4 and H2.5) would exceed the threshold, and the location of the maximum on-land receptor. Figure H2.3 shows the areas where the modeled 1-hour state NO_2 concentration (presented in Table H2.4 only) would exceed the threshold, and the location of the maximum receptor. Both figures apply to all Action Alternatives because short-term activities (24-hour, 8-hour, and 1-hour) would be nearly identical and would therefore result in the same concentrations for all Action Alternatives. In all cases, the exceedance areas are over Port property and open water.

Section 5.5.5 of the EIS/EIR identifies five mitigation measures to reduce construction emissions, of which three are quantified. The following three measures were quantified in the dispersion modeling. The remaining mitigation measures were assessed qualitatively in the EIS/EIR.

MM-AQ-1: Electric clamshell dredge. The use of an electric clamshell dredge shall be required for project clamshell dredging activities during the entire construction period of the project, and the construction of an electrical substation at Pier J is also required to provide electric power to the clamshell dredge. This mitigation measure would reduce significant Impacts AQ-1, AQ-3, and AQ-4.

MM-AQ-2: Construction-Related Harbor Craft. Construction-related harbor craft (tugboats, crew boats, and survey boats) with Category 1 or Category 2 marine engines shall meet USEPA Tier 3 emission standards for marine engines. In addition, the construction contractor shall require all construction-related tugboats that home fleet in the San Pedro Bay Ports: 1) to shut down their main engines and 2) to refrain from using auxiliary engines while at dock and instead use electrical shore power, if feasible. This mitigation measure would reduce significant Impacts AQ-1, AQ-3, and AQ-4.

MM-AQ-3: Off-Road Construction Equipment. Self-propelled, diesel-fueled off-road construction equipment 25 hp or greater shall meet USEPA/CARB Tier 4 emission standards for non-road equipment. This mitigation measure would reduce significant Impacts AQ-1, AQ-3, and AQ-4.

Figure H2.2. Location of Maximum Concentration and Area of Exceedance of the 1-Hour Federal NO2 Threshold, Without Mitigation

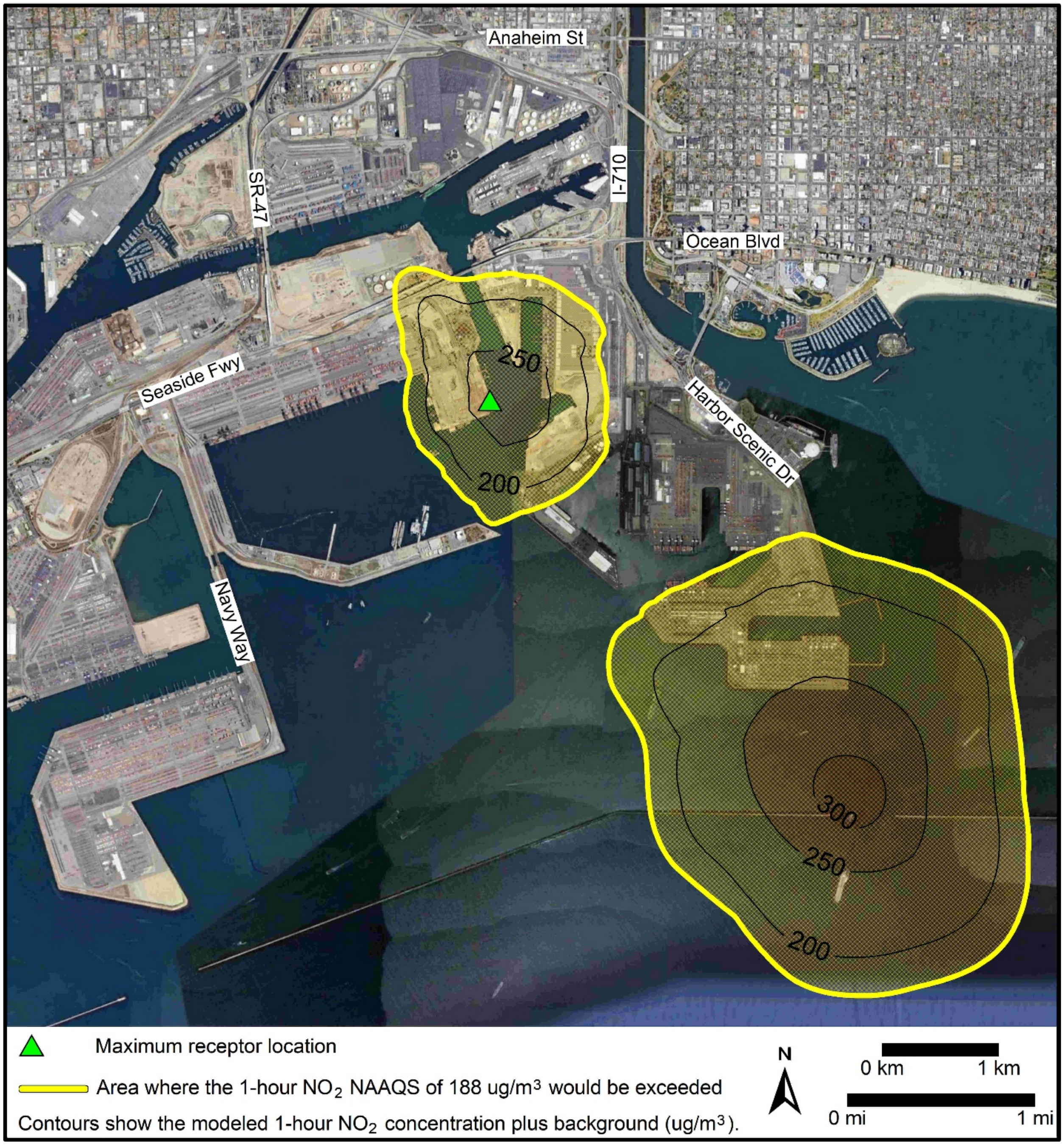


Figure H2.2. Location of Maximum Concentration and Area of Exceedance of the 1-Hour State NO_2 Threshold, Without Mitigation

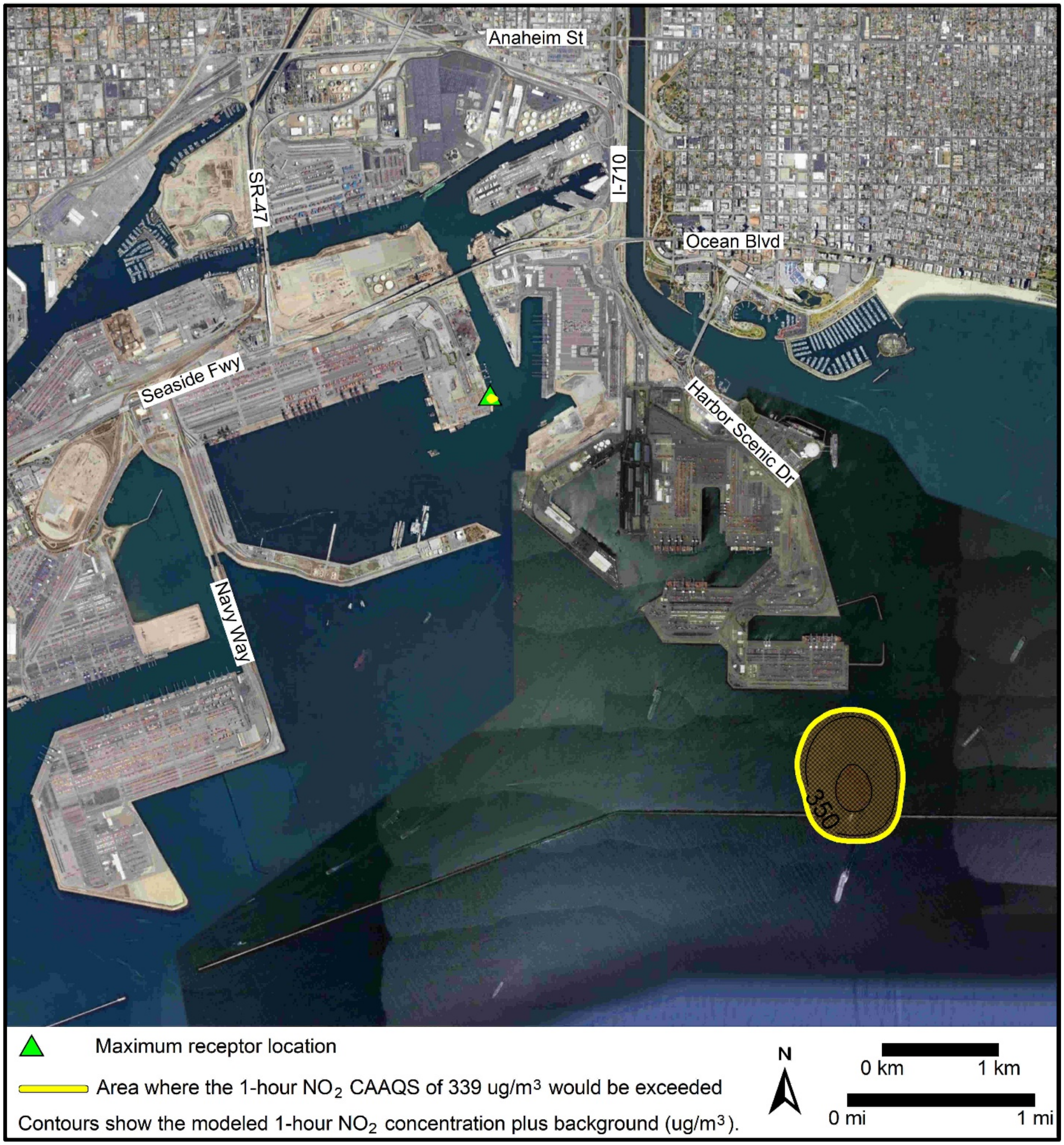


Table H2.6 presents the maximum offsite pollutant concentrations for the CEQA analysis associated with all mitigated Action Alternatives. This table presents the highest modeled concentrations on land. Concentrations at all other modeled on-land receptors would be less than the displayed values.

Table H2.6. Maximum Pollutant Concentrations for CEQA, After Mitigation – Action Alternatives

Pollutant	Averaging Time	Maximum Modeled Project Concentration (ug/m3)	Background Concentration (ug/m3)	Total Concentration (ug/m3)	Significance Threshold (ug/m3)	Concentration Above Threshold?
Alternative 2						
NO_2	1-Hour State	138.8	181.0	320	339	No
	1-Hour Federal	114.9	141.4	256	188	**Yes**
	Annual	0.9	33.9	35	57	No
SO_2	1-Hour State	0.1	31.5	32	655	No
	1-Hour Federal	0.1	23.6	24	196	No
	24-Hour State	0.02	13.1	13	105	No
CO	1-Hour	129.7	2,410.7	2,540	23,000	No
	8-Hour	44.0	1,951.5	1,995	10,000	No
PM_{10}	24-Hour	1.9	n/a	1.9	10.4	No
	Annual	0.05	n/a	0.05	1.0	No
$PM_{2.5}$	24-Hour	1.7	n/a	1.7	10.4	No
Alternative 3						
NO_2	1-Hour State	138.8	181.0	320	339	No
	1-Hour Federal	114.9	141.4	256	188	**Yes**
	Annual	1.2	33.9	35	57	No
SO_2	1-Hour State	0.1	31.5	32	655	No
	1-Hour Federal	0.1	23.6	24	196	No
	24-Hour State	0.02	13.1	13	105	No
CO	1-Hour	129.7	2,410.7	2,540	23,000	No
	8-Hour	44.0	1,951.5	1,995	10,000	No
PM_{10}	24-Hour	1.9	n/a	1.9	10.4	No
	Annual	0.06	n/a	0.06	1.0	No
$PM_{2.5}$	24-Hour	1.7	n/a	1.7	10.4	No
Alternative 4						
NO_2	1-Hour State	138.8	181.0	320	339	No
	1-Hour Federal	114.9	141.4	256	188	**Yes**

Pollutant	Averaging Time	Maximum Modeled Project Concentration (ug/m3)	Background Concentration (ug/m3)	Total Concentration (ug/m3)	Significance Threshold (ug/m3)	Concentration Above Threshold?
	Annual	1.9	33.9	36	57	No
SO_2	1-Hour State	0.1	31.5	32	655	No
	1-Hour Federal	0.1	23.6	24	196	No
	24-Hour State	0.02	13.1	13	105	No
CO	1-Hour	129.7	2,410.7	2,540	23,000	No
	8-Hour	44.0	1,951.5	1,995	10,000	No
PM_{10}	24-Hour	1.9	n/a	1.9	10.4	No
	Annual	0.1	n/a	0.1	1.0	No
$PM_{2.5}$	24-Hour	1.7	n/a	1.7	10.4	No
Alternative 5						
NO_2	1-Hour State	138.8	181.0	320	339	No
	1-Hour Federal	114.9	141.4	256	188	**Yes**
	Annual	1.2	33.9	35	57	No
SO_2	1-Hour State	0.1	31.5	32	655	No
	1-Hour Federal	0.1	23.6	24	196	No
	24-Hour State	0.02	13.1	13	105	No
CO	1-Hour	129.7	2,410.7	2,540	23,000	No
	8-Hour	44.0	1,951.5	1,995	10,000	No
PM_{10}	24-Hour	1.9	n/a	1.9	10.4	No
	Annual	0.06	n/a	0.06	1.0	No
$PM_{2.5}$	24-Hour	1.7	n/a	1.7	10.4	No

Table H2.7 presents the maximum offsite pollutant concentrations for the NEPA analysis associated with all mitigated Action Alternatives. This table presents the highest modeled concentrations on land. Concentrations at all other modeled on-land receptors would be less than the displayed values.

Table H2.7. Maximum Pollutant Concentrations for NEPA, After Mitigation – Action Alternatives

Pollutant	Averaging Time	Maximum Modeled Project Concentration (ug/m3)	Background Concentration (ug/m3)	Total Concentration (ug/m3)	NAAQS (ug/m3)	Concentration Exceeds NAAQS?
Alternative 2						
NO_2	1-Hour	114.9	141.4	256	188	**Yes**
	Annual	0.9	33.9	35	100	No
SO_2	1-Hour	0.1	23.6	24	196	No
CO	1-Hour	129.7	2,410.7	2,540	40,000	No
	8-Hour	44.0	1,951.5	1,995	10,000	No
PM_{10}	24-Hour	1.9	66.4	68	150	No
$PM_{2.5}$	24-Hour	1.7	27.2	29	35	No
	Annual	0.04	9.2	9.2	12.0	No
Alternative 3						
NO_2	1-Hour	114.9	141.4	256	188	**Yes**
	Annual	1.2	33.9	35	100	No
SO_2	1-Hour	0.1	23.6	24	196	No
CO	1-Hour	129.7	2,410.7	2,540	40,000	No
	8-Hour	44.0	1,951.5	1,995	10,000	No
PM_{10}	24-Hour	1.9	66.4	68	150	No
$PM_{2.5}$	24-Hour	1.7	27.2	29	35	No
	Annual	0.06	9.2	9.2	12.0	No
Alternative 4						
NO_2	1-Hour	114.9	141.4	256	188	**Yes**
	Annual	1.9	33.9	36	100	No
SO_2	1-Hour	0.1	23.6	24	196	No
CO	1-Hour	129.7	2,410.7	2,540	40,000	No
	8-Hour	44.0	1,951.5	1,995	10,000	No
PM_{10}	24-Hour	1.9	66.4	68	150	No
$PM_{2.5}$	24-Hour	1.7	27.2	29	35	No
	Annual	0.1	9.2	9.3	12.0	No
Alternative 5						
NO_2	1-Hour	114.9	141.4	256	188	**Yes**
	Annual	1.2	33.9	35	100	No
SO_2	1-Hour	0.1	23.6	24	196	No
CO	1-Hour	129.7	2,410.7	2,540	40,000	No
	8-Hour	44.0	1,951.5	1,995	10,000	No
PM_{10}	24-Hour	1.9	66.4	68	150	No
$PM_{2.5}$	24-Hour	1.7	27.2	29	35	No
	Annual	0.06	9.2	9.2	12.0	No

Figure H2.4 shows the area where the mitigated modeled 1-hour federal NO_2 concentration (presented in both Tables H2.6 and H2.7) would exceed the threshold, and the location of the maximum on-land receptor. The figure applies to all Action Alternatives because short-term activities (24-hour, 8-hour, and 1-hour) would be nearly identical and would therefore result in the same concentrations for all Action Alternatives. The exceedance area is over Port property and open water. There is no figure for the 1-hour state NO_2 concentration because the mitigation measures would reduce the modeled on-land concentrations to less than significant.

Figure H2.3. Location of Maximum Concentration and Area of Exceedance of the 1-Hour Federal NO_2 Threshold, With Mitigation

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Appendix H3. Potential Impacts of Criteria Pollutant Emissions on Public Health

H3.1. Potential Impact of Significant Regional Emissions on Public Health

In *Sierra Club v. County of Fresno (2018)*, the California Supreme Court ruled that an EIR for a proposed master-planned, mixed-use development in Fresno County known as Friant Ranch did not adequately relate the expected adverse air quality impacts to likely health consequences or explain in meaningful detail why it is not feasible at the time of drafting to provide such an analysis. The specific language in the Court's decision is provided below.

> *The EIR fails to provide an adequate discussion of health and safety problems that will be caused by the rise in various pollutants resulting from the Project's development. At this point, we cannot know whether the required additional analysis will disclose that the Project's effects on air quality are less than significant or unavoidable, or whether that analysis will require reassessment of proposed mitigation measures. Absent an analysis that reasonably informs the public how anticipated air quality effects will adversely affect human health, an EIR may still be sufficient if it adequately explains why it is not scientifically feasible at the time of drafting to provide such an analysis.*

In response to the Court's decision, this section provides a discussion of the potential health effects associated with the TSP's significant construction emissions identified in Impact AQ-1.

Impact AQ-1 concluded that the TSP's mitigated construction emissions would exceed the SCAQMD's daily emission thresholds for PM2.5, NOx, CO, and VOC with mitigation. The SCAQMD's daily emission thresholds relate to *regional* air quality impacts. An exceedance of a daily emission threshold means the TSP would make a significant contribution to regional air pollutant emissions in the SCAB. However, a daily emission threshold exceedance does not necessarily mean that the TSP would contribute to a violation of the CAAQS or NAAQS or cause adverse health effects. Further analysis, discussed below, would be necessary to determine the downwind ambient concentrations of the emitted pollutant (or secondary pollutants formed from that pollutant) in the atmosphere where the general population would be exposed.

The pollutants evaluated for potential regional health effects associated with TSP construction are PM2.5, NO2, CO, and ozone. PM2.5 would be both directly emitted ("primary" PM2.5) and would form through secondary reactions of precursor pollutants NOx and VOC ("secondary" PM2.5). NO2 would be directly emitted as one of the NOx components and would form through secondary photochemical reactions between nitric oxide (NO) and other air pollutants (CARB, 2019a). CO would be directly emitted. Ozone would not be directly emitted, but would form through secondary photochemical reactions between precursor pollutant NOx and VOC. Primary pollutants typically reach their peak ambient concentrations in close proximity to the emission sources. Secondary pollutants typically reach their peak ambient concentrations farther downwind of the sources, sometimes many miles downwind, as the secondary reactions can take a considerable amount of time.

Approach and Limitations

This analysis links TSP emissions to regional health effects qualitatively because technical and scientific limitations prevent the accurate quantification of regional health effects. The quantification of regional health effects would not be possible for some pollutants and would produce an unacceptably high level of uncertainty for other pollutants.

Health effects quantification would require a two-stage process consisting of (a) regional modeling of emissions to estimate ambient pollutant concentrations in the region and to determine the exposed population; and (b) applying available methodologies to estimate the quantities of adverse health outcomes for the exposed population at the predicted concentration levels. There are modeling tools that could theoretically carry out these steps for ozone and secondary PM2.5. For example, the Community Multiscale Air Quality Modeling System (CMAQ) (USEPA 2019a) and Comprehensive Air Quality Model with Extensions (CAMx) (Ramboll Environ 2019) are air quality modeling systems that can estimate ozone and secondary PM concentrations on a regional scale. The Environmental Benefits Mapping and Analysis Program (BenMAP) (USEPA 2019b) is a regional-scale health effects estimation model for ozone and PM. CARB also developed a methodology (CARB 2010) for estimating premature mortality associated with regional exposure to PM. Currently, there is no reliable methodology available to quantify health effects associated with regional exposure to CO and NO2 concentrations.

The SCAQMD and San Joaquin Valley Air Pollution Control District (SJVAPCD) filed separate *amicus curiae* briefs with the California Supreme Court for the Friant Ranch case (SCAQMD 2015, SJVAPCD 2015). Both districts concluded that currently available regional modeling tools are not well suited to analyze relatively small changes in pollutant concentrations associated with individual projects. Regional modeling tools are generally designed to be used at the national, state, regional, and/or city levels. They are not equipped to analyze whether and to what extent the criteria pollutant emissions of an individual project directly impact human health in a particular area (SJVAPCD 2015). For example, running a photochemical grid model used for predicting ozone attainment with the emissions solely from an individual project is not likely to yield valid information given the relative scale involved (SJVAPCD 2015). SCAQMD stated that it does not currently know of a way to accurately quantify ozone-related health impacts caused by NOx or VOC emissions from relatively small projects. The primary author of the CARB methodology (CARB 2010) for PM mortality has reported that this methodology is not suited for small projects and may yield unreliable results due to various uncertainties (SCAQMD 2015). Therefore, quantification of regional health effects associated with the TSP's criteria pollutant emissions is not feasible for this analysis. As a result, this document provides a qualitative discussion of the potential for the TSP's construction emissions to cause regional adverse health effects.

The qualitative regional health effects discussion follows a two-step approach. The first step determines whether the TSP's significant regional emissions would likely contribute to a violation of the CAAQS or NAAQS outside of the local Port area. If so, then the TSP is presumed to contribute to regional adverse health effects. If not, then the TSP is presumed not to contribute to regional adverse health effects because the CAAQS and NAAQS were established by CARB and USEPA to protect public health and welfare. Specifically, the CAAQS were established to protect public health, including the most sensitive groups (CARB 2019b). The NAAQS were established to protect public health with an adequate margin of safety (Title 42 United States Code [U.S.C.] Chapter 85, Subchapter I, Part A, Section 7409). The final step describes the general types of adverse health effects that could be associated with the TSP's significant regional pollutant impacts.

A discussion of the TSP's *local* contributions to adverse health effects in the Port vicinity is provided below as part of Impact AQ-2.

Identification of Potential Regional Adverse Health Effects

PM2.5. The SCAB is currently nonattainment of the CAAQS and NAAQS for PM2.5. The state standard for PM2.5 is 12 µg/m3 for an annual average. The federal standards for PM2.5 are 35 µg/m3 for a 3-year average of the 98th percentile of the 24-hour concentrations, and 12 µg/m3 for a 3-year annual average. The highest annual PM2.5 concentration recorded in the SCAB over the last 3 available years (2016-2018) is 14.73 µg/m3, which is 1.2 times the state standard. This concentration occurred in 2016 at a station adjacent to Route 60 in Ontario. Exceedances of the annual standard occurred at several stations in the SCAB in each year of the 3-year period. The highest 3-year average of the 98th percentile of the 24-hour PM2.5 concentrations recorded in the SCAB over the last 3 available years (2016-2018) is 35.9 µg/m3, which is 1.03 times the federal standard. This concentration occurred at the Mira Loma (Jurupa Valley) station in Riverside County. The 24-hour PM2.5 concentration threshold of 35 µg/m3 was exceeded somewhere in the SCAB on 3 percent of days over the 3-year period. The highest 3-year annual average PM2.5 concentration recorded in the SCAB over the last 3 available years (2016-2018) is 14.5 µg/m3, which is 1.2 times the federal standard. This concentration occurred at a station adjacent to Route 60 in Ontario (SCAQMD 2019). Therefore, because (a) the region is nonattainment for PM2.5 and (b) construction of the TSP would exceed the SCAQMD's daily emission threshold for PM2.5, the TSP would potentially contribute to regional violations of the PM2.5 standards and to regional adverse health effects related to PM2.5.

Table 5.5-31 shows that the TSP's mitigated peak daily construction emissions would be 0.04 ton per day of PM2.5 (reported emissions were converted from pounds to tons). By comparison and for context, the most recent USEPA-approved SCAB emissions inventory estimated total anthropogenic emissions within the SCAB in 2012 to be 66 tons per day of PM2.5 (SCAQMD 2017). This estimate shows that the TSP's direct maximum regional PM2.5 contribution would be equivalent to about 0.06 percent of the total SCAB emissions. This emissions comparison shows that the TSP's contribution to regional violations of the PM2.5 standards would be relatively small. The TSP's VOC and NOx emissions, described below under ozone, would also contribute to secondary PM2.5 formation in the region.

The following summary of adverse health effects associated with PM10 and PM2.5 exposure was compiled in the 2016 AQMP (SCAQMD 2017). Appendix I of the 2016 AQMP provides an expanded discussion of the adverse health effects.

> *Several studies have found correlations between elevated ambient particulate matter levels (PM) and an increase in mortality rates, respiratory infections, number and severity of asthma attacks, and the number of hospital admissions in different parts of the United States and in various areas around the world. In recent years, studies have reported an association between long-term exposure to PM2.5 and increased total mortality (reduction in life-span and increased mortality from lung cancer). Higher levels of PM2.5 have also been related to increased mortality due to cardiovascular or respiratory diseases, hospital admissions for acute respiratory conditions, school absences, lost work days, a decrease in respiratory function in children, and increased medication*

use in children and adults with asthma. Long-term exposure to PM has been found to be associated with reduced lung function growth in children, and increased risk of cardiovascular diseases in adults. Elderly persons, young children, and people with pre-existing respiratory and/or cardiovascular disease appear to be more susceptible to the effects of PM10 and PM2.5. In its most recent review, USEPA concluded that both short-term and long-term exposures to PM2.5 are causally related to increased mortality risk (USEPA 2009).

Nitrogen Dioxide. The SCAB is currently in attainment of the CAAQS and NAAQS for NO2. The most stringent state and federal NO2 standards are 0.18 ppm for a 1-hour average (state 1-hour standard), 0.100 ppm for a 3-year average of the 98th percentile of the annual distributions of daily maximum 1-hour average concentrations (federal 1-hour standard), and 0.030 ppm for an annual average. The highest NO2 concentrations recorded anywhere in the SCAB over the last 3 available years (2016-2018) are 0.1155 ppm for the state 1-hour average, 0.079 ppm for the federal 1-hour average (3-year average), and 0.0321 ppm for an annual average (SCAQMD 2019). These pollutant levels are 64, 79, and 107 percent of the state 1-hour, federal 1-hour, and state annual standards, respectively. The exceedance of the state annual standard of 0.030 ppm occurred in all 3 years at a single monitoring station adjacent to Route 60 in Ontario. This station is one of four near-road sites in the SCAB purposely placed by the SCAQMD to capture impacts from heavily traveled roadways (SCAQMD 2016). In November 2018, CARB proposed to separate the area surrounding this monitor from the remainder of the SCAB and reclassify the area as nonattainment. CARB is currently working with the SCAQMD to define the specific boundary of the nonattainment area. The remainder of the SCAB will remain classified as attainment (CARB 2018).

Table 5.5-31 shows that the TSP's mitigated peak daily construction emissions would be 0.8 ton per day of NOx. By comparison and for context, the most recent EPA-approved SCAB emissions inventory estimated total anthropogenic emissions within the SCAB in 2012 to be 540 tons per day of NOx (SCAQMD, 2017). This estimate shows that the TSP's maximum regional NOx contribution would be equivalent to about 0.1 percent of the total SCAB emissions. Therefore, given (a) the attainment status of the region and (b) the relatively small increase in regional NOx emissions contributions from the TSP, the TSP would not contribute to a regional violation of the NO2 standards and would not contribute to regional adverse health effects related to NO2 outside of the local Port area. Adverse health effects related to the TSP's NO2 emissions are also addressed on a *local* level in Impact AQ-2.

Carbon Monoxide. The SCAB is currently in attainment of the CAAQS and NAAQS for CO. The most stringent CAAQS or NAAQS for CO are 20 ppm for a 1-hour average and 9.0 ppm for an 8-hour average. The highest CO concentrations recorded anywhere in the SCAB over the last 3 available years (2016-2018) are 8.4 ppm for a 1-hour average and 4.6 ppm for an 8-hour average (SCAQMD 2019). These pollutant levels are 42 and 51 percent of the 1-hour and 8-hour standards, respectively.

Table 5.5-31 shows that the TSP's mitigated peak daily construction emissions would be 0.5 ton per day of CO. By comparison and for context, the most recent EPA-approved SCAB emissions inventory estimated total anthropogenic emissions within the SCAB in 2012 to be 2,123 tons per day of CO (SCAQMD, 2017). This estimate shows that the TSP's maximum regional CO contribution would be equivalent to about 0.02 percent of the total SCAB emissions. Therefore, given (a) the attainment status of the region and (b) the relatively small regional emissions contribution from the TSP, the TSP would not contribute to a regional violation of the CO standards and would not contribute to regional adverse health effects related to CO.

Ozone. VOC and NOx are precursors to ozone, for which the SCAB is currently in nonattainment of the CAAQS and NAAQS (also referred to as state and federal standards). The most stringent state and federal ozone standards are 0.09 ppm for a 1-hour average, 0.070 ppm for the 3-year average of the fourth-highest 8-hour concentration each year (known as the federal 8-hour standard), and 0.07 ppm for an 8-hour average (known as the state 8-hour standard). The highest 1-hour ozone concentration recorded in the SCAB over the last three available years (2016-2018) is 0.163 ppm, which is 1.8 times the standard. This concentration occurred in 2016 at the Crestline station in the central San Bernardino Mountains. The standard was exceeded somewhere in the SCAB on 25 percent of days during the 3-year period. The highest federal 8- hour ozone concentration (3-year average) recorded in the SCAB over the last three available years (2016-2018) is 0.112 ppm, which is 1.6 times the standard. This concentration occurred at both the Crestline and San Bernardino stations. The threshold of 0.070 ppm was exceeded somewhere in the SCAB on 38 percent of days during the 3-year period. The highest state 8-hour ozone concentration recorded in the SCAB over the last three available years (2016-2018) is 0.136 ppm, which is 1.9 times the standard. This concentration occurred in 2017 at the San Bernardino station. The standard was exceeded somewhere in the SCAB on 38 percent of days during the 3-year period (SCAQMD 2019). Therefore, because (a) the region is nonattainment for ozone and (b) construction of the TSP would exceed the SCAQMD's daily emission thresholds for NOx and VOC, the TSP would potentially contribute to regional violations of the ozone standards and to regional adverse health effects related to ozone.

Table 5.5-31 shows that the TSP's mitigated peak daily construction emissions would be 0.05 ton per day of VOC and 0.8 ton per day of NOx. By comparison and for context, the most recent EPA-approved SCAB emissions inventory estimated total anthropogenic emissions within the SCAB in 2012 to be 470 tons per day of VOC and 540 tons per day of NOx (SCAQMD, 2017). These estimates show that the TSP's maximum regional VOC and NOx contributions would be equivalent to about 0.01 and 0.1 percent, respectively, of the total SCAB emissions. These emissions comparisons show that the TSP's contribution to regional violations of the ozone standards would be relatively small.

The following summary of adverse health effects associated with ozone exposure was compiled by the SCAQMD in its Final 2016 AQMP (SCAQMD 2017). Appendix I of the 2016 AQMP provides an expanded discussion of the adverse health effects:

> *Short-term exposures (lasting for a few hours) to ozone at levels typically observed in Southern California can result in breathing pattern changes, reduction of breathing capacity, increased susceptibility to infections, inflammation of the lung tissue, and some immunological changes. Individuals working outdoors, children (including teenagers), older adults, people with pre-existing lung disease, such as asthma, and individuals with certain nutritional deficiencies are considered to be the subgroups most susceptible to ozone effects. Elevated ozone levels are associated with increased school absences and daily hospital admission rates, as well as increased mortality. An increased risk for asthma has been found in children who participate in multiple sports and live in high-ozone communities. Ozone exposure under exercising conditions is known to increase the severity of respiratory symptoms. Although lung volume and airway resistance changes observed after a single exposure diminish with repeated exposures, biochemical and cellular changes appear to persist, which can lead to subsequent lung structural changes.*

In summary, construction of the TSP would potentially contribute to regional adverse health effects associated with exposure to PM2.5 and ozone in the SCAB. The TSP would not contribute to regional adverse health effects associated with exposure to CO or NO2. Impacts would be temporary, occurring only during the construction period.

H3.2. Potential Impact of Significant Local Ambient Concentrations on Public Health

In response to the California Supreme Court's recent decision on *Sierra Club v. County of Fresno (2018)*, this section provides a discussion of the potential health effects associated with the significant local ambient pollutant concentrations identified in Impact AQ-2 for TSP construction. These pollutant concentrations are considered local impacts because they were determined through dispersion modeling of the TSP's primary pollutant emissions in the local Port area, and because the maximum pollutant concentrations predicted by the dispersion model would be located very close to the construction activities. By definition, a modeled exceedance of a SCAQMD ambient concentration threshold means that the TSP would contribute to a local violation of the CAAQS or NAAQS and therefore would contribute to local adverse health effects in the modeled exceedance area. If no modeled exceedance is predicted, the TSP is presumed not to contribute to local adverse health effects because the CAAQS and NAAQS were established by CARB and USEPA to protect public health and welfare.

Tables 5.5-32 and 5.5-33 show that construction of the TSP would produce significant local NO2 concentrations with mitigation. The local concentrations would be less than significant for SO2, CO, PM10, and PM2.5. Therefore, construction of the TSP would potentially contribute to local adverse health effects associated with exposure to NO2.

Analysis Approach and Limitations

There is currently no reliable methodology available that can quantify health effects associated with local exposure to NO2 concentrations. Therefore, this document provides a qualitative discussion of the potential for the TSP's local NO2 impacts to cause adverse health effects. The qualitative discussion (a) identifies the local area where NO2 concentrations are predicted to exceed the standards, which is presumed to be the area where project-related adverse health effects could potentially occur; and (b) describes the general types of adverse health effects that could be associated with exposure to elevated NO2 levels.

A discussion of the TSP's *regional* contributions to adverse health effects in the SCAB is provided as part of Impact AQ-1.

Identification of Potential Local Adverse Health Effects

Nitrogen Dioxide. Table 5.5-32 shows that construction of the TSP with mitigation would produce local ambient NO2 concentrations that exceed the 1-hour NAAQS. The maximum concentration on land is predicted to be 256 ug/m3 (Project plus background), which is 1.4 times the standard. Therefore, construction of the TSP would potentially contribute to local adverse health effects associated with short-term exposure to NO2.

Appendix A, Figure A2.4 shows the area where the modeled NO2 concentration would exceed the federal 1-hour NO2 standard during TSP construction, after mitigation. This is the area where the potential for adverse health effects associated with NO2 exposure during construction is presumed to exist. Most of the impact area is over water, but a portion of the area covers Pier J, which is a POLB container terminal. The significant impact area would not extend over any existing residences.

The following summary of adverse health effects associated with NO2 exposure was compiled in the 2016 AQMP. Appendix I of the 2016 AQMP provides an expanded discussion of the adverse health effects.

> *USEPA noted the respiratory effects of NO2, and evidence suggestive of impacts on cardiovascular health, mortality and cancer (USEPA 2016). Evidence for low-level nitrogen dioxide (NO2) exposure effects is derived from laboratory studies of asthmatics and from epidemiological studies. Additional evidence is derived from animal studies. USEPA cited the coherence of the results from a variety of studies, and a plausible biological mechanism to support the determination of a causal relationship between short term NO2 exposures and asthma exacerbations ("asthma attacks"). The long-term link with respiratory outcomes was strengthened by recent experimental and epidemiological studies, and the strongest evidence available is from studies of asthma development. Experimental studies have found that NO2 exposures increase responsiveness of airways, pulmonary inflammation, and oxidative stress, and can lead to the development of allergic responses. These biological responses provide evidence of a plausible mechanism for NO2 to cause asthma. Additionally, results from controlled exposure studies of asthmatics demonstrate an increase in the tendency of airways to contract in response to a chemical stimulus (airway responsiveness) or after inhaled allergens. Animal studies also provide evidence that NO2 exposures have negative effects on the immune system, and therefore increase the host's susceptibility to respiratory infections. Epidemiological studies showing associations between NO2 levels and hospital admissions for respiratory infections support such a link, although the studies examining respiratory infections in children are less consistent.*

In summary, construction of the TSP would potentially contribute to local adverse health effects associated with exposure to NO2. The area of impact would occur on POLB property. The TSP would not contribute to local adverse health effects associated with exposure to SO2, CO, PM10, or PM2.5. Impacts would be temporary, occurring only during the construction period.

H3.3. References

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Appendix H4. Health Risk Evaluation

H4.1. Introduction

This appendix describes the methods and results of a health risk evaluation of toxic air contaminant (TAC) emissions from construction activities associated with all Action Alternatives. The Action Alternatives are described in detail in Section 4 (Plan Formulation). The No Action Alternative is also described in detail in Section 4 (Plan Formulation), is assessed qualitatively in Sections 5.5 (Air Quality Environmental Consequences) and 5.6 (Greenhouse Gas Environmental Consequences) of the EIS/EIR, and therefore is not included in this appendix. TACs are compounds that are known or suspected to cause adverse carcinogenic or non-carcinogenic human health effects after short-term (acute) or long-term (chronic) exposure. This evaluation assesses the individual cancer risks and non-cancer chronic impacts associated with construction of the Action Alternatives to residential/sensitive receptors and offsite workers.[1]

Individual cancer risk represents the chance that a person would contract cancer resulting from long-term exposure to the TACs of concern. A non-cancer chronic hazard index represents the potential for non-cancer health impacts resulting from long-term exposure to TACs. An acute non-cancer hazard index represents the potential for non-cancer health impacts resulting from a short-term (i.e., one-hour) exposure to TACs. Population cancer burden is the potential increase in the number of cancer cases in the affected population.

H4.2. Health Risk Estimation Approach

Since the Action Alternatives would produce TAC emissions only during temporary construction activities and because emissions would occur at a considerable distance from the nearest residential and sensitive receptors, a detailed health risk assessment was not performed. Instead, results of the PM_{10} dispersion modeling, detailed in Appendix H2, and CARB's Hotspots Analysis and Reporting Program (HARP) were used to estimate maximum cancer risks. HARP's Risk Assessment Standalone Tool (RAST), which calculates potential health impacts using ground level TAC concentrations, was used to estimate health impacts (CARB 2019a).

TAC-related cancer risk in the Port area is dominated by emissions of diesel particulate matter (DPM), a TAC and component of diesel exhaust. This health risk evaluation used the annual PM_{10} concentrations predicted by AERMOD (Appendix H2) during construction as a proxy for DPM. Although conservative, the approach is appropriate because more than 99 percent of PM_{10} emissions associated with construction of the Action Alternatives would be from diesel exhaust. Non-exhaust PM_{10} (i.e., fugitive dust, entrained road dust, tire wear, brake wear) would be limited to the project's minimal land-based construction activities.

Cancer risk at the maximally-impacted residential/sensitive receptor was calculated by HARP assuming the exposure period would start in the receptor's third trimester of gestation ("3TM") and continue for the duration of construction. Cancer risks were calculated separately for the period of the third trimester until just before the second birthday (referred to as "3TM < 2") and the period of the second birthday until just before the sixth birthday ("2 < 6") due to different risk sensitivity assumptions in HARP. The two resulting risk values were then added together to produce the final risk result. The receptor age period 3TM < 2 was conservatively modeled with the average PM_{10} concentration during the two consecutive years with the greatest construction emissions because this age period has the greatest cancer risk sensitivity according to OEHHA guidelines (OEHHA 2015). The receptor age period 2 < 6 was modeled with the average PM_{10} concentration during all other years of construction. The average PM_{10} concentrations

[1] Sensitive receptors were conservatively evaluated with residential exposure assumptions.

during these two exposure periods were estimated by scaling the PM_{10} concentration during the year of maximum emissions (Appendix H2) by the ratio of DPM emissions from the respective periods. Residential cancer risk was calculated by HARP using the “RMP derived” option in accordance with SCAQMD's *AB 2588 and Rule 1402 Supplemental Guidelines* (SCAQMD 2018).

Cancer risk at the maximally-impacted occupational receptor was calculated by HARP assuming an average PM_{10} concentration over the entire construction period. The average PM_{10} concentration was estimated by scaling the PM_{10} concentration during the year of maximum emissions (Appendix H2) by the ratio of DPM emissions from the respective periods. Occupational cancer risk was estimated using the “OEHHA derived” option in accordance with SCAQMD's *AB 2588 and Rule 1402 Supplemental Guidelines*.

Chronic hazard indices at the maximally-impacted residential/sensitive and occupational receptors were directly calculated by dividing the PM_{10} concentration during the year of maximum emissions (Appendix H2) by the Chronic Reference Exposure Level of 5.0 ug/m3 as published in CARB's *Consolidated Table of OEHHA/ARB Approved Risk Assessment Health Values* (CARB 2019b).

Acute non-cancer impacts and population cancer burden are addressed qualitatively. Past Port projects have consistently shown that the non-cancer acute hazard index and population cancer burden would not exceed SCAQMD thresholds. For example, the residential cancer risk for the Port’s recent Pier B On-Dock Rail Support Facility project (POLB 2016) was estimated to be 8.7 in a million with mitigation, and the associated population cancer burden was estimated to be only 0.27 (POLB 2016), about one-half of the significance threshold of 0.5.

Table H4-1 shows that the Action Alternatives would produce maximum cancer risks roughly similar to Pier B; however, most activities associated with the Action Alternatives would occur over water and further from population centers than the Pier B project. Therefore, the population cancer burden for the Action Alternatives would likely be lower than 0.27 calculated for Pier B. Similarly, acute non-cancer impacts would also likely be lower than the 0.07 acute hazard index calculated for Pier B and therefore below the SCAQMD threshold of 1.

H4.3. Predicted Air Quality Impacts

Table **H4-1** presents the estimated residential cancer risk, off-site occupational cancer risk, residential chronic hazard index, and off-site occupational chronic hazard index associated with each Action Alternative using the methodology described above. The table shows that the cancer risk at the maximally-impacted residential/sensitive receptor would exceed the significance threshold for Alternative 4, both without and with mitigation. The residential/sensitive cancer risks associated with Alternatives 2, 3, and 5 would be below the threshold, both without and with mitigation. The occupational cancer risks and residential and occupational chronic hazard indices would be well below the thresholds for all Action Alternatives, both without and with mitigation.

Table H4-1. Estimated Cancer Risks Associated with Construction of the Action Alternatives

	Construction DPM Emissions [a]				Estimated DPM Concentration at the Maximum Residential Receptor			Estimated DPM Concentration at the Maximum Occupational Receptor		Estimated Individual Cancer Risk		Estimated Chronic Hazard Index [m]	
Alternative	**Maximum Year (lb/yr) [b]**	**Average Years 1-2 (lb/yr) [c]**	**Average Years 3-6 (lb/yr) [d]**	**Average Years 1-6 (lb/yr) [e]**	**Maximum Year (ug/m3) [f]**	**Average Years 1-2 (ug/m3) [g]**	**Average Years 3-6 (ug/m3) [h]**	**Maximum Year (ug/m3) [i]**	**Average Years 1-6 (ug/m3) [j]**	**Maximum Residential Receptor [k]**	**Maximum Occupational Receptor [l]**	**Maximum Residential Receptor**	**Maximum Occupational Receptor**
Alt 2 Unmitigated	12,645	9,405	107	3,207	2.3E-02	1.7E-02	1.9E-04	9.4E-02	2.4E-02	5.8E-06	3.7E-07	0.005	0.02
Alt 2 Mitigated	8,529	5,656	67	1,930	1.2E-02	7.7E-03	9.1E-05	4.6E-02	1.0E-02	2.6E-06	1.6E-07	0.002	0.009
Alt 3 Unmitigated	19,263	13,335	723	4,927	2.9E-02	2.0E-02	1.1E-03	1.1E-01	2.8E-02	6.9E-06	4.4E-07	0.006	0.02
Alt 3 Mitigated	15,108	9,225	344	3,305	2.0E-02	1.2E-02	4.6E-04	6.1E-02	1.3E-02	4.2E-06	2.1E-07	0.004	0.01
Alt 4 Unmitigated	27,035	19,484	5,077	9,879	5.0E-02	3.6E-02	9.4E-03	1.5E-01	5.4E-02	1.3E-05	8.4E-07	0.01	0.03
Alt 4 Mitigated	26,824	17,324	2,472	7,422	4.7E-02	3.0E-02	4.3E-03	1.0E-01	2.8E-02	1.1E-05	4.3E-07	0.009	0.02
Alt 5 Unmitigated	19,263	13,335	2,253	5,947	2.9E-02	2.0E-02	3.4E-03	1.1E-01	3.4E-02	7.2E-06	5.3E-07	0.006	0.02
Alt 5 Mitigated	15,108	9,225	1,035	3,765	2.0E-02	1.2E-02	1.4E-03	6.1E-02	1.5E-02	4.3E-06	2.4E-07	0.004	0.01
Threshold										**1.0E-05**	**1.0E-05**	**1**	**1**

Notes:

a. DPM emissions are from the emission calculations for each alternative, as described in Appendix H1.

b. This emission rate represents the maximum year of construction emissions, which occurs during dredging of the Approach Channel (hopper dredge). It is used in the chronic hazard index calculation.

c. This emission rate includes the two consecutive years with the greatest construction emissions. It is used in the residential cancer risk calculation for receptor age 3TM < 2.

d. This emission rate includes all remaining construction years except for the two consecutive years with the greatest emissions. It is used in the residential cancer risk calculation for receptor age 2 < 6.

e. This emission rate equals total construction emissions averaged over 6 years, which is the exposure duration selected in the HARP analysis to cover the alternative with the longest duration (6 years for Alternative 4). It is used in the occupational cancer risk calculation.

f. To be consistent with HARP HRA methodology, this concentration is the equivalent of the AERMOD "PERIOD" average using a 5-year meteorological data set; the emission rate modeled in AERMOD was the maximum annual PM_{10} emissions converted to g/s. This concentration is used to determine the residential chronic hazard index. The dispersion modeling methodology is described in Appendix H2.

g. The estimated Average Years 1-2 Concentration = Maximum Year Concentration x Average Years 1-2 Emissions / Maximum Year Emissions. This concentration is used in the residential cancer risk calculation for receptor age 3TM < 2.

h. The estimated Average Years 3-6 Concentration = Maximum Year Concentration x Average Years 3-6 Emissions / Maximum Year Emissions. This concentration is used in the residential cancer risk calculation for receptor age 2 < 6.

i. To be consistent with HARP HRA methodology, this concentration is the AERMOD "PERIOD" average using a 5-year meteorological data set; the emission rate modeled in AERMOD was the maximum annual PM_{10} emissions converted to grams per second. This concentration is used to determine the occupational chronic hazard index. The dispersion modeling methodology is described in Appendix H2.

j. The estimated Avg Years 1-6 Concentration = Maximum Year Concentration x Avg Years 1-6 Emissions / Maximum Year Emissions. This concentration is used in the occupational cancer risk calculation.

k. Residential cancer risk was calculated using HARP Risk Assessment Standalone Tool (RAST) (run at a unit concentration of 1 ug/m3 and scaled to the Project modeled concentration). The exposure period was assumed to start in the 3rd trimester of gestation (3TM) and continue for the duration of construction. The risks for receptor age 3TM < 2 and 2 < 6 were calculated separately due to different exposure parameters, and added together. Residential cancer risk was estimated using RMP derived methodology in accordance with SCAQMD's AB 2588 and Rule 1402 Supplemental Guidelines (September 2018). The HARP RAST residential cancer risk results at a DPM unit concentration of 1 ug/m3 are 3.42E-04 for receptor age 3TM < 2 (2-year exposure) and 1.14E-04 for receptor age 2 < 6 (4-year exposure).

l. Occupational cancer risk was calculated using HARP RAST (run at a unit concentration of 1 ug/m3 and scaled to the Project modeled concentration). The exposure period was assumed to be for the duration of construction (up to 6 years depending on the alternative). Occupational cancer risk was estimated using OEHHA derived methodology in accordance with SCAQMD's AB 2588 and Rule 1402 Supplemental Guidelines (September 2018). The HARP RAST occupational cancer risk results at a DPM unit concentration of 1 ug/m3 are 1.55E-05 (6-year exposure).

m. The chronic hazard index was directly calculated by dividing the maximum year concentration by the Chronic Reference Exposure Level of 5.0 ug/m3 as published in CARB's Consolidated Table of OEHHA/ARB Approved Risk Assessment Health Values. https://ww3.arb.ca.gov/toxics/healthval/contable.pdf. (CARB, 2019b).

Table H4-2 presents locations of sensitive receptors in the project vicinity.

Table H4-2. Sensitive Receptors

Receptor No.	UTM X (m)	UTM Y (m)	Receptor Description	Category	Street Address	City
1	389912	3738586	12th Street Head Start	Child Care	1212 Long Beach Blvd	Long Beach
2	389883	3738053	8th Street Early Head Start	Child Care	820 Long Beach Blvd	Long Beach
3	390048	3737366	A Love 4 Learning Academy	Child Care	306 Elm Avenue	Long Beach
4	389599	3738178	ABC 123 Long Beach Learning Center	Child Care	909 Pine Ave	Long Beach
5	387995	3740853	Agu Family Child Care	Child Care	4400 Boyar Ave	Long Beach
6	389600	3738360	Aspiranet Foster Family Agency	Child Care	1043 Pine Ave	Long Beach
7	390314	3739617	Atlantic Headstart	Child Care	1862 Atlantic Ave	Long Beach
8	390224	3738014	Benford Family Child Care	Child Care	530 E 8th St	Long Beach
9	388691	3740431	Briggs Family Child Care	Child Care	Golden Ave	Long Beach
10	387340	3741495	Brown Family Child Care	Child Care	1831 W Jeanette Pl	Long Beach
11	386680	3739773	Cabrillo Child Development Center	Child Care	2205 San Gabriel Ave.	Long Beach
12	388011	3741615	Carol Daycare	Child Care	2842 Easy Ave	Long Beach
13	386767	3739844	Century Villages at Cabrillo Homeless Housing Community	Child Care	2001 River Ave	Long Beach
14	390062	3738250	Child Care Center At St Mary Medical Center	Child Care	930 Elm Ave	Long Beach
15	388899	3737062	Childtime Learning Center	Child Care	1 World Trade Ctr # 199	Long Beach
16	389481	3741039	Comprehensive Child Development	Child Care	2565 Pacific Ave.	Long Beach
17	387982	3740075	Costa Family Child Care	Child Care	2085 Easy Ave	Long Beach
18	388870	3737870	Edison Child Development Center	Child Care	640 W 7th St	Long Beach
19	389981	3738882	Elm Street Head Start	Child Care	1425 & 1429 Elm Ave	Long Beach
20	388635	3741379	Fords Family Day Care	Child Care	2726 San Francisco Ave	Long Beach
21	388088	3740588	Franklin Day Care Center	Child Care	2333 Fashion Ave	Carson
22	387556	3739981	Gallegos Family Child Care	Child Care	2024 Adriatic Ave	Long Beach
23	387670	3740411	Garfield Head Start	Child Care	2240 Baltic Ave	Long Beach
24	390403	3740229	Garibay Family Child Care	Child Care	2172 Lime Ave	Long Beach
25	388688	3740334	Hernandez Family Child Care	Child Care	2200 Golden Ave	Long Beach
26	388894	3740733	Hernandez Family Child Care	Child Care	5322 Elm Ave	Long Beach
27	388832	3740311	Herrera Family Child Care	Child Care	737 W Hill St	Long Beach
28	387501	3739748	Job Corp Head Start	Child Care	1903 Santa Fe Ave.	Long Beach
29	390444	3739033	Jones Family Child Care	Child Care	2275 Baltic Ave	Long Beach
30	390594	3738247	Kelly's Care	Child Care	943 N Washington Pl	Long Beach

Receptor No.	UTM X (m)	UTM Y (m)	Receptor Description	Category	Street Address	City
31	388725	3741155	Kelly's Kids Daycare Center	Child Care	855 W Willow St	Long Beach
32	390195	3739970	Kim Family Child Care	Child Care	2035 Linden Ave	Long Beach
33	388192	3740542	Lara Family Day Care	Child Care	1303 W 253rd St	Harbor City
34	383107	3737969	Lil Cowpoke Preschool	Child Care	445 N Avalon Blvd	Wilmington
35	389577	3738176	Little Lighthouse Educational Childcare Center	Child Care	911 Pine Avenue	Long Beach
36	389940	3740373	Long Beach Blvd Head Start	Child Care	2236 Long Beach Blvd	Long Beach
37	390373	3740260	Long Beach Center for Child Development	Child Care	622 E. Hill St	Long Beach
38	390533	3740347	Long Beach Child Development Center	Child Care	2222 Olive Ave	Long Beach
39	389282	3739139	Long Beach Day Nursery - West Branch	Child Care	1548 Chestnut Ave	Long Beach
40	388917	3737693	Loves Family Child Care	Child Care	527 Daisy Ave	Long Beach
41	388856	3738266	Lucy's Baby Care	Child Care	940 Maine Ave	Long Beach
42	390021	3738204	Montessori On Elm Preschool + Kindergarten	Child Care	930 Elm Ave	Long Beach
43	389217	3739222	N2 Lil Folkz	Child Care	1624 Chestnut Ave	Long Beach
44	389533	3741212	Oakwood Children's Center	Child Care	2650 Pacific Ave	Long Beach
45	389020	3739872	P.A.L. Family Day Care	Child Care	1980 Daisy Ave	Long Beach
46	389472	3740264	Pacific Head Start	Child Care	2179 Pacific Ave	Long Beach
47	387188	3740575	Patterson Family Child Care	Child Care	2133 Canal Ave	Long Beach
48	389579	3738221	Pine Head Start	Child Care	927 Pine Ave	Long Beach
49	390399	3739915	Poole Family Child Care	Child Care	2002 Lime Ave	Long Beach
50	389621	3738176	Progressive Steps Children Center	Child Care	911 Pine Ave	Long Beach
51	389036	3741241	Ruiz Family Daycare	Child Care	2670 Daisy Ave	Long Beach
52	389765	3740701	Sandford Family Child Care	Child Care	215 E Burnett St	Long Beach
53	390098	3740230	Sar Family Child Care	Child Care	2171 Pasadena Ave	Long Beach
54	390623	3740004	Smart & Manageable	Child Care	2054 Myrtle Ave	Long Beach
55	389894	3738960	Un Mundo De Amigos Preschool	Child Care	1480 Long Beach Blvd	Long Beach
56	389193	3738664	West Anaheim Child Care Center	Child Care	440 W. Anaheim St	Long Beach
57	387505	3740187	West Child Development Center/Westside Neighborhood Clinic	Child Care	2125 Santa Fe Ave.	Long Beach
58	384704	3739154	Wilmington Park Children's Center	Child Care	1419 E Young St	Wilmington
59	390296	3737362	YMCA GLB Fairfield 3rd Street Preschool	Child Care	607 E. 3rd St	Long Beach
60	389492	3740248	YMCA Play & Learn Preschool	Child Care	2179 Pacific Ave	Long Beach
61	389517	3739600	Young Horizons Child Development Center	Child Care	1840 Pacific Ave	Long Beach
62	389536	3740757	Young Horizons Child Development Center	Child Care	2418 Pacific Ave	Long Beach

Receptor No.	UTM X (m)	UTM Y (m)	Receptor Description	Category	Street Address	City
63	390248	3737686	Young Horizons Child Development Center	Child Care	501 Atlantic Ave	Long Beach
64	389459	3737689	Young Horizons/El Jardin de la Felicidad	Child Care	507 Pacific Ave	Long Beach
65	388854	3740055	Zarate Family Child Care	Child Care	2496 Oregon Ave	Long Beach
66	390353	3741373	Akin's Post Acute Rehab Hospital; Atlantic Memorial Healthcare Center	Elder Care	2750 Atlantic Ave	Long Beach
67	383100	3738224	American AAA Health Care Center	Elder Care	629 N Avalon Blvd	Wilmington
68	387401	3740832	Aquarius Home	Elder Care	1765 Aquarius St	Long Beach
69	387445	3739252	Bay Breeze Care	Elder Care	1653 Santa Fe Ave	Long Beach
70	389740	3736892	Breakers Of Long Beach, The	Elder Care	210 E Ocean Blvd	Long Beach
71	387440	3740697	Burnett Home Care	Elder Care	1740 West Burnett St.	Long Beach
72	390386	3740307	Caruthers Royale Care	Elder Care	2204 Lime Ave.	Long Beach
73	389587	3740686	Deluxe Guest Home	Elder Care	3260 Pine Ave	Long Beach
74	389586	3740722	Deluxe Guest Home II	Elder Care	3266 Pine Ave	Long Beach
75	389401	3740862	Garden, The	Elder Care	2485 Cedar Ave	Long Beach
76	389119	3738782	Harbor View Rehabilitation Center	Elder Care	490 W. 14th Street	Long Beach
77	387192	3740865	Hayes Home	Elder Care	2470 Hayes Ave	Long Beach
78	389645	3737994	Healthview Pine Villa Assisted Living	Elder Care	117 East 8th Street	Long Beach
79	389498	3740798	Heritage Board & Care #2	Elder Care	1509 E 4th St	Long Beach
80	387231	3740475	Loram Manor	Elder Care	1925 Gemini St	Long Beach
81	390455	3738345	Olive Tree Home	Elder Care	1035 Olive Street	Long Beach
82	390278	3738221	Padua House	Elder Care	940 Atlantic Ave	Long Beach
83	387154	3741415	Pioneer Homes Of California	Elder Care	2041 W Carolyn Pl	Long Beach
84	387349	3740831	Reliable Residential Care	Elder Care	1840 Aquarius St	Long Beach
85	390005	3740389	Right At Home	Elder Care	2245 Elm Ave	Long Beach
86	389478	3741347	Royal Care Skilled Nursing Center	Elder Care	2725 Pacific Avenue	Long Beach
87	390388	3740918	Serra Project Long Beach	Elder Care	1043 Elm Ave	Long Beach
88	390475	3738176	Villa Maria Care Center	Elder Care	723 E 9th St	Long Beach
89	389978	3741459	Earl & Lorraine Miller Children's Hospital; Long Beach Memorial Medical Center and Hospital	Hospital	2801 Atlantic Ave	Long Beach
90	389449	3739338	Long Beach Doctors Hospital	Hospital	1725 Pacific Ave	Long Beach
91	389539	3741329	Pacific Hospital of Long Beach (Hospital and Convalescent/Nursing Home)	Hospital	2776 Pacific Ave	Long Beach
92	390100	3738380	St Mary Medical Center	Hospital	1050 Linden Ave	Long Beach
93	389215	3739462	Tom Redgate Memorial Hospital	Hospital	1775 Chestnut Ave	Long Beach

Receptor No.	UTM X (m)	UTM Y (m)	Receptor Description	Category	Street Address	City
94	387362	3740183	Admiral Kidd Park	Recreational	2125 Santa Fe Ave	Long Beach
95	388669	3737500	Cesar Chavez Park	Recreational	401 Golden Avenue	Long Beach
96	388060	3738639	City of Long Beach Multi-Service Center	Recreational	1301 W. 12th Street	Long Beach
97	387306	3739448	Harbor Japanese Community Cultural Center	Recreational	1766 Seabright Ave	Long Beach
98	386955	3740430	Hudson Park	Recreational	2335 Webster Ave	Long Beach
99	387067	3741097	Khemara Buddhikaram Cambodian Buddhist Temple	Recreational	2100 W Willow Street	Long Beach
100	387129	3740300	Pramuan Simsriwatna Place of Worship	Recreational	2015 W Hill Street	Long Beach
101	386856	3739792	VA Long Beach Clinic and Veteran's Support Services	Recreational	2001 River Ave, Building 28	Long Beach
102	382237	3737492	Wilmington Waterfront Park	Recreational	S. C Street	Wilmington
103	383262	3736996	Wilmington Waterfront Promenade	Recreational	Water Street	Wilmington
104	384770	3739365	Apostolic Faith Center/Apostolic Faith Academy	School	1530 E Robidoux St	Wilmington
105	389454	3738592	Artesia Well Preparatory Academy	School	1235 Pacific Ave	Long Beach
106	386739	3740042	Bethune School/Program for the Homeless	School	2101 San Gabriel Ave	Long Beach
107	390228	3740326	Burnett Elementary	School	565 East Hill St.	Long Beach
108	387438	3739936	Cabrillo High School	School	2001 Santa Fe Ave.	Long Beach
109	389562	3740833	Cambodian Christian	School	2474 Pacific Ave	Long Beach
110	388744	3737296	Cesar Chavez Elementary	School	730 West Third St.	Long Beach
111	389879	3739303	Colegio New City	School	1637 Long Beach Blvd	Long Beach
112	390505	3737788	Constellation Community Charter Middle	School	620 Olive Ave.	Long Beach
113	388749	3737794	Edison Elementary	School	625 Maine Ave.	Long Beach
114	386969	3740593	Elizabeth Hudson Elementary School and Development Center Daycare	School	2335 Webster Ave	Long Beach
115	389624	3738317	First Baptist Church School	School	1000 Pine Ave	Long Beach
116	390180	3738228	First Lutheran Day Care, Preschool and Elementary School	School	946 Linden Ave	Long Beach
117	382757	3737606	Gang Alternative Program	School	231 Island Ave	Wilmington
118	382820	3738093	George de la Torre Jr. Elementary School	School	500 Island Ave	Wilmington
119	389389	3738887	George Washington Middle School	School	1450 Cedar Ave	Long Beach
120	384377	3739369	Holy Family Preschool and Elementary School	School	1122 E Robidoux St	Wilmington
121	389544	3740927	Holy Innocents Elementary School	School	2500 Pacific Ave	Long Beach
122	387067	3740604	Hudson Development Center Daycare and Elementary School	School	2335 Webster Ave	Long Beach
123	389714	3737893	International Elementary	School	700 Locust Ave	Long Beach
124	389686	3741436	Jackie Robinson Academy	School	2750 Pine Ave	Long Beach
125	387724	3740376	James Garfield Elementary School / LBUSD Child Development Center	School	2240 Baltic Ave	Long Beach

Receptor No.	UTM X (m)	UTM Y (m)	Receptor Description	Category	Street Address	City
126	387255	3739936	Juan Rodriguez Cabrillo High School	School	2001 Santa Fe Ave	Long Beach
127	389235	3740749	Lafayette Elementary School	School	2445 Chestnut Ave	Long Beach
128	390207	3737910	Long Beach Montessori School	School	525 E. 7th St	Long Beach
129	390337	3739143	Polytechnic High School	School	1600 Atlantic Ave.	Long Beach
130	389106	3738800	Regency High School	School	490 W. 14th Street	Long Beach
131	387111	3740236	Reid Continuation High School	School	2153 W Hill St	Long Beach
132	389785	3738088	Renaissance High School for the Arts	School	235 East 8th St.	Long Beach
133	390160	3739058	Roosevelt Elementary	School	1574 Linden Ave.	Long Beach
134	390534	3737794	Saint Anthony High School	School	620 Olive Ave.	Long Beach
135	390580	3737582	Saint Anthony Preschool / Elementary	School	855 East 5th St.	Long Beach
136	387406	3740569	Saint Lucy School	School	2320 Cota Ave.	Long Beach
137	387022	3740319	Savannah Academy	School	2152 Hill St.	Long Beach
138	390248	3737371	Select Community Day School	School	5869 Atlantic Ave.	Long Beach
139	390538	3737763	St. Anthony High School/Constellation Community Charter Middle	School	620 Olive Ave.	Long Beach
140	387420	3740551	St. Lucy School	School	2320 Cota Ave	Long Beach
141	387250	3741600	Stephens Middle School	School	1830 West Columbia Street	Long Beach
142	390365	3737647	Stevenson Elementary; Stevenson Child Development Centers/Preschool	School	515 Lime Ave.	Long Beach
143	389624	3738615	The New City School	School	1230 Pine Ave	Long Beach
144	390276	3738162	True Social Justice Academy	School	630 Magnolia Ave	Long Beach
145	387129	3741587	William Logan Stephens Middle School	School	1830 W Columbia St	Long Beach
146	384625	3739124	Wilmington Park Elementary School/Mahar House	School	1140 Mahar Ave	Wilmington

Note: Individual residences are not included in the table and accompanying figure.

The locations of sensitive receptors in Table H4-2 are shown on Figure 3-4 in Section 3.5.

H4.4. References for Appendix H4

CARB 2019a. Hotspots Analysis and Reporting Program (HARP). Risk Assessment Standalone Tool (RAST). Version 19044. https://ww3.arb.ca.gov/toxics/harp/harp.htm. February 13.

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OEHHA 2015. Office of Environmental Health Hazard Assessment. *Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments.* March 2015.

POLB 2016. Port of Long Beach. *Pier B On-Dock Rail Support Facility Draft EIR*, Appendix A, Table A3-7. December 2016. Available: http://www.polb.com/environment/docs.asp. Accessed: September 2019.

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Appendix H5. General Conformity Determination

Deep Draft Navigation Project

Port of Long Beach, California

Final General Conformity Determination

June 2021

US Army Corps of Engineers

Los Angeles District

Table of Contents

1 Introduction

Section 176 (c) of the Clean Air Act (42 U.S.C. § 7506(c)) requires any entity of the Federal government that engages in, supports, or in any way provides financial support for, licenses or permits, or approves any activity to demonstrate that the action conforms to the applicable State Implementation Plan (SIP) required under Section 110 (a) of the Clean Air Act (42 U.S.C. § 7410(a)) before the action is otherwise approved. In this context, conformity means that such Federal actions must be consistent with a SIP's purpose of eliminating or reducing the severity and number of violations of national ambient air quality standards (NAAQS) and achieving expeditious attainment of those standards. Each Federal agency (including the U.S. Army Corps of Engineers [USACE]) must determine that any action that is proposed by the agency and that is subject to the regulations implementing the conformity requirements will, in fact, conform to the applicable SIP before the action is taken.

This final general conformity determination documents the evaluation of the Federal actions with Section 176 (c) requirements of the Clean Air Act. The remainder of Section 1 discusses the background of the regulatory requirements. Section 2 discusses the USACE's Federal actions. Section 3 discusses the regulatory procedures for the conformity evaluation. Section 4 describes how applicability of the conformity requirements to the Federal actions were analyzed. Section 5 presents the methods and criteria that were used to evaluate the conformity of the Federal actions. Section 6 discusses the concepts of mitigation required under conformity regulations. Section 7 presents the reporting process to be followed to formalize the conformity determination. Section 8 offers the USACE's findings and conclusions. Section 9 provides references for the evaluation.

1.1 General Conformity Requirements

On November 30, 1993, the U.S. Environmental Protection Agency (EPA) promulgated final general conformity regulations at 40 C.F.R. Part 93 Subpart B for all Federal activities except those covered under transportation conformity. The EPA issued final revised general conformity regulations on April 5, 2010. The general conformity regulations apply to a Federal action in a nonattainment or maintenance area if the total of direct and indirect emissions of the relevant criteria pollutants and precursor pollutants caused by the Federal action equal or exceed certain applicability rates (also known as de minimis levels), thus requiring the Federal agency to make a determination of general conformity. By requiring an analysis of direct and indirect emissions, EPA intended the regulating Federal agency to make sure that only those emissions that are reasonably foreseeable and that the Federal agency can practicably control subject to that agency's continuing program responsibility will be addressed.

The general conformity regulations incorporate a stepwise process, beginning with an applicability analysis. Before any approval is given for a Federal action to go forward, the regulating Federal agency must apply the applicability requirements found at 40 C.F.R. § 93.153(b) to the Federal action(s) to evaluate whether, on a pollutant-by-pollutant basis, a determination of general conformity is required. The applicability analysis can be (but is not required to be) completed concurrently with any analysis required under the National Environmental Policy Act (NEPA). If the regulating Federal agency determines that the general conformity regulations do not apply to the Federal action, no further analysis or documentation is required. If the general conformity regulations do apply to the Federal action, the regulating Federal agency must next conduct a conformity evaluation in accord with the criteria and procedures in the implementing regulations, publish a draft determination of general conformity for public review, and then publish the final determination of general conformity.

2 Description of the Federal Action

In accordance with applicable general conformity regulations and guidance when a general conformity determination is necessary, the USACE is only required to conduct a general conformity evaluation for a specific Federal action associated with the selected alternative for a project or program (EPA 1994), and the USACE must issue a positive conformity determination before the Federal action is approved.[1] Each Federal agency is responsible for determining conformity of those proposed actions over which it has jurisdiction. This final general conformity determination is related only to those activities included in the USACE's Federal action pertaining to the Project, which is more fully described in Section 2.1.

The general conformity requirements only apply to Federal actions proposed in nonattainment areas (i.e., areas where one or more NAAQS are not being achieved at the time of the proposed action and requiring SIP provisions to demonstrate how attainment will be achieved) and in maintenance areas (i.e., areas recently reclassified from nonattainment to attainment and requiring SIP provisions pursuant to Section 175A of the Clean Air Act to demonstrate how attainment will be maintained). The attainment status of the South Coast Air Basin (SCAB) in the vicinity of Port of Long Beach (POLB) is discussed in Section 4.1.

2.1 Navigation Improvements for Deep Draft Vessels

The Federal actions related to the POLB Deep Draft Navigation Project (proposed Project) include the General Navigation Features and the Local Service Facilities (LSF) with the USACE's regulatory purview. As indicated in the Integrated Feasibility Report with Environmental Impact Statement/Environmental Impact Report (EIS/EIR), the preferred alternative is Alternative 3 which includes the following:

- Construction of navigation improvements at POLB to improve deep draft vessel operations. The Federal construction project includes management measures for container vessels (constructing the Pier J Approach Channel and Turning

[1] Although General Conformity Regulations were revised in 2010, this guidance remains generally applicable.

Basin and deepening the West Basin Channel to a new depth of -55 feet mean lower low water (MLLW)), liquid bulk vessels (deepening the Approach Channel to -80 feet MLLW, and bend easing in portions of the Main Channel to match the currently authorized depth in the Main Channel of -76 feet MLLW).

- Issuance of a Department of the Army permit for construction of LSFs. LFSs are features not included in the Federal construction project but are improvements in adjoining areas that would be constructed by the POLB to account for the deepened Federal channels. These include berth dredging and potential wharf improvements to account for the deepened Federal channels. In particular, LSFs includes deepening of Pier J Basin and berths to a new depth of -55 feet MLLW, and Pier J breakwaters improvements at the entrance of the Pier J Slip. Though outside the Federal construction project, their construction is subject to the USACE's regulatory purview pursuant to Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act.

- Dredged material from both the General Navigation Features and LSFs would be disposed via a combination of nearshore placement at the Surfside Borrow Site Nearshore Placement Area and ocean dredge material disposal site (LA-2 and LA -3).

Per 40 C.F.R. § 93.152, USACE's Federal authority would extend only to construction emissions associated with Alternative 3. The only reasonably foreseeable activities extending beyond the construction period and subject to USACE authority would be maintenance dredging, which is exempt from conformity applicability per 40 C.F.R. § 93.153(c). Hence, the USACE would have no continuing program responsibility for activities beyond construction.

3 Regulatory Procedures

The general conformity regulations establish certain procedural requirements that must be followed when preparing a general conformity evaluation. This section addresses the major procedural issues and specifies how these requirements are met for the evaluation of the Federal actions. The procedures required for the general conformity evaluation are similar but not identical to those for conducting an air quality impact analysis under NEPA regulations.

3.1 Use of Latest Planning Assumptions

The general conformity regulations require the use of the latest planning assumptions for the area encompassing the Federal actions, derived from the estimates of population, employment, travel, and congestion most recently approved by the Metropolitan Planning Organization (MPO, 40 C.F.R. § 93.159(a)).

The Southern Association of Governments (SCAG) is the MPO for the region encompassing POLB. The SCAG region covers an area of over 38,000 square miles and includes the counties of Imperial, Los Angeles, Orange, Riverside, San Bernardino, and Ventura. The applicable planning document encompassing the Federal actions is the Regional Transportation Plan (RTP). The most current RTP is the 2020 RTP which SCAG approved on May 7, 2020.

It should be noted that the latest planning assumptions available from the MPO at the time of this evaluation may differ from the planning assumptions used in establishing the applicable SIP emissions budgets. The South Coast Air Quality Management District's (SCAQMD) most current approved SIP incorporated estimates and projections from the 2016 RTP. Likewise, air quality analysis in the EIS/EIR for the proposed Project also incorporated estimates and projections from the 2016 RTP.

3.2 Use of Latest Emission Estimation Techniques

The general conformity regulations require the use of the latest and most accurate emission estimation techniques available, unless such techniques are inappropriate (40 C.F.R. § 93.159(b)). Prior written approval from EPA is required to modify or substitute emission estimation techniques. It should be noted that the latest and most accurate emission estimation techniques available at the time of this evaluation may differ from the emission estimation techniques used in establishing the applicable SIP emissions budgets.

Air pollutant emissions for the proposed action were calculated using the most current emission factors and methods available at the time the calculations were performed including:

- Dredging Equipment. The Federal actions would use hopper and clamshell dredges. Hopper dredge engines are large marine engines used for propulsion and operation of the dredging equipment. Emission factors for hopper dredge propulsion and auxiliary engines therefore reflect existing EPA marine engine standards. Hopper dredge propulsion and auxiliary engines were assumed to be Tier 2 marine diesel engines.

  Clamshell dredges are not self-propelled and emission factors for these engines reflect existing EPA non-road engine standards; clamshell dredge engines were assumed to be Tier 3 non-road diesel engines.

  Both hopper dredge and clamshell dredge utilization, schedule, activity, engine size, and load factors were based on project-specific dredging requirements presented in Appendix A.

- On-road Equipment: Criteria pollutant emission factors reflect EPA on-road engine standards and California Air Resources Board (CARB) requirements. Emission factors were generated using CARB's on-road EMFAC2017 model for truck and passenger vehicle fleets representative of the South Coast region. Emissions include engine exhaust, entrained road dust, and brake and tire wear.

- Off-road Equipment: Criteria pollutant emission factors for off-road construction equipment reflect EPA non-road engine standards and CARB requirements. Emission factors were generated using CARB's 2017 OFFROAD Inventory Model for an average equipment fleet composition in the SCAB.

- Harbor Craft. Emission factors for harbor craft reflect EPA marine engine standards and harbor craft engine types common at the Port, as documented in the Port's Air Emissions Inventory. POLB's 2017 Air Emissions Inventory identifies that most harbor craft propulsion engines operating at the port in 2017 were EPA Tier 2 diesel engines and that approximately half of all harbor craft auxiliary engines were Tier 3. This analysis conservatively used EPA Tier 2 harbor craft emission standards for both propulsion and auxiliary engines.

- Fugitive Dust. PM_{10} and $PM_{2.5}$ fugitive dust emissions from construction activities such as debris loading and materials handling were calculated using emission factors from EPA's AP-42 emission factor handbook and default parameters for soil and wind conditions from CalEEMod. PM_{10} and $PM_{2.5}$ emissions from on- and off-site paved road dust were calculated using CARB's Miscellaneous Process Methodology.

The details of emissions estimating are described in Attachment C.

3.3 Emission Scenarios

The general conformity regulations require that the evaluation must reflect certain emission scenarios (40 C.F.R. §93.159(d)). Specifically, these scenarios must include emissions from the Federal actions for the following years: (1) the attainment year specified in the SIP, or if the SIP does not specify an attainment year, the latest attainment year possible under the Clean Air Act or the last year for which emissions are projected in the maintenance plan; (2) the year during which the total of direct and indirect emissions from the action is expected to be the greatest on an annual basis; and (3) any year for which the applicable SIP specifies an emissions budget. Table 1 specifies the years for which the general conformity evaluation was performed for comparison to the approved SIP.

Table 1. Emission Scenarios

Pollutant	NAAQS Attainment Designation	Attainment/ Maintenance Year	Greatest Emission Year	Emissions Budget Years
Ozone	Nonattainment (Extreme)	2022 [a], 2023 [b], 2031[c]	2025	2017-2030
CO	Attainment (Maintenance)	2030	2025	2017-2030
NO_2	Attainment (Maintenance)	2030	2025	2017-2030
PM_{10}	Attainment (Maintenance)	2030	2025	2017-2030
$PM_{2.5}$	Nonattainment (Serious)	2019 [d], 2021[e], 2025[f]	2025	2017-2030

a. 2016 AQMP, Table ES-1, 1979 1-hr ozone
b. 2016 AQMP, Table ES-1, 1997 8-hr ozone
c. 2016 AQMP, Table ES-1, 2008 8-hr ozone
d. 2016 AQMP, Table ES-1, 2006 24-hr $PM_{2.5}$
e. 2016 AQMP, Table ES-1, 2021 annual $PM_{2.5}$ (moderate)
f. 2016 AQMP, Table ES-1, 2021 annual $PM_{2.5}$ (serious)

4 Applicability Analysis

As stated previously, the first step in a general conformity evaluation is an analysis of whether the requirements apply to a Federal action proposed to be taken in a nonattainment or a maintenance area. Unless exempted by the regulations or otherwise presumed to conform, a Federal action requires a general conformity determination for each pollutant where the total of direct and indirect emissions caused by the Federal action would equal or exceed the applicability rate.

4.1 Attainment Status of South Coast Air Basin

POLB is located within Los Angeles County in the SCAB of southern California. The regulatory agencies with primary responsibility for air quality management in the SCAB include SCAQMD and CARB, with oversight by EPA. Pursuant to the Clean Air Act, EPA established NAAQS to protect the public health with an adequate margin of safety and secondary NAAQS to protect the public welfare for seven air pollutants. These pollutants are known as criteria pollutants: particulate matter with an equivalent aerodynamic diameter less than or equal to ten micrometers (μm) in diameter (PM_{10}), particulate matter with an equivalent aerodynamic diameter less than or equal to 2.5 μm in diameter ($PM_{2.5}$), sulfur dioxide (SO_2), carbon monoxide (CO), ozone (O_3), nitrogen dioxide (NO_2), and lead (Pb). EPA has delegated authority to SCAQMD to implement and enforce the NAAQS in the SCAB.

That portion of the SCAB encompassing POLB is designated as an extreme non-attainment area for ozone; serious non-attainment for $PM_{2.5}$; maintenance for PM_{10}, maintenance for CO, maintenance for NO_2, and attainment for SO_2 and non-attainment for Pb.

Estimates of Pb emissions were not calculated. Pb emissions from mobile sources in have significantly decreased due to the near elimination of Pb in fuels. Thus, emission factors databases such as EMFAC2017 do not provide estimated emissions for Pb. Little to no quantifiable and foreseeable Pb emissions would be generated by the Federal actions.

Thus, for purposes of the general conformity requirements, this evaluation addresses NO_2, O_3, CO, PM_{10}, and $PM_{2.5}$.

4.2 Exemptions from General Conformity Requirements

As noted previously, the general conformity requirements apply to a Federal action if the net project emissions equal or exceed certain applicability rates. The only exceptions to this applicability criterion are the topical exemptions summarized below. However, the emissions caused by the Federal action do not meet any of these exempt categories (except maintenance dredging and associated debris disposal pursuant to 40 C.F.R. § 93.153(c)(2)(ix)).

- Actions which would result in no emissions increase or an increase in emissions that is clearly below the de minimis levels (40 C.F.R. § 93.153(c)(2)). Examples include administrative actions and routine maintenance and repair.

- Actions where the emissions are not reasonably foreseeable (40 C.F.R. § 93.153(c)(3)).

- Actions which implement a decision to conduct or carry out a conforming program (40 C.F.R. § 93.153 (c)(4)).

- Actions which include major new or modified sources requiring a permit under the New Source Review (NSR) program (40 C.F.R. § 93.153(d)(1)).

- Actions in response to emergencies or natural disasters (40 C.F.R. § 93.153(d)(2)).

- Actions which include air quality research not harming the environment (40 C.F.R. § 93.153(d)(3)).

- Actions which include modifications to existing sources to enable compliance with applicable environmental requirements (40 C.F.R. § 93.153(d)(4)).

- Actions which include emissions from remedial measures carried out under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) that comply with other applicable requirements (40 C.F.R. § 93.153(d)(5)).

In addition to these topical exemptions, the general conformity regulations allow each Federal agency to establish a list of activities that are presumed to conform (40 C.F.R. § 93.153(f)). The USACE has not established a presumed-to-conform list of activities at the time of this evaluation.

4.3 Applicability Rates

The general conformity requirements will apply to a Federal action for each pollutant for which the total of direct and indirect emissions caused by the Federal action equal or exceed the applicability rates shown in Table 2. These emission rates are expressed in units of tons per year (tpy) and are compared to the total of direct and indirect emissions caused by Federal actions for the calendar year during which the net emissions are expected to be the greatest.

It should be noted that, because O_3 is a secondary pollutant (i.e., it is not emitted directly into the atmosphere but is formed in the atmosphere from the photochemical reactions of volatile organic compounds, VOC, and oxides of nitrogen, NOx, in the presence of sunlight), its applicability rate is based on primary emissions of its precursor pollutants - VOC and NOx. If the net emissions of either VOC or NOx equal or exceed the applicability rate for O_3 (EPA 1994), then the Federal actions are subject to a general conformity evaluation for O_3.

Table 2: SCAB Attainment Designations and General Conformity Applicability Rates

Pollutant	NAAQS Attainment Designation	General Conformity Applicability Rates (tpy)
Ozone	Nonattainment (Extreme)	10
CO	Attainment (Maintenance)	100
NO_2	Attainment (Maintenance)	100
PM_{10}	Attainment (Maintenance)	100
$PM_{2.5}$	Nonattainment (Serious)	70

4.4 Applicability for Federal Action

The applicability of the general conformity requirements to the Federal actions were evaluated by comparing the total of direct and indirect emissions (calculated as presented in Attachment C) for the calendar year of greatest emissions to the applicability rates specified in Table 2. Those pollutants that could not be excluded from applicability underwent a complete general conformity evaluation consistent with the procedures in Section 3 above using the methods in Attachment C and the criteria in Section 5 below.

4.4.1 Methodology

Attachment C presents the calculations used to estimate emissions associated with the proposed Federal actions. Equipment parameters and construction activities have been described in the Final EIS/EIR. This information has been incorporated into the emission calculations presented in Attachment C and summarized below.

4.4.2 Estimated Emissions and Comparison to Applicability Rates

Unmitigated Emissions

Emissions were calculated for precursors of ozone (VOC and NOx), CO, NO_2, PM_{10}, and $PM_{2.5}$ for construction activities associated with the Federal actions. Results are summarized in Table 3 for each year of construction. These data show that annual emissions from construction year 2025 would exceed the applicability rates for ozone (NOx and VOC as precursors), NO_2 and CO, construction years 2026 and 2027 would exceed the applicability rates for ozone (NOx precursor). Therefore, a general conformity determination is required for precursors of ozone (VOC and NOx), NO_2 and CO.

Table 3: Estimated Construction Emissions (Unmitigated)

Construction Year	PM_{10}	$PM_{2.5}$	Ozone (NO_x)	Ozone (VOC)	NO_2	CO
2024	0.2	0.2	4.1	0.2	4.1	2.3
2025	9.6	8.7	**194.8**	**10.8**	**194.8**	**106.7**
2026	3.7	3.4	**84.2**	4.7	84.2	47.3
2027	1.2	1.1	**28.0**	1.6	28.0	15.7
GC Applicability Rates	100	70	10	10	100	100

Mitigated Emissions

As part of a conformity evaluation, it may be necessary for the Federal agency to identify mitigation measures and mechanisms for their implementation and enforcement. For example, if a Federal action does not initially conform to the applicable SIP, mitigation measures could be pursued. If mitigation measures are used to support a positive conformity determination, the Federal agency must obtain a written commitment from the entity required to implement these measures and the Federal agency must include the mitigation measures as conditions in any permit or license granted for the Federal action (40 C.F.R. § 93.160). Mitigation measures may be used in combination with other criteria to demonstrate conformity.

The Federal actions, as evaluated herein, assume various air quality mitigation measures as described in the EIS/EIR. The measures were adapted from the POLB's

“Best Management Practices for Reducing Air Emissions from Construction Equipment” and were developed in conjunction with the 2010 Clean Air Action Plan. See Section 5.5.5 of the EIS/EIR. In particular, the mitigation measures include:

MM-AQ-1: Electric clamshell dredge. The use of an electric clamshell dredge shall be required for project clamshell dredging activities during the entire construction period of the project, and the construction of an electrical substation at Pier J is also required to provide electric power to the clamshell dredge.

MM-AQ-2: Construction-Related Harbor Craft. Construction-related harbor craft (tugboats, crew boats, and survey boats) with Category 1 or Category 2 marine engines shall meet EPA Tier 3 emission standards for marine engines. In addition, the construction contractor shall require all construction-related tugboats that home fleet in the San Pedro Bay Ports: 1) to shut down their main engines and 2) to refrain from using auxiliary engines while at dock and instead use electrical shore power, if feasible.

MM-AQ-3: Off-Road Construction Equipment. Self-propelled, diesel-fueled off-road construction equipment 25 hp or greater shall meet EPA/CARB Tier 4 Final emission standards for non-road equipment.

MM-AQ-4: Additional Mitigation for Off-Road Construction Equipment. Off-road diesel-powered construction equipment shall comply with the following:

- Construction equipment shall be maintained according to manufacturer’s specifications.
- Construction equipment shall not idle for more than 5 minutes when not in use.

With application of mitigation measures, estimated emissions are reduced to levels shown in Table 4. These data show that annual emissions from construction years 2025, 2026, and 2027 would exceed the applicability rate for NO_x (ozone precursor), and construction year 2025 would exceed the applicability rate for NO_2.

Table 4: Estimated Construction Emissions (Mitigated)

Construction Year	PM_{10}	$PM_{2.5}$	Ozone (NO_x)	Ozone (VOC)	NO_2	CO
2024	0.2	0.1	2.8	0.2	2.8	2.4
2025	7.6	6.7	**145.5**	8.1	**145.5**	86.9
2026	1.7	1.5	**35.8**	2.0	35.8	27.4
2027	0.6	0.5	**11.9**	0.7	11.9	9.1
GC Applicability Rates	100	70	10	10	100	100

4.4.3 Applicability Determination

The General Conformity Determination thus far has reported unmitigated and mitigated emissions associated with the Federal actions for disclosure. Henceforth, the General Conformity Determination will solely use mitigated emissions since the Federal actions will fully implement air quality mitigation measures listed above. These measures will be included in the final plans and specifications and become part of USACE construction contracts for the General Navigation Features and any Department of the Army permit for the LSFs. USACE will be responsible for monitoring and enforcing these mitigation measures.

The total of mitigated direct and indirect emissions of PM_{10}, $PM_{2.5}$, VOC (ozone precursor), and CO associated with the Federal actions are less than the general conformity applicability rates.

Based on the above:

- General Conformity requirements do not apply to PM_{10}, $PM_{2.5}$, VOC (ozone precursor), and CO. These pollutants are not further evaluated.
- General Conformity requirements do apply to NO_x (ozone precursor) and NO_2.

5 General Conformity Evaluation

For Federal actions subject to a general conformity evaluation, the regulations delineate several criteria that can be used to demonstrate conformity (40 C.F.R. § 93.158). In fact, a combination of these criteria may be used to support a positive general conformity determination (EPA 1994). The approach to be taken to evaluate the Federal actions relies on a combination of these available criteria, and the remainder of this section summarizes the findings to make the final determination.

5.1 Designation of Applicable SIP

Section 110(a) of the Clean Air Act (42 U.S.C. § 7410(a)) requires each state to adopt and submit to EPA a plan which provides for the implementation, maintenance, and enforcement of each NAAQS. This plan is known as the SIP. Over time, states have made and continue to make many such submittals to EPA to address issues as they arise related to the various NAAQS. As EPA reviews these submittals, it can either approve or disapprove them in whole or in part. The compilation of a state's approved submittals constitutes that state's applicable SIP. In California, the state agency responsible for preparing and maintaining the SIP is CARB.

5.1.1 SIP Process in the South Coast Air Basin

CARB designates both air quality management districts and air pollution control districts within California for the purpose of implementing and enforcing ambient air quality standards on a regional or air shed basis. These district agencies must prepare regional plans (Air Quality Management Plans [AQMPs]) to support the broader SIP, as well as to meet the goals of the California Clean Air Act.

The Federal actions at POLB are located within the SCAB which is within the geographic jurisdiction of the SCAQMD. The approved SIP for the SCAB is the 2016 AQMP.

5.2 Comparison of Construction Emissions to Emission Budgets

To support the general conformity determination, the USACE demonstrates herein that the emissions of NO_x (ozone precursor) and NO_2 caused by the Federal actions either will result in a level of emissions which, together with all other emissions in the nonattainment area, will not exceed the emissions budgets specified in the approved SIP (criterion at 40 C.F.R. § 93.158(a)(5)(i)(A)) or, in the alternative, will not exceed the emissions budgets specified in the 2016 AQMP.

The 2016 AQMP, which is the latest plan approved by EPA, established set-aside budgets to accommodate emissions subject to general conformity requirements. The set-aside accounts include 730 tpy of NOx and 182.5 tpy of VOC each year starting in 2017 through 2030, and 182.5 tpy of NOx and 73 tpy of VOC each year in 2031 and thereafter.

The 2016 AQMD does not establish set aside budgets for NO_2 as further explained below.

Table 7 below compares the construction emissions to the corresponding years from the 2016 AQMP budget for ozone precursor (NO_x).

Table 7: Comparison of NOx Emission to Approved SIP Budget

Construction Year	Pollutant	Construction Emissions (tpy)	Approved SIP Emissions Budget (tpy)[a]
2025	NO_x	145.5	730
2026	NO_x	35.8	730
2027	NO_x	11.9	730

a. 2016 AQMP III-2-87

By letter dated March 3, 2021 the USACE requested the SCAQMD accommodate the anticipated emissions in the 2016 AQMP emission budget (Attachment A). By letter dated April 12, 2021, the SCAQMD confirmed the following (Attachment B):

- NO_x emissions would be accommodated into the set-aside emission budgets for 2025, 2026, and 2027.

- NO_2 emissions exceed the de minimis threshold in 2025. However, General Conformity requirements are not applicable to these emissions.

  South Coast Air Basin was designated as a maintenance area for the 1971 annual NO_2 NAAQS on July 24, 1998. However, twenty years after the effective date of redesignation to attainment, general conformity no longer applies unless a maintenance plan approved under CAA Section 175A specifies that conformity requirements apply for a longer time period. The approved maintenance plan for the SCAB did not extend the maintenance plan period beyond 20 years from redesignation. Consequently, conformity requirements for NO_2 ceased to apply after September 22, 2018.

Based on the above, NO_x emissions associated with the Federal actions conform with the 2016 AQMP, the approved SIP for the SCAB whereas conformity requirements are no longer applicable to NO_2.

5.3 Consistency with Requirements and Milestones in Applicable SIP

The general conformity regulations state that notwithstanding the other requirements of the rule, a Federal action may not be determined to conform unless the total of direct and indirect emissions from the Federal action is in compliance or consistent with all relevant requirements and milestones in the applicable SIP (40 C.F.R. § 93.158(c)). This includes but is not limited to such issues as reasonable further progress schedules, assumptions specified in the attainment or maintenance demonstration, prohibitions, numerical emission limits, and work practice standards. This section briefly addresses how the Federal action were assessed for SIP consistency for this evaluation.

5.3.1 Applicable Requirements from EPA

EPA has already promulgated, and will continue to promulgate, numerous requirements to support the goals of the Clean Air Act with respect to the NAAQS. Typically, these requirements take the form of rules regulating emissions from significant new sources, including emission standards for major stationary point sources and classes of mobile sources as well as permitting requirements for new major stationary point sources. Since states have the primary responsibility for implementation and enforcement of requirements under the Clean Air Act and can impose stricter limitations than EPA, the EPA requirements often serve as guidance to the states in formulating their air quality management strategies.

5.3.2 Applicable Requirements from CARB

In California, to support the attainment and maintenance of the NAAQS, CARB is primarily responsible for regulating emissions from mobile sources. In fact, EPA has delegated authority to CARB to establish emission standards for on-road and some non-road vehicles separate from the EPA vehicle emission standards, although CARB is preempted by the Clean Air Act from regulating emissions from many non-road mobile sources, including marine craft. Emission standards for preempted equipment can only be set by EPA.

5.3.3 Applicable Requirements from SCAQMD

To support the attainment and maintenance of the NAAQS in the SCAB, SCAQMD is primarily responsible for regulating emissions from stationary sources. As noted above, SCAQMD develops and updates its AQMP regularly to support the California SIP. While the AQMP contains rules and regulations geared to attain and maintain the NAAQS, these rules and regulations also have the much more difficult goal of attaining and maintaining the California ambient air quality standards.

5.3.4 Consistency with Applicable Requirements

POLB already complies with, and will continue to comply with, a myriad of rules and regulations implemented and enforced by Federal, state, regional, and local agencies to protect and enhance ambient air quality in the SCAB. In particular, due to the long persistence of challenges to attain the ambient air quality standards in the SCAB, the rules and regulations promulgated by CARB and SCAQMD are among the most stringent in the U.S. POLB will continue to comply with all existing applicable air quality regulatory requirements for activities over which it has direct control and will meet in a timely manner all regulatory requirements that become applicable in the future. Likewise, POLB actively encourages all tenants and users of its facilities to comply with applicable air quality requirements.

The nature and extent of the requirements with which POLB complies and will continue to comply include, but are not limited to, the following.

- EPA Rule 40 C.F.R. Part 89, Control of Emissions from New and In-Use Non-road Compression-Ignition Engines: requires stringent emission standards for mobile non-road diesel engines of almost all types using a tiered phase in of standards.

- CARB Rule 13 C.C.R. § 1956.8, California Exhaust Emission Standards and Test Procedures for 1985 and Subsequent Model Heavy-Duty Diesel Engines and Vehicles: requires significant reductions in emissions of NOx, particulate matter, and non-methane organic compounds using exhaust treatment on heavy-duty diesel engines manufactured in model year 2007 and later years.

- SCAQMD Rule 403, Fugitive Dust: identifies the minimum particulate controls for construction-related fugitive dust. For example, Rule 403 requires twice daily watering of all active grading or construction sites. Haul trucks leaving the facility must be covered and maintain at least two feet of freeboard (C.V.C. § 23114). Low emission street sweepers must be used at the end of each construction day if visible soil is carried onto adjacent public paved roads, as required by SCAQMD Rule 1186.1, Less-Polluting-Sweepers. Wheel washers must be used to clean off the trucks, particularly the tires, prior to them entering the public roadways.

- SCAQMD Rule 431.2, Sulfur Content of Liquid Fuels: requires that, after January 1, 2005, only low sulfur diesel fuel (containing 15 parts per million by weight sulfur) will be permitted for sale in the SCAB for any stationary- or mobile-source application.

- SCAQMD Rule 2202, On-Road Motor Vehicle Mitigation Options: requires employers in the SCAB with more than 250 employees to implement an approved rideshare program and attain an average vehicle ridership of at least 1.5.

6 Reporting

To support a decision concerning the Federal actions, the USACE is making public this final general conformity determination for the proposed action.

6.1 Draft General Conformity Determination

The USACE provided copies of the draft general conformity determination to the appropriate regional offices of EPA, CARB, SCAQMD, and Federally-recognized tribes, providing opportunity for a 30-day review. The USACE also placed a notice in the Long Beach Press-Telegram, a daily newspaper of general circulation in the Long Beach area, announcing the availability of this draft general conformity determination and requesting written public comments for a 30-day period. For any member of the public requesting a copy of this draft general conformity determination, the USACE provided a copy. No comments were received in response to the draft general conformity determination.

6.2 Final General Conformity Determination

The USACE is providing copies of this final general conformity determination to the appropriate regional offices of EPA, CARB, SCAQMD, and Federally-recognized tribes, within 30 days of its promulgation. The USACE is also placing a notice in the Long Beach Press-Telegram, a daily newspaper of general circulation in Long Beach, announcing the availability of this final general conformity determination within 30 days of such determination. As part of the general conformity evaluation, the USACE will make the final general conformity determination available to the public as part of the Final EIS/ EIR.

6.3 Frequency of General Conformity Determinations

The general conformity regulations state that the status of a specific conformity determination lapses five years after the date of public notification for the final general conformity determination, unless the action has been completed or a continuous program has been commenced to implement the action (40 C.F.R. § 93.157(a)).

This general conformity determination will lapse during the construction period. However, continuation of the Federal action is expected for the duration of the construction period. Thus, reevaluation of the general conformity determination prior to completion of the Federal action is not expected.

7 Findings and Conclusions

The Federal actions conform to the SIP for NO_x (as an ozone precursor) because the net emissions associated with the Federal actions, taken together with all other NOx emissions in the SCAB, would not exceed the emissions budgets in the approved SIP for the years subject to the general conformity evaluation.

General Conformity requirements are not applicable to emissions of NO_2 associated with the Federal actions. As noted by the SCAQMD, the SCAB was designated as a maintenance area for the 1971 annual NO_2 NAAQS on July 24, 1998. However, twenty years after the effective date of redesignation to attainment, general conformity no longer applies unless a maintenance plan approved under CAA Section 175A specifies that conformity requirements apply for a longer time period. The approved maintenance plan for the SCAB did not extend the maintenance plan period beyond 20 years from redesignation. Consequently, conformity requirements for NO_2 ceased to apply after September 22, 2018.

Therefore, USACE herewith concludes that the Federal actions have been determined to comply with the requirements of the general conformity regulations and conforms to applicable SIP based on the mitigation measures specified above and NOx emissions accommodated into the set-aside emission budgets for years 2025, 2026, and 2027..

8 References

South Coast Air Quality Management District (SCAQMD). 2016. Final 2016 Air Quality Management Plan. November. Web site: http://www.aqmd.gov/home/air-quality/clean-air-plans/air-quality-mgt-plan/final-2016-aqmp.

U.S. Environmental Protection Agency (EPA). 1994. General Conformity Guidance: Questions and Answers. July 13. Web site: http://www.epa.gov/ttn/oarpg/conform/gcgqa_71394.pdf.

Attachment A

March 3, 2021 USACE Letter to the SCAQMD

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS
LOS ANGELES DISTRICT
915 WILSHIRE BOULEVARD, SUITE 930
LOS ANGELES, CALIFORNIA 90017-3489

April 9, 2021

Ms. Sang-Mi Lee
Program Supervisor
Air Quality Modeling/Emissions Inventory
South Coast Air Quality Management District
21865 Copley Drive
Diamond Bar, California 91765

Dear Ms. Lee:

This letter concerns the United States Army Corps of Engineers (USACE), Port of Long Beach Deep Draft Navigation Project (proposed project) as it relates to the general conformity rule. Established under the Clean Air Act (CAA) section 176(c) [42 USC 7506(c)], the purpose of the general conformity rule is to ensure that actions taken by Federal agencies do not interfere with a state's plan to attain and maintain National Ambient Air Quality Standards (NAAQS). Under the general conformity rule, federal agencies must work with state and local governments, in nonattainment or maintenance areas, to ensure that federal actions conform to the established, applicable State Implementation Plan (SIP). To do so, the federal agency must either determine that the action is exempt from general conformity regulations or make a conformity determination consistent with the general conformity requirements.

The USACE, in conjunction with the Port of Long Beach (POLB), intends to dredge specific areas in the POLB as discussed in detail in the Integrated Feasibility Report and Draft Environmental Impact Statement and Environmental Impact Report (IFR). Per 40 CFR 93.152, USACE's federal authority would extend only to construction emissions associated with the proposed project. There would be no net changes in operational air emissions expected following completion of project construction activities. The only reasonably foreseeable activities extending beyond the construction period and subject to USACE authority would be maintenance dredging, which is exempt from conformity applicability per 40 CFR 93.153(c)(2)(ix). Hence, the USACE would have no continuing program responsibility for activities beyond construction.

Alternative 3[1] is the USACE's preferred project alternative. The USACE's federal actions include the General Navigation Features and Local Service Facilities within the USACE's regulatory purview. Based on the USACE's applicability analysis in the IFR, the total of direct and indirect emissions caused by the federal actions would exceed the applicability rates specified in 40 CFR 93.153(b) for nitrogen dioxide (NO_2), ozone (nitrogen oxides (NO_x) and volatile organic compounds (VOC) precursors), and carbon monoxide (CO), in construction years 2025, 2026, and 2027. Therefore, the USACE is required to have a general conformity determination for these three criteria pollutants.

The USACE can use one of several methods to show that the federal actions conform to the SIP. For actions where the direct and indirect emissions exceed the rates in 40 CFR 93.153(b), the federal action can include mitigation measures to offset the emission increases from the federal action or can show that the action will conform by meeting any of the following requirements:

- Showing that the net emission increases caused by an action are included in the SIP,
- documenting that the state agrees to include the emission increases in the SIP,
- offsetting the action's emissions in the same or nearby area of equal or greater classification, or
- providing an air quality modeling demonstration in some circumstances.

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[1] Alternative 3 is composed of measures for liquid bulk vessels, container vessels, and the local service facilities, as identified below:

- General Navigation Features for Liquid Bulk Vessels
  - Deepen the entrance to the Main Channel (the Approach Channel through Queens Gate) from a project depth of -76 feet to -80 feet mean lower low water (MLLW)
  - Widen portions of the Main Channel (bend easing) to a depth of -76 feet MLLW

- General Navigation Features for Container Ships
  - Construct an approach channel and turning basin to Pier J South to a depth of -55 feet MLLW.
  - Deepen portions of the West Basin and West Basin Approach to a depth of -55 feet MLLW.

- Local Service Facilities to be constructed by the POLB
  - Deepen two additional locations within the harbor to a depth of -55 feet MLLW – the Pier J Slip, including berths J266-J270, and berth T140 on Pier T
  - Perform structural improvements on Pier J breakwaters at the entrance of the Pier J Slip to accommodate deepening of the Pier J Slip and Approach Channel to -55 feet MLLW.

Approximately 7.4 million cubic yards (mcy) of material would be dredged. Dredged material would be placed either at a nearshore placement site, a USEPA-designated ocean disposal site (LA-2 and/or LA-3), or a combination of the two. The nearshore placement site, approximately five miles from the project site, can accommodate about 2.5 mcy of dredged material. LA-2 and LA-3, approximately nine and 22 miles, respectively, from the project site, have an annual disposal volume limit of 1.0 and 2.5 mcy, respectively, from all sources. It is assumed that 0.9 mcy for LA-2 and 2.2 mcy for LA-3 is available for use by this proposed project each year.

As part of the USACE's analysis in the IFR, the USACE considered the following mitigation measures to reduce construction-related emissions:

- *MM-AQ-1. Electric clamshell dredge.* The use of an electric clamshell dredge shall be required for project clamshell dredging activities during the entire construction period of the project.

- *MM-AQ-2·. Construction-Related Harbor Craft.* Construction-related harbor craft (tugboats, crew boats, and survey boats) with Category 1 or Category 2 marine engines shall meet USEPA Tier 3 emission standards for marine engines. In addition, the construction contractor shall require all construction-related tugboats that home fleet in the San Pedro Bay Ports: 1) to shut down their main engines; and 2) to refrain from using auxiliary engines while at dock and instead use electrical shore power, if feasible.

- *MM-AQ-3: Off-Road Construction Equipment.* Self-propelled, diesel-fueled off-road construction equipment 25 horsepower or greater shall meet United States Environmental Protection Agency (USEPA)/California Air Resources Board (CARB) Tier 4 emission standards for non-road equipment.

Table 1 presents the mitigated annual construction emissions associated with Alternative 3 (this information can be found in Section 5.5.5 and Table 5-19 in the Draft IFR). The table shows that NO_2 and ozone (NOx precursor) emissions would be reduced but would remain above the applicability rates. All other pollutants would be reduced to below the applicability rates. All methods, input/output data and emissions before and after the application of above mitigation measures were made available to public as part of the Draft IFR distributed publicly on October 21, 2019, and still available for download at: https://www.spl.usace.army.mil/Missions/Civil-Works/Projects-Studies/Port-of-Long-Beach-Deep-Draft-Navigation-Study/.

Table 1. Alternative 3 Emissions After Mitigation

Source Category	**PM_{10}**	**$PM_{2.5}$**	**Ozone (NOx precursor)**	**NO_2**	**CO**	**Ozone (VOC precursor)**
2024						
Offroad Construction Equipment	0.0	0.0	0.1	0.1	0.2	0.0
Onroad Construction Vehicles	0.0	0.0	0.0	0.0	0.1	0.0
Fugitive Emissions	0.0	0.0	0.0	0.0	0.0	0.0
Marine Equipment	0.1	0.1	2.7	2.7	2.2	0.2
Total Construction Year 2024	0.2	0.1	2.8	2.8	2.4	0.2
Conformity Determination Applicability Rate	100	100	10	100	100	10
Equal or Exceed Applicability Rate?	No	No	No	No	No	No

Source Category	PM_{10}	$PM_{2.5}$	Ozone (NOx precursor)	NO_2	CO	Ozone (VOC precursor)
2025						
Offroad Construction Equipment	0.0	0.0	0.0	0.0	0.0	0.0
Onroad Construction Vehicles	0.0	0.0	0.0	0.0	0.0	0.0
Fugitive Emissions	0.0	0.0	0.0	0.0	0.0	0.0
Marine Equipment	7.6	6.7	145.5	145.5	86.9	8.1
Total Construction Year 2025	7.6	6.7	145.5	145.5	86.9	8.1
Conformity Determination Applicability Rate	100	100	10	100	100	10
Equal or Exceed Applicability Rate?	No	No	Yes	Yes	No	No
2026						
Offroad Construction Equipment	0.0	0.0	0.0	0.0	0.0	0.0
Onroad Construction Vehicles	0.0	0.0	0.0	0.0	0.0	0.0
Fugitive Emissions	0.0	0.0	0.0	0.0	0.0	0.0
Marine Equipment	1.7	1.5	35.8	35.8	27.4	2.0
Total Construction Year 2026	1.7	1.5	35.8	35.8	27.4	2.0
Conformity Determination Applicability Rate	100	100	10	100	100	10
Equal or Exceed Applicability Rate?	No	No	Yes	No	No	No
2027						
Offroad Construction Equipment	0.0	0.0	0.0	0.0	0.0	0.0
Onroad Construction Vehicles	0.0	0.0	0.0	0.0	0.0	0.0
Fugitive Emissions	0.0	0.0	0.0	0.0	0.0	0.0
Marine Equipment	0.6	0.5	11.9	11.9	9.1	0.7
Total Construction Year 2027	0.6	0.5	11.9	11.9	9.1	0.7
Conformity Determination Applicability Rate	100	100	10	100	100	10
Equal or Exceed Applicability Rate?	No	No	Yes	No	No	No

Notes:
Tons per day for each year are based on the number of construction days in each year of the proposed project (i.e., 365 days in each year 2024 through 2026, and 113 days in year 2027), per Table 5-19 of IFR.

During a December 1, 2020, conference call, the South Coast Air Quality Management District (SCAQMD) raised a concern that the NOx and NO_2 emissions in Table 1 were the same and suggested that the USACE consider recalculating NO_2 emissions to account for the fraction of NO_2 in NOx exhaust. Although the USACE recognizes NOx consists of both NO and NO_2, and that NO_2 emissions are initially low in exhaust at the tailpipe, it is conservative and common industry practice to assume that most NO in NOx exhaust is rapidly converted to NO_2. The SCAQMD's Localized

Significance Threshold methodology assumes that although initially only 5 percent of the emitted NOx is NO_2, within 500 meters downwind all NO is converted to NO_2. During a December 15, 2020, conference call between the SCAQMD and iLanco Environmental, LLC, the POLB's air quality contractor, it is the USACE's understanding that the SCAQMD discussed amongst their groups whether it was appropriate to assume that NOx and NO_2 emissions are equal and decided that this approach is appropriate.

The USACE recognizes that the SCAQMD's NOx set-aside conformity budget was primarily established to streamline determinations for ozone conformity. Notwithstanding, NO_2 is the only component of NOx that directly drives tropospheric ozone formation. If the SCAQMD can find that a certain NOx budget would not interfere with reaching ozone attainment, it seems reasonable to assume that the same NOx budget would also not interfere with maintaining NO_2 attainment.

Additionally, the South Coast Air Basin (SCAB) has been in attainment of the NO_2 standard for many years and has been designated as "maintenance" since 1998. It is possible that the SCAB may be moved to "attainment" since it has been in maintenance status for over ten years. It is our understanding that USEPA's clarification is needed for this determination in which case there would be no need for a NO_2 demonstration of conformity. We respectfully request that the SCAQMD advise us on the SCAB's "maintenance" vs "attainment" designation for purposes of determining conformity.

During the December 1, 2020, conference call, the SCAQMD raised concerns regarding future operational emissions in the POLB and emissions levels associated with Tier 2 hopper dredges. Regarding future operational emissions, alternatives evaluated in the IFR would result only in construction activities (i.e., both land-based construction and dredging) that would affect air quality within the POLB and surrounding region. While the action alternatives may accommodate changes in the vessel fleet calling at the POLB, they would not increase cargo or liquid bulk throughput. Therefore, operational emissions have not been assessed in the IFR.

Reducing inefficiencies would allow current fleet vessels to arrive fully loaded and to avoid delays associated with tide riding, lightering, or traffic conflicts (for liquid bulk vessels). Throughput at the POLB is limited by backland storage areas, which are constrained and at capacity. While the proposed project would not result in larger vessels calling at the POLB beyond those that currently call at the POLB and those that have previously been forecasted, the efficiencies afforded by accommodating these larger vessels fully loaded with no operational restrictions would in turn reduce the total number of vessels calling at the POLB over time. The objective of the proposed project is to improve conditions for vessel operations and safety, and to accommodate the existing large vessels that call at the POLB with fewer restrictions as they come online. Appendix E of the IFR includes projected fleet forecasts for the POLB for all alternatives, including the no action alternative that were used for the economic evaluation of project benefits. Ship sizes and expected numbers calling on the POLB

are discussed in this appendix. Attention is called to Tables 4-8 and 4-9 for details. A summary table (Table 2) is provided here to illustrate the expected decrease in ship calls for the proposed project.

Table 2. Expected Decrease in Ship Calls for the Proposed Project

Year	Alternative	Container Vessel Calls	Tanker Calls
2021	Current	1,278	932
2030	No Action	1,494	916
2030	Proposed Project	1,444	908
2040	No Action	1,724	912
2040	Proposed Project	1,643	903

Container vessel calls are expected to go up for all alternatives from 2021 to 2030 and from 2030 to 2040. Tanker calls are expected to decrease slightly over the same time period, although there is a slight increase from 2030 to 2040. However, fewer container vessel calls are projected for the years 2030 and 2040 with the proposed project for the same years as the no action alternative. There are 50 fewer container vessels and 8 fewer tanker vessels projected to call at the POLB for the proposed project as compared to future without project conditions (no action alternative) for 2030. Furthermore, there are 81 fewer container vessels and 9 fewer tanker vessels projected to call at the POLB for the proposed project as compared to future without project conditions (no action alternative) for 2040.

Regarding hopper dredge emissions, the areas that are proposed for hopper dredges are unsuitable for dredging by the electric clamshell for two reasons. First, is the distance between the on-land transformer and the dredge location. The distance is impracticable for efficient operations and safety as this would require placing the electric power cable through the busy ship traffic lane at Queen’s Gate. The tether to the shoreline would need to be at least 1 mile long at the closest point all the way up to 4 plus miles to dredge at the “daylight” location of the entrance channel, and this would be crossing the major thoroughfare through the Queen’s Gate. The second reason is the depth of the dredge cut. Dredging from -70 feet MLLW to -80 feet MLLW is inefficient for a clamshell dredge due to the depth of water. A hopper dredge keeps its drag head continuously on the ocean floor while dredging while a clamshell must repeatedly go up and down through the water column leading to extended time for each cycle and increased loss of sediments from the clamshell while transiting the water column. The clamshell would also have a significantly lower production rate to the hopper due to the proposed dredging depths. It is about 1/3 of the hopper daily production rate in optimal conditions, and with the proposed depths, this would decrease even more. This would increase the proposed project timeline by 1-2 years.

Sediments in the Approach Channel (where the hopper dredge would operate) are sandy and thus suitable for nearshore placement. This allows the hopper dredge to

operate more efficiently by using a shortened transit from dredge site to the nearshore placement site, as opposed to a transit from the dredge site to the ocean disposal site. Reduced transit times results in a longer dredging period per day for the hopper dredge.

POLB staff reached out to their contacts in the U.S. dredging industry as well as conducted an on-line search to find information on hopper dredges with Tier 3 or better engines. There are only two USACE-owned dredges stationed on the west coast of the U.S. Both are Tier 2 equipped. The *Yaquina* is unable to reach the depths needed for the proposed project and is unsuitable. The *Essayons* could reach the required depths, if modified. There currently are no privately-owned hopper dredges stationed on the west coast. Regarding the international market, these are not available for operation in the U.S. market. There has not been any indication that changes will be made to the Jones Act, Public Law 66-261, to allow non-U.S. constructed, owned and crewed vessels to operate in U.S. waters.

We appreciate the SCAQMD staff's recommendation during our conference call on December 1, 2020, for the USACE to include a requirement for the hopper dredge to be equipped with Tier 3/4 engines as a mitigation measure for the proposed project. The use of Tier 3/4 engines is not a regulatory requirement in effect for the SCAB now or at the estimated time of construction. We are unable to accommodate such a mitigation measure under our current contracting standards. We may consider it in the future if available, feasible, and consistent with competition in contracting.

According to 40 CFR 93.161, the state or local agency responsible for implementing and enforcing the SIP can develop and adopt an emissions budget to be used for demonstrating conformity under 40 CFR 93.158(a)(1). The SCAQMD's 2016 Air Quality Management Plan (AQMP) addresses general conformity budgets beginning on page VI-D-1 of Appendix VI and on pages 111-2-85 through 11-2-88 of Appendix Ill. To streamline the general conformity process for federal projects and to facilitate general conformity determinations, the 2016 AQMP establishes VOC and NOx general conformity budgets of 2.0 tons per day (tpd) of NOx and 0.5 tpd of VOC on an annual basis from 2017 to 2030, and budgets of 0.5 tpd of NOx and 0.2 tpd VOC in 2031. These general conformity budgets are included in the "set-aside" account added to baseline emissions in tables 9, 10 and 11 in section 111.D.2.c of this document. The general conformity budgets in the 2016 AQMP are not set aside for specific facilities per se but were developed in the anticipation of the construction and operation of certain development projects in the South Coast Air Basin that are expected over the next decade. Under the 2016 AQMP, emissions from general conformity projects are tracked by the SCAQMD's tracking system and debited from this set-aside budget on a first-come-first-served basis until the budget has been exhausted. The USEPA approved the general conformity budgets in the 2016 AQMP on October 1, 2019.

Federal agencies can use these budgets to demonstrate that their federal actions conform to the SIP through a letter from the State and SCAQMD confirming that the federal actions emissions are accounted for in the SIP's general conformity

budgets. The USACE requests the SCAQMD provide written confirmation that the federal actions emissions of 146 tons NOx, 36 tons NOx and 12 tons NOx in years 2025, 2026, and 2027, respectively, are accounted for in the SIPs general conformity budget, which would be used by the USACE to demonstrate conformity under 40 CFR 93.158(a)(1).

If you have questions, please contact Mr. Larry Smith, Project Environmental Coordinator, at (213) 452-3846 or by email at lawrence.j.smith@usace.army.mil.

Sincerely,

Eduardo T. De Mesa
Chief, Planning Division

Attachment B

April 12, 2021 SCAQMD Letter to the USACE

South Coast
Air Quality Management District
21865 Copley Drive, Diamond Bar, CA 91765-4178
South Coast AQMD
(909) 396-2000 • www.aqmd.gov

April 12, 2021

Eduardo T. De Mesa
Chief, Planning Division
U.S. Army Corps of Engineers
Los Angeles District
915 Wilshire boulevard, Suite 930
Los Angeles, CA 90017-3489

Dear Mr. De Mesa,

This letter is in response to your letter dated March 3, 2021 requesting South Coast AQMD to accommodate the anticipated emissions from the Port of Long Beach Deep Draft Navigation Project in the Air Quality Management Plan (AQMP)/State Implementation Plan (SIP) emissions budget for general conformity purposes.

The general conformity determination process is intended to demonstrate that a proposed Federal action will not: (1) cause or contribute to new violations of a national ambient air quality standard (NAAQS); (2) interfere with provisions in the applicable SIP for maintenance of any NAAQS; (3) increase the frequency or severity of existing violations of any standard; or (4) delay the timely attainment of any standard. As such, for general conformity determination, the proposed federal action needs to conform to the latest approved SIP/AQMP.

The South Coast Air Basin (Basin) is designated as an extreme non-attainment area for ozone, serious non-attainment for PM2.5 and maintenance area for Carbon Monoxide. In order to accommodate projects subject to general conformity requirements and to streamline the review process, general conformity budgets for NOx and VOC emissions are established in the AQMP. The 2016 AQMP (https://www.aqmd.gov/home/air-quality/clean-air-plans/air-quality-mgt-plan/final-2016-aqmp), which is the latest plan approved by U.E. EPA, established set aside accounts to accommodate emissions subject to general conformity requirements. The set-aside accounts include 2 tons per day (tpd) or 730 tons per year (tpy) of NOx and 0.5 tpd or 182.5 tpy of VOC each year starting in 2017 through 2030, and 0.5 tpd (182.5 tpy) of NOx and 0.2 tpd (73 tpy) of VOC each year in 2031 and thereafter.

The anticipated emissions from the proposed project exceed the General Conformity de minimis thresholds of NOx in the years 2025, 2026 and 2027 as indicated in Table 1, "Alternative 3 Emissions After Mitigation", in your letter. These emissions are associated with construction activities of Alternative 3 scenario, which is the preferred alternative scenario by U.S. Corps of Army Engineers. After the completion of project construction activities, no changes in net operational emissions are anticipated. Emissions from potential maintenance dredging in the future, if any, will be exempt from conformity applicability if the action has no emissions increase or the emissions increase is below de minimis threshold per 40 CFR 93.153(c)(2)(ix). Detailed method to calculate emissions included in the general conformity determination can be found at the Port of Long Beach Deep Draft Navigation Project[1].

South Coast AQMD staff has reviewed the proposed project emissions based on the information provided in your letter. Based on our review, we have determined that NOx emissions above de minimis thresholds can be accommodated within the general conformity budgets established in the 2016 AQMP. The emissions accommodated in the general conformity budgets for 2025, 2026 and 2027 are listed in Table 1 below.

Table 1. Proposed Project Emissions Accommodated in 2016 AQMP General Conformity Budgets (tons per year)

Pollutants	Emission Phase	2025	2026	2027
NOx	Construction	145.5	35.8	11.9

In addition to NOx emissions, NO2 emissions exceed the de minimis threshold in 2025. South Coast Air Basin was designated as a maintenance area for the 1971 annual NO2 NAAQS on July 24, 1998. However, twenty years after the effective date of redesignation to attainment, general conformity no longer applies unless a maintenance plan approved under CAA Section 175A specifies that conformity requirements apply for a longer time period. The approved maintenance plan for the Basin did not extend the maintenance plan period beyond 20 years from redesignation. Consequently, conformity requirements for NO2 ceased to apply after September 22, 2018. Therefore, no conformity requirement applies to the NO2 emissions from the proposed project.

In summary, based on our evaluation, the proposed project will conform to the latest EPA approved AQMP as the emissions from the project are accommodated within the AQMP's emissions budgets, and the proposed project is not expected to result in any new or additional violations of the NAAQS or impede the projected attainment of the NAAQS.

[1] Documents are available at https://www.spl.usace.army.mil/Missions/Civil-Works/Projects-Studies/Port-of-Long-Beach-Deep-Draft-Navigation-Study
Refer Table 5-19 for the amount of emissions subject to general conformity determination and Appendix for detailed methodology

If you have any questions, please contact me at (909) 396-2856 or srees@aqmd.gov or Sang-Mi Lee, Program Supervisor at (909)-396-3169 or slee@aqmd.gov.

Sincerely,

Sarah Rees

Sarah L. Rees, Ph.D.
Deputy Executive Officer
Planning, Rule Development & Area Sources
South Coast Air Quality Management District

Attachment:
Letter from U.S. Army Corps of Engineers dated March 3, 2021

cc: Tom Kelly, US EPA Region IX
Barbara Baird, South Coast AQMD
Zorik Pirveysian, South Coast AQMD
Sang-Mi Lee, South Coast AQMD
Jillian Wong, South Coast AQMD
Lijin Sun, South Coast AQMD

ZP:SL

Attachment C

Emission Estimation Methodology
and
Calculations

DRAFT INTEGRATED FEASIBILITY REPORT AND ENVIRONMENTAL IMPACT STATEMENT / ENVIRONMENTAL IMPACT REPORT (EIS/EIR)

APPENDIX H: AIR QUALITY ANALYSIS

PORT OF LONG BEACH
DEEP DRAFT NAVIGATION STUDY
Los Angeles County, California

October 2019

US Army Corps of Engineers ®

Port of LONG BEACH The Green Port

Appendix H1 Criteria Pollutant and GHG Emission Calculations

H1.1 Introduction

This appendix describes the methods and assumptions used to quantify criteria pollutant and greenhouse gas (GHG) emissions generated from construction of the Deep Draft Navigation Project and Alternatives. Section H1.2 defines the pollutants, averaging times, analysis years, emission sources, and geographical boundaries included in the emission calculations under NEPA and CEQA. Section H1.3 describes the methodology for the construction emission calculations. Detailed source activity and emission calculation tables for the Action Alternatives are included as attachments at the end of this appendix.

Implementation of the No Action and Action Alternatives would not result in operational activities and would therefore not result in operational impacts. Furthermore, the No Action Alternative would not construct an Approach Channel to Pier J South, deepen the West Basin Channel, deepen the Approach Channel, widen portions of the Main Channel, or construct the Local Service Facilities. However maintenance dredging of existing channel depths would continue, when and where needed. The No Action Alternative would not increase ship calls or throughput, and would not incrementally increase operational emissions within the study area. Future maintenance dredging and disposal of dredged material would be subject to separate detailed analysis under CEQA and/or NEPA. Emission calculations associated with maintenance dredging are not included in this appendix. Please refer to Chapter 2 and Chapter 4 for a detailed explanation of the No Action Alternative and Action Alternatives, respectively.

The Action Alternatives are described in detail in Section 4 (Plan Formulation). The No Action Alternative is also described in detail in Section 4 (Plan Formulation), is assessed qualitatively in Sections 5.5 (Air Quality Environmental Consequences) and 5.6 (Greenhouse Gas Environmental Consequences) of the DEIS/DEIR, and therefore is not included in this appendix.

H1.2 Emission Parameters

Pollutants

The air quality analysis quantified emissions of the following criteria pollutants or precursors: volatile organic compounds (VOC), carbon monoxide (CO), nitrogen oxides (NO_x), particulate matter less than 10 microns (PM_{10}), particulate matter less than 2.5 microns ($PM_{2.5}$), and sulfur oxides (SO_x). Emissions of diesel particulate matter (DPM), a subset of PM_{10}, were also quantified because DPM is the dominant toxic air contaminant in the health risk evaluation conducted for this EIS/EIR. Estimates of lead emissions were not calculated. Lead emissions from mobile sources in California have significantly decreased due to the near elimination of lead in fuels. Emission factors developed by the U.S. Environmental Protection Agency, the California Air Resources Board, and the South Coast Air Quality Management District (SCAQMD), including those in CalEEMod, the SCAQMD-approved emission modeling software, do not provide estimated emissions for lead. Little to no quantifiable and foreseeable lead emissions would be generated by the Action Alternatives.

The air quality analysis also quantified emissions of the following GHGs: carbon dioxide (CO_2), nitrous oxide (N_2O), and methane (CH_4), which are products of engine exhaust. Global warming potential (GWP) is the ability of a gas or aerosol to trap heat in the atmosphere. GHGs have varying amounts of GWP. By convention, CO_2 is assigned a GWP of 1. In comparison, CH_4 has a GWP of 25, which means that it has a global warming effect 25 times greater than CO_2 on an equal-mass basis. N_2O has a GWP of 298 (IPCC, 2007). To account for their GWP, GHG emissions are reported in the emission tables as carbon dioxide equivalent (CO_2e). CO_2e was calculated by multiplying each GHG emission by its GWP and adding the results together to produce a single, combined emission rate representing all GHGs. The GWPs used in the emission calculations are shown in tables at the end of this appendix.

Averaging Times

For criteria pollutants, annual emissions were calculated for comparison against the General Conformity applicability rates in nonattainment or maintenance areas (40 CFR Part 93). For CEQA impacts, peak daily (24-hour) emissions were calculated for comparison against the South Coast Air Quality Management District (SCAQMD) daily significance thresholds (SCAQMD 2019). Annual, peak 24-hour, peak 8-hour (for CO), and peak 1-hour criteria pollutant emissions were calculated to support the dispersion modeling analysis used to predict local ambient pollutant concentrations.

For GHG, annual and total construction emissions were calculated for presentation under NEPA. For CEQA impacts, total construction emissions were amortized over a 30-year period in accordance with SCAQMD guidance (SCAQMD 2008) for comparison against the SCAQMD CO_2e annualized significant emissions threshold for industrial projects (SCAQMD 2019).

Analysis Years

Construction emissions were based on anticipated equipment utilization in each construction year. Tables detailing construction schedules for all Action Alternatives are included as attachments at the end of this appendix. The following general construction schedules were used for the Action Alternatives:

- All Action Alternatives include widening of the Main channel to the authorized depth of -76' mean lower low water (MLLW), construction of structural improvements to the Pier J breakwater as described in Section 4.6.5, deepening Pier J Basin, berth dredging at the Pier J South Slips in the Pier J Basin and along Pier T, and, with implementation of MM-AQ-1, use of electric clamshell dredges and construction of an electrical substation at Pier J. Dredged material would be disposed at the Surfside Borrow Area, LA-2, and/or LA-3.
- Alternative 2. In addition, Alternative 2 includes constructing an approach channel to Pier J South to -53 ft MLLW; constructing a turning basin outside of Pier J South to -53 ft MLLW; deepening the West Basin to -53 ft MLLW; and the deepening of the Approach Channel to -78' MLLW. Construction activities associated with Alternative 2 would occur over approximately 34 months, from January 2024 through October 2026.
- Alternative 3. In addition to activities common to all Action Alternatives, Alternative 3 includes constructing an approach channel to Pier J South to -55 ft MLLW; constructing a turning basin outside of Pier J South to -55 ft MLLW; deepening the West Basin to -55 ft MLLW; and deepening of the Approach Channel to -80' MLLW. Construction activities associated with Alternative 3 would occur over approximately 40 months, from January 2024 through April 2027.
- Alternative 4. In addition to activities common to all Action Alternatives, Alternative 4 includes constructing an approach channel to Pier J South to -57 ft MLLW; constructing a turning basin outside of Pier J South to -57 ft MLLW; deepening the West Basin to -57 ft MLLW; deepening of the Approach Channel to -82' MLLW, Pier T wharf upgrades, and Pier J wharf upgrades. Construction activities associated with Alternative 4 would take occur over approximately 62 months, from January 2024 through February 2029.
- Alternative 5. In addition to activities common to all Action Alternatives, Alternative 5 includes constructing an approach channel to Pier J South to -55 ft MLLW; constructing a turning basin outside of Pier J South to -55 ft MLLW; deepening the West Basin to -55 ft MLLW; the deepening of the Approach Channel to -80' MLLW (like Alternative 3), and the construction of a Standby Area adjacent

to the Main Channel dredged to -67' MLLW, with a 300-foot diameter center anchor placement with a depth of -73'MLLW. Construction activities associated with Alternative 5 would take occur over approximately 50 months, from January 2024 through February 2028.

For the purposes of the emission calculations, construction activities were assumed to occur in the earliest foreseeable years. Should construction be delayed beyond the assumed dates, emissions would be lower due to the gradual replacement of older construction equipment with newer equipment meeting the existing State and federal off-road engine emission standards.

Emission Sources

Criteria pollutant and GHG emission sources associated with construction activities would include dredging equipment (hopper and clamshell dredges), harbor craft, off-road construction equipment, on-road vehicles, and worker vehicles. Earth-disturbance activities, such as grading, bulldozing, material handling, and driving over paved and unpaved surfaces, would be minimal and would generate particulate matter (PM) emissions in the form of fugitive dust. The same emission sources and utilization assumptions were analyzed under both NEPA (including General Conformity applicability) and CEQA. The emission calculation approach for each source category is described in Section H1.3 of this appendix.

Geographical Boundaries

All activity and therefore all emissions would occur within the South Coast Air Basin (SCAB). Therefore, criteria pollutant and GHG construction emissions were calculated within the SCAB to align with the General Conformity applicability rates in nonattainment and maintenance areas and SCAQMD daily emission significance thresholds.

H1.3 Methodology for Construction Emission Calculations

Air pollutant emissions from the proposed construction activities were calculated using the most current emission factors and methods available at the time the calculations were performed. Annual emissions, which were used for General Conformity applicability, GHG impacts, and dispersion modeling, were quantified based on the annual construction activity assumptions in each year of construction. To estimate peak daily construction emissions, emissions were first calculated for the individual construction activities and then summed for overlapping construction activities, per the anticipated construction schedule. The combination of construction activities producing the highest daily emissions was then selected as the peak day and compared to the SCAQMD emission thresholds for construction. The specific emission calculation approach for each construction source category is described below.

The Federal actions annual VOC, CO, NO_2, PM_{10} and $PM_{2.5}$ (including precursors) emission rates for each Action Alternative were first calculated for the applicable analysis years. For purposes of this evaluation, emissions of NO_2 are assumed to equal emissions of NO_x since NO_2 is the predominant form of NO_x. These emissions are associated with mobile and area sources expected to be used for on-site construction-related purposes. The annual emissions (tons per year) from each of the Action Alternatives where then compared to the General Conformity applicability rates, presented in Table 5.5-2, to assess General Conformity applicability under the Clean Air Act.

Dredging Equipment. As described in Section 4, hopper dredges would be used to dredge sediment in the Approach Channel and transport and place the dredged sediment at nearshore (primarily), LA-2, and/or LA-3 placement sites. Hopper dredge engines are large marine engines used for propulsion and operation of the dredging equipment. Emission factors for hopper dredge propulsion and auxiliary engines therefore reflect existing USEPA marine engine standards (USEPA 2016a). Hopper dredge propulsion and auxiliary engines were assumed to be Tier 2 marine diesel engines, per USACE.

As described in Section 4, clamshell dredges would be used to dredge the Main Channel, West Basin, Pier J Basin (including berth dredging at Pier J South), Pier J Approach Channel and turning basin, Pier T Berths, and Standby Area (Alternative 5 only). Clamshell dredges are not self-propelled and emission factors for these engines reflect existing USEPA non-road engine standards; clamshell dredge engines were assumed to be Tier 3 non-road diesel engines, per USACE and the Port.

Both hopper dredge and clamshell dredge utilization, schedule, activity, engine size, and load factors were based on project-specific dredging requirements presented in tables at the end of this appendix.

Harbor Craft. Tugboats would be used to position clamshell dredges and transport sediment-laden barges to the nearshore, LA-2, and/or LA-3 placement sites. Crew boats and survey boats would also be used to support dredging activities. Harbor craft utilization, schedule, activity, and engine sizes, provided by the USACE and the Port, were used in the analysis. Harbor craft load factors were obtained from the Port 2013 Emissions Inventory (POLB 2013), which is consistent with the most recent Port emissions inventory (POLB 2017) available at the time the emission calculations were performed.

Emission factors for harbor craft reflect USEPA marine engine standards (USEPA 2016a) and harbor craft engine types common at the Port, as documented in the Port's Air Emissions Inventory (POLB 2017). The Port's 2017 Air Emissions Inventory identifies that most harbor craft propulsion engines operating at the Port in 2017 were USEPA Tier 2 diesel engines and that approximately half of all harbor craft auxiliary engines were Tier 3. This analysis conservatively used USEPA Tier 2 harbor craft emission standards for both propulsion and auxiliary engines.

Off-road Construction Equipment. Off-road construction equipment would be used during non-dredging activities such as construction of the electrical substation at Pier J (only for mitigated emissions), Pier J breakwater improvements, and wharf upgrades. Equipment type, utilization, schedule, activity, and engine sizes, provided by the Port, were used in the analysis, as shown in Table H1.6.

Criteria pollutant and GHG emission factors for off-road construction equipment reflect USEPA non-road engine standards (USEPA 2016b) and CARB requirements. Emission factors were generated using CARB's 2017 OFFROAD Inventory Model (CARB 2017a) for an average equipment fleet composition in the SCAB.

On-Road Construction Vehicles and Worker Vehicles. Construction vehicles would be used during non-dredging activities to deliver construction materials, such as sheetpiles (for wharf upgrades and Pier J breakwater improvements) and concrete (for the electrical substation), and haul away waste. Vehicle type, utilization, schedule, activity, and engine sizes, provided by the Port, were used in the analysis, as shown in Table H1.6.

Criteria pollutant and GHG emission factors reflect USEPA on-road engine standards and CARB requirements. Emission factors were generated using CARB's on-road EMFAC2017 model for truck and passenger vehicle fleets representative of the South Coast region (CARB 2017b). Emissions include engine exhaust, entrained road dust, and brake and tire wear.

Fugitive Dust. PM_{10} and $PM_{2.5}$ fugitive dust emissions from construction activities, such as grading, bulldozing, and material and debris loading and handling were calculated using emission factors from EPA's AP-42 emission factor handbook (USEPA 2006) and default parameters for soil and wind conditions from CalEEMod (CAPCOA 2016). PM_{10} and $PM_{2.5}$ emissions from on- and off-site paved road dust were calculated using CARB's Miscellaneous Process Methodology (CARB 2016).

H1.4 Quantified Regulations for Construction

The following regulations were incorporated into the unmitigated emission calculations for the Action Alternatives, as applicable. These regulations are described in greater detail in the Air Quality Regulatory Setting and GHG Regulatory Setting of the EIS/EIR.

- Dredging Equipment: USEPA Emission Standards for Nonroad Diesel Engines; USEPA Emission Standards for Marine Diesel Engines; CARB In-Use Off-Road Diesel-Fleets Regulation; CARB Portable Diesel-Fueled Engines Air Toxic Control Measure (ATCM).
- Harbor Craft: USEPA Emission Standards for Marine Diesel Engines; CARB Commercial Harbor Craft Regulation.
- Off-Road Construction Equipment: USEPA Emission Standards for Nonroad Diesel Engines; California Diesel Fuel Regulations (Ultra Low Sulfur Diesel [ULSD] fuel); CARB In-Use Off-Road Diesel-Fleets Regulation; CARB Portable Diesel-Fueled Engines ATCM; Statewide Portable Equipment Registration Program.
- On-Road Construction Vehicles and Worker Vehicles: USEPA Emission Standards for On-Road Trucks; California Diesel Fuel Regulations (ULSD fuel); Heavy Duty Vehicle National Program to reduce fuel consumption and GHG; State Standards for Light-Duty Vehicle GHG Emissions and Corporate Average Fuel Economy Standards.
- Fugitive Dust: SCAQMD Rule 403 Compliance.

H1.5 Quantified Mitigation Measures for Construction

The EIS/EIR identifies mitigation measures designed to reduce construction emissions. The following three measures were quantified in the mitigated emission calculations for the Action Alternatives. The remaining mitigation measures were assessed qualitatively in the EIS/EIR.

MM-AQ-1: Electric clamshell dredge. This mitigation measure requires the use of an electric clamshell dredge and requires the construction of an electrical substation at Pier J to provide electric power to the clamshell dredge. The analysis assumes that it would not be possible to electrify all equipment on a clamshell dredge. Therefore, per communication with Dutra Group, a dredging contractor, the analysis conservatively assumes that 90 percent of clamshell dredge horsepower-hours would be electric (Dutra Group 2019). Criteria pollutant and GHG emissions associated with construction of the electrical substation, and indirect GHG emissions associated with clamshell dredge electricity consumption, were quantified for all mitigated Action Alternatives.

MM-AQ-2: Fleet Modernization of Harbor Craft. Harbor craft (tugboats, crew boats, and survey boats) with Category 1 or Category 2 marine engines shall meet USEPA Tier 3 emission standards for marine engines. In addition, the construction contractor shall require all construction tugboats that home fleet in the San Pedro Bay Ports: 1) to shut down their main engines and 2) to refrain from using auxiliary engines while at dock and instead to use electrical shore power, if feasible.

MM-AQ-3: Fleet Modernization of Construction Equipment. Self-propelled, diesel-fueled off-road construction equipment 25 hp or greater shall meet USEPA/CARB Tier 4 emission standards for non-road equipment.

H1.6 References for Appendix H1

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Appendix H1. Tables

Table H1.1
Construction Schedule: Alternative 2. (-53 and -78 MLLW)

Task ID	Alternative 2	Start Date	End Date	Duration (days)
1	Electrical Substation Construction at Pier J (mitigation only)	1/1/2024	12/31/2024	60
2	Pier J Breakwater Construction	1/1/2024	3/2/2024	54
3	Approach Channel (hopper dredge 1,144,000 CY)	1/1/2025	3/8/2025	66
4	Main Channel Widening (clam shell dredge 1,065,000 CY)	1/1/2025	6/28/2025	178
5	West Basin (clam shell dredge 501,000 CY)	6/29/2025	9/21/2025	84
6	Pier J Basin (clam shell dredge 202,000 CY)	9/22/2025	10/26/2025	34
7	Pier J Approach (clam shell dredge 270,000 CY)	10/27/2025	12/11/2025	45
8	Pier J Approach (clam shell dredge 1,699,000 CY)	1/1/2026	10/11/2026	283

Source:
Dredging Alternative 2: POLB Channel Deepening - 53 and 78 Rev4.xlsx.
Substation and Pier J Breakwater - Email From: Khan, Naser <naser.khan@aecom.com>, Sent: Friday, May 31, 2019 10:54 PM, To: Barrera, Baron <baron.barrera@polb.com>.

Table H1.2
Construction Schedule: Alternative 3 NED (-55 and -80 MLLW)

Task ID	Alternative 3	Start Date	End Date	Duration (days)
1	Electrical Substation Construction at Pier J (mitigation only)	1/1/2024	12/31/2024	60
2	Pier J Breakwater Construction	1/1/2024	3/2/2024	54
3	Approach Channel (hopper dredge 2,600,000 CY)	1/1/2025	5/31/2025	150
4	Main Channel Widening (clam shell dredge 1,065,000 CY)	1/1/2025	6/27/2025	177
5	West Basin (clam shell dredge 717,000 CY)	6/28/2025	10/26/2025	120
6	Pier J Basin (clam shell dredge 258,000 CY)	10/27/2025	12/9/2025	43
7	Pier J Basin (clam shell dredge 46,000 CY)	1/1/2026	1/9/2026	8
8	Pier J Approach (clam shell dredge 1,994,000 CY)	1/10/2026	12/8/2026	332
9	Pier J Approach (clam shell dredge 679,000 CY)	1/1/2027	4/24/2027	113

Source:
Dredging Alternative 3: POLB Channel Deepening - NED 55 and 80 Rev4.xlsx.
Substation and Pier J Breakwater - Email From: Khan, Naser <naser.khan@aecom.com>, Sent: Friday, May 31, 2019 10:54 PM, To: Barrera, Baron <baron.barrera@polb.com>.

Table H1.3
Construction Schedule: Alternative 4: (-57 and -83 MLLW)

Task ID	Alternative 4	Start Date	End Date	Duration (days)
1	Electrical Substation Construction at Pier J (mitigation only)	1/1/2024	12/31/2024	60
2	Pier J Breakwater Construction	1/1/2024	3/2/2024	54
3	Pier J Wharf Upgrade	1/1/2024	6/24/2024	175
4	Pier T Wharf Upgrade	1/1/2024	11/16/2024	320
5	Approach Channel (hopper dredge 5,447,000 CY)	1/1/2025	2/4/2026	399
6	Main Channel Widening (clam shell dredge 1,065,000 CY)	1/1/2026	6/28/2026	178
7	West Basin (clam shell dredge 975,000 CY)	6/29/2026	12/9/2026	163
8	West Basin (clam shell dredge 513,000 CY)	1/1/2027	3/28/2027	86
9	Pier T Berths (clam shell dredge Berths T132 to T140, 44,000 CY)	3/29/2027	4/5/2027	7
10	Pier J Basin (clam shell dredge 408,000 CY)	4/6/2027	6/13/2027	68
11	Pier J Approach (clam shell dredge 1,066,000 CY)	6/14/2027	12/9/2027	178
12	Pier J Approach (clam shell dredge 2,040,000 CY)	1/1/2028	12/6/2028	340
13	Pier J Approach (clam shell dredge 297,000 CY)	1/1/2029	2/20/2029	50

Source:
Dredging Alternative 4: POLB Channel Deepening - 57 and 83 Rev4.xlsx.
Substation and Pier J Breakwater - Email From: Khan, Naser <naser.khan@aecom.com>, Sent: Friday, May 31, 2019 10:54 PM, To: Barrera, Baron <baron.barrera@polb.com>.

Table H1.4
Construction Schedule: Alternative 5 and Standby Area (-55 and -80 MLLW)

Task ID	Alternative 5	Start Date	End Date	Duration (days)
1	Electrical Substation Construction at Pier J (mitigation only)	1/1/2024	12/31/2024	60
2	Pier J Breakwater Construction	1/1/2024	3/2/2024	54
3	Approach Channel (hopper dredge 2,600,000 CY)	1/1/2025	5/31/2025	150
4	Main Channel Widening (clam shell dredge 1,065,000 CY)	1/1/2025	6/27/2025	177
5	West Basin (clam shell dredge 717,000 CY)	6/28/2025	10/26/2025	120
6	Pier J Basin (clam shell dredge 258,000 CY)	10/27/2025	12/9/2025	43
7	Pier J Basin (clam shell dredge 46,000 CY)	1/1/2026	1/9/2026	8
8	Pier J Approach (clam shell dredge 1,994,000 CY)	1/10/2026	12/8/2026	332
9	Pier J Approach (clam shell dredge 679,000 CY)	1/1/2027	4/24/2027	113
10	Standby Area (clam shell dredge 921,000 CY)	4/25/2027	12/8/2027	227
11	Standby Area (clam shell dredge 118,000 CY)	1/1/2028	2/24/2028	54

Source:
Dredging Alternative 5: POLB Channel Deepening - NED and Standby Area Rev4.xlsx.
Substation and Pier J Breakwater - Email From: Khan, Naser <naser.khan@aecom.com>, Sent: Friday, May 31, 2019 10:54 PM, To: Barrera, Baron <baron.barrera@polb.com>.

Table H1.5
Dredging Activity

		Activity				Rating		
		Quantity	Number of Engines	(hr/day)	Load	(hp)	(kw)	Engine Tier
Hopper Dredging								
Hopper propulsion engine	dredging	1	2	18	10%	9,000	6,711	Marine Tier 2
Hopper propulsion engine	transit	1	2	4	85%	9,000	6,711	Marine Tier 2
Hopper auxiliary engine	disposal	1	2	1.5	25%	600	447	Marine Tier 2
Hopper Crew boat propulsion engine	support	1	2	2	38%	325	242	Marine Tier 2
Hopper Crew boat auxiliary engine	support	1	1	2	32%	80	60	Marine Tier 2
Hopper Survey boat propulsion engine	dredging	1	1	8	38%	580	433	Marine Tier 2
Clamshell Dredging								
Clamshell Dredge hoist	dredging	1	1	22	50%	1,200	895	Offroad Tier 3
Clamshell Dredge generator	dredging	1	1	22	50%	900	671	Offroad Tier 3
Clamshell Barge dump scow	disposal	1	1	1	80%	175	130	Offroad Tier 3
Clamshell Tugboat propulsion engine	dredging	1	2	4	31%	300	224	Marine Tier 2
Clamshell Tugboat auxiliary engine	dredging	1	1	4	43%	78	58	Marine Tier 2
Clamshell Tugboat propulsion engine	transit	2	2	18	31%	600	447	Marine Tier 2
Clamshell Tugboat auxiliary engine	transit	2	2	18	43%	78	58	Marine Tier 2
Clamshell Crew boat propulsion engine	support	1	2	2	38%	325	242	Marine Tier 2
Clamshell Crew boat auxiliary engine	support	1	1	2	32%	80	60	Marine Tier 2
Clamshell Survey boat propulsion engine	dredging	1	1	2	38%	580	433	Marine Tier 2
Pier J Breakwater Construction								
Pier J Breakwater Tugboat propulsion engine		2	2	12	31%	475	354	Marine Tier 2
Pier J Breakwater Tugboat auxiliary engine		2	2	12	43%	78	58	Marine Tier 2
Pier J Breakwater Crew boat propulsion engine		1	2	2	38%	325	242	Marine Tier 2
Pier J Breakwater Crew boat auxiliary engine		1	1	2	32%	80	60	Marine Tier 2
Pier J Breakwater Survey boat propulsion engine		1	1	2	38%	580	433	Marine Tier 2
Pier J Wharf Upgrade								
Pier J Wharf Tugboat propulsion engine		1	2	12	31%	1000	746	Marine Tier 2
Pier J Wharf Tugboat auxiliary engine		1	2	12	43%	78	58	Marine Tier 2
Pier J Wharf Crew boat propulsion engine		1	2	2	38%	400	298	Marine Tier 2
Pier J Wharf Crew boat auxiliary engine		1	1	2	32%	80	60	Marine Tier 2
Pier J Wharf Survey boat propulsion engine		1	1	2	38%	400	298	Marine Tier 2
Pier T Wharf Upgrade								
Pier T Wharf Tugboat propulsion engine		1	2	12	31%	1000	746	Marine Tier 2
Pier T Wharf Tugboat auxiliary engine		1	2	12	43%	78	58	Marine Tier 2
Pier T Wharf Crew boat propulsion engine		1	2	2	38%	400	298	Marine Tier 2
Pier T Wharf Crew boat auxiliary engine		1	1	2	32%	80	60	Marine Tier 2
Pier T Wharf Survey boat propulsion engine		1	1	2	38%	400	298	Marine Tier 2

Notes:

Hopper dredge is used only during dredging of Approach Channel.

Dutra's hopper ship Stuyvensant has 2 aux engines (used for jet pumps which are only active during disposal events). These engines are scheduled to be upgraded to Tier 3 in a couple of years. Analysis conservatively assumed Tier 2 auxiliary engines.

Dutra's dredge pumps are electric and are powered via main engines.

Hopper auxiliary engine is only used during disposal events. 15 min per event and 6 events per day.

Survey boats have outboard propulsion. If there is hopper and clamshells working concurently then one survey boat can support both operations.

Dutra's biggest clamshell dredge generator is 895bhp.

Barge dump scow engine only runs for about 15 min while disposal event occures; assumed 4 loads per day.

Dutra's anchor tug fleet has typical twin 300 hp tier II configuration.

Tugboats used for disposal - Dutra uses 1200 hp on the low end. Used this conservatively in lieu of 2017 POLB EI.

Dutra survey boats don't have aux engines. Equipment is run off of inverters.

Source:

Dredging: KeyAssumptionsSummary Dutra revision.xlsx e-mailed 4/3/2019. Provided by USACE and Dutra

Pier J Breakwater:

E-mail from: Khan, Naser <naser.khan@aecom.com> Sent: Tuesday, May 21, 2019 10:51 PM To: Barrera, Baron <baron.barrera@polb.com>; Paulsen, Eric <eric.paulsen@polb.com>

E-mail from: Khan, Naser <naser.khan@aecom.com> Sent: Thursday, May 30, 2019 11:56 AM To: Barrera, Baron <baron.barrera@polb.com>; Paulsen, Eric <eric.paulsen@polb.com>
E-mail from: Khan, Naser <naser.khan@aecom.com> Sent: Friday, May 31, 2019 10:54 PM To: Barrera, Baron <baron.barrera@polb.com>

Table H1.6
Landside Construction Equipment Activity

Equipment	Number of Pieces (peak day)	Number of Active Days	Utilization (hr/day)	HP (each) or other info	Transit Distance Offsite (mi)	Transit Distance Onsite (mi)
Electrical Substation Construction at Pier J						
Offroad Equipment						
Caterpillar 320 excavator	1	20	8	164		
Small asphalt roller	1	26	8	33		
Water truck	1	20	8	300		
Forklift	1	22	2	50		
Mobile crane (35 ton)	1	2	8	282		
Onroad Equipment						
Dump trucks	3	5	8	600	11	1
Concrete trucks	7	5	8	335	20	1
Workers	20	60			30	
Pier J Breakwater Construction						
Offroad Equipment						
Piling crane	1	54	10	250		
Long arm excavator	1	54	10	315		
Onroad Equipment						
Pile delivery truck	5	5			200	1
Workers	21	54			30	
Pier J Wharf Upgrade						
Offroad Equipment						
Const Barge - piling crane	1	170	10	250		
Cong Barge - long arm excavator	1	170	10	315		
Const barge - deck equipment	1	170	10	100		
Sheet pile barge - deck equipment	1	170	10	100		
Onroad Equipment						
Workers	19	175			30	
Pier T Wharf Upgrade						
Offroad Equipment						
Const Barge - piling crane	1	310	10	250		
Cong Barge - long arm excavator	1	310	10	315		
Const barge - deck equipment	1	310	10	100		
Sheet pile barge - deck equipment	1	310	10	100		
Onroad Equipment						
Workers	19	320			30	

Notes:

1-way transit distance multiplied by 2 for total transit distance. Telephone conversation with Naser Khan (AECom) 5/21/19.

Source:

Telephone conversation with Naser Khan (AECom) 5/21/19.
E-mail from: Khan, Naser <naser.khan@aecom.com> Sent: Tuesday, May 21, 2019 10:51 PM To: Barrera, Baron <baron.barrera@polb.com>; Paulsen, Eric <eric.paulsen@polb.com>
E-mail from: Khan, Naser <naser.khan@aecom.com> Sent: Thursday, May 30, 2019 11:56 AM To: Barrera, Baron <baron.barrera@polb.com>; Paulsen, Eric <eric.paulsen@polb.com>
E-mail from: Khan, Naser <naser.khan@aecom.com> Sent: Friday, May 31, 2019 10:54 PM To: Barrera, Baron <baron.barrera@polb.com>

Table H1.7
Soil Handling - Electrical Substation Construction

Task	Peak Day Volume of Soil Handled (cyd/day)	Total Volume of Soil Handled (cyd)	Peak Day Volume of Soil Handled (ton/day)	Total Volume of Soil Handled (ton)
Electrical Substation Construction at Pier J	72	1500	91.8	1912.5

Table H1.8
Wharf Upgrades: Pier J, Berths 266-270

Activity No.	Description	No. of Working Days	Equipment	Horsepower	No. of People	Notes
1	Mobilize/Demobilize	5	Construction Barge with piling crane and long arm excavator. Tug boat	Piling Crane: 250 HP	8	Assume piling frame is constructed off site and placed onto barge at contractors' yard
		5		Long Arm Excavator: 315 HP		
		5		Tugboat: 2,000 HP		
2	Sheet Pile Delivery	10	As Activity No. 1	Construction Barge Deck Equipment: 100 HP	As above	Assume sheet piles are delivered onsite via a small barge as needed. Sheet piles will be loaded onto the small barge at the contractors' yard and delivered onsite from the waterside.
		10	Small barge for sheet piles	Sheet pile Barge Deck Equipment: 100 HP		
		10	Tug Boat	Survey Boat: 400 HP		
3	Clearing of seabed of any obstruction prior to pile driving	20	As Activity No. 1	Crew Boat: 400 HP	As above	Any debris will be cleared using the long arm excavator mounted on the construction barge, includes team of four divers
		20	Survey boat		7	
4	Driving of bulkhead wall	135	As Activity No. 3		19	Assumes driving rate of 20 LF per day
		135	Crew Boat		2	
5	Installation of anti-scour rock in front of new bulkhead wall	130	Small barge for storage of rock		4	Long arm excavator on construction barge used to place rock. Overlaps with activity No. 4, finish at probably the same time.
		130	Tug Boat			
6	Survey of installed bulkhead wall	5	Survey boat		3	Survey team

Source:
E-mail: From: Barrera, Baron <baron.barrera@polb.com>, Sent: Thursday, June 6, 2019 1:13 PM, To: Lora Granovsky <lora.granovsky@ilancoenvironmental.com>, Subject: FW: LB Deep Draft Nav Study - Construction Schedule for Pier J and T Sheet Pile Wall.
Duration: 175 working days for Pier J, Berths 266-270
Wharf upgrades apply to Alternative 4 only.

Table H1.9
Wharf Upgrades: Pier T, Berths 134-140

Activity No.	Description	No. of Working Days	Equipment	Horsepower	No. of People	Notes
1	Mobilize/Demobilize	5	Construction Barge with piling crane and long arm excavator. Tug boat	Piling Crane: 250 HP	8	Assume piling frame is constructed off site and placed onto barge at contractors' yard
		5		Long Arm Excavator: 315 HP		
		5		Tugboat: 2,000 HP		
2	Sheet Pile Delivery	20	As Activity No. 1	Construction Barge Deck Equipment: 100 HP	As above	Assume sheet piles are delivered onsite via a small barge as needed. Sheet piles will be loaded onto the small barge at the contractors' yard and delivered onsite from the waterside.
		20	Small barge for sheet piles	Sheet pile Barge Deck Equipment: 100 HP		
		20	Tug Boat	Survey Boat: 400 HP		
3	Clearing of seabed of any obstruction prior to pile driving	35	As Activity No. 1	Crew Boat: 400 HP	As above	Any debris will be cleared using the long arm excavator mounted on the construction barge, includes team of four divers
		35	Survey boat		7	
4	Driving of bulkhead wall	250	As Activity No. 3		19	Assumes driving rate of 20 LF per day
		250	Crew Boat		2	
5	Installation of anti-scour rock in front of new bulkhead wall	245	Small barge for storage of rock		4	Long arm excavator on construction barge used to place rock. Overlaps with activity No. 4, finish at probably the same time.
		245	Tug Boat			
6	Survey of installed bulkhead wall	10	Survey boat		3	Survey team

Source:
E-mail: From: Barrera, Baron <baron.barrera@polb.com>, Sent: Thursday, June 6, 2019 1:13 PM, To: Lora Granovsky <lora.granovsky@ilancoenvironmental.com>, Subject: FW: LB Deep Draft Nav Study - Construction Schedule for Pier J and T Sheet Pile Wall.
Duration: 320 working days for Pier T, Berths 134-140
Wharf upgrades apply to Alternative 4 only.

Table H1.10
Offroad Engine Emission Factors - USEPA Standards

	Emission Factor (g/hp-hr)							
	High HP	**PM10**	**PM2.5**	**DPM**	**NOX**	**SOX**	**CO**	**VOC**
Tier 1	50	0.6	0.6	0.6	6.745	0.005552	4.1	
	100	0.6	0.6	0.6	6.9	0.005552	4.1	
	175	0.6	0.6	0.6	6.9	0.004994	4.1	
	300	0.4	0.4	0.4	6.9	0.004994	8.5	1.053
	600	0.4	0.4	0.4	6.9	0.004994	8.5	1.053
	750	0.4	0.4	0.4	6.9	0.004994	8.5	1.053
	>750	0.4	0.4	0.4	6.9	0.004994	8.5	1.053
Tier 2	50	0.45	0.45	0.45	5.32	0.005552	4.1	0.29484
	100	0.3	0.3	0.3	5.32	0.005552	3.7	0.29484
	175	0.22	0.22	0.22	4.655	0.004994	3.7	0.257985
	300	0.15	0.15	0.15	4.655	0.004994	2.6	0.257985
	600	0.15	0.15	0.15	4.56	0.004994	2.6	0.25272
	750	0.15	0.15	0.15	4.56	0.004994	2.6	0.25272
	>750	0.15	0.15	0.15	4.56	0.004994	2.6	0.25272
Tier 3	50	0.45	0.45	0.45	5.32	0.005552	4.1	0.29484
	100	0.3	0.3	0.3	3.325	0.005552	3.7	0.184275
	175	0.22	0.22	0.22	2.85	0.004994	3.7	0.15795
	300	0.15	0.15	0.15	2.85	0.004994	2.6	0.15795
	600	0.15	0.15	0.15	2.85	0.004994	2.6	0.15795
	750	0.15	0.15	0.15	2.85	0.004994	2.6	0.15795
	>750	0.15	0.15	0.15	4.56	0.004994	2.6	0.25272
Tier 4 Interim	50	0.22	0.22	0.22	5.32	0.005552	4.1	0.29484
	75	0.22	0.22	0.22	3.325	0.005552	3.7	0.184275
	175	0.015	0.015	0.015	0.3	0.004994	3.7	0.14742
	750	0.015	0.015	0.015	0.3	0.004994	2.6	0.14742
	>750	0.075	0.075	0.075	2.6	0.004994	2.6	0.3159
Tier 4 Final	50	0.022	0.022	0.022	3.325	0.005552	4.1	0.184275
	75	0.022	0.022	0.022	3.325	0.005552	3.7	0.184275
	175	0.015	0.015	0.015	0.3	0.004994	3.7	0.14742
	750	0.015	0.015	0.015	0.3	0.004994	2.6	0.14742
	>750	0.03	0.03	0.03	2.6	0.004994	2.6	0.3159

Source:
USEPA Engine Standards. DieselNet: https://www.dieselnet.com/standards/us/nonroad.php#tier3
NMHC+NOx Pollutant Fractions (2017 Carl Moyer Program Guidelines, Table D-25):
NOx = 0.95
HC 0.05
SOx is a function of fuel sulfur content and does not change with Tier.
Used for Marine Offroad Equipment: Tier 3
Used for Mitigation: Tier 4 offroad equipment

Table H1.11
Harbor Craft Emission Factors - USEPA Standards

				g/kw-hr											
Engine Displacement	**(kW)**	**EPA Tier**	**MY**	**NMHC+NOx**	**PM10**	**PM2.5**	**DPM**	**NOx**	**SOX**	**CO**	**HC**	**VOC**	**CO2**	**CH4**	**N2O**
Category 1	**HC auxiliary engines**														
>2.5	>37	Tier 1	2004		0.54	0.4806	0.54	17	0.00552	11.4	1.3	1.3689	652	0.026	0.031
<0.9	≥37	Tier 2	2005	7.5	0.4	0.356	0.4	7.125	0.00552	5	0.375	0.394875	652	0.0075	0.031
0.9 < displ < 1.2	75-130	Tier 2	2004	7.2	0.3	0.267	0.3	6.84	0.00552	5	0.36	0.37908	652	0.0072	0.031
1.2 < displ < 2.5	130-560	Tier 2	2004	7.2	0.3	0.267	0.3	6.84	0.00552	5	0.36	0.37908	652	0.0072	0.031
2.5 < displ < 5	>560	Tier 2	2007	7.2	0.2	0.178	0.2	6.84	0.00552	5	0.36	0.37908	652	0.0072	0.031
<0.9	<19	Tier 3	2009	7.5	0.4	0.356	0.4	7.125	0.00552	6.6	0.375	0.394875	652	0.0075	0.031
<0.9	19-75	Tier 3	2009-2013	7.5	0.3	0.267	0.3	7.125	0.00552	5.5	0.375	0.394875	652	0.0075	0.031
<0.9	19-75	Tier 3	2014+	4.7	0.3	0.267	0.3	4.465	0.00552	5.5	0.235	0.247455	652	0.0047	0.031
<0.9	>75	Tier 3	2012+	5.4	0.14	0.1246	0.14	5.13	0.00552	5.5	0.27	0.28431	652	0.0054	0.031
0.9 < displ < 1.2	all	Tier 3	2013+	5.4	0.14	0.1246	0.14	5.13	0.00552	5	0.27	0.28431	652	0.0054	0.031
1.2 < displ < 2.5	<600	Tier 3	2014-2017	5.6	0.11	0.0979	0.11	5.32	0.00552	5	0.28	0.29484	652	0.0056	0.031
1.2 < displ < 2.5	<600	Tier 3	2018+	5.6	0.1	0.089	0.1	5.32	0.00552	5	0.28	0.29484	652	0.0056	0.031
1.2 < displ < 2.5	≥600	Tier 3	2014+	5.6	0.11	0.0979	0.11	5.32	0.00552	5	0.28	0.29484	652	0.0056	0.031
2.5 < displ < 3.5	<600	Tier 3	2013-2017	5.6	0.11	0.0979	0.11	5.32	0.00552	5	0.28	0.29484	652	0.0056	0.031
2.5 < displ < 3.5	<600	Tier 3	2018+	5.6	0.1	0.089	0.1	5.32	0.00552	5	0.28	0.29484	652	0.0056	0.031
2.5 < displ < 3.5	≥600	Tier 3	2013+	5.6	0.11	0.0979	0.11	5.32	0.00552	5	0.28	0.29484	652	0.0056	0.031
3.5 ≤ D < 7	<600	Tier 3	2012-2017	5.8	0.11	0.0979	0.11	5.51	0.00552	5	0.29	0.30537	652	0.0058	0.031
3.5 ≤ D < 7	<600	Tier 3	2018+	5.8	0.1	0.089	0.1	5.51	0.00552	5	0.29	0.30537	652	0.0058	0.031
3.5 ≤ D < 7	≥600	Tier 3	2012+	5.8	0.11	0.0979	0.11	5.51	0.00552	5	0.29	0.30537	652	0.0058	0.031
	600-1400	Tier 4	2017+		0.04	0.0356	0.04	1.8	0.00552	5	0.19	0.20007	652	0.0038	0.031
	1400-2000	Tier 4	2016+		0.04	0.0356	0.04	1.8	0.00552	5	0.19	0.20007	652	0.0038	0.031
	2000-3700	Tier 4	2014+		0.04	0.0356	0.04	1.8	0.00552	5	0.19	0.20007	652	0.0038	0.031
<15.0	>3700	Tier 4	2014-2015		0.12	0.1068	0.12	1.8	0.00552	5	0.19	0.20007	652	0.0038	0.031
15 < displ < 30	>3700	Tier 4	2014-2015		0.25	0.2225	0.25	1.8	0.00552	5	0.19	0.20007	652	0.0038	0.031
all	>3700	Tier 4	2016+		0.06	0.0534	0.06	1.8	0.00552	5	0.19	0.20007	652	0.0038	0.031
Category 2	**HC propulsion engines**														
>2.5	>37	Tier 1	2004		0.54	0.4806	0.54	17	0.00552	11.4	1.3	1.3689	652	0.026	0.031
5.0 ≤ D < 15	all	Tier 2	2007	7.8	0.27	0.2403	0.27	7.41	0.00552	5	0.39	0.41067	652	0.0078	0.031
15 ≤ D < 20	< 3300 kW	Tier 2	2007	8.7	0.5	0.445	0.5	8.265	0.00552	5	0.435	0.458055	652	0.0087	0.031
15 ≤ D < 20	≥ 3300 kW	Tier 2	2007	9.8	0.5	0.445	0.5	9.31	0.00552	5	0.49	0.51597	652	0.0098	0.031
20 ≤ D < 25	all	Tier 2	2007	9.8	0.5	0.445	0.5	9.31	0.00552	5	0.49	0.51597	652	0.0098	0.031
25 ≤ D < 30	all	Tier 2	2007	11	0.5	0.445	0.5	10.45	0.00552	5	0.55	0.57915	652	0.011	0.031
7 ≤ D < 15	<2000	Tier 3	2013+	6.2	0.14	0.1246	0.14	5.89	0.00552	5	0.31	0.32643	652	0.0062	0.031
7 ≤ D < 15	2000-3700	Tier 3	2013+	7.8	0.14	0.1246	0.14	7.41	0.00552	5	0.39	0.41067	652	0.0078	0.031
15 ≤ D < 20	<2000	Tier 3	2014+	7	0.34	0.3026	0.34	6.65	0.00552	5	0.35	0.36855	652	0.007	0.031
20 ≤ D < 25	<2000	Tier 3	2014+	9.8	0.27	0.2403	0.27	9.31	0.00552	5	0.49	0.51597	652	0.0098	0.031
25 ≤ D < 30	<2000	Tier 3	2014+	11	0.27	0.2403	0.27	10.45	0.00552	5	0.55	0.57915	652	0.011	0.031
all	2000-3700	Tier 4	2014		0.04	0.0356	0.04	1.8	0.00552	5	0.19	0.20007	652	0.0038	0.031
<15	>3700	Tier 4	2014		0.12	0.1068	0.12	1.8	0.00552	5	0.19	0.20007	652	0.0038	0.031
15 ≤ D < 30	>3700	Tier 4	2014		0.25	0.2225	0.25	1.8	0.00552	5	0.19	0.20007	652	0.0038	0.031
all	>3700	Tier 4	2016		0.06	0.0534	0.06	1.8	0.00552	5	0.19	0.20007	652	0.0038	0.031
all	1400-2000	Tier 4	2016		0.04	0.0356	0.04	1.8	0.00552	5	0.19	0.20007	652	0.0038	0.031
all	600-1400	Tier 4	2017		0.04	0.0356	0.04	1.8	0.00552	5	0.19	0.20007	652	0.0038	0.031
	600-1400	Tier 4	2017+		0.04	0.0356	0.04	1.8	0.00552	5	0.19	0.20007	652	0.0038	0.031
	1400-2000	Tier 4	2016+		0.04	0.0356	0.04	1.8	0.00552	5	0.19	0.20007	652	0.0038	0.031
	2000-3700	Tier 4	2014+		0.04	0.0356	0.04	1.8	0.00552	5	0.19	0.20007	652	0.0038	0.031
<15.0	>3700	Tier 4	2014-2015		0.12	0.1068	0.12	1.8	0.00552	5	0.19	0.20007	652	0.0038	0.031
15 < displ < 30	>3700	Tier 4	2014-2015		0.25	0.2225	0.25	1.8	0.00552	5	0.19	0.20007	652	0.0038	0.031
all	>3700	Tier 4	2016+		0.06	0.0534	0.06	1.8	0.00552	5	0.19	0.20007	652	0.0038	0.031

Source:
Federal Marine Compression-Ignition Engines - Exhaust Emission Standards Reference Guide, http://epa.gov/OMS/standards/nonroad/marineci.htm
Tier 1 and Tier 2 standards: 40CFR Part 94.8
Tier 3 and Tier 4 standards: 40CFR Part 1042.101
EPA Tier 1 emissions standards for marine engines do not specify restrictions to PM, SOx, CO, or VOC. NOx reflects Marpol Annex VI (17 g/kW-hr). PM10, SOX, CO and VOC emissions factors were obtained from EPA offroad emission engine standards for Tier 1 engines.
EPA Tier 2 and Tier 3 emission standards are reported as NOx+THC. 5% is HC per Carl Moyer Program guidelines. 95% is NOx.
SOx emission factor is based on 15 ppm fuel sulfur content.
PM2.5 is 89% of PM10, per SCAQMD 2006 Final Methodology to Calculate PM2.5 and PM 2.5 Significance Thresholds, Table 5.
CO2 and N20 emission factors are from IVL: Methodology for Calculating Emissions from Ships: Update on Emission Factors, 2004, also summarized in POLA 2009 Emissions Inventory, Appendix B. CH4 is 2% of HC, per IVL study.

Table H1.12

SOx Emission Factor - Harbor Craft

Harbor Craft 0.00552 g/hp-hr		
Dredging Equipment use OFFROAD BSCF and convert to g SOx /hp-hr		
SOx (gms/hp-hr) = (S content in X/1,000,000) x (MW SO2/ MW S) x BSF =		
Where:		
X = S content in parts per million (ppm)	15	ppm
S MW = Molecular Weight	32	
SO2 MW = Molecular Weight	64	
BSFC for harbor craft = Brake Specific Fuel Consumption (per CARB 2007 Harbor Craft Methodology)	184	(g/hp-hr)

Table H1.13

Habor Craft Load Factor

Type		Main Engine	Auxiliary Engine
Assist tugboat		0.31	0.43
Commercial fishing		0.27	0.43
Crew boat		0.38	0.32
Excursion		0.42	0.43
Ferry		0.42	0.43
Government		0.51	0.43
Ocean tug		0.68	0.43
Tugboat		0.31	0.43
Workboat	Diveboat	0.38	0.32

Source:

2013 POLB Emissions Inventory, Table 3.4.

Table H1.14

Paved Road Dust Emission Factor Derivation

Emission Source	(sL) Silt Loading (g/m2)	(k) Particle Size Multiplier - PM10 (g/VMT)	(k) Particle Size Multiplier - PM2.5 (g/VMT)	(W) Average Vehicle Weight on Road (tons)	(E) Uncontrolled PM10 Emission Factor (g/VMT)	(E) Uncontrolled PM2.5 Emission Factor (g/VMT)
Onsite Trucks	0.6	1.00	0.25	20.0	**13.34**	**3.34**
Offsite Roadway (all vehicles) - CARB 2016						
Freeway Statewide	0.015	1.00	0.25	2.4	0.05	0.01
Major LA County	0.013	1.00	0.25	2.4	0.05	0.01
Collector LA County	0.013	1.00	0.25	2.4	0.05	0.01
Local LA County	0.135	1.00	0.25	2.4	0.39	0.10

Notes:

1. Emission factors are calculated using CARB's Miscellaneous Process Methodology 7.9, Entrained Road Travel, Paved Road Dust.

November 2016. Available: https://ww3.arb.ca.gov/ei/areasrc/fullpdf/full7-9_2016.pdf. Accessed 7/2019. Because the emissions are primarily used for peak day or peak hour calculations, downward adjustment due to annual precipitation was not made.

2. Emission factors exclude engine exhaust, tire wear, and brake wear, which are accounted for in EMFAC calculations.
3. The equation is: E = k (sL)^0.91 x (W)^1.02

Summary of Daily VMT by Roadway Type

Los Angeles - Long Beach - Santa Ana Metro Area

Metropolitan Area	Interstate/ Other Fwy/ Exprwy	Other Principal Arterial	Minor Arterial	Collector	Local
Daily Vehicle-Miles Travelled (Thousands)	132,796	67,118	49,528	15,304	14,481
Travel Fraction	0.48	0.24	0.18	0.05	0.05

Source: Federal Highway Adminstration. Highway Statistics 2016 - Urbanized Areas - 2016 Miles and Daily
Last accessed February 2019. https://www.fhwa.dot.gov/policyinformation/statistics/2016/

Composite Paved Road Dust Emission Factors for Project Trips

Road Type	Fraction of Travel by Roadway Type					Composite EF	
	Interstate/ Other Fwy/ Exprwy	Other Principal Arterial	Minor Arterial	Collector	Local	PM10 (g/VMT)	PM2.5 (g/VMT)
Vehicle Trips in Los Angeles - Long Beach - Santa Ana Metro Area	0.48	0.24	0.18	0.05	0.05	**0.068**	**0.017**

Table H1.15

Material Loading/Handling Dust Emision Factors

PM10 (lb/ton)	0.0560274	
PM2.5 (lb/ton)	0.0084841	
$EF = (k)(0.0032)[(U/5)^{1.3}]/[(M/2)^{1.4}]$		
EF = lb/ton		
k = Particle Size Constant (0.35 for PM10 and 0.053 for PM2.5)		
U = average wind speed = 2.2 m/s (CalEEMod), 4.9 mph		
M = moisture content = 12% (CalEEMod)		
Soil density (ton/cyd):	1.26	
Truck capacity (cyd)	20	
Truck capacity (ton)	25.28	
Source: AP-42, p. 13.2.4 & CalEEMod		

Table H1.16

Asphalt Paving

VOC (lb/acre)	2.62	(lb/ft2)	6.015E-05
Source: CalEEMod, Appendix A, Section 4.8.			

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Table H1.17
OFFROAD 2017 Output

OFFROAD2017 (v1.0.1) Emissions Inventory
Region Type: Air District
Region: South Coast AQMD
Calendar Year: 2024
Scenario: All Adopted Rules - Exhaust
Vehicle Classification: OFFROAD2017 Equipment Types
Units: Emissions: tons/day, Fuel Consumption: gallons/year, Activity: hours/year, HP-Hours: HP-hours/year

Region	CalYr	VehClass	MdlYr	HP_Bin	Fuel	HC_tpd	ROG_tpd	TOG_tpd	CO_tpd	NOx_tpd	CO2_tpd	PM10_tpd	PM2_5_tpd	PM_tpd	SOx_tpd	NH3_tpd	Fuel_gpy	Total_Activity_hpy	Total_Population	Horsepower_Hours_hhpy
South Coast	2024	Industrial - Aerial Lifts	Aggregated	25	Diesel	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
South Coast	2024	Industrial - Aerial Lifts	Aggregated	50	Diesel	0.003326937	0.004025594	0.004790789	0.079014703	0.073312641	14.908399	0.000549907	0.000505915	0.000549907	0.000137736	0.00012168	483686.6	591600.15	1911.1402	27291100
South Coast	2024	Industrial - Aerial Lifts	Aggregated	75	Diesel	0.00196584	0.002378667	0.00283081	0.068456702	0.035496583	11.411501	0.000789221	0.000726084	0.000789221	0.000105446	9.31391E-05	370233.6	332424.62	1079.5822	23226784.67
South Coast	2024	Industrial - Aerial Lifts	Aggregated	100	Diesel	0.002124473	0.002570612	0.003059241	0.087821283	0.039766347	14.601892	0.000515682	0.000474427	0.000515682	0.000134938	0.000119179	473742.3	382664.21	1235.6121	29712613.35
South Coast	2024	Industrial - Aerial Lifts	Aggregated	175	Diesel	0.000214867	0.000259989	0.000309409	0.008606927	0.001722874	1.589834	7.29618E-05	6.71248E-05	7.29618E-05	1.46924E-05	1.2976E-05	51580.414	24809.443	80.269691	3236722.847
South Coast	2024	Industrial - Aerial Lifts	Aggregated	300	Diesel	1.20506E-05	1.45812E-05	1.73529E-05	0.000174235	0.000123207	0.095005	1.66541E-06	1.53218E-06	1.66541E-06	8.78006E-07	7.75418E-07	3082.3312	840.96234	2.7057199	193421.3391
South Coast	2024	Industrial - Aerial Lifts	Aggregated	600	Diesel	6.889E-06	8.33569E-06	9.92015E-06	0.000122497	3.36709E-05	0.0674673	1.17545E-06	1.08141E-06	1.17545E-06	6.23562E-07	5.50659E-07	2188.9019	280.32078	0.9019066	137357.1828
South Coast	2024	OFF - ConstMin - Plate Compactors	Aggregated	25	Diesel	0.00057186	0.000680561	0.000823478	0.004319479	0.005156935	0.7074236	0.000201509	0.000185389	0.000201509	1.10081E-05	5.93633E-06	23597.25	119822.2	199.52	958577.6
South Coast	2024	OFF - Light Commercial - Air Compressors	Aggregated	25	Diesel	0.000876803	0.001043468	0.001262597	0.004623625	0.00778996	1.0040399	0.000324279	0.000298337	0.000324279	1.33207E-05	8.40727E-06	33419.4	61002.45	74.88	1218428.4
South Coast	2024	OFF - Light Commercial - Air Compressors	Aggregated	50	Diesel	0.009822428	0.011689501	0.014144297	0.09693465	0.076597813	11.231237	0.002732976	0.002514338	0.002732976	0.000145192	9.4613E-05	376092.35	368463.85	452.64	13633162.45
South Coast	2024	ConstMin - Cranes	Aggregated	25	Diesel	2.0286E-05	2.4546E-05	2.92118E-05	0.000113714	9.66561E-05	0.0116572	7.59123E-06	6.98393E-06	7.59123E-06	1.07168E-07	9.51442E-08	378.20384	913.58918	1.8645734	22839.72944
South Coast	2024	ConstMin - Cranes	Aggregated	50	Diesel	0.000533764	0.000645855	0.000768621	0.00240237	0.001906914	0.1888651	0.000192194	0.000176818	0.000192194	1.73014E-06	1.54149E-06	6127.5216	8886.7971	19.888783	366338.4637
South Coast	2024	ConstMin - Cranes	Aggregated	75	Diesel	0.000150058	0.000181571	0.000216084	0.0006252	0.001360003	0.0724763	0.000128061	0.000117816	0.000128061	6.65577E-07	5.91542E-07	2351.413	2336.9873	6.2152447	156830.8722
South Coast	2024	ConstMin - Cranes	Aggregated	100	Diesel	0.00341141	0.004127807	0.004912431	0.033268294	0.03700243	4.5468204	0.002322333	0.002136547	0.002322333	4.19353E-05	3.71105E-05	147516.58	111966.96	244.88064	9930003.218
South Coast	2024	ConstMin - Cranes	Aggregated	175	Diesel	0.007878513	0.009533001	0.011345059	0.082290973	0.091768248	12.794175	0.004960442	0.004563606	0.004960442	0.000118052	0.000104424	415092.91	188449.19	404.61243	27828778.99
South Coast	2024	ConstMin - Cranes	Aggregated	300	Diesel	0.010227138	0.012374837	0.014727078	0.070919069	0.13264119	22.212489	0.005532029	0.005089467	0.005532029	0.000205059	0.000181295	720659.73	220360.18	456.82048	48391095.85
South Coast	2024	ConstMin - Cranes	Aggregated	600	Diesel	0.013079131	0.015825749	0.018833949	0.126470765	0.160367746	39.707164	0.006453087	0.00593684	0.006453087	0.00036672	0.000324085	1288255.2	235911.53	465.52183	86509887
South Coast	2024	ConstMin - Cranes	Aggregated	750	Diesel	0.000414325	0.000501334	0.000596629	0.003739171	0.005075816	0.683406	0.000251319	0.000231213	0.000251319	6.306E-06	5.57787E-06	22172.354	2334.8086	5.5937202	1489529.811
South Coast	2024	ConstMin - Cranes	Aggregated	9999	Diesel	0.001949465	0.002358853	0.00280723	0.020123424	0.028121534	2.1690511	0.00124691	0.001147157	0.00124691	1.99955E-05	1.77035E-05	70372.473	5039.9912	9.9443915	4725395.503
South Coast	2024	ConstMin - Bore/Drill Rigs	Aggregated	25	Diesel	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
South Coast	2024	ConstMin - Bore/Drill Rigs	Aggregated	50	Diesel	0.00051222	0.000619786	0.000737597	0.004409124	0.004234062	0.6033835	0.000223061	0.000205216	0.000223061	5.56321E-06	4.92474E-06	19576.114	17120.573	47.013303	664158.3093
South Coast	2024	ConstMin - Bore/Drill Rigs	Aggregated	75	Diesel	0.000263062	0.000318305	0.000378809	0.004716774	0.004728884	0.7420076	0.000228886	0.000210575	0.000228886	6.85234E-06	6.05617E-06	24073.619	12982.677	26.228474	943030.4836
South Coast	2024	ConstMin - Bore/Drill Rigs	Aggregated	100	Diesel	0.000793599	0.000960255	0.001142782	0.019037587	0.011339025	3.029392	0.000420387	0.000386756	0.000420387	2.79844E-05	2.47255E-05	98285.289	45684.545	117.28582	3828325.49
South Coast	2024	ConstMin - Bore/Drill Rigs	Aggregated	175	Diesel	0.000864172	0.001045648	0.001244408	0.024581837	0.008641458	4.4183065	0.000395182	0.000363567	0.000395182	4.08235E-05	3.60616E-05	143347.09	36690.577	113.3268	5472037.01
South Coast	2024	ConstMin - Bore/Drill Rigs	Aggregated	300	Diesel	0.001173139	0.001419498	0.00168932	0.012973941	0.013711353	6.437411	0.000444948	0.000409352	0.000444948	5.94819E-05	5.25413E-05	208854.71	38539.793	116.79094	8081075.955
South Coast	2024	ConstMin - Bore/Drill Rigs	Aggregated	600	Diesel	0.001554492	0.001880935	0.002238468	0.018645424	0.014595768	9.9165954	0.00052562	0.00048357	0.00052562	9.16372E-05	8.09379E-05	321733.02	31270.72	92.541974	12510630.99
South Coast	2024	ConstMin - Bore/Drill Rigs	Aggregated	750	Diesel	0.000781732	0.000945895	0.001125694	0.011646979	0.006753384	6.4171702	0.000260066	0.000239261	0.000260066	5.93065E-05	5.23761E-05	208198.02	12460.525	20.784828	7940119.213
South Coast	2024	ConstMin - Bore/Drill Rigs	Aggregated	9999	Diesel	0.000874856	0.001058576	0.001259793	0.0061952	0.024104296	3.295717	0.000556735	0.000512196	0.000556735	3.04443E-05	2.68992E-05	106925.91	2215.243	2.9692612	4121374.97
South Coast	2024	ConstMin - Excavators	Aggregated	25	Diesel	2.61182E-05	3.16031E-05	3.76103E-05	8.87472E-05	6.0281E-05	0.0046697	8.40136E-06	7.72925E-06	8.40136E-06	4.23906E-08	3.81139E-08	151.50483	275.77022	1.1054457	6894.255522
South Coast	2024	ConstMin - Excavators	Aggregated	50	Diesel	0.014301432	0.017304733	0.020594062	0.174964361	0.14597323	24.486123	0.004967812	0.004570387	0.004967812	0.000225957	0.000199852	794425.29	1009598	1349.1965	36148196.64
South Coast	2024	ConstMin - Excavators	Aggregated	75	Diesel	0.000507738	0.000614363	0.000731143	0.003570783	0.005562328	0.459396	0.000486584	0.000447657	0.000486584	4.23211E-06	3.74953E-06	14904.596	10331.373	17.687131	754837.4229
South Coast	2024	ConstMin - Excavators	Aggregated	100	Diesel	0.010208364	0.01235212	0.014700044	0.205672734	0.129200323	31.273571	0.005594634	0.005147063	0.005594634	0.000288833	0.000255251	1014636.6	633591.45	954.55236	51613820.79
South Coast	2024	ConstMin - Excavators	Aggregated	175	Diesel	0.018032642	0.021819497	0.025967005	0.391556344	0.169853816	67.036141	0.008413443	0.007740368	0.008413443	0.000619241	0.00054714	2174913.8	753439.12	1245.2846	110081748.9
South Coast	2024	ConstMin - Excavators	Aggregated	300	Diesel	0.018874332	0.022837941	0.027179038	0.179374516	0.183938627	85.411425	0.006010834	0.005529967	0.006010834	0.000789105	0.000697117	2771079.6	640988.81	1072.835	140136243.1
South Coast	2024	ConstMin - Excavators	Aggregated	600	Diesel	0.028770215	0.03481196	0.041429109	0.301095489	0.23734104	151.63337	0.008158568	0.007505882	0.008158568	0.001401063	0.001237611	4919577.8	738096.09	1125.3437	249471503.6
South Coast	2024	ConstMin - Excavators	Aggregated	750	Diesel	0.00057652	0.000697589	0.000830189	0.005593627	0.007306292	1.8945769	0.000289998	0.000266798	0.000289998	1.7499E-05	1.54633E-05	61467.46	5041.3638	8.8435656	3094568.773
South Coast	2024	ConstMin - Excavators	Aggregated	9999	Diesel	0.000527283	0.000638013	0.000759288	0.007852624	0.0186676	4.2238993	0.000168585	0.000155098	0.000168585	3.90362E-05	3.44749E-05	137039.76	5756.9455	8.2908427	6862542.808
South Coast	2024	Industrial - Forklifts	Aggregated	25	Diesel	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
South Coast	2024	Industrial - Forklifts	Aggregated	50	Diesel	0.009766457	0.011817413	0.014063699	0.086864408	0.06895685	10.033952	0.003465042	0.003187838	0.003465042	9.24759E-05	8.18958E-05	325540.51	663567.5	885.96181	28152589.38
South Coast	2024	Industrial - Forklifts	Aggregated	75	Diesel	0.001763312	0.002133608	0.002539169	0.007030789	0.016791477	0.6530002	0.001308283	0.00120362	0.001308283	5.98441E-06	5.3297E-06	21185.873	28130.245	62.969187	2050942.214
South Coast	2024	Industrial - Forklifts	Aggregated	100	Diesel	0.054981773	0.066527946	0.079173754	0.824370118	0.627377742	120.20099	0.03587931	0.033008965	0.03587931	0.001109668	0.000981064	3899788.7	4558134.9	5848.8124	375713959.6
South Coast	2024	Industrial - Forklifts	Aggregated	175	Diesel	0.013475249	0.016305051	0.019404358	0.229756629	0.135380414	38.198857	0.006967114	0.006409745	0.006967114	0.000352763	0.000311774	1239319.9	844249.57	1101.2286	119291770.4
South Coast	2024	Industrial - Forklifts	Aggregated	300	Diesel	0.002488849	0.003011508	0.003583943	0.019027699	0.024884209	8.3200432	0.000939482	0.000864323	0.000939482	7.68483E-05	6.79071E-05	269934.64	123583.15	161.08397	25946815.34
South Coast	2024	Industrial - Forklifts	Aggregated	600	Diesel	0.000771931	0.000934036	0.00111158	0.004956592	0.007541408	2.1019464	0.000285909	0.000263036	0.000285909	1.94104E-05	1.71558E-05	68195.337	18394.169	24.894795	6519863.032
South Coast	2024	Industrial - Forklifts	Aggregated	9999	Diesel	2.78196E-05	3.36617E-05	4.00602E-05	0.000325499	0.000760618	0.1663868	7.03585E-06	6.47298E-06	7.03585E-06	1.53749E-06	1.35803E-06	5398.2354	590.32449	0.7321998	519485.5481
South Coast	2024	OFF - Light Commercial - Generator Sets	Aggregated	25	Diesel	0.02121002	0.025241677	0.030542429	0.133197229	0.202293488	26.255631	0.00834676	0.007679019	0.00834676	0.000366459	0.000219883	874047.25	1437665.7	4258.77	20672851.75
South Coast	2024	OFF - Light Commercial - Generator Sets	Aggregated	50	Diesel	0.018458294	0.021966895	0.026579943	0.208124013	0.1965088	31.085386	0.006015189	0.005533974	0.006015189	0.000401856	0.000260655	1036118.2	741690.95	2197.08	24475801.35
South Coast	2024	ConstMin - Rubber Tired Loaders	Aggregated	25	Diesel	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
South Coast	2024	ConstMin - Rubber Tired Loaders	Aggregated	50	Diesel	0.002718664	0.003289583	0.003914876	0.019523559	0.014568556	1.9122025	0.000933331	0.000858665	0.000933331	1.75977E-05	1.56071E-05	62039.305	71581.408	81.429742	2967204
South Coast	2024	ConstMin - Rubber Tired Loaders	Aggregated	75	Diesel	0.000208588	0.000252391	0.000300366	0.000865126	0.00195542	0.0993576	0.000175097	0.000161089	0.000175097	9.12353E-07	8.10944E-07	3223.5495	2345.2452	4.4016077	174427.6092
South Coast	2024	ConstMin - Rubber Tired Loaders	Aggregated	100	Diesel	0.02867256	0.034693798	0.041288487	0.339598613	0.291967625	46.383324	0.019201809	0.017665664	0.019201809	0.000427977	0.000378574	1504855.9	943929.68	1000.8155	81118397.57
South Coast	2024	ConstMin - Rubber Tired Loaders	Aggregated	175	Diesel	0.043073681	0.052119154	0.0620261	0.6912983	0.399254028	110.47658	0.021380367	0.019669938	0.021380367	0.001020119	0.000901695	3584291	1281985.7	1333.6871	192101453
South Coast	2024	ConstMin - Rubber Tired Loaders	Aggregated	300	Diesel	0.050310658	0.060875896	0.072447347	0.368737462	0.562927377	166.21495	0.018666486	0.017173167	0.018666486	0.00153523	0.001356624	5392660.8	1371060	1252.8076	288830495.4
South Coast	2024	ConstMin - Rubber Tired Loaders	Aggregated	600	Diesel	0.069419209	0.083997243	0.099963662	0.5161172	0.687779611	201.47439	0.026029491	0.023947132	0.026029491	0.001860648	0.001644407	6536614.8	1056605.6	1067.3899	350564257.6
South Coast	2024	ConstMin - Rubber Tired Loaders	Aggregated	750	Diesel	0.005914509	0.007156556	0.008516893	0.055872518	0.047384456	19.107969	0.001715892	0.00157862	0.001715892	0.000176485	0.000155957	619937.03	51273.308	51.168689	33237564.36
South Coast	2024	ConstMin - Rubber Tired Loaders	Aggregated	9999	Diesel	0.004770226	0.005771973	0.006869125	0.031649189	0.101131032	14.314569	0.002096418	0.001928705	0.002096418	0.000132202	0.000116834	464420.43	25882.558	21.457837	24784347.74
South Coast	2024	OFF - ConstMin - Cement and Mortar Mixers	Aggregated	25	Diesel	0.00083898	0.000998456	0.001208131	0.005871732	0.007576109	1.0280532	0.000295881	0.000272211	0.000295881	1.54066E-05	8.61663E-06	34251.6	103638.1	345.19	1069574.1
South Coast	2024	ConstMin - Pavers	Aggregated	25	Diesel	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
South Coast	2024	ConstMin - Pavers	Aggregated	50	Diesel	0.000894062	0.001081815	0.00128745	0.005641957	0.004784583	0.6708561	0.000317712	0.000292295	0.000317712	6.17558E-06	5.47544E-06	21765.186	23489.024	64.727137	909960.9803
South Coast	2024	ConstMin - Pavers	Aggregated	75	Diesel	0.001142034	0.001381861	0.001644529	0.006000588	0.010371064	0.776833	0.001000061	0.000920056	0.001000061	7.14795E-06	6.34041E-06	25203.491	16531.624	46.387781	1181453.775
South Coast	2024	ConstMin - Pavers	Aggregated	100	Diesel	0.002211828	0.002676311	0.003185032	0.036988361	0.029262745	5.6880144	0.001560137	0.001435326	0.001560137	5.25222E-05	4.64248E-05	184541.36	106751.56	265.92065	8614366.98
South Coast	2024	ConstMin - Pavers	Aggregated	175	Diesel	0.002721805	0.003293384	0.003919399	0.050529022	0.031072553	8.863986	0.001478319	0.001360053	0.001478319	8.18703E-05	7.23467E-05	287582.26	84677.461	214.67834	13361041.79
South Coast	2024	ConstMin - Pavers	Aggregated	300	Diesel	0.001409079	0.001704986	0.002029074	0.013215103	0.019379495	6.9182465	0.000627429	0.000577234	0.000627429	6.39203E-05	5.64658E-05	224454.89	47355.571	103.02403	10434925.44
South Coast	2024	ConstMin - Pavers	Aggregated	600	Diesel	0.000204541	0.000247495	0.000294539	0.002353635	0.002360001	1.2732926	6.63257E-05	6.10196E-05	6.63257E-05	1.17661E-05	1.03924E-05	41310.576	5094.9923	11.327249	1923521.386
South Coast	2024	ConstMin - Pavers	Aggregated	750	Diesel	2.37991E-05	2.87969E-05	3.42707E-05	0.000465306	0.000128362	0.2594833	4.41859E-06	4.0651E-06	4.41859E-06	2.39834E-06	2.11787E-06	8418.6504	522.48251	1.0787856	391861.8823
South Coast	2024	OFF - Light Commercial - Pumps	Aggregated	25	Diesel	0.011601955	0.013807285	0.016706815	0.071496026	0.10368016	13.478816	0.004414417	0.004061264	0.004414417	0.000192725	0.000112954	448997.45	965687.8	2399.3	10612929.8
South Coast	2024	OFF - Light Commercial - Pumps	Aggregated	50	Diesel	0.011890183	0.0141503	0.017121863	0.127856018	0.116552114	18.193843	0.003744271	0.00344473	0.003744271	0.000235201	0.000152688	606943.9	387177.4	961.89	14325563.8

Table H1.17
OFFROAD 2017 Output

OFFROAD2017 (v1.0.1) Emissions Inventory
Region Type: Air District
Region: South Coast AQMD
Calendar Year: 2024
Scenario: All Adopted Rules - Exhaust
Vehicle Classification: OFFROAD2017 Equipment Types
Units: Emissions: tons/day, Fuel Consumption: gallons/year, Activity: hours/year, HP-Hours: HP-hours/year

Region	CalYr	VehClass	MdlYr	HP_Bin	Fuel	HC_tpd	ROG_tpd	TOG_tpd	CO_tpd	NOx_tpd	CO2_tpd	PM10_tpd	PM2_5_tpd	PM_tpd	SOx_tpd	NH3_tpd	Fuel_gpy	Total_Activity_hpy	Total_Population	Horsepower_Hours_hhpy
South Coast	2024	ConstMin - Rollers	Aggregated	25	Diesel	1.23124E-05	1.4898E-05	1.77299E-05	4.09387E-05	2.81896E-05	0.0021541	3.87551E-06	3.56547E-06	3.87551E-06	1.95467E-08	1.75818E-08	69.888498	129.65933	0.5548322	3241.483206
South Coast	2024	ConstMin - Rollers	Aggregated	50	Diesel	0.011992489	0.014510912	0.017269184	0.098438392	0.0895041	13.770478	0.00450214	0.004141969	0.00450214	0.000126955	0.000112393	446767.98	579437.17	1636.2003	20710298.11
South Coast	2024	ConstMin - Rollers	Aggregated	75	Diesel	0.000421644	0.00051019	0.000607168	0.001676968	0.004108178	0.1440202	0.000292348	0.00026896	0.000292348	1.31889E-06	1.17547E-06	4672.576	3397.0744	14.425638	240816.2704
South Coast	2024	ConstMin - Rollers	Aggregated	100	Diesel	0.008695146	0.010521127	0.012521011	0.138388178	0.11129523	21.378227	0.005815078	0.005349871	0.005815078	0.000197391	0.000174486	693593.04	409397.38	1206.2053	35725253.04
South Coast	2024	ConstMin - Rollers	Aggregated	175	Diesel	0.004923844	0.005957852	0.007090336	0.122822641	0.055812137	22.25171	0.002550065	0.00234606	0.002550065	0.00020558	0.000181615	721932.22	258909.58	705.74662	37231225.07
South Coast	2024	ConstMin - Rollers	Aggregated	300	Diesel	0.001262148	0.001527199	0.001817493	0.010840604	0.01678491	3.7610907	0.000644822	0.000593237	0.000644822	3.47353E-05	3.06975E-05	122024.44	28939.962	91.547321	6285112.896
South Coast	2024	ConstMin - Rollers	Aggregated	600	Diesel	0.000458011	0.000554193	0.000659535	0.005551711	0.005668297	2.0783996	0.000192721	0.000177303	0.000192721	1.92021E-05	1.69636E-05	67431.385	9829.4737	31.625438	3457290.353
South Coast	2024	OFF - ConstMin - Concrete/Industrial Saws	Aggregated	25	Diesel	2.77468E-05	3.3021E-05	3.99554E-05	0.000136373	0.000252486	0.0331201	9.43423E-06	8.6795E-06	9.43423E-06	4.20231E-07	2.74549E-07	1091.35	1460	2.47	26280
South Coast	2024	OFF - ConstMin - Concrete/Industrial Saws	Aggregated	50	Diesel	0.000357428	0.000425369	0.000514696	0.003966817	0.003389996	0.5205313	0.000106107	9.76183E-05	0.000106107	6.72917E-06	4.37259E-06	17381.3	12574.25	21.69	414950.25
South Coast	2024	ConstMin - Sweepers/Scrubbers	Aggregated	25	Diesel	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
South Coast	2024	ConstMin - Sweepers/Scrubbers	Aggregated	50	Diesel	0.006662172	0.008061228	0.009593528	0.05406046	0.044072078	6.3492579	0.0025773	0.002371116	0.0025773	5.85022E-05	5.18218E-05	205994.68	220674.69	305.16729	7861115.123
South Coast	2024	ConstMin - Sweepers/Scrubbers	Aggregated	75	Diesel	0.001452469	0.001757487	0.002091555	0.008058636	0.012884958	0.9662441	0.001160007	0.001067206	0.001160007	8.88983E-06	7.88635E-06	31348.724	18620.121	37.808336	1339585.937
South Coast	2024	ConstMin - Sweepers/Scrubbers	Aggregated	100	Diesel	0.003624851	0.004386069	0.005219785	0.060272849	0.044447771	8.8467446	0.002327824	0.002141598	0.002327824	8.16838E-05	7.22059E-05	287022.89	154842.87	210.64644	12174024.85
South Coast	2024	ConstMin - Sweepers/Scrubbers	Aggregated	175	Diesel	0.001017612	0.00123131	0.001465361	0.014956776	0.010422026	2.4477513	0.000495738	0.000456079	0.000495738	2.26001E-05	1.99782E-05	79414.597	21078.906	28.626312	3369090.779
South Coast	2024	ConstMin - Sweepers/Scrubbers	Aggregated	300	Diesel	0.000432949	0.000523869	0.000623447	0.003152671	0.005546099	1.4699861	0.000178266	0.000164005	0.000178266	1.35778E-05	1.19978E-05	47692.079	9648.3328	12.962858	2023292.245
South Coast	2024	ConstMin - Sweepers/Scrubbers	Aggregated	600	Diesel	2.29474E-05	2.77664E-05	3.30443E-05	0.000366227	0.000100205	0.1985199	3.56024E-06	3.27542E-06	3.56024E-06	1.83473E-06	1.62029E-06	6440.7599	828.00972	1.0802382	273243.2084
South Coast	2024	ConstMin - Sweepers/Scrubbers	Aggregated	9999	Diesel	2.27293E-05	2.75024E-05	3.27301E-05	0.000455952	0.00109877	0.255068	8.77137E-06	8.06966E-06	8.77137E-06	2.35755E-06	2.08183E-06	8275.4006	414.00486	0.5401191	351076.1223
South Coast	2024	ConstMin - Off-Highway Trucks	Aggregated	25	Diesel	0.000128867	0.000155929	0.000185568	0.000546659	0.000360918	0.0371849	4.04906E-05	3.72513E-05	4.04906E-05	3.39926E-07	3.03498E-07	1206.4216	2198.4654	1.6210636	54961.63618
South Coast	2024	ConstMin - Off-Highway Trucks	Aggregated	50	Diesel	0.000791984	0.0009583	0.001140456	0.008510279	0.006412569	0.944039	0.000285524	0.000262682	0.000285524	8.70435E-06	7.70512E-06	30628.306	48486.833	29.179145	1406479.035
South Coast	2024	ConstMin - Off-Highway Trucks	Aggregated	75	Diesel	0.000119463	0.00014455	0.000172027	0.002441878	0.001010142	0.3278079	1.57444E-05	1.44848E-05	1.57444E-05	3.02716E-06	2.67552E-06	10635.365	7435.1319	4.8631908	536120.823
South Coast	2024	ConstMin - Off-Highway Trucks	Aggregated	100	Diesel	0.000367415	0.000444572	0.000529077	0.004878728	0.003805187	0.6478043	0.000249476	0.000229518	0.000249476	5.97825E-06	5.28729E-06	21017.297	12066.305	9.1860271	1061262.052
South Coast	2024	ConstMin - Off-Highway Trucks	Aggregated	175	Diesel	0.008357059	0.010112041	0.012034165	0.147215904	0.067944933	23.215059	0.003228043	0.002969799	0.003228043	0.000214384	0.000189478	753187.01	242050.29	168.59062	38211388.35
South Coast	2024	ConstMin - Off-Highway Trucks	Aggregated	300	Diesel	0.015129065	0.018306168	0.021785853	0.114997517	0.123528153	47.238543	0.004959633	0.004562862	0.004959633	0.00043629	0.000385555	1532602.5	370015.88	284.76684	77867725.97
South Coast	2024	ConstMin - Off-Highway Trucks	Aggregated	600	Diesel	0.058236141	0.07046573	0.083860042	0.459017571	0.474739913	202.75199	0.017019359	0.01565781	0.017019359	0.001872796	0.001654835	6578065.1	884662.62	634.37623	333092899.3
South Coast	2024	ConstMin - Off-Highway Trucks	Aggregated	750	Diesel	0.027894111	0.033751875	0.04016752	0.215852461	0.269766929	68.782433	0.010317412	0.009492019	0.010317412	0.000635091	0.000561393	2231570.3	170543.34	136.7097	113065982.5
South Coast	2024	ConstMin - Off-Highway Trucks	Aggregated	9999	Diesel	0.036383424	0.044023943	0.05239213	0.277142358	0.743397735	121.84398	0.013918208	0.012804751	0.013918208	0.001125417	0.000994474	3953093.8	157171.97	108.61126	199864257.2
South Coast	2024	Portable Equipment - Non-Rental Generator	Aggregated	9999	Diesel	0.054834837	0.066350153	0.078962166	0.364390609	0.860047669	173.40668	0.022422232	0.020628453	0.022422232	0.001601586	0.001415322	5625988.8	287460.91	209.54657	355674068.2
South Coast	2024	ConstMin - Other Construction Equipment	Aggregated	175	Diesel	0.003873866	0.004687378	0.005578367	0.05614685	0.045236761	9.3493624	0.0023471	0.002159332	0.0023471	8.63233E-05	7.63082E-05	303329.77	93141.719	220.48396	14171966.91
South Coast	2024	ConstMin - Other Construction Equipment	Aggregated	300	Diesel	0.004011354	0.004853739	0.00577635	0.030878801	0.051786757	12.214429	0.002006795	0.001846252	0.002006795	0.000112808	9.96925E-05	396283.68	84034.967	201.66216	18414850.18
South Coast	2024	ConstMin - Other Construction Equipment	Aggregated	600	Diesel	0.01221304	0.014777778	0.017586777	0.118138309	0.141507367	47.820916	0.005305875	0.004881405	0.005305875	0.000441762	0.000390308	1551496.9	188946.41	411.92856	72164310.34
South Coast	2024	ConstMin - Other Construction Equipment	Aggregated	750	Diesel	0.002402639	0.002907193	0.0034598	0.018556932	0.030189068	8.9145077	0.001049856	0.000965868	0.001049856	0.000082347	0.000072759	289221.38	21884.983	44.634557	13442495.18
South Coast	2024	ConstMin - Other Construction Equipment	Aggregated	9999	Diesel	0.000651657	0.000788505	0.000938386	0.005748044	0.016643808	3.0263327	0.000306163	0.00028167	0.000306163	2.79604E-05	2.47005E-05	98186.033	4977.8299	10.217549	4572752.526

Table H1.18
Onroad Vehicles Emission Factors

	Year	Vehicle Type	Units	PM10 brake wear	PM10 tire wear	PM2.5 brake wear	PM2.5 tire wear	PM10	PM2.5	DPM	NOX	SOX	CO	HC	VOC	CO2	CH4	N2O
Onsite Transit																		
	2024	Construction Trucks	g/mi					0.0138088	0.0132114	0.01380879	7.1482981	0.0222671	0.8332295		0.0954593	2356.9337	0.0044338	0.3704772
	2024	Worker Vehicles	g/mi					0.0094329	0.0086791	0.000157774	0.0773779	0.0062548	1.2481561		0.0622942	632.26873	0.0159141	0.0087178
	2025	Construction Trucks	g/mi					0.0125616	0.0120182	0.012561611	7.2105688	0.0220306	0.8408242		0.0902488	2331.8994	0.0041918	0.3665421
	2025	Worker Vehicles	g/mi					0.009093	0.0083658	0.000134133	0.0698737	0.0060653	1.1723031		0.0552776	613.11787	0.0142835	0.008216
	2026	Construction Trucks	g/mi					0.0114689	0.0109728	0.011468947	7.2869609	0.0218538	0.8488409		0.0855193	2313.1788	0.0039721	0.3635995
	2026	Worker Vehicles	g/mi					0.0087032	0.0080066	0.000111355	0.0637728	0.0058973	1.1099064		0.0494789	596.14033	0.0129276	0.0078087
Offsite Transit																		
	2024	Construction Trucks	g/mi	0.13034	0.012	0.05586	0.003	0.0100878	0.0096514	0.010087792	1.4591341	0.0086835	0.0838267		0.0115988	919.13301	0.0005387	0.1444749
	2024	Worker Vehicles	g/mi	0.03675	0.008	0.01575	0.002	0.0016106	0.0014829	5.21621E-05	0.0419133	0.0026543	0.6905881		0.0107865	268.3068	0.002754	0.0047139
	2025	Construction Trucks	g/mi	0.13034	0.012	0.05586	0.003	0.0099871	0.0095551	0.009987136	1.446922	0.0085844	0.0832898		0.0110903	908.64595	0.0005151	0.1428265
	2025	Worker Vehicles	g/mi	0.03675	0.008	0.01575	0.002	0.0015419	0.0014195	4.56363E-05	0.0376355	0.0025626	0.6460573		0.0094866	259.03839	0.0024539	0.004419
	2026	Construction Trucks	g/mi	0.13034	0.012	0.05586	0.003	0.00992	0.0094909	0.009920032	1.4390438	0.008509	0.0828843		0.0106317	900.66095	0.0004938	0.1415714
	2026	Worker Vehicles	g/mi	0.03675	0.008	0.01575	0.002	0.0014682	0.0013515	3.93525E-05	0.0342168	0.0024832	0.6098724		0.0084219	251.01696	0.0022067	0.0041838

Source: EMFAC2017
Notes: Refer to Table H1.19 for onsite and offsite transit vehicles speeds and worker vehicle fleet mix.

Table H1.19
EMFAC2017 Output Onsite Transit Fleet Mix Exhaust
EMFAC2017 (v1.0.2) Emission Rates
Region Type: Air District
Region: SOUTH COAST AQMD
Calendar Year: 2024, 2025, 2026
Season: Annual
Vehicle Classification: EMFAC2011 Categories
Units: miles/day for VMT, g/mile for RUNEX, PMBW and PMTW

Region	CalYr	VehClass	MdlYr	Speed	Fuel	VMT	ROG_RUNEX	TOG_RUNEX	CO_RUNEX	NOx_RUNEX	SOx_RUNEX	CO2_RUNEX	CH4_RUNEX	PM10_RUNEX	PM2_5_RUNEX	N2O_RUNEX	DPM
SOUTH COAST	2024	LDA	Aggregated	5	GAS	720460.97	0.0470391	0.0686394	1.05892149	0.0546265	0.0058733	593.51674	0.01285	0.0090214	0.0082949	0.0068814	0
SOUTH COAST	2024	LDA	Aggregated	5	DSL	7337.2646	0.1570907	0.1788373	3.091287246	0.1141596	0.0045594	482.29097	0.007297	0.018095	0.0173122	0.0758094	0.018095
SOUTH COAST	2024	LDT1	Aggregated	5	GAS	81952.175	0.1245176	0.1816814	2.038238071	0.1624728	0.0068432	691.52653	0.029136	0.0120593	0.0110882	0.0127061	0
SOUTH COAST	2024	LDT1	Aggregated	5	DSL	23.045112	0.7094762	0.8076915	3.723673086	0.7190657	0.0097987	1036.5024	0.032954	0.4710287	0.4506522	0.1629237	0.4710287
SOUTH COAST	2024	LDT2	Aggregated	5	GAS	247273.33	0.0816633	0.1191576	1.473764265	0.1137081	0.0072224	729.84822	0.020747	0.0094428	0.0086823	0.009991	0
SOUTH COAST	2024	LDT2	Aggregated	5	DSL	2002.5419	0.257779	0.2934642	2.356618059	0.1521124	0.0060967	644.90278	0.011973	0.0117186	0.0112117	0.1013697	0.0117186
SOUTH COAST	2024	T6 instate c	Aggregated	5	DSL	517.83259	0.0954593	0.1086731	0.833229494	7.1482981	0.0222671	2356.9337	0.004434	0.0138088	0.0132114	0.3704772	0.0138088
SOUTH COAST	2025	LDA	Aggregated	5	GAS	719865.83	0.041315	0.0602867	0.998863317	0.049705	0.005702	576.20675	0.011485	0.0087325	0.0080292	0.0065106	0
SOUTH COAST	2025	LDA	Aggregated	5	DSL	7572.0712	0.1468369	0.167164	3.043218836	0.102991	0.0044332	468.94706	0.00682	0.0150433	0.0143925	0.0737119	0.0150433
SOUTH COAST	2025	LDT1	Aggregated	5	GAS	83153.597	0.1087688	0.1587152	1.84570184	0.1435799	0.0066594	672.95289	0.025701	0.0113458	0.0104321	0.0116068	0
SOUTH COAST	2025	LDT1	Aggregated	5	DSL	21.61003	0.6745385	0.7679173	3.643948927	0.6755583	0.009606	1016.1174	0.031331	0.4350876	0.4162659	0.1597195	0.4350876
SOUTH COAST	2025	LDT2	Aggregated	5	GAS	248475.98	0.0732723	0.1069188	1.381806608	0.1018897	0.0069694	704.27494	0.018816	0.0091508	0.0084138	0.0092515	0
SOUTH COAST	2025	LDT2	Aggregated	5	DSL	2096.776	0.2581362	0.2938709	2.403328973	0.1513147	0.0059232	626.55562	0.01199	0.0108116	0.0103439	0.0984858	0.0108116
SOUTH COAST	2025	T6 instate c	Aggregated	5	DSL	513.877	0.0902488	0.1027414	0.840824192	7.2105688	0.0220306	2331.8994	0.004192	0.0125616	0.0120182	0.3665421	0.0125616
SOUTH COAST	2026	LDA	Aggregated	5	GAS	718112.77	0.0366883	0.0535355	0.950427358	0.0458416	0.0055499	560.82858	0.010369	0.0083858	0.0077104	0.0062177	0
SOUTH COAST	2026	LDA	Aggregated	5	DSL	7761.4934	0.137457	0.1564857	3.000891738	0.0931671	0.0043236	457.35359	0.006385	0.0120555	0.011534	0.0718896	0.0120555
SOUTH COAST	2026	LDT1	Aggregated	5	GAS	84093.411	0.0954301	0.1392514	1.681728688	0.1276488	0.0064961	656.44567	0.022784	0.0106604	0.0098018	0.0106829	0
SOUTH COAST	2026	LDT1	Aggregated	5	DSL	19.63734	0.6135771	0.6985168	3.546443567	0.6100648	0.0093765	991.84897	0.028499	0.3720013	0.3559087	0.1559048	0.3720013
SOUTH COAST	2026	LDT2	Aggregated	5	GAS	249304.65	0.0662088	0.0966117	1.30564874	0.0921561	0.0067457	681.67186	0.017184	0.0088093	0.0080998	0.0086447	0
SOUTH COAST	2026	LDT2	Aggregated	5	DSL	2177.4535	0.2589294	0.2947739	2.447840667	0.1510853	0.005777	611.08714	0.012027	0.0104381	0.0099865	0.0960544	0.0104381
SOUTH COAST	2026	T6 instate c	Aggregated	5	DSL	512.39198	0.0855193	0.0973572	0.848840877	7.2869609	0.0218538	2313.1788	0.003972	0.0114689	0.0109728	0.3635995	0.0114689

Table H1.20

EMFAC2017 Output Offsite Transit Fleet Mix Exhaust

EMFAC2017 (v1.0.2) Emission Rates

Region Type: Air District

Region: SOUTH COAST AQMD

Calendar Year: 2024, 2025, 2026

Season: Annual

Vehicle Classification: EMFAC2011 Categories

Units: miles/day for VMT, trips/day for Trips, g/mile for RUNEX, PMBW and PMTW, g/trip for STREX, HTSK and RUNLS, g/vehicle/day for IDLEX, RESTL and DIURN

Region	Calendar Year	Vehicle Category	Model Year	Speed	Fuel	Population	VMT	Trips	ROG_RUNEX	ROG_IDLEX	ROG_STREX	ROG_HOTSOAK	ROG_RUNLOSS	ROG_RESTLOSS	ROG_DIURN	TOG_RUNEX	TOG_IDLEX	TOG_STREX	TOG_HOTSOAK	TOG_RUNLOSS	TOG_RESTLOSS	TOG_DIURN
SOUTH COA	2024	LDA	Aggregated	Aggregated	GAS	6543321.5	247047080	30912773	0.0082219	0	0.1888817	0.0900536	0.1997274	0.2074037	0.2191751	0.0119974	0	0.2068017	0.0900536	0.1997274	0.2074037	0.2191751
SOUTH COA	2024	LDA	Aggregated	Aggregated	DSL	63999.088	2508733.2	304606.89	0.0145786	0	0	0	0	0	0	0.0165967	0	0	0	0	0	0
SOUTH COA	2024	LDA	Aggregated	Aggregated	ELEC	172307.13	7265020	857849.63	0	0	0	0.004888	0	0.0079037	0.023477	0	0	0	0.004888	0	0.0079037	0.023477
SOUTH COA	2024	LDT1	Aggregated	Aggregated	GAS	758038.32	27517267	3506784.4	0.0241292	0	0.2935381	0.1753748	0.6117487	0.4403211	0.5238993	0.0352054	0	0.3213871	0.1753748	0.6117487	0.4403211	0.5238993
SOUTH COA	2024	LDT1	Aggregated	Aggregated	DSL	328.77854	7657.7325	1149.5715	0.1708218	0	0	0	0	0	0	0.1944693	0	0	0	0	0	0
SOUTH COA	2024	LDT1	Aggregated	Aggregated	ELEC	8873.8766	385871.85	44565.445	0	0	0	0.004888	0	0.0078613	0.0233652	0	0	0	0.004888	0	0.0078613	0.0233652
SOUTH COA	2024	LDT2	Aggregated	Aggregated	GAS	2256847	83361536	10593017	0.0149087	0	0.2669594	0.1136523	0.3879008	0.3356143	0.332401	0.0217534	0	0.2922868	0.1136523	0.3879008	0.3356143	0.332401
SOUTH COA	2024	LDT2	Aggregated	Aggregated	DSL	16402.997	669969.53	80362.135	0.020122	0	0	0	0	0	0	0.0229076	0	0	0	0	0	0
SOUTH COA	2024	LDT2	Aggregated	Aggregated	ELEC	34685.637	1081895.4	174560.97	0	0	0	0.004888	0	0.0078852	0.0234323	0	0	0	0.004888	0	0.0078852	0.0234323
SOUTH COA	2024	T6 instate co	Aggregated	Aggregated	DSL	4467.8956	291328.11	20199.182	0.0115988	0.0497707	0	0	0	0	0	0.0132043	0.0566602	0	0	0	0	0
SOUTH COA	2025	LDA	Aggregated	Aggregated	GAS	6623932.9	247134863	31282323	0.0072078	0	0.1730799	0.0857858	0.1949939	0.1971446	0.2069079	0.0105176	0	0.1895006	0.0857858	0.1949939	0.1971446	0.2069079
SOUTH COA	2025	LDA	Aggregated	Aggregated	DSL	66922.32	2593390.4	318755.57	0.0131775	0	0	0	0	0	0	0.0150017	0	0	0	0	0	0
SOUTH COA	2025	LDA	Aggregated	Aggregated	ELEC	200007.11	8588255.8	994212.63	0	0	0	0.004888	0	0.0079137	0.0235063	0	0	0	0.004888	0	0.0079137	0.0235063
SOUTH COA	2025	LDT1	Aggregated	Aggregated	GAS	778181.88	27926963	3602142.6	0.0209762	0	0.2647065	0.1625491	0.5727636	0.4114373	0.4829739	0.0306084	0	0.2898203	0.1625491	0.5727636	0.4114373	0.4829739
SOUTH COA	2025	LDT1	Aggregated	Aggregated	DSL	306.69855	7182.2408	1077.0936	0.1589987	0	0	0	0	0	0	0.1810095	0	0	0	0	0	0
SOUTH COA	2025	LDT1	Aggregated	Aggregated	ELEC	10974.675	485559.29	55032.388	0	0	0	0.004888	0	0.0078683	0.0233853	0	0	0	0.004888	0	0.0078683	0.0233853
SOUTH COA	2025	LDT2	Aggregated	Aggregated	GAS	2295149.4	83832765	10772144	0.0133343	0	0.2461323	0.1083691	0.376717	0.3261566	0.3205227	0.0194574	0	0.2694839	0.1083691	0.376717	0.3261566	0.3205227
SOUTH COA	2025	LDT2	Aggregated	Aggregated	DSL	17587.778	702822.89	85874.295	0.0198868	0	0	0	0	0	0	0.0226398	0	0	0	0	0	0
SOUTH COA	2025	LDT2	Aggregated	Aggregated	ELEC	41917.383	1280277.3	210324.6	0	0	0	0.004888	0	0.0078902	0.0234468	0	0	0	0.004888	0	0.0078902	0.0234468
SOUTH COA	2025	T6 instate co	Aggregated	Aggregated	DSL	4547.4396	289102.73	20558.798	0.0110903	0.0496598	0	0	0	0	0	0.0126254	0.0565339	0	0	0	0	0
SOUTH COA	2026	LDA	Aggregated	Aggregated	GAS	6704944.2	246806990	31652207	0.006388	0	0.1593916	0.0819021	0.1906985	0.187688	0.1957856	0.0093213	0	0.1745138	0.0819021	0.1906985	0.187688	0.1957856
SOUTH COA	2026	LDA	Aggregated	Aggregated	DSL	69486.663	2662198.2	331542.63	0.0118584	0	0	0	0	0	0	0.0135	0	0	0	0	0	0
SOUTH COA	2026	LDA	Aggregated	Aggregated	ELEC	226692.73	9539586.4	1124278.2	0	0	0	0.004888	0	0.0079235	0.0235345	0	0	0	0.004888	0	0.0079235	0.0235345
SOUTH COA	2026	LDT1	Aggregated	Aggregated	GAS	797971.55	28250579	3694973.3	0.0183022	0	0.2394362	0.1509449	0.5377018	0.3845134	0.4455651	0.0267065	0	0.2621525	0.1509449	0.5377018	0.3845134	0.4455651
SOUTH COA	2026	LDT1	Aggregated	Aggregated	DSL	270.69602	6522.8307	971.57155	0.1391271	0	0	0	0	0	0	0.1583869	0	0	0	0	0	0
SOUTH COA	2026	LDT1	Aggregated	Aggregated	ELEC	13055.319	564811.17	65291.34	0	0	0	0.004888	0	0.0078739	0.0234014	0	0	0	0.004888	0	0.0078739	0.0234014
SOUTH COA	2026	LDT2	Aggregated	Aggregated	GAS	2335277.2	84175951	10957538	0.012009	0	0.2278263	0.1034755	0.3655973	0.3166753	0.3090774	0.0175236	0	0.2494411	0.1034755	0.3655973	0.3166753	0.3090774
SOUTH COA	2026	LDT2	Aggregated	Aggregated	DSL	18735.824	731082.45	91136.642	0.0198152	0	0	0	0	0	0	0.0225583	0	0	0	0	0	0
SOUTH COA	2026	LDT2	Aggregated	Aggregated	ELEC	48997.68	1464375.6	244977.96	0	0	0	0.004888	0	0.0078949	0.0234608	0	0	0	0.004888	0	0.0078949	0.0234608
SOUTH COA	2026	T6 instate co	Aggregated	Aggregated	DSL	4614.6301	288267.27	20862.563	0.0106317	0.0495653	0	0	0	0	0	0.0121033	0.0564263	0	0	0	0	0

Table H1.20

EMFAC2017 Output Offsite Transit Fleet Mix Exhaust

EMFAC2017 (v1.0.2) Emission Rates

Region Type: Air District

Region: SOUTH COAST AQMD

Calendar Year: 2024, 2025, 2026

Season: Annual

Vehicle Classification: EMFAC2011 Categories

Units: miles/day for VMT, trips/day for Trips, g/mile for RUNEX, PMBW an

Region	Calendar Year	Vehicle Category	Model Year	Speed	Fuel	CO_RUNEX	CO_IDLEX	CO_STREX	NOx_RUNEX	NOx_IDLEX	NOx_STREX	CO2_RUNEX	CO2_IDLEX	CO2_STREX	CH4_RUNEX	CH4_IDLEX	CH4_STREX	PM10_RUNEX	PM10_IDLEX	PM10_STREX	PM10_PMTW	PM10_PMBW	PM2_5_RUNEX
SOUTH COA	2024	LDA	Aggregated	Aggregated	GAS	0.6170464	0	2.0207049	0.0309611	0	0.1642574	258.07942	0	51.791051	0.0022311	0	0.0436026	0.0015408	0	0.0017461	0.008	0.03675	0.0014167
SOUTH COA	2024	LDA	Aggregated	Aggregated	DSL	0.2478206	0	0	0.0491271	0	0	199.32668	0	0	0.0006771	0	0	0.0059574	0	0	0.008	0.03675	0.0056997
SOUTH COA	2024	LDA	Aggregated	Aggregated	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.008	0.03675	0
SOUTH COA	2024	LDT1	Aggregated	Aggregated	GAS	1.1388644	0	2.1397201	0.0881606	0	0.2238707	301.4961	0	60.692708	0.0055697	0	0.0603888	0.002162	0	0.0023056	0.008	0.03675	0.0019879
SOUTH COA	2024	LDT1	Aggregated	Aggregated	DSL	1.0129839	0	0	0.9123372	0	0	439.67457	0	0	0.0079343	0	0	0.1275098	0	0	0.008	0.03675	0.1219938
SOUTH COA	2024	LDT1	Aggregated	Aggregated	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.008	0.03675	0
SOUTH COA	2024	LDT2	Aggregated	Aggregated	GAS	0.8502923	0	2.5178682	0.0632094	0	0.2371036	317.80192	0	65.105601	0.0037395	0	0.0589011	0.0016344	0	0.0017692	0.008	0.03675	0.0015027
SOUTH COA	2024	LDT2	Aggregated	Aggregated	DSL	0.1813322	0	0	0.0405709	0	0	271.56232	0	0	0.0009346	0	0	0.0050299	0	0	0.008	0.03675	0.0048123
SOUTH COA	2024	LDT2	Aggregated	Aggregated	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.008	0.03675	0
SOUTH COA	2024	T6 instate co	Aggregated	Aggregated	DSL	0.0838267	2.065668	0	1.4591341	2.9858499	2.608719	919.13301	611.50258	0	0.0005387	0.0023117	0	0.0100878	0.0010908	0	0.012	0.13034	0.0096514
SOUTH COA	2025	LDA	Aggregated	Aggregated	GAS	0.5828174	0	1.9420882	0.0281874	0	0.1548852	250.52752	0	50.2837	0.0019906	0	0.0404113	0.0014892	0	0.0016933	0.008	0.03675	0.0013692
SOUTH COA	2025	LDA	Aggregated	Aggregated	DSL	0.23993	0	0	0.0413241	0	0	193.81353	0	0	0.0006121	0	0	0.0050812	0	0	0.008	0.03675	0.0048614
SOUTH COA	2025	LDA	Aggregated	Aggregated	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.008	0.03675	0
SOUTH COA	2025	LDT1	Aggregated	Aggregated	GAS	1.0361128	0	2.0545514	0.0777812	0	0.2079147	293.35819	0	59.006598	0.0048877	0	0.0552078	0.0020231	0	0.0021721	0.008	0.03675	0.0018602
SOUTH COA	2025	LDT1	Aggregated	Aggregated	DSL	0.9514419	0	0	0.8441278	0	0	430.90778	0	0	0.0073852	0	0	0.1178524	0	0	0.008	0.03675	0.1127542
SOUTH COA	2025	LDT1	Aggregated	Aggregated	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.008	0.03675	0
SOUTH COA	2025	LDT2	Aggregated	Aggregated	GAS	0.7987576	0	2.4329096	0.0565713	0	0.2188839	306.65172	0	62.854964	0.0033811	0	0.0548503	0.0015807	0	0.0017244	0.008	0.03675	0.0014534
SOUTH COA	2025	LDT2	Aggregated	Aggregated	DSL	0.1833707	0	0	0.0385982	0	0	263.81093	0	0	0.0009237	0	0	0.0048189	0	0	0.008	0.03675	0.0046105
SOUTH COA	2025	LDT2	Aggregated	Aggregated	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.008	0.03675	0
SOUTH COA	2025	T6 instate co	Aggregated	Aggregated	DSL	0.0832898	2.0686502	0	1.446922	2.9691191	2.614563	908.64595	606.79401	0	0.0005151	0.0023066	0	0.0099871	0.0010229	0	0.012	0.13034	0.0095551
SOUTH COA	2026	LDA	Aggregated	Aggregated	GAS	0.5551503	0	1.8711474	0.026021	0	0.1470536	243.80237	0	48.911179	0.0017939	0	0.0376081	0.0014287	0	0.001636	0.008	0.03675	0.0013136
SOUTH COA	2026	LDA	Aggregated	Aggregated	DSL	0.2328975	0	0	0.0343627	0	0	189.00964	0	0	0.0005508	0	0	0.0042255	0	0	0.008	0.03675	0.0040427
SOUTH COA	2026	LDA	Aggregated	Aggregated	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.008	0.03675	0
SOUTH COA	2026	LDT1	Aggregated	Aggregated	GAS	0.9485731	0	1.9744754	0.0691259	0	0.1943035	286.11364	0	57.468364	0.004308	0	0.0506358	0.001893	0	0.0020461	0.008	0.03675	0.0017405
SOUTH COA	2026	LDT1	Aggregated	Aggregated	DSL	0.8707018	0	0	0.7424044	0	0	420.343	0	0	0.0064622	0	0	0.1007983	0	0	0.008	0.03675	0.0964378
SOUTH COA	2026	LDT1	Aggregated	Aggregated	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.008	0.03675	0
SOUTH COA	2026	LDT2	Aggregated	Aggregated	GAS	0.7560499	0	2.3573407	0.0511453	0	0.2035334	296.78376	0	60.814875	0.0030782	0	0.0512609	0.0015198	0	0.001672	0.008	0.03675	0.0013974
SOUTH COA	2026	LDT2	Aggregated	Aggregated	DSL	0.1858674	0	0	0.0375382	0	0	257.27608	0	0	0.0009204	0	0	0.0047493	0	0	0.008	0.03675	0.0045438
SOUTH COA	2026	LDT2	Aggregated	Aggregated	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.008	0.03675	0
SOUTH COA	2026	T6 instate co	Aggregated	Aggregated	DSL	0.0828843	2.0712518	0	1.4390438	2.9545035	2.6200331	900.66095	602.4448	0	0.0004938	0.0023022	0	0.00992	0.0009645	0	0.012	0.13034	0.0094909

Table H1.20

EMFAC2017 Output Offsite Transit Fleet Mix Exhaust

EMFAC2017 (v1.0.2) Emission Rates
Region Type: Air District
Region: SOUTH COAST AQMD
Calendar Year: 2024, 2025, 2026
Season: Annual
Vehicle Classification: EMFAC2011 Categories
Units: miles/day for VMT, trips/day for Trips, g/mile for RUNEX, PMBW an

Region	Calendar Year	Vehicle Category	Model Year	Speed	Fuel	PM2_5_IDLEX	PM2_5_STREX	PM2_5_PMTW	PM2_5_PMBW	SOx_RUNEX	SOx_IDLEX	SOx_STREX	N2O_RUNEX	N2O_IDLEX	N2O_STREX
SOUTH COA	2024	LDA	Aggregated	Aggregated	GAS	0	0.0016055	0.002	0.01575	0.0025539	0	0.0005125	0.0039333	0	0.0237369
SOUTH COA	2024	LDA	Aggregated	Aggregated	DSL	0	0	0.002	0.01575	0.0018844	0	0	0.0313314	0	0
SOUTH COA	2024	LDA	Aggregated	Aggregated	ELEC	0	0	0.002	0.01575	0	0	0	0	0	0
SOUTH COA	2024	LDT1	Aggregated	Aggregated	GAS	0	0.0021199	0.002	0.01575	0.0029835	0	0.0006006	0.0070454	0	0.0264144
SOUTH COA	2024	LDT1	Aggregated	Aggregated	DSL	0	0	0.002	0.01575	0.0041565	0	0	0.0691107	0	0
SOUTH COA	2024	LDT1	Aggregated	Aggregated	ELEC	0	0	0.002	0.01575	0	0	0	0	0	0
SOUTH COA	2024	LDT2	Aggregated	Aggregated	GAS	0	0.0016267	0.002	0.01575	0.0031449	0	0.0006443	0.0056392	0	0.0288227
SOUTH COA	2024	LDT2	Aggregated	Aggregated	DSL	0	0	0.002	0.01575	0.0025672	0	0	0.0426858	0	0
SOUTH COA	2024	LDT2	Aggregated	Aggregated	ELEC	0	0	0.002	0.01575	0	0	0	0	0	0
SOUTH COA	2024	T6 instate c	Aggregated	Aggregated	DSL	0.0010436	0	0.003	0.05586	0.0086835	0.0057772	0	0.1444749	0.0961197	0
SOUTH COA	2025	LDA	Aggregated	Aggregated	GAS	0	0.0015569	0.002	0.01575	0.0024792	0	0.0004976	0.0037231	0	0.0227572
SOUTH COA	2025	LDA	Aggregated	Aggregated	DSL	0	0	0.002	0.01575	0.0018322	0	0	0.0304648	0	0
SOUTH COA	2025	LDA	Aggregated	Aggregated	ELEC	0	0	0.002	0.01575	0	0	0	0	0	0
SOUTH COA	2025	LDT1	Aggregated	Aggregated	GAS	0	0.0019972	0.002	0.01575	0.002903	0	0.0005839	0.0064378	0	0.0252484
SOUTH COA	2025	LDT1	Aggregated	Aggregated	DSL	0	0	0.002	0.01575	0.0040736	0	0	0.0677327	0	0
SOUTH COA	2025	LDT1	Aggregated	Aggregated	ELEC	0	0	0.002	0.01575	0	0	0	0	0	0
SOUTH COA	2025	LDT2	Aggregated	Aggregated	GAS	0	0.0015855	0.002	0.01575	0.0030346	0	0.000622	0.0052221	0	0.0273272
SOUTH COA	2025	LDT2	Aggregated	Aggregated	DSL	0	0	0.002	0.01575	0.002494	0	0	0.0414674	0	0
SOUTH COA	2025	LDT2	Aggregated	Aggregated	ELEC	0	0	0.002	0.01575	0	0	0	0	0	0
SOUTH COA	2025	T6 instate c	Aggregated	Aggregated	DSL	0.0009786	0	0.003	0.05586	0.0085844	0.0057327	0	0.1428265	0.0953796	0
SOUTH COA	2026	LDA	Aggregated	Aggregated	GAS	0	0.0015042	0.002	0.01575	0.0024126	0	0.000484	0.0035575	0	0.0219275
SOUTH COA	2026	LDA	Aggregated	Aggregated	DSL	0	0	0.002	0.01575	0.0017868	0	0	0.0297097	0	0
SOUTH COA	2026	LDA	Aggregated	Aggregated	ELEC	0	0	0.002	0.01575	0	0	0	0	0	0
SOUTH COA	2026	LDT1	Aggregated	Aggregated	GAS	0	0.0018813	0.002	0.01575	0.0028313	0	0.0005687	0.0059312	0	0.0242542
SOUTH COA	2026	LDT1	Aggregated	Aggregated	DSL	0	0	0.002	0.01575	0.0039738	0	0	0.0660721	0	0
SOUTH COA	2026	LDT1	Aggregated	Aggregated	ELEC	0	0	0.002	0.01575	0	0	0	0	0	0
SOUTH COA	2026	LDT2	Aggregated	Aggregated	GAS	0	0.0015373	0.002	0.01575	0.0029369	0	0.0006018	0.0048815	0	0.0260461
SOUTH COA	2026	LDT2	Aggregated	Aggregated	DSL	0	0	0.002	0.01575	0.0024322	0	0	0.0404402	0	0
SOUTH COA	2026	LDT2	Aggregated	Aggregated	ELEC	0	0	0.002	0.01575	0	0	0	0	0	0
SOUTH COA	2026	T6 instate c	Aggregated	Aggregated	DSL	0.0009228	0	0.003	0.05586	0.008509	0.0056916	0	0.1415714	0.0946959	0

Table H1.21

Vehicle Idling Exhaust Onsite Fleet Mix

EMFAC2011 Vehicle Category used in calculations	CY	EMFAC2007 Vehicle Category	Fuel_Type	air_basin	season	HC (g/hr-veh)	CO (g/hr-veh)	NOX (g/hr-veh)	PM10 (g/hr-veh)	PM2.5 (g/hr-veh)	CO2 (g/hr-veh)	CO2 (with Pavley+LCFS) (g/hr-veh)	TOG (g/hr-veh)	ROG (g/hr-veh)	Sox (g/hr-veh)
T6	2024	HHDT	D	SC	a	5.7674343	41.174525	39.594888	0.1098485	0.1010606	7034.4313	6330.9882	8.31491	7.3038788	0.0671118
MDV	2024	MHDT	D	SC	a	1.6687434	24.958118	40.456694	0.0924351	0.0850403	7631.5418	6868.3876	2.4058274	2.1132967	0.0728085
T6	2025	HHDT	D	SC	a	5.7741329	41.226754	39.487118	0.1095804	0.100814	7034.5905	6331.1314	8.3245674	7.3123619	0.0671133
MDV	2025	MHDT	D	SC	a	1.6722817	25.016612	40.203586	0.0921005	0.0847325	7632.6786	6869.4107	2.4109285	2.1177775	0.0728193
T6	2026	HHDT	D	SC	a	5.7806792	41.277289	39.381355	0.1093443	0.1005968	7034.7179	6331.2461	8.3340052	7.3206522	0.0671145
MDV	2026	MHDT	D	SC	a	1.6757603	25.073503	39.955666	0.0917989	0.084455	7633.684	6870.3156	2.4159437	2.1221829	0.0728289

Source:
EMFAC2011 Idling Emission Rates - Idling rates for combined model year: HD_Idle_ER worksheet

Table H1.22
Construction Equipment Load Factors

Equipment	CalEEMod HP	CalEEMod LF
Aerial Lifts	63	0.31
Air Compressors	78	0.48
Bore/Drill Rigs	221	0.5
Cement and Mortar Mixers	9	0.56
Concrete/Industrial Saws	81	0.73
Cranes	231	0.29
Crawler Tractors	212	0.43
Crushing/Proc. Equipment	85	0.78
Dumpers/Tenders	16	0.38
Excavators	158	0.38
Forklifts	89	0.2
Generator Sets	84	0.74
Graders	187	0.41
Off-Highway Tractors	124	0.44
Off-Highway Trucks	402	0.38
Other Construction Equipment	172	0.42
Other General Industrial Equipment	88	0.34
Other Material Handling Equipment	168	0.4
Pavers	130	0.42
Paving Equipment	132	0.36
Plate Compactors	8	0.43
Pressure Washers	13	0.3
Pumps	84	0.74
Rollers	80	0.38
Rough Terrain Forklifts	100	0.4
Rubber Tired Dozers	247	0.4
Rubber Tired Loaders	203	0.36
Scrapers	367	0.48
Signal Boards	6	0.82
Skid Steer Loaders	65	0.37
Surfacing Equipment	263	0.3
Sweepers/Scrubbers	64	0.46
Tractors/Loaders/Backhoes	97	0.37
Trenchers	78	0.5
Welders	46	0.45

Source:
CalEEMod, Appendix D.

Table H1.23
GHG Emission Factors

	CO2 (lb CO2/MWhr)	CH4 (lb CO2/GWhr)	N2O (lb CO2/GWhr)
Electricity generation	527.9	33	4
Source: 2019 Climate Registry Default Emission Factors, Table 3.1, Default Factors for Calculating Emissions from Grid Electricity by eGrid Subregion. CAMX subregion.			

Table H1.24
Global Warming Potentials (GWP)

CO2	CH4	N2O
1	25	298
Source: IPCC 2007. Intergovernmental Panel on Climate Change. 4th Assessment Report, Climate Change 2007: The Physical Science Basis, Chapter 2, Table 2.14. June, 4th Assessment Report was chosen to maintain consistency with the U.S. EPA, Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2015, April 2017.		

Table H1.25
SOx Emission Factor - Offroad Construction Equipment

Offroad Construction Equipment less	0.005552064	g/hp-hr		
Offroad Construction Equipment grea	0.004994136	g/hp-hr		
SOx (gms/hp-hr) = (S content in X/1,000,000) x (MW SO2/ MW S) x BSF =				
Where:				
X = S content in parts per million (ppm)			15	ppm
S MW = Molecular Weight			32	
SO2 MW = Molecular Weight			64	
BSFC for offroad construction equipment less than 100 hp (per CARB OFFROAD 2017 Diesel Emission Factors excel spreadsheet)			0.408	(lb/hp-hr)
BSFC for offroad construction equipment greater than 100 hp (per CARB OFFROAD 2017 Diesel Emission Factors excel spreadsheet)			0.367	(lb/hp-hr)
BSFC for offroad construction equipment less than 100 hp			185.0688	(g/hp-hr)
BSFC for offroad construction equipment greater than 100 hp			166.4712	(g/hp-hr)

Table H1.26
Alternative 2 Emissions by Task

							Unmitigated Emissions										
							Peak Day										
							PM10	PM2.5	DPM	NOX	SOX	CO	VOC	CO2	CH4	N2O	CO2e
Task ID		**Construction Element/Equipment**	**Source Type 1**	**Source Type 2**	**Onsite/Offsite**	**Days Total**	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(tonnes/day)	(tonnes/day)	(tonnes/day)	(tonnes/day)
1		**Electrical Substation Construction at Pier J (mitigation only)**															
1		**Off-Road Equipment**															
1		Caterpillar 320 excavator	Offroad Construction Equipment		onsite	20	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1		Small asphalt roller	Offroad Construction Equipment		onsite	26	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1		Water truck	Offroad Construction Equipment		onsite	20	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1		Forklift	Offroad Construction Equipment		onsite	22	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1		Mobile crane (35 ton)	Offroad Construction Equipment		onsite	2	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1		**On-Road Vehicles**															
1		Haul trucks	Onroad Construction Vehicles		onsite	5	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1		Supply trucks	Onroad Construction Vehicles		onsite	5	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1		Haul trucks	Onroad Construction Vehicles		offsite	5	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1		Supply trucks	Onroad Construction Vehicles		offsite	5	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1		Workers	Onroad Construction Vehicles		offsite	60	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1		**Fugitive Dust**															
1		Soil handling	Fugitive Emissions		onsite	20	n/a	n/a									
1		Asphalting	Fugitive Emissions		onsite												
2		**Pier J Breakwater Construction**															
2		**Marine Activities**															
2		Pier J Breakwater Tugboat propulsion engine	Marine Equipment		onsite	54	5.81	5.17	5.81	108.18	0.06	58.10	6.00	3.44	0.00	0.00	3.4864
2		Pier J Breakwater Tugboat auxiliary engine	Marine Equipment		onsite	54	1.06	0.94	1.06	18.86	0.01	13.23	1.05	0.78	0.00	0.00	0.7941
2		Pier J Breakwater Crew boat propulsion engine	Marine Equipment		onsite	54	0.41	0.36	0.41	8.02	0.00	4.06	0.44	0.24	0.00	0.00	0.2437
2		Pier J Breakwater Crew boat auxiliary engine	Marine Equipment		onsite	54	0.03	0.03	0.03	0.60	0.00	0.42	0.03	0.02	0.00	0.00	0.0253
2		Pier J Breakwater Survey boat propulsion engine	Marine Equipment		onsite	54	0.36	0.32	0.36	7.16	0.00	3.62	0.40	0.21	0.00	0.00	0.2174
2		**Off-Road Equipment**															
2		Piling crane	Offroad Construction Equipment		onsite	54	0.21	0.19	0.21	5.00	0.01	2.67	0.47	0.38	0.00	0.00	0.3800
2		Long arm excavator	Offroad Construction Equipment		onsite	54	0.08	0.07	0.08	2.19	0.01	2.78	0.32	0.63	0.00	0.00	0.6340
2		**On-Road Vehicles**															
2		Delivery Trucks	Onroad Construction Vehicles		onsite	5	0.15	0.04	0.00	0.08	0.00	0.01	0.00	0.01	0.00	0.00	0.0123
2		Delivery Trucks	Onroad Construction Vehicles		offsite	5	0.49	0.19	0.02	3.22	0.02	0.18	0.03	0.92	0.00	0.00	0.9622
2		Workers	Onroad Construction Vehicles		offsite	54	0.16	0.05	0.00	0.06	0.00	0.96	0.01	0.17	0.00	0.00	0.1700

Table H1.26
Alternative 2 Emissions by Task

			Unmitigated Emissions										
			Total										
			PM10	PM2.5	DPM	NOX	SOX	CO	VOC	CO2	CH4	N2O	CO2e
Task ID	**Construction Element/Equipment**	**Source Type 1**	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(tonnes)	(tonnes)	(tonnes)	(tonnes)
1	**Electrical Substation Construction at Pier J (mitigation only)**												
1	**Off-Road Equipment**												
1	Caterpillar 320 excavator	Offroad Construction Equipment	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1	Small asphalt roller	Offroad Construction Equipment	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1	Water truck	Offroad Construction Equipment	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1	Forklift	Offroad Construction Equipment	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1	Mobile crane (35 ton)	Offroad Construction Equipment	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1	**On-Road Vehicles**												
1	Haul trucks	Onroad Construction Vehicles	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1	Supply trucks	Onroad Construction Vehicles	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1	Haul trucks	Onroad Construction Vehicles	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1	Supply trucks	Onroad Construction Vehicles	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1	Workers	Onroad Construction Vehicles	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1	**Fugitive Dust**												
1	Soil handling	Fugitive Emissions	n/a	n/a									
1	Asphalting	Fugitive Emissions											
2	**Pier J Breakwater Construction**												
2	**Marine Activities**												
2	Pier J Breakwater Tugboat propulsion engine	Marine Equipment	313.73	279.22	313.73	5841.59	3.46	3137.27	323.75	185.57	0.00	0.01	188.27
2	Pier J Breakwater Tugboat auxiliary engine	Marine Equipment	57.17	50.88	57.17	1018.30	0.79	714.59	56.44	42.27	0.00	0.00	42.88
2	Pier J Breakwater Crew boat propulsion engine	Marine Equipment	21.93	19.52	21.93	433.28	0.24	219.27	24.01	12.97	0.00	0.00	13.16
2	Pier J Breakwater Crew boat auxiliary engine	Marine Equipment	1.82	1.62	1.82	32.38	0.03	22.73	1.79	1.34	0.00	0.00	1.36
2	Pier J Breakwater Survey boat propulsion engine	Marine Equipment	19.57	17.41	19.57	386.62	0.22	195.66	21.43	11.57	0.00	0.00	11.74
2	**Off-Road Equipment**												
2	Piling crane	Offroad Construction Equipment	11.27	10.36	11.27	270.12	0.42	144.43	25.20	20.52	0.00	0.00	20.52
2	Long arm excavator	Offroad Construction Equipment	4.06	3.74	4.06	118.13	0.70	149.87	17.33	34.23	0.00	0.00	34.23
2	**On-Road Vehicles**												
2	Delivery Trucks	Onroad Construction Vehicles	0.74	0.18	0.00	0.39	0.00	0.05	0.01	0.06	0.00	0.00	0.06
2	Delivery Trucks	Onroad Construction Vehicles	2.43	0.94	0.11	16.08	0.10	0.92	0.13	4.60	0.00	0.00	4.81
2	Workers	Onroad Construction Vehicles	8.58	2.72	0.00	3.14	0.20	51.79	0.81	9.13	0.00	0.00	9.18

Table H1.26
Alternative 2 Emissions by Task

			Mitigated										
			Peak Day										
			PM10	PM2.5	DPM	NOX	SOX	CO	VOC	CO2	CH4	N2O	CO2e
Task ID	**Construction Element/Equipment**	**Source Type 1**	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(tonnes/day)	(tonnes/day)	(tonnes/day)	(tonnes/day)
1	**Electrical Substation Construction at Pier J (mitigation only)**												
1	**Off-Road Equipment**												
1	Caterpillar 320 excavator	Offroad Construction Equipment	0.02	0.02	0.02	0.33	0.01	1.23	0.16	0.26	0.00	0.00	0.2648
1	Small asphalt roller	Offroad Construction Equipment	0.00	0.00	0.00	0.74	0.00	0.91	0.04	0.06	0.00	0.00	0.0581
1	Water truck	Offroad Construction Equipment	0.03	0.03	0.03	0.60	0.01	2.59	0.30	0.00	0.00	0.00	0.0000
1	Forklift	Offroad Construction Equipment	0.00	0.00	0.00	0.15	0.00	0.16	0.01	0.00	0.00	0.00	0.0000
1	Mobile crane (35 ton)	Offroad Construction Equipment	0.02	0.02	0.02	0.43	0.01	2.41	0.21	0.00	0.00	0.00	0.0000
1	**On-Road Vehicles**												
1	Haul trucks	Onroad Construction Vehicles	0.09	0.02	0.00	0.05	0.00	0.01	0.00	0.01	0.00	0.00	0.0074
1	Supply trucks	Onroad Construction Vehicles	0.21	0.05	0.00	0.11	0.00	0.01	0.00	0.02	0.00	0.00	0.0173
1	Haul trucks	Onroad Construction Vehicles	0.02	0.01	0.00	0.11	0.00	0.01	0.00	0.03	0.00	0.00	0.0318
1	Supply trucks	Onroad Construction Vehicles	0.07	0.03	0.00	0.45	0.00	0.03	0.00	0.13	0.00	0.00	0.1347
1	Workers	Onroad Construction Vehicles	0.15	0.05	0.00	0.06	0.00	0.91	0.01	0.16	0.00	0.00	0.1619
1	**Fugitive Dust**												
1	Soil handling	Fugitive Emissions	2.01	0.30									
1	Asphalting	Fugitive Emissions											
2	**Pier J Breakwater Construction**												
2	**Marine Activities**												
2	Pier J Breakwater Tugboat propulsion engine	Marine Equipment	3.95	3.52	3.95	77.27	0.06	58.10	4.28	3.44	0.00	0.00	3.4860
2	Pier J Breakwater Tugboat auxiliary engine	Marine Equipment	0.37	0.33	0.37	13.58	0.01	14.56	0.75	0.78	0.00	0.00	0.7940
2	Pier J Breakwater Crew boat propulsion engine	Marine Equipment	0.28	0.25	0.28	5.40	0.00	4.06	0.30	0.24	0.00	0.00	0.2436
2	Pier J Breakwater Crew boat auxiliary engine	Marine Equipment	0.01	0.01	0.01	0.43	0.00	0.46	0.02	0.02	0.00	0.00	0.0253
2	Pier J Breakwater Survey boat propulsion engine	Marine Equipment	0.25	0.22	0.25	4.82	0.00	3.62	0.27	0.21	0.00	0.00	0.2174
2	**Off-Road Equipment**												
2	Piling crane	Offroad Construction Equipment	0.02	0.02	0.02	0.48	0.01	2.67	0.24	0.38	0.00	0.00	0.3800
2	Long arm excavator	Offroad Construction Equipment	0.04	0.04	0.04	0.79	0.01	2.78	0.32	0.63	0.00	0.00	0.6340
2	**On-Road Vehicles**												
2	Delivery Trucks	Onroad Construction Vehicles	0.15	0.04	0.00	0.08	0.00	0.01	0.00	0.01	0.00	0.00	0.0123
2	Delivery Trucks	Onroad Construction Vehicles	0.49	0.19	0.02	3.22	0.02	0.18	0.03	0.92	0.00	0.00	0.9622
2	Workers	Onroad Construction Vehicles	0.16	0.05	0.00	0.06	0.00	0.96	0.01	0.17	0.00	0.00	0.1700

Table H1.26
Alternative 2 Emissions by Task

			Mitigated Emissions										
			Total										
			PM10	PM2.5	DPM	NOX	SOX	CO	VOC	CO2	CH4	N2O	CO2e
Task ID	**Construction Element/Equipment**	**Source Type 1**	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(tonnes)	(tonnes)
1	**Electrical Substation Construction at Pier J (mitigation only)**												
1	**Off-Road Equipment**												
1	Caterpillar 320 excavator	Offroad Construction Equipment	0.33	0.33	0.33	6.59	0.11	24.52	3.12	5.30	0.00	0.00	5.30
1	Small asphalt roller	Offroad Construction Equipment	0.13	0.13	0.13	19.12	0.03	23.58	1.06	1.51	0.00	0.00	1.51
1	Water truck	Offroad Construction Equipment	0.60	0.60	0.60	12.06	0.20	51.75	5.93	0.00	0.00	0.00	0.00
1	Forklift	Offroad Construction Equipment	0.02	0.02	0.02	3.23	0.01	3.59	0.18	0.00	0.00	0.00	0.00
1	Mobile crane (35 ton)	Offroad Construction Equipment	0.04	0.04	0.04	0.87	0.01	4.83	0.43	0.00	0.00	0.00	0.00
1	**On-Road Vehicles**												
1	Haul trucks	Onroad Construction Vehicles	0.44	0.11	0.00	0.24	0.00	0.03	0.00	0.04	0.00	0.00	0.04
1	Supply trucks	Onroad Construction Vehicles	1.03	0.26	0.00	0.55	0.00	0.06	0.01	0.08	0.00	0.00	0.09
1	Haul trucks	Onroad Construction Vehicles	0.08	0.03	0.00	0.53	0.00	0.03	0.00	0.15	0.00	0.00	0.16
1	Supply trucks	Onroad Construction Vehicles	0.34	0.13	0.02	2.25	0.01	0.13	0.02	0.64	0.00	0.00	0.67
1	Workers	Onroad Construction Vehicles	9.08	2.88	0.00	3.33	0.21	54.81	0.86	9.66	0.00	0.00	9.71
1	**Fugitive Dust**												
1	Soil handling	Fugitive Emissions	40.12	6.07									
1	Asphalting	Fugitive Emissions											
2	**Pier J Breakwater Construction**												
2	**Marine Activities**												
2	Pier J Breakwater Tugboat propulsion engine	Marine Equipment	213.33	189.87	213.33	4172.56	3.46	3137.27	231.25	185.57	0.00	0.01	188.25
2	Pier J Breakwater Tugboat auxiliary engine	Marine Equipment	20.01	17.81	20.01	733.17	0.79	786.05	40.63	42.27	0.00	0.00	42.88
2	Pier J Breakwater Crew boat propulsion engine	Marine Equipment	14.91	13.27	14.91	291.63	0.24	219.27	16.16	12.97	0.00	0.00	13.16
2	Pier J Breakwater Crew boat auxiliary engine	Marine Equipment	0.64	0.57	0.64	23.32	0.03	25.00	1.29	1.34	0.00	0.00	1.36
2	Pier J Breakwater Survey boat propulsion engine	Marine Equipment	13.30	11.84	13.30	260.22	0.22	195.66	14.42	11.57	0.00	0.00	11.74
2	**Off-Road Equipment**												
2	Piling crane	Offroad Construction Equipment	1.29	1.29	1.29	25.89	0.42	144.43	12.72	20.52	0.00	0.00	20.52
2	Long arm excavator	Offroad Construction Equipment	2.14	2.14	2.14	42.75	0.70	149.87	17.33	34.23	0.00	0.00	34.23
2	**On-Road Vehicles**												
2	Delivery Trucks	Onroad Construction Vehicles	0.74	0.18	0.00	0.39	0.00	0.05	0.01	0.06	0.00	0.00	0.06
2	Delivery Trucks	Onroad Construction Vehicles	2.43	0.94	0.11	16.08	0.10	0.92	0.13	4.60	0.00	0.00	4.81
2	Workers	Onroad Construction Vehicles	8.58	2.72	0.00	3.14	0.20	51.79	0.81	9.13	0.00	0.00	9.18

Table H1.26
Alternative 2 Emissions by Task

							Unmitigated Emissions										
							Peak Day										
							PM10	PM2.5	DPM	NOX	SOX	CO	VOC	CO2	CH4	N2O	CO2e
Task ID		**Construction Element/Equipment**	**Source Type 1**	**Source Type 2**	**Onsite/Offsite**	**Days Total**	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(tonnes/day)	(tonnes/day)	(tonnes/day)	(tonnes/day)
3	**Approach Channel (hopper dredge 1,144,000 CY)**																
3		**Marine Hopper Dredge**															
3		Hopper propulsion engine	Marine Equipment	dredging	onsite	66	26.63	23.70	26.63	495.89	0.29	266.32	27.48	15.75	0.00	0.00	15.9819
3		Hopper propulsion engine	Marine Equipment	transit	offsite	66	50.31	44.77	50.31	936.68	0.56	503.05	51.91	29.76	0.00	0.00	30.1880
3		Hopper auxiliary engine	Marine Equipment	disposal	near shore	66	0.22	0.20	0.22	5.06	0.00	3.70	0.28	0.22	0.00	0.00	0.2219
3		Hopper Crew boat propulsion engine	Marine Equipment	support	onsite	66	0.41	0.36	0.41	8.02	0.00	4.06	0.44	0.24	0.00	0.00	0.2437
3		Hopper Crew boat auxiliary engine	Marine Equipment	support	onsite	66	0.03	0.03	0.03	0.60	0.00	0.42	0.03	0.02	0.00	0.00	0.0253
3		Hopper Survey boat propulsion engine	Marine Equipment	dredging	onsite	66	1.45	1.29	1.45	28.64	0.02	14.49	1.59	0.86	0.00	0.00	0.8697
4	**Main Channel Widening (clam shell dredge 1,065,000 CY)**																
4		**Marine Clamshell Dredge**															
4		Clamshell Dredge hoist	Marine Equipment	dredging	onsite	178	4.37	4.37	4.37	132.70	0.15	75.66	7.35	5.79	0.00	0.00	5.7854
4		Clamshell Dredge generator	Marine Equipment	dredging	onsite	178	3.27	3.27	3.27	99.52	0.11	56.75	5.52	3.20	0.00	0.00	3.1964
4		Clamshell Barge dump scow	Marine Equipment	disposal	near shore	178	0.05	0.05	0.05	0.88	0.00	0.80	0.05	0.04	0.00	0.00	0.0382
4		Clamshell Tugboat propulsion engine	Marine Equipment	dredging	onsite	178	0.61	0.54	0.61	11.39	0.01	6.12	0.63	0.36	0.00	0.00	0.3670
4		Clamshell Tugboat auxiliary engine	Marine Equipment	dredging	onsite	178	0.09	0.08	0.09	1.57	0.00	1.10	0.09	0.07	0.00	0.00	0.0662
4		Clamshell Tugboat propulsion engine	Marine Equipment	transit	offsite	178	11.01	9.80	11.01	204.97	0.12	110.08	11.36	6.51	0.00	0.00	6.6058
4		Clamshell Tugboat auxiliary engine	Marine Equipment	transit	offsite	178	1.59	1.41	1.59	28.29	0.02	19.85	1.57	1.17	0.00	0.00	1.1911
4		Clamshell Crew boat propulsion engine	Marine Equipment	support	onsite	178	0.41	0.36	0.41	8.02	0.00	4.06	0.44	0.24	0.00	0.00	0.2437
4		Clamshell Crew boat auxiliary engine	Marine Equipment	support	onsite	178	0.03	0.03	0.03	0.60	0.00	0.42	0.03	0.02	0.00	0.00	0.0253
4		Clamshell Survey boat propulsion engine	Marine Equipment	dredging	onsite	178	0.36	0.32	0.36	7.16	0.00	3.62	0.40	0.21	0.00	0.00	0.2174
5	**West Basin (clam shell dredge 501,000 CY)**																
5		**Marine Clamshell Dredge**															
5		Clamshell Dredge hoist	Marine Equipment	dredging	onsite	84	4.37	4.37	4.37	132.70	0.15	75.66	7.35	5.79	0.00	0.00	5.7854
5		Clamshell Dredge generator	Marine Equipment	dredging	onsite	84	3.27	3.27	3.27	99.52	0.11	56.75	5.52	3.20	0.00	0.00	3.1964
5		Clamshell Barge dump scow	Marine Equipment	disposal	near shore	84	0.05	0.05	0.05	0.88	0.00	0.80	0.05	0.04	0.00	0.00	0.0382
5		Clamshell Tugboat propulsion engine	Marine Equipment	dredging	onsite	84	0.61	0.54	0.61	11.39	0.01	6.12	0.63	0.36	0.00	0.00	0.3670
5		Clamshell Tugboat auxiliary engine	Marine Equipment	dredging	onsite	84	0.09	0.08	0.09	1.57	0.00	1.10	0.09	0.07	0.00	0.00	0.0662
5		Clamshell Tugboat propulsion engine	Marine Equipment	transit	offsite	84	11.01	9.80	11.01	204.97	0.12	110.08	11.36	6.51	0.00	0.00	6.6058
5		Clamshell Tugboat auxiliary engine	Marine Equipment	transit	offsite	84	1.59	1.41	1.59	28.29	0.02	19.85	1.57	1.17	0.00	0.00	1.1911
5		Clamshell Crew boat propulsion engine	Marine Equipment	support	onsite	84	0.41	0.36	0.41	8.02	0.00	4.06	0.44	0.24	0.00	0.00	0.2437
5		Clamshell Crew boat auxiliary engine	Marine Equipment	support	onsite	84	0.03	0.03	0.03	0.60	0.00	0.42	0.03	0.02	0.00	0.00	0.0253
5		Clamshell Survey boat propulsion engine	Marine Equipment	dredging	onsite	84	0.36	0.32	0.36	7.16	0.00	3.62	0.40	0.21	0.00	0.00	0.2174

Table H1.26
Alternative 2 Emissions by Task

				Unmitigated Emissions										
				Total										
				PM10	PM2.5	DPM	NOX	SOX	CO	VOC	CO2	CH4	N2O	CO2e
Task ID		**Construction Element/Equipment**	**Source Type 1**	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(tonnes)	(tonnes)	(tonnes)	(tonnes)
3 Approach Channel (hopper dredge 1,144,000 CY)														
3		**Marine Hopper Dredge**												
3		Hopper propulsion engine	Marine Equipment	1757.72	1564.37	1757.72	32728.77	19.41	17577.21	1813.86	1039.68	0.02	0.05	1054.80
3		Hopper propulsion engine	Marine Equipment	3320.14	2954.92	3320.14	61821.01	36.65	33201.40	3426.19	1963.84	0.03	0.09	1992.41
3		Hopper auxiliary engine	Marine Equipment	14.65	13.04	14.65	333.97	0.27	244.13	18.51	14.44	0.00	0.00	14.65
3		Hopper Crew boat propulsion engine	Marine Equipment	26.80	23.85	26.80	529.56	0.30	268.00	29.35	15.85	0.00	0.00	16.08
3		Hopper Crew boat auxiliary engine	Marine Equipment	2.22	1.98	2.22	39.58	0.03	27.78	2.19	1.64	0.00	0.00	1.67
3		Hopper Survey boat propulsion engine	Marine Equipment	95.65	85.13	95.65	1890.14	1.06	956.55	104.75	56.58	0.00	0.00	57.40
4 Main Channel Widening (clam shell dredge 1,065,000 CY)														
4		**Marine Clamshell Dredge**												
4		Clamshell Dredge hoist	Marine Equipment	776.98	776.98	776.98	23620.32	25.87	13467.72	1309.06	1029.80	0.00	0.00	1029.80
4		Clamshell Dredge generator	Marine Equipment	582.74	582.74	582.74	17715.24	19.40	10100.79	981.80	568.97	0.00	0.00	568.97
4		Clamshell Barge dump scow	Marine Equipment	8.24	8.24	8.24	156.57	0.27	142.84	8.68	6.80	0.00	0.00	6.80
4		Clamshell Tugboat propulsion engine	Marine Equipment	108.86	96.88	108.86	2026.91	1.20	1088.56	112.33	64.39	0.00	0.00	65.32
4		Clamshell Tugboat auxiliary engine	Marine Equipment	15.70	13.98	15.70	279.72	0.22	196.29	15.50	11.61	0.00	0.00	11.78
4		Clamshell Tugboat propulsion engine	Marine Equipment	1959.42	1743.88	1959.42	36484.31	21.63	19594.15	2022.00	1158.98	0.02	0.06	1175.84
4		Clamshell Tugboat auxiliary engine	Marine Equipment	282.66	251.57	282.66	5034.91	3.90	3533.27	279.04	208.99	0.00	0.01	212.01
4		Clamshell Crew boat propulsion engine	Marine Equipment	72.28	64.33	72.28	1428.22	0.80	722.78	79.15	42.75	0.00	0.00	43.38
4		Clamshell Crew boat auxiliary engine	Marine Equipment	5.99	5.33	5.99	106.75	0.08	74.91	5.92	4.43	0.00	0.00	4.50
4		Clamshell Survey boat propulsion engine	Marine Equipment	64.49	57.40	64.49	1274.41	0.71	644.94	70.63	38.15	0.00	0.00	38.70
5 West Basin (clam shell dredge 501,000 CY)														
5		**Marine Clamshell Dredge**												
5		Clamshell Dredge hoist	Marine Equipment	366.67	366.67	366.67	11146.67	12.21	6355.56	617.76	485.97	0.00	0.00	485.97
5		Clamshell Dredge generator	Marine Equipment	275.00	275.00	275.00	8360.00	9.16	4766.67	463.32	268.50	0.00	0.00	268.50
5		Clamshell Barge dump scow	Marine Equipment	3.89	3.89	3.89	73.89	0.13	67.41	4.10	3.21	0.00	0.00	3.21
5		Clamshell Tugboat propulsion engine	Marine Equipment	51.37	45.72	51.37	956.52	0.57	513.70	53.01	30.39	0.00	0.00	30.83
5		Clamshell Tugboat auxiliary engine	Marine Equipment	7.41	6.60	7.41	132.00	0.10	92.63	7.32	5.48	0.00	0.00	5.56
5		Clamshell Tugboat propulsion engine	Marine Equipment	924.67	822.95	924.67	17217.32	10.21	9246.68	954.20	546.94	0.01	0.03	554.89
5		Clamshell Tugboat auxiliary engine	Marine Equipment	133.39	118.72	133.39	2376.02	1.84	1667.38	131.68	98.62	0.00	0.00	100.05
5		Clamshell Crew boat propulsion engine	Marine Equipment	34.11	30.36	34.11	673.99	0.38	341.09	37.35	20.18	0.00	0.00	20.47
5		Clamshell Crew boat auxiliary engine	Marine Equipment	2.83	2.52	2.83	50.38	0.04	35.35	2.79	2.09	0.00	0.00	2.12
5		Clamshell Survey boat propulsion engine	Marine Equipment	30.44	27.09	30.44	601.41	0.34	304.36	33.33	18.00	0.00	0.00	18.26

Table H1.26
Alternative 2 Emissions by Task

Task ID		Construction Element/Equipment	Source Type 1	Mitigated Peak Day PM10 (lb/day)	PM2.5 (lb/day)	DPM (lb/day)	NOX (lb/day)	SOX (lb/day)	CO (lb/day)	VOC (lb/day)	CO2 (tonnes/day)	CH4 (tonnes/day)	N2O (tonnes/day)	CO2e (tonnes/day)
3		**Approach Channel (hopper dredge 1,144,000 CY)**												
3		**Marine Hopper Dredge**												
3		Hopper propulsion engine	Marine Equipment	26.63	23.70	26.63	495.89	0.29	266.32	27.48	15.75	0.00	0.00	15.9819
3		Hopper propulsion engine	Marine Equipment	50.31	44.77	50.31	936.68	0.56	503.05	51.91	29.76	0.00	0.00	30.1880
3		Hopper auxiliary engine	Marine Equipment	0.22	0.20	0.22	5.06	0.00	3.70	0.28	0.22	0.00	0.00	0.2219
3		Hopper Crew boat propulsion engine	Marine Equipment	0.28	0.25	0.28	5.40	0.00	4.06	0.30	0.24	0.00	0.00	0.2436
3		Hopper Crew boat auxiliary engine	Marine Equipment	0.01	0.01	0.01	0.43	0.00	0.46	0.02	0.02	0.00	0.00	0.0253
3		Hopper Survey boat propulsion engine	Marine Equipment	0.99	0.88	0.99	19.28	0.02	14.49	1.07	0.86	0.00	0.00	0.8696
4		**Main Channel Widening (clam shell dredge 1,065,000 CY)**												
4		**Marine Clamshell Dredge**												
4		Clamshell Dredge hoist	Marine Equipment	0.44	0.44	0.44	13.27	0.01	7.57	0.74	0.58	0.00	0.00	0.5785
4		Clamshell Dredge generator	Marine Equipment	0.33	0.33	0.33	9.95	0.01	5.67	0.55	0.32	0.00	0.00	0.3196
4		Clamshell Barge dump scow	Marine Equipment	0.05	0.05	0.05	0.88	0.00	0.80	0.05	0.04	0.00	0.00	0.0382
4		Clamshell Tugboat propulsion engine	Marine Equipment	0.42	0.37	0.42	8.13	0.01	6.12	0.45	0.36	0.00	0.00	0.3670
4		Clamshell Tugboat auxiliary engine	Marine Equipment	0.03	0.03	0.03	1.13	0.00	1.21	0.06	0.07	0.00	0.00	0.0662
4		Clamshell Tugboat propulsion engine	Marine Equipment	7.49	6.66	7.49	146.41	0.12	110.08	8.11	6.51	0.00	0.00	6.6051
4		Clamshell Tugboat auxiliary engine	Marine Equipment	0.56	0.49	0.56	20.37	0.02	21.83	1.13	1.17	0.00	0.00	1.1910
4		Clamshell Crew boat propulsion engine	Marine Equipment	0.28	0.25	0.28	5.40	0.00	4.06	0.30	0.24	0.00	0.00	0.2436
4		Clamshell Crew boat auxiliary engine	Marine Equipment	0.01	0.01	0.01	0.43	0.00	0.46	0.02	0.02	0.00	0.00	0.0253
4		Clamshell Survey boat propulsion engine	Marine Equipment	0.25	0.22	0.25	4.82	0.00	3.62	0.27	0.21	0.00	0.00	0.2174
5		**West Basin (clam shell dredge 501,000 CY)**												
5		**Marine Clamshell Dredge**												
5		Clamshell Dredge hoist	Marine Equipment	0.44	0.44	0.44	13.27	0.01	7.57	0.74	0.58	0.00	0.00	0.5785
5		Clamshell Dredge generator	Marine Equipment	0.33	0.33	0.33	9.95	0.01	5.67	0.55	0.32	0.00	0.00	0.3196
5		Clamshell Barge dump scow	Marine Equipment	0.05	0.05	0.05	0.88	0.00	0.80	0.05	0.04	0.00	0.00	0.0382
5		Clamshell Tugboat propulsion engine	Marine Equipment	0.42	0.37	0.42	8.13	0.01	6.12	0.45	0.36	0.00	0.00	0.3670
5		Clamshell Tugboat auxiliary engine	Marine Equipment	0.03	0.03	0.03	1.13	0.00	1.21	0.06	0.07	0.00	0.00	0.0662
5		Clamshell Tugboat propulsion engine	Marine Equipment	7.49	6.66	7.49	146.41	0.12	110.08	8.11	6.51	0.00	0.00	6.6051
5		Clamshell Tugboat auxiliary engine	Marine Equipment	0.56	0.49	0.56	20.37	0.02	21.83	1.13	1.17	0.00	0.00	1.1910
5		Clamshell Crew boat propulsion engine	Marine Equipment	0.28	0.25	0.28	5.40	0.00	4.06	0.30	0.24	0.00	0.00	0.2436
5		Clamshell Crew boat auxiliary engine	Marine Equipment	0.01	0.01	0.01	0.43	0.00	0.46	0.02	0.02	0.00	0.00	0.0253
5		Clamshell Survey boat propulsion engine	Marine Equipment	0.25	0.22	0.25	4.82	0.00	3.62	0.27	0.21	0.00	0.00	0.2174

Note: clamshell dredge would be electric with mitigation; assume 90 percent reduction in diesel exhaust emissions.

Table H1.26
Alternative 2 Emissions by Task

				Mitigated Emissions										
				Total										
				PM10	PM2.5	DPM	NOX	SOX	CO	VOC	CO2	CH4	N2O	CO2e
Task ID		**Construction Element/Equipment**	**Source Type 1**	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(tonnes)	(tonnes)
3 Approach Channel (hopper dredge 1,144,000 CY)														
3		**Marine Hopper Dredge**												
3		Hopper propulsion engine	Marine Equipment	1757.72	1564.37	1757.72	32728.77	19.41	17577.21	1813.86	1039.68	0.02	0.05	1054.80
3		Hopper propulsion engine	Marine Equipment	3320.14	2954.92	3320.14	61821.01	36.65	33201.40	3426.19	1963.84	0.03	0.09	1992.41
3		Hopper auxiliary engine	Marine Equipment	14.65	13.04	14.65	333.97	0.27	244.13	18.51	14.44	0.00	0.00	14.65
3		Hopper Crew boat propulsion engine	Marine Equipment	18.22	16.22	18.22	356.44	0.30	268.00	19.75	15.85	0.00	0.00	16.08
3		Hopper Crew boat auxiliary engine	Marine Equipment	0.78	0.69	0.78	28.50	0.03	30.55	1.58	1.64	0.00	0.00	1.67
3		Hopper Survey boat propulsion engine	Marine Equipment	65.05	57.89	65.05	1272.21	1.06	956.55	70.51	56.58	0.00	0.00	57.40
4 Main Channel Widening (clam shell dredge 1,065,000 CY)														
4		**Marine Clamshell Dredge**												
4		Clamshell Dredge hoist	Marine Equipment	77.70	77.70	77.70	2362.03	2.59	1346.77	130.91	102.98	0.00	0.00	102.98
4		Clamshell Dredge generator	Marine Equipment	58.27	58.27	58.27	1771.52	1.94	1010.08	98.18	56.90	0.00	0.00	56.90
4		Clamshell Barge dump scow	Marine Equipment	8.24	8.24	8.24	156.57	0.27	142.84	8.68	6.80	0.00	0.00	6.80
4		Clamshell Tugboat propulsion engine	Marine Equipment	74.02	65.88	74.02	1447.79	1.20	1088.56	80.24	64.39	0.00	0.00	65.32
4		Clamshell Tugboat auxiliary engine	Marine Equipment	5.50	4.89	5.50	201.40	0.22	215.92	11.16	11.61	0.00	0.00	11.78
4		Clamshell Tugboat propulsion engine	Marine Equipment	1332.40	1185.84	1332.40	26060.22	21.63	19594.15	1444.28	1158.98	0.01	0.06	1175.72
4		Clamshell Tugboat auxiliary engine	Marine Equipment	98.93	88.05	98.93	3625.13	3.90	3886.59	200.91	208.99	0.00	0.01	212.00
4		Clamshell Crew boat propulsion engine	Marine Equipment	49.15	43.74	49.15	961.30	0.80	722.78	53.28	42.75	0.00	0.00	43.37
4		Clamshell Crew boat auxiliary engine	Marine Equipment	2.10	1.87	2.10	76.86	0.08	82.40	4.26	4.43	0.00	0.00	4.49
4		Clamshell Survey boat propulsion engine	Marine Equipment	43.86	39.03	43.86	857.78	0.71	644.94	47.54	38.15	0.00	0.00	38.70
5 West Basin (clam shell dredge 501,000 CY)														
5		**Marine Clamshell Dredge**												
5		Clamshell Dredge hoist	Marine Equipment	36.67	36.67	36.67	1114.67	1.22	635.56	61.78	48.60	0.00	0.00	48.60
5		Clamshell Dredge generator	Marine Equipment	27.50	27.50	27.50	836.00	0.92	476.67	46.33	26.85	0.00	0.00	26.85
5		Clamshell Barge dump scow	Marine Equipment	3.89	3.89	3.89	73.89	0.13	67.41	4.10	3.21	0.00	0.00	3.21
5		Clamshell Tugboat propulsion engine	Marine Equipment	34.93	31.09	34.93	683.23	0.57	513.70	37.87	30.39	0.00	0.00	30.82
5		Clamshell Tugboat auxiliary engine	Marine Equipment	2.59	2.31	2.59	95.04	0.10	101.90	5.27	5.48	0.00	0.00	5.56
5		Clamshell Tugboat propulsion engine	Marine Equipment	628.77	559.61	628.77	12298.08	10.21	9246.68	681.57	546.94	0.01	0.03	554.83
5		Clamshell Tugboat auxiliary engine	Marine Equipment	46.69	41.55	46.69	1710.74	1.84	1834.12	94.81	98.62	0.00	0.00	100.04
5		Clamshell Crew boat propulsion engine	Marine Equipment	23.19	20.64	23.19	453.65	0.38	341.09	25.14	20.18	0.00	0.00	20.47
5		Clamshell Crew boat auxiliary engine	Marine Equipment	0.99	0.88	0.99	36.27	0.04	38.89	2.01	2.09	0.00	0.00	2.12
5		Clamshell Survey boat propulsion engine	Marine Equipment	20.70	18.42	20.70	404.79	0.34	304.36	22.43	18.00	0.00	0.00	18.26

Note: clamshell dredge would be electric with mitigation; assume 90 percent reduction in diesel exhaust emissions.

Table H1.26
Alternative 2 Emissions by Task

							Unmitigated Emissions Peak Day										
							PM10	PM2.5	DPM	NOX	SOX	CO	VOC	CO2	CH4	N2O	CO2e
Task ID		**Construction Element/Equipment**	**Source Type 1**	**Source Type 2**	**Onsite/Offsite**	**Days Total**	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(tonnes/day)	(tonnes/day)	(tonnes/day)	(tonnes/day)
6 Pier J Basin (clam shell dredge 202,000 CY)																	
6		**Marine Clamshell Dredge**															
6		Clamshell Dredge hoist	Marine Equipment	dredging	onsite	34	4.37	4.37	4.37	132.70	0.15	75.66	7.35	5.79	0.00	0.00	5.7854
6		Clamshell Dredge generator	Marine Equipment	dredging	onsite	34	3.27	3.27	3.27	99.52	0.11	56.75	5.52	3.20	0.00	0.00	3.1964
6		Clamshell Barge dump scow	Marine Equipment	disposal	offsite	34	0.05	0.05	0.05	0.88	0.00	0.80	0.05	0.04	0.00	0.00	0.0382
6		Clamshell Tugboat propulsion engine	Marine Equipment	dredging	onsite	34	0.61	0.54	0.61	11.39	0.01	6.12	0.63	0.36	0.00	0.00	0.3670
6		Clamshell Tugboat auxiliary engine	Marine Equipment	dredging	onsite	34	0.09	0.08	0.09	1.57	0.00	1.10	0.09	0.07	0.00	0.00	0.0662
6		Clamshell Tugboat propulsion engine	Marine Equipment	transit	offsite	34	11.01	9.80	11.01	204.97	0.12	110.08	11.36	6.51	0.00	0.00	6.6058
6		Clamshell Tugboat auxiliary engine	Marine Equipment	transit	offsite	34	1.59	1.41	1.59	28.29	0.02	19.85	1.57	1.17	0.00	0.00	1.1911
6		Clamshell Crew boat propulsion engine	Marine Equipment	support	onsite	34	0.41	0.36	0.41	8.02	0.00	4.06	0.44	0.24	0.00	0.00	0.2437
6		Clamshell Crew boat auxiliary engine	Marine Equipment	support	onsite	34	0.03	0.03	0.03	0.60	0.00	0.42	0.03	0.02	0.00	0.00	0.0253
6		Clamshell Survey boat propulsion engine	Marine Equipment	dredging	onsite	34	0.36	0.32	0.36	7.16	0.00	3.62	0.40	0.21	0.00	0.00	0.2174
7 Pier J Approach (clam shell dredge 270,000 CY)																	
7		**Marine Clamshell Dredge**															
7		Clamshell Dredge hoist	Marine Equipment	dredging	onsite	45	4.37	4.37	4.37	132.70	0.15	75.66	7.35	5.79	0.00	0.00	5.7854
7		Clamshell Dredge generator	Marine Equipment	dredging	onsite	45	3.27	3.27	3.27	99.52	0.11	56.75	5.52	3.20	0.00	0.00	3.1964
7		Clamshell Barge dump scow	Marine Equipment	disposal	offsite	45	0.05	0.05	0.05	0.88	0.00	0.80	0.05	0.04	0.00	0.00	0.0382
7		Clamshell Tugboat propulsion engine	Marine Equipment	dredging	onsite	45	0.61	0.54	0.61	11.39	0.01	6.12	0.63	0.36	0.00	0.00	0.3670
7		Clamshell Tugboat auxiliary engine	Marine Equipment	dredging	onsite	45	0.09	0.08	0.09	1.57	0.00	1.10	0.09	0.07	0.00	0.00	0.0662
7		Clamshell Tugboat propulsion engine	Marine Equipment	transit	offsite	45	11.01	9.80	11.01	204.97	0.12	110.08	11.36	6.51	0.00	0.00	6.6058
7		Clamshell Tugboat auxiliary engine	Marine Equipment	transit	offsite	45	1.59	1.41	1.59	28.29	0.02	19.85	1.57	1.17	0.00	0.00	1.1911
7		Clamshell Crew boat propulsion engine	Marine Equipment	support	onsite	45	0.41	0.36	0.41	8.02	0.00	4.06	0.44	0.24	0.00	0.00	0.2437
7		Clamshell Crew boat auxiliary engine	Marine Equipment	support	onsite	45	0.03	0.03	0.03	0.60	0.00	0.42	0.03	0.02	0.00	0.00	0.0253
7		Clamshell Survey boat propulsion engine	Marine Equipment	dredging	onsite	45	0.36	0.32	0.36	7.16	0.00	3.62	0.40	0.21	0.00	0.00	0.2174
8 Pier J Approach (clam shell dredge 1,699,000 CY)																	
8		**Marine Clamshell Dredge**															
8		Clamshell Dredge hoist	Marine Equipment	dredging	onsite	283	4.37	4.37	4.37	132.70	0.15	75.66	7.35	5.79	0.00	0.00	5.7854
8		Clamshell Dredge generator	Marine Equipment	dredging	onsite	283	3.27	3.27	3.27	99.52	0.11	56.75	5.52	3.20	0.00	0.00	3.1964
8		Clamshell Barge dump scow	Marine Equipment	disposal	offsite	283	0.05	0.05	0.05	0.88	0.00	0.80	0.05	0.04	0.00	0.00	0.0382
8		Clamshell Tugboat propulsion engine	Marine Equipment	dredging	onsite	283	0.61	0.54	0.61	11.39	0.01	6.12	0.63	0.36	0.00	0.00	0.3670
8		Clamshell Tugboat auxiliary engine	Marine Equipment	dredging	onsite	283	0.09	0.08	0.09	1.57	0.00	1.10	0.09	0.07	0.00	0.00	0.0662
8		Clamshell Tugboat propulsion engine	Marine Equipment	transit	offsite	283	11.01	9.80	11.01	204.97	0.12	110.08	11.36	6.51	0.00	0.00	6.6058
8		Clamshell Tugboat auxiliary engine	Marine Equipment	transit	offsite	283	1.59	1.41	1.59	28.29	0.02	19.85	1.57	1.17	0.00	0.00	1.1911
8		Clamshell Crew boat propulsion engine	Marine Equipment	support	onsite	283	0.41	0.36	0.41	8.02	0.00	4.06	0.44	0.24	0.00	0.00	0.2437
8		Clamshell Crew boat auxiliary engine	Marine Equipment	support	onsite	283	0.03	0.03	0.03	0.60	0.00	0.42	0.03	0.02	0.00	0.00	0.0253
8		Clamshell Survey boat propulsion engine	Marine Equipment	dredging	onsite	283	0.36	0.32	0.36	7.16	0.00	3.62	0.40	0.21	0.00	0.00	0.2174

Table H1.26
Alternative 2 Emissions by Task

				Unmitigated Emissions										
				Total										
				PM10	PM2.5	DPM	NOX	SOX	CO	VOC	CO2	CH4	N2O	CO2e
Task ID		**Construction Element/Equipment**	**Source Type 1**	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(tonnes)	(tonnes)	(tonnes)	(tonnes)
6	**Pier J Basin (clam shell dredge 202,000 CY)**													
6		**Marine Clamshell Dredge**												
6		Clamshell Dredge hoist	Marine Equipment	148.41	148.41	148.41	4511.75	4.94	2572.49	250.05	196.70	0.00	0.00	196.70
6		Clamshell Dredge generator	Marine Equipment	111.31	111.31	111.31	3383.81	3.71	1929.37	187.53	108.68	0.00	0.00	108.68
6		Clamshell Barge dump scow	Marine Equipment	1.57	1.57	1.57	29.91	0.05	27.28	1.66	1.30	0.00	0.00	1.30
6		Clamshell Tugboat propulsion engine	Marine Equipment	20.79	18.51	20.79	387.16	0.23	207.93	21.46	12.30	0.00	0.00	12.48
6		Clamshell Tugboat auxiliary engine	Marine Equipment	3.00	2.67	3.00	53.43	0.04	37.49	2.96	2.22	0.00	0.00	2.25
6		Clamshell Tugboat propulsion engine	Marine Equipment	374.27	333.10	374.27	6968.91	4.13	3742.70	386.22	221.38	0.00	0.01	224.60
6		Clamshell Tugboat auxiliary engine	Marine Equipment	53.99	48.05	53.99	961.72	0.75	674.89	53.30	39.92	0.00	0.00	40.50
6		Clamshell Crew boat propulsion engine	Marine Equipment	13.81	12.29	13.81	272.81	0.15	138.06	15.12	8.17	0.00	0.00	8.29
6		Clamshell Crew boat auxiliary engine	Marine Equipment	1.14	1.02	1.14	20.39	0.02	14.31	1.13	0.85	0.00	0.00	0.86
6		Clamshell Survey boat propulsion engine	Marine Equipment	12.32	10.96	12.32	243.43	0.14	123.19	13.49	7.29	0.00	0.00	7.39
7	**Pier J Approach (clam shell dredge 270,000 CY)**													
7		**Marine Clamshell Dredge**												
7		Clamshell Dredge hoist	Marine Equipment	196.43	196.43	196.43	5971.43	6.54	3404.76	330.94	260.34	0.00	0.00	260.34
7		Clamshell Dredge generator	Marine Equipment	147.32	147.32	147.32	4478.57	4.90	2553.57	248.21	143.84	0.00	0.00	143.84
7		Clamshell Barge dump scow	Marine Equipment	2.08	2.08	2.08	39.58	0.07	36.11	2.19	1.72	0.00	0.00	1.72
7		Clamshell Tugboat propulsion engine	Marine Equipment	27.52	24.49	27.52	512.42	0.30	275.20	28.40	16.28	0.00	0.00	16.51
7		Clamshell Tugboat auxiliary engine	Marine Equipment	3.97	3.53	3.97	70.71	0.05	49.62	3.92	2.94	0.00	0.00	2.98
7		Clamshell Tugboat propulsion engine	Marine Equipment	495.36	440.87	495.36	9223.56	5.47	4953.58	511.18	293.00	0.00	0.01	297.26
7		Clamshell Tugboat auxiliary engine	Marine Equipment	71.46	63.60	71.46	1272.87	0.99	893.24	70.54	52.83	0.00	0.00	53.60
7		Clamshell Crew boat propulsion engine	Marine Equipment	18.27	16.26	18.27	361.07	0.20	182.73	20.01	10.81	0.00	0.00	10.97
7		Clamshell Crew boat auxiliary engine	Marine Equipment	1.52	1.35	1.52	26.99	0.02	18.94	1.50	1.12	0.00	0.00	1.14
7		Clamshell Survey boat propulsion engine	Marine Equipment	16.30	14.51	16.30	322.18	0.18	163.05	17.86	9.64	0.00	0.00	9.78
8	**Pier J Approach (clam shell dredge 1,699,000 CY)**													
8		**Marine Clamshell Dredge**												
8		Clamshell Dredge hoist	Marine Equipment	1235.32	1235.32	1235.32	37553.65	41.13	21412.17	2081.26	1637.26	0.00	0.00	1637.26
8		Clamshell Dredge generator	Marine Equipment	926.49	926.49	926.49	28165.24	30.85	16059.13	1560.95	904.59	0.00	0.00	904.59
8		Clamshell Barge dump scow	Marine Equipment	13.10	13.10	13.10	248.94	0.44	227.10	13.80	10.82	0.00	0.00	10.82
8		Clamshell Tugboat propulsion engine	Marine Equipment	173.07	154.03	173.07	3222.55	1.91	1730.69	178.60	102.37	0.00	0.00	103.86
8		Clamshell Tugboat auxiliary engine	Marine Equipment	24.97	22.22	24.97	444.72	0.34	312.08	24.65	18.46	0.00	0.00	18.73
8		Clamshell Tugboat propulsion engine	Marine Equipment	3115.25	2772.57	3115.25	58005.95	34.39	31152.50	3214.75	1842.65	0.03	0.09	1869.45
8		Clamshell Tugboat auxiliary engine	Marine Equipment	449.40	399.97	449.40	8004.94	6.20	5617.50	443.64	332.27	0.00	0.02	337.08
8		Clamshell Crew boat propulsion engine	Marine Equipment	114.91	102.27	114.91	2270.71	1.27	1149.14	125.85	67.97	0.00	0.00	68.96
8		Clamshell Crew boat auxiliary engine	Marine Equipment	9.53	8.48	9.53	169.72	0.13	119.10	9.41	7.04	0.00	0.00	7.15
8		Clamshell Survey boat propulsion engine	Marine Equipment	102.54	91.26	102.54	2026.17	1.13	1025.39	112.29	60.65	0.00	0.00	61.53

Table H1.26
Alternative 2 Emissions by Task

				Mitigated										
				Peak Day										
				PM10	PM2.5	DPM	NOX	SOX	CO	VOC	CO2	CH4	N2O	CO2e
Task ID		**Construction Element/Equipment**	**Source Type 1**	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(tonnes/day)	(tonnes/day)	(tonnes/day)	(tonnes/day)
6 Pier J Basin (clam shell dredge 202,000 CY)														
6		**Marine Clamshell Dredge**												
6		Clamshell Dredge hoist	Marine Equipment	0.44	0.44	0.44	13.27	0.01	7.57	0.74	0.58	0.00	0.00	0.5785
6		Clamshell Dredge generator	Marine Equipment	0.33	0.33	0.33	9.95	0.01	5.67	0.55	0.32	0.00	0.00	0.3196
6		Clamshell Barge dump scow	Marine Equipment	0.05	0.05	0.05	0.88	0.00	0.80	0.05	0.04	0.00	0.00	0.0382
6		Clamshell Tugboat propulsion engine	Marine Equipment	0.42	0.37	0.42	8.13	0.01	6.12	0.45	0.36	0.00	0.00	0.3670
6		Clamshell Tugboat auxiliary engine	Marine Equipment	0.03	0.03	0.03	1.13	0.00	1.21	0.06	0.07	0.00	0.00	0.0662
6		Clamshell Tugboat propulsion engine	Marine Equipment	7.49	6.66	7.49	146.41	0.12	110.08	8.11	6.51	0.00	0.00	6.6051
6		Clamshell Tugboat auxiliary engine	Marine Equipment	0.56	0.49	0.56	20.37	0.02	21.83	1.13	1.17	0.00	0.00	1.1910
6		Clamshell Crew boat propulsion engine	Marine Equipment	0.28	0.25	0.28	5.40	0.00	4.06	0.30	0.24	0.00	0.00	0.2436
6		Clamshell Crew boat auxiliary engine	Marine Equipment	0.01	0.01	0.01	0.43	0.00	0.46	0.02	0.02	0.00	0.00	0.0253
6		Clamshell Survey boat propulsion engine	Marine Equipment	0.25	0.22	0.25	4.82	0.00	3.62	0.27	0.21	0.00	0.00	0.2174
7 Pier J Approach (clam shell dredge 270,000 CY)														
7		**Marine Clamshell Dredge**												
7		Clamshell Dredge hoist	Marine Equipment	0.44	0.44	0.44	13.27	0.01	7.57	0.74	0.58	0.00	0.00	0.5785
7		Clamshell Dredge generator	Marine Equipment	0.33	0.33	0.33	9.95	0.01	5.67	0.55	0.32	0.00	0.00	0.3196
7		Clamshell Barge dump scow	Marine Equipment	0.05	0.05	0.05	0.88	0.00	0.80	0.05	0.04	0.00	0.00	0.0382
7		Clamshell Tugboat propulsion engine	Marine Equipment	0.42	0.37	0.42	8.13	0.01	6.12	0.45	0.36	0.00	0.00	0.3670
7		Clamshell Tugboat auxiliary engine	Marine Equipment	0.03	0.03	0.03	1.13	0.00	1.21	0.06	0.07	0.00	0.00	0.0662
7		Clamshell Tugboat propulsion engine	Marine Equipment	7.49	6.66	7.49	146.41	0.12	110.08	8.11	6.51	0.00	0.00	6.6051
7		Clamshell Tugboat auxiliary engine	Marine Equipment	0.56	0.49	0.56	20.37	0.02	21.83	1.13	1.17	0.00	0.00	1.1910
7		Clamshell Crew boat propulsion engine	Marine Equipment	0.28	0.25	0.28	5.40	0.00	4.06	0.30	0.24	0.00	0.00	0.2436
7		Clamshell Crew boat auxiliary engine	Marine Equipment	0.01	0.01	0.01	0.43	0.00	0.46	0.02	0.02	0.00	0.00	0.0253
7		Clamshell Survey boat propulsion engine	Marine Equipment	0.25	0.22	0.25	4.82	0.00	3.62	0.27	0.21	0.00	0.00	0.2174
8 Pier J Approach (clam shell dredge 1,699,000 CY)														
8		**Marine Clamshell Dredge**												
8		Clamshell Dredge hoist	Marine Equipment	0.44	0.44	0.44	13.27	0.01	7.57	0.74	0.58	0.00	0.00	0.5785
8		Clamshell Dredge generator	Marine Equipment	0.33	0.33	0.33	9.95	0.01	5.67	0.55	0.32	0.00	0.00	0.3196
8		Clamshell Barge dump scow	Marine Equipment	0.05	0.05	0.05	0.88	0.00	0.80	0.05	0.04	0.00	0.00	0.0382
8		Clamshell Tugboat propulsion engine	Marine Equipment	0.42	0.37	0.42	8.13	0.01	6.12	0.45	0.36	0.00	0.00	0.3670
8		Clamshell Tugboat auxiliary engine	Marine Equipment	0.03	0.03	0.03	1.13	0.00	1.21	0.06	0.07	0.00	0.00	0.0662
8		Clamshell Tugboat propulsion engine	Marine Equipment	7.49	6.66	7.49	146.41	0.12	110.08	8.11	6.51	0.00	0.00	6.6051
8		Clamshell Tugboat auxiliary engine	Marine Equipment	0.56	0.49	0.56	20.37	0.02	21.83	1.13	1.17	0.00	0.00	1.1910
8		Clamshell Crew boat propulsion engine	Marine Equipment	0.28	0.25	0.28	5.40	0.00	4.06	0.30	0.24	0.00	0.00	0.2436
8		Clamshell Crew boat auxiliary engine	Marine Equipment	0.01	0.01	0.01	0.43	0.00	0.46	0.02	0.02	0.00	0.00	0.0253
8		Clamshell Survey boat propulsion engine	Marine Equipment	0.25	0.22	0.25	4.82	0.00	3.62	0.27	0.21	0.00	0.00	0.2174

Note: clamshell dredge would be electric with mitigation; assume 90 percent reduction in diesel exhaust emissions.

Table H1.26
Alternative 2 Emissions by Task

Task ID	Construction Element/Equipment	Source Type 1	Mitigated Emissions Total PM10 (lb)	PM2.5 (lb)	DPM (lb)	NOX (lb)	SOX (lb)	CO (lb)	VOC (lb)	CO2 (lb)	CH4 (lb)	N2O (tonnes)	CO2e (tonnes)
6	**Pier J Basin (clam shell dredge 202,000 CY)**												
6	**Marine Clamshell Dredge**												
6	Clamshell Dredge hoist	Marine Equipment	14.84	14.84	14.84	451.17	0.49	257.25	25.00	19.67	0.00	0.00	19.67
6	Clamshell Dredge generator	Marine Equipment	11.13	11.13	11.13	338.38	0.37	192.94	18.75	10.87	0.00	0.00	10.87
6	Clamshell Barge dump scow	Marine Equipment	1.57	1.57	1.57	29.91	0.05	27.28	1.66	1.30	0.00	0.00	1.30
6	Clamshell Tugboat propulsion engine	Marine Equipment	14.14	12.58	14.14	276.54	0.23	207.93	15.33	12.30	0.00	0.00	12.48
6	Clamshell Tugboat auxiliary engine	Marine Equipment	1.05	0.93	1.05	38.47	0.04	41.24	2.13	2.22	0.00	0.00	2.25
6	Clamshell Tugboat propulsion engine	Marine Equipment	254.50	226.51	254.50	4977.80	4.13	3742.70	275.87	221.38	0.00	0.01	224.57
6	Clamshell Tugboat auxiliary engine	Marine Equipment	18.90	16.82	18.90	692.44	0.75	742.38	38.38	39.92	0.00	0.00	40.49
6	Clamshell Crew boat propulsion engine	Marine Equipment	9.39	8.36	9.39	183.62	0.15	138.06	10.18	8.17	0.00	0.00	8.28
6	Clamshell Crew boat auxiliary engine	Marine Equipment	0.40	0.36	0.40	14.68	0.02	15.74	0.81	0.85	0.00	0.00	0.86
6	Clamshell Survey boat propulsion engine	Marine Equipment	8.38	7.46	8.38	163.84	0.14	123.19	9.08	7.29	0.00	0.00	7.39
7	**Pier J Approach (clam shell dredge 270,000 CY)**												
7	**Marine Clamshell Dredge**												
7	Clamshell Dredge hoist	Marine Equipment	19.64	19.64	19.64	597.14	0.65	340.48	33.09	26.03	0.00	0.00	26.03
7	Clamshell Dredge generator	Marine Equipment	14.73	14.73	14.73	447.86	0.49	255.36	24.82	14.38	0.00	0.00	14.38
7	Clamshell Barge dump scow	Marine Equipment	2.08	2.08	2.08	39.58	0.07	36.11	2.19	1.72	0.00	0.00	1.72
7	Clamshell Tugboat propulsion engine	Marine Equipment	18.71	16.66	18.71	366.01	0.30	275.20	20.28	16.28	0.00	0.00	16.51
7	Clamshell Tugboat auxiliary engine	Marine Equipment	1.39	1.24	1.39	50.91	0.05	54.59	2.82	2.94	0.00	0.00	2.98
7	Clamshell Tugboat propulsion engine	Marine Equipment	336.84	299.79	336.84	6588.26	5.47	4953.58	365.13	293.00	0.00	0.01	297.23
7	Clamshell Tugboat auxiliary engine	Marine Equipment	25.01	22.26	25.01	916.47	0.99	982.57	50.79	52.83	0.00	0.00	53.59
7	Clamshell Crew boat propulsion engine	Marine Equipment	12.43	11.06	12.43	243.03	0.20	182.73	13.47	10.81	0.00	0.00	10.96
7	Clamshell Crew boat auxiliary engine	Marine Equipment	0.53	0.47	0.53	19.43	0.02	20.83	1.08	1.12	0.00	0.00	1.14
7	Clamshell Survey boat propulsion engine	Marine Equipment	11.09	9.87	11.09	216.85	0.18	163.05	12.02	9.64	0.00	0.00	9.78
8	**Pier J Approach (clam shell dredge 1,699,000 CY)**												
8	**Marine Clamshell Dredge**												
8	Clamshell Dredge hoist	Marine Equipment	123.53	123.53	123.53	3755.37	4.11	2141.22	208.13	163.73	0.00	0.00	163.73
8	Clamshell Dredge generator	Marine Equipment	92.65	92.65	92.65	2816.52	3.08	1605.91	156.09	90.46	0.00	0.00	90.46
8	Clamshell Barge dump scow	Marine Equipment	13.10	13.10	13.10	248.94	0.44	227.10	13.80	10.82	0.00	0.00	10.82
8	Clamshell Tugboat propulsion engine	Marine Equipment	117.69	104.74	117.69	2301.82	1.91	1730.69	127.57	102.37	0.00	0.00	103.85
8	Clamshell Tugboat auxiliary engine	Marine Equipment	8.74	7.78	8.74	320.20	0.34	343.29	17.75	18.46	0.00	0.00	18.72
8	Clamshell Tugboat propulsion engine	Marine Equipment	2118.37	1885.35	2118.37	41432.82	34.39	31152.50	2296.25	1842.65	0.02	0.09	1869.26
8	Clamshell Tugboat auxiliary engine	Marine Equipment	157.29	139.99	157.29	5763.55	6.20	6179.25	319.42	332.27	0.00	0.02	337.05
8	Clamshell Crew boat propulsion engine	Marine Equipment	78.14	69.55	78.14	1528.36	1.27	1149.14	84.70	67.97	0.00	0.00	68.95
8	Clamshell Crew boat auxiliary engine	Marine Equipment	3.33	2.97	3.33	122.20	0.13	131.01	6.77	7.04	0.00	0.00	7.15
8	Clamshell Survey boat propulsion engine	Marine Equipment	69.73	62.06	69.73	1363.77	1.13	1025.39	75.58	60.65	0.00	0.00	61.53

Note: clamshell dredge would be electric with mitigation; assume 90 percent reduction in diesel exhaust emissions.

Table H1.27
Alternative 3 Emissions by Task

							Unmitigated Emissions										
							Peak Day										
							PM10	PM2.5	DPM	NOX	SOX	CO	VOC	CO2	CH4	N2O	CO2e
Task ID		**Construction Element/Equipment**	**Source Type 1**	**Source Type 2**	**Onsite/Offsite**	**Days Total**	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(tonnes/day)	(tonnes/day)	(tonnes/day)	(tonnes/day)
1 Electrical Substation Construction at Pier J (mitigation only)																	
1		**Off-Road Equipment**															
1		Caterpillar 320 excavator	Offroad Construction Equipment		onsite	20.00	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1		Small asphalt roller	Offroad Construction Equipment		onsite	26.00	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1		Water truck	Offroad Construction Equipment		onsite	20.00	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1		Forklift	Offroad Construction Equipment		onsite	22.00	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1		Mobile crane (35 ton)	Offroad Construction Equipment		onsite	2.00	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1		**On-Road Vehicles**															
1		Haul trucks	Onroad Construction Vehicles		onsite	5.00	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1		Supply trucks	Onroad Construction Vehicles		onsite	5.00	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1		Haul trucks	Onroad Construction Vehicles		offsite	5.00	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1		Supply trucks	Onroad Construction Vehicles		offsite	5.00	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1		Workers	Onroad Construction Vehicles		offsite	60.00	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1		Fugitive Dust															
1		Soil handling	Fugitive Emissions		onsite	20.00	n/a	n/a									
1		Asphalting	Fugitive Emissions		onsite												
2 Pier J Breakwater Construction																	
2		**Marine Activities**															
2		Pier J Breakwater Tugboat propulsion	Marine Equipment	Pier J Breakwater Construction	onsite	54.00	5.81	5.17	5.81	108.18	0.06	58.10	6.00	3.44	0.0001	0.00	3.49
2		Pier J Breakwater Tugboat auxiliary	Marine Equipment	Pier J Breakwater Construction	onsite	54.00	1.06	0.94	1.06	18.86	0.01	13.23	1.05	0.78	0.0000	0.00	0.79
2		Pier J Breakwater Crew boat propulsion engine	Marine Equipment	Pier J Breakwater Construction	onsite	54.00	0.41	0.36	0.41	8.02	0.00	4.06	0.44	0.24	0.0000	0.00	0.24
2		Pier J Breakwater Crew boat auxiliary engine	Marine Equipment	Pier J Breakwater Construction	onsite	54.00	0.03	0.03	0.03	0.60	0.00	0.42	0.03	0.02	0.0000	0.00	0.03
2		Pier J Breakwater Survey boat propulsion engine	Marine Equipment	Pier J Breakwater Construction	onsite	54.00	0.36	0.32	0.36	7.16	0.00	3.62	0.40	0.21	0.0000	0.00	0.22
2		**Off-Road Equipment**															
2		Piling crane	Offroad Construction Equipment		onsite	54.00	0.21	0.19	0.21	5.00	0.01	2.67	0.47	0.38	0.0000	0.00	0.38
2		Long arm excavator	Offroad Construction Equipment		onsite	54.00	0.08	0.07	0.08	2.19	0.01	2.78	0.32	0.63	0.0000	0.00	0.63
2		**On-Road Vehicles**															
2		Delivery Trucks	Onroad Construction Vehicles		onsite	5.00	0.15	0.04	0.00	0.08	0.00	0.01	0.00	0.01	0.0000	0.00	0.01
2		Delivery Trucks	Onroad Construction Vehicles		offsite	5.00	0.49	0.19	0.02	3.22	0.02	0.18	0.03	0.92	0.0000	0.00	0.96
2		Workers	Onroad Construction Vehicles		offsite	54.00	0.16	0.05	0.00	0.06	0.00	0.96	0.01	0.17	0.0000	0.00	0.17

Table H1.27
Alternative 3 Emissions by Task

				Unmitigated Emissions										
				Total										
				PM10	PM2.5	DPM	NOX	SOX	CO	VOC	CO2	CH4	N2O	CO2e
Task ID		**Construction Element/Equipment**	**Source Type 1**	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(tonnes)	(tonnes)	(tonnes)	(tonnes)
1		**Electrical Substation Construction at Pier J (mitigation only)**												
1		**Off-Road Equipment**												
1		Caterpillar 320 excavator	Offroad Construction Equipment	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1		Small asphalt roller	Offroad Construction Equipment	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1		Water truck	Offroad Construction Equipment	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1		Forklift	Offroad Construction Equipment	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1		Mobile crane (35 ton)	Offroad Construction Equipment	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1		**On-Road Vehicles**												
1		Haul trucks	Onroad Construction Vehicles	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1		Supply trucks	Onroad Construction Vehicles	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1		Haul trucks	Onroad Construction Vehicles	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1		Supply trucks	Onroad Construction Vehicles	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1		Workers	Onroad Construction Vehicles	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1		Fugitive Dust												
1		Soil handling	Fugitive Emissions	n/a	n/a									
1		Asphalting	Fugitive Emissions											
2		**Pier J Breakwater Construction**												
2		**Marine Activities**												
2		Pier J Breakwater Tugboat propulsion	Marine Equipment	313.73	279.22	313.73	5841.59	3.46	3137.27	323.75	185.57	0.00	0.01	188.27
2		Pier J Breakwater Tugboat auxiliary	Marine Equipment	57.17	50.88	57.17	1018.30	0.79	714.59	56.44	42.27	0.00	0.00	42.88
2		Pier J Breakwater Crew boat propulsion engine	Marine Equipment	21.93	19.52	21.93	433.28	0.24	219.27	24.01	12.97	0.00	0.00	13.16
2		Pier J Breakwater Crew boat auxiliary engine	Marine Equipment	1.82	1.62	1.82	32.38	0.03	22.73	1.79	1.34	0.00	0.00	1.36
2		Pier J Breakwater Survey boat propulsion engine	Marine Equipment	19.57	17.41	19.57	386.62	0.22	195.66	21.43	11.57	0.00	0.00	11.74
2		**Off-Road Equipment**												
2		Piling crane	Offroad Construction Equipment	11.27	10.36	11.27	270.12	0.42	144.43	25.20	20.52	0.00	0.00	20.52
2		Long arm excavator	Offroad Construction Equipment	4.06	3.74	4.06	118.13	0.70	149.87	17.33	34.23	0.00	0.00	34.23
2		**On-Road Vehicles**												
2		Delivery Trucks	Onroad Construction Vehicles	0.74	0.18	0.00	0.39	0.00	0.05	0.01	0.06	0.00	0.00	0.06
2		Delivery Trucks	Onroad Construction Vehicles	2.43	0.94	0.11	16.08	0.10	0.92	0.13	4.60	0.00	0.00	4.81
2		Workers	Onroad Construction Vehicles	8.58	2.72	0.00	3.14	0.20	51.79	0.81	9.13	0.00	0.00	9.18

Table H1.27
Alternative 3 Emissions by Task

				Mitigated										
				Peak Day										
				PM10	PM2.5	DPM	NOX	SOX	CO	VOC	CO2	CH4	N2O	CO2e
Task ID		**Construction Element/Equipment**	**Source Type 1**	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(tonnes/day)	(tonnes/day)	(tonnes/day)	(tonnes/day)
1 Electrical Substation Construction at Pier J (mitigation only)														
1		**Off-Road Equipment**												
1		Caterpillar 320 excavator	Offroad Construction Equipment	0.02	0.02	0.02	0.33	0.01	1.23	0.1561	0.26	0.00	0.00	0.26
1		Small asphalt roller	Offroad Construction Equipment	0.00	0.00	0.00	0.74	0.00	0.91	0.0408	0.06	0.00	0.00	0.06
1		Water truck	Offroad Construction Equipment	0.03	0.03	0.03	0.60	0.01	2.59	0.2964	0.00	0.00	0.00	0.00
1		Forklift	Offroad Construction Equipment	0.00	0.00	0.00	0.15	0.00	0.16	0.0081	0.00	0.00	0.00	0.00
1		Mobile crane (35 ton)	Offroad Construction Equipment	0.02	0.02	0.02	0.43	0.01	2.41	0.2126	0.00	0.00	0.00	0.00
1		**On-Road Vehicles**												
1		Haul trucks	Onroad Construction Vehicles	0.09	0.02	0.00	0.05	0.00	0.01	0.0006	0.01	0.00	0.00	0.01
1		Supply trucks	Onroad Construction Vehicles	0.21	0.05	0.00	0.11	0.00	0.01	0.0015	0.02	0.00	0.00	0.02
1		Haul trucks	Onroad Construction Vehicles	0.02	0.01	0.00	0.11	0.00	0.01	0.0008	0.03	0.00	0.00	0.03
1		Supply trucks	Onroad Construction Vehicles	0.07	0.03	0.00	0.45	0.00	0.03	0.0036	0.13	0.00	0.00	0.13
1		Workers	Onroad Construction Vehicles	0.15	0.05	0.00	0.06	0.00	0.91	0.0143	0.16	0.00	0.00	0.16
1		Fugitive Dust												
1		Soil handling	Fugitive Emissions	2.01	0.30									
1		Asphalting	Fugitive Emissions											
2 Pier J Breakwater Construction														
2		**Marine Activities**												
2		Pier J Breakwater Tugboat propulsion	Marine Equipment	3.95	3.52	3.95	77.27	0.06	58.10	4.2824	3.44	0.00	0.00	3.49
2		Pier J Breakwater Tugboat auxiliary	Marine Equipment	0.37	0.33	0.37	13.58	0.01	14.56	0.7525	0.78	0.00	0.00	0.79
2		Pier J Breakwater Crew boat propulsion engine	Marine Equipment	0.28	0.25	0.28	5.40	0.00	4.06	0.2993	0.24	0.00	0.00	0.24
2		Pier J Breakwater Crew boat auxiliary engine	Marine Equipment	0.01	0.01	0.01	0.43	0.00	0.46	0.0239	0.02	0.00	0.00	0.03
2		Pier J Breakwater Survey boat propulsion engine	Marine Equipment	0.25	0.22	0.25	4.82	0.00	3.62	0.2671	0.21	0.00	0.00	0.22
2		**Off-Road Equipment**												
2		Piling crane	Offroad Construction Equipment	0.02	0.02	0.02	0.48	0.01	2.67	0.2356	0.38	0.00	0.00	0.38
2		Long arm excavator	Offroad Construction Equipment	0.04	0.04	0.04	0.79	0.01	2.78	0.3209	0.63	0.00	0.00	0.63
2		**On-Road Vehicles**												
2		Delivery Trucks	Onroad Construction Vehicles	0.15	0.04	0.00	0.08	0.00	0.01	0.0011	0.01	0.00	0.00	0.01
2		Delivery Trucks	Onroad Construction Vehicles	0.49	0.19	0.02	3.22	0.02	0.18	0.0256	0.92	0.00	0.00	0.96
2		Workers	Onroad Construction Vehicles	0.16	0.05	0.00	0.06	0.00	0.96	0.0150	0.17	0.00	0.00	0.17

Table H1.27
Alternative 3 Emissions by Task

				Mitigated Emissions										
				Total										
				PM10	PM2.5	DPM	NOX	SOX	CO	VOC	CO2	CH4	N2O	CO2e
Task ID		**Construction Element/Equipment**	**Source Type 1**	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(tonnes)	(tonnes)
1 Electrical Substation Construction at Pier J (mitigation only)														
1		**Off-Road Equipment**												
1		Caterpillar 320 excavator	Offroad Construction Equipment	0.33	0.33	0.33	6.59	0.11	24.52	3.12	5.30	0.00	0.00	5.30
1		Small asphalt roller	Offroad Construction Equipment	0.13	0.13	0.13	19.12	0.03	23.58	1.06	1.511223352	0	0	1.511223352
1		Water truck	Offroad Construction Equipment	0.60	0.60	0.60	12.06	0.20	51.75	5.93	0	0	0	0
1		Forklift	Offroad Construction Equipment	0.02	0.02	0.02	3.23	0.01	3.59	0.18	0	0	0	0
1		Mobile crane (35 ton)	Offroad Construction Equipment	0.04	0.04	0.04	0.87	0.01	4.83	0.43	0	0	0	0
1		**On-Road Vehicles**												
1		Haul trucks	Onroad Construction Vehicles	0.44	0.11	0.00	0.24	0.00	0.03	0.00	0.035354006	6.65075E-08	5.55716E-06	0.037011702
1		Supply trucks	Onroad Construction Vehicles	1.03	0.26	0.00	0.55	0.00	0.06	0.01	0.082492681	1.55184E-07	1.29667E-05	0.086360637
1		Haul trucks	Onroad Construction Vehicles	0.08	0.03	0.00	0.53	0.00	0.03	0.00	0.151656946	8.88911E-08	2.38384E-05	0.158763
1		Supply trucks	Onroad Construction Vehicles	0.34	0.13	0.02	2.25	0.01	0.13	0.02	0.643393105	3.77114E-07	0.000101132	0.673539999
1		Workers	Onroad Construction Vehicles	9.08	2.88	0.00	3.33	0.21	54.81	0.86	9.659044664	9.91447E-05	0.0001697	9.712093981
1		Fugitive Dust												
1		Soil handling	Fugitive Emissions	40.12	6.07									
1		Asphalting	Fugitive Emissions											
2 Pier J Breakwater Construction														
2		**Marine Activities**												
2		Pier J Breakwater Tugboat propulsion	Marine Equipment	213.33	189.87	213.33	4172.56	3.46	3137.27	231.25	185.57	0.00	0.01	188.25
2		Pier J Breakwater Tugboat auxiliary	Marine Equipment	20.01	17.81	20.01	733.17	0.79	786.05	40.63	42.27	0.00	0.00	42.88
2		Pier J Breakwater Crew boat propulsion engine	Marine Equipment	14.91	13.27	14.91	291.63	0.24	219.27	16.16	12.97	0.00	0.00	13.16
2		Pier J Breakwater Crew boat auxiliary engine	Marine Equipment	0.64	0.57	0.64	23.32	0.03	25.00	1.29	1.34	0.00	0.00	1.36
2		Pier J Breakwater Survey boat propulsion engine	Marine Equipment	13.30	11.84	13.30	260.22	0.22	195.66	14.42	11.57	0.00	0.00	11.74
2		**Off-Road Equipment**												
2		Piling crane	Offroad Construction Equipment	1.29	1.29	1.29	25.89	0.42	144.43	12.72	20.52	0.00	0.00	20.52
2		Long arm excavator	Offroad Construction Equipment	2.14	2.14	2.14	42.75	0.70	149.87	17.33	34.23	0.00	0.00	34.23
2		**On-Road Vehicles**												
2		Delivery Trucks	Onroad Construction Vehicles	0.74	0.18	0.00	0.39	0.00	0.05	0.01	0.058923344	1.10846E-07	9.26193E-06	0.06168617
2		Delivery Trucks	Onroad Construction Vehicles	2.43	0.94	0.11	16.08	0.10	0.92	0.13	4.595665034	2.69367E-06	0.000722375	4.81099999
2		Workers	Onroad Construction Vehicles	8.58	2.72	0.00	3.14	0.20	51.79	0.81	9.127797208	9.36918E-05	0.000160367	9.177928812

Table H1.27
Alternative 3 Emissions by Task

							Unmitigated Emissions										
							Peak Day										
							PM10	PM2.5	DPM	NOX	SOX	CO	VOC	CO2	CH4	N2O	CO2e
Task ID		**Construction Element/Equipment**	**Source Type 1**	**Source Type 2**	**Onsite/Offsite**	**Days Total**	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(tonnes/day)	(tonnes/day)	(tonnes/day)	(tonnes/day)
3 Approach Channel (hopper dredge 2,600,000 CY)																	
3		**Marine Hopper Dredge**															
3		Hopper propulsion engine	Marine Equipment	dredging	onsite	150.00	26.63	23.70	26.63	495.89	0.29	266.32	27.48	15.75	0.0002	0.00	15.98
3		Hopper propulsion engine	Marine Equipment	transit	offsite	150.00	50.31	44.77	50.31	936.68	0.56	503.05	51.91	29.76	0.0004	0.00	30.19
3		Hopper auxiliary engine	Marine Equipment	disposal	near shore	150.00	0.22	0.20	0.22	5.06	0.00	3.70	0.28	0.22	0.0000	0.00	0.22
3		Crew boat propulsion engine	Marine Equipment	support	onsite	150.00	0.41	0.36	0.41	8.02	0.00	4.06	0.44	0.24	0.0000	0.00	0.24
3		Crew boat auxiliary engine	Marine Equipment	support	onsite	150.00	0.03	0.03	0.03	0.60	0.00	0.42	0.03	0.02	0.0000	0.00	0.03
3		Survey boat propulsion engine	Marine Equipment	dredging	onsite	150.00	1.45	1.29	1.45	28.64	0.02	14.49	1.59	0.86	0.0000	0.00	0.87
4 Main Channel Widening (clam shell dredge 1,065,000 CY)																	
4		**Marine Clamshell Dredge**															
4		Clamshell Dredge hoist	Marine Equipment	dredging	onsite	177.00	4.37	4.37	4.37	132.70	0.15	75.66	7.35	5.79	0.0000	0.00	5.79
4		Clamshell Dredge generator	Marine Equipment	dredging	onsite	177.00	3.27	3.27	3.27	99.52	0.11	56.75	5.52	3.20	0.0000	0.00	3.20
4		Clamshell Barge dump scow	Marine Equipment	disposal	near shore	177.00	0.05	0.05	0.05	0.88	0.00	0.80	0.05	0.04	0.0000	0.00	0.04
4		Clamshell Tugboat propulsion engine	Marine Equipment	dredging	onsite	177.00	0.61	0.54	0.61	11.39	0.01	6.12	0.63	0.36	0.0000	0.00	0.37
4		Clamshell Tugboat auxiliary engine	Marine Equipment	dredging	onsite	177.00	0.09	0.08	0.09	1.57	0.00	1.10	0.09	0.07	0.0000	0.00	0.07
4		Clamshell Tugboat propulsion engine	Marine Equipment	transit	offsite	177.00	11.01	9.80	11.01	204.97	0.12	110.08	11.36	6.51	0.0001	0.00	6.61
4		Clamshell Tugboat auxiliary engine	Marine Equipment	transit	offsite	177.00	1.59	1.41	1.59	28.29	0.02	19.85	1.57	1.17	0.00	0.00	1.19
4		Clamshell Crew boat propulsion engine	Marine Equipment	support	onsite	177	0.4060579	0.3613915	0.4060579	8.0237043	0.0044829	4.0605791	0.4446821	0.240181	3.83111E-06	1.14196E-05	0.2436798
4		Clamshell Crew boat auxiliary engine	Marine Equipment	support	onsite	177.0000	0.0336683	0.0300	0.0336683	0.5997163	0.0004646	0.4208535	0.0332369	0.0248933	2.86349E-07	1.18357E-06	0.0252531
4		Clamshell Survey boat propulsion engine	Marine Equipment	dredging	onsite	177.00	0.36	0.32	0.36	7.16	0.00	3.62	0.40	0.21	0.0000	0.00	0.22

Table H1.27
Alternative 3 Emissions by Task

Task ID		Construction Element/Equipment	Source Type 1	PM10 (lb)	PM2.5 (lb)	DPM (lb)	NOX (lb)	SOX (lb)	CO (lb)	VOC (lb)	CO2 (tonnes)	CH4 (tonnes)	N2O (tonnes)	CO2e (tonnes)
				Unmitigated Emissions – Total										
3 Approach Channel (hopper dredge 2,600,000 CY)														
3		**Marine Hopper Dredge**												
3		Hopper propulsion engine	Marine Equipment	3994.82	3555.39	3994.82	74383.56	44.10	39948.21	4122.42	2362.91	0.04	0.11	2397.28
3		Hopper propulsion engine	Marine Equipment	7545.77	6715.74	7545.77	140502.28	83.31	75457.73	7786.78	4463.28	0.07	0.21	4528.20
3		Hopper auxiliary engine	Marine Equipment	33.29	29.63	33.29	759.02	0.61	554.84	42.07	32.82	0.00	0.00	33.29
3		Crew boat propulsion engine	Marine Equipment	60.91	54.21	60.91	1203.56	0.67	609.09	66.70	36.03	0.00	0.00	36.55
3		Crew boat auxiliary engine	Marine Equipment	5.05	4.49	5.05	89.96	0.07	63.13	4.99	3.73	0.00	0.00	3.79
3		Survey boat propulsion engine	Marine Equipment	217.40	193.48	217.40	4295.77	2.40	2173.97	238.08	128.59	0.00	0.01	130.46
4 Main Channel Widening (clam shell dredge 1,065,000 CY)														
4		**Marine Clamshell Dredge**												
4		Clamshell Dredge hoist	Marine Equipment	772.62	772.62	772.62	23487.62	25.72	13392.06	1301.71	1024.01	0.00	0.00	1024.01
4		Clamshell Dredge generator	Marine Equipment	579.46	579.46	579.46	17615.71	19.29	10044.05	976.28	565.77	0.00	0.00	565.77
4		Clamshell Barge dump scow	Marine Equipment	8.19	8.19	8.19	155.69	0.27	142.04	8.63	6.77	0.00	0.00	6.77
4		Clamshell Tugboat propulsion engine	Marine Equipment	108.24	96.34	108.24	2015.52	1.20	1082.45	111.70	64.03	0.00	0.00	64.96
4		Clamshell Tugboat auxiliary engine	Marine Equipment	15.62	13.90	15.62	278.15	0.22	195.19	15.42	11.55	0.00	0.00	11.71
4		Clamshell Tugboat propulsion engine	Marine Equipment	1948.41	1734.08	1948.41	36279.34	21.51	19484.07	2010.64	1152.47	0.02	0.05	1169.23
4		Clamshell Tugboat auxiliary engine	Marine Equipment	281.07	250.16	281.07	5006.62	3.88	3513.42	277.47	207.82	0.00	0.01	210.82
4		Clamshell Crew boat propulsion engine	Marine Equipment	71.87225	63.966303	71.87225	1420.19566	0.7934696	718.7225	78.708739	42.512033	0.000678106	0.002021278	43.131327
4		Clamshell Crew boat auxiliary engine	Marine Equipment	5.9592862	5.3037647	5.9592862	106.149785	0.0822381	74.49	5.8829328	4.4061055	0.00	0.000209493	4.4698014
4		Clamshell Survey boat propulsion engine	Marine Equipment	64.13	57.08	64.13	1267.25	0.71	641.32	70.23	37.93	0.00	0.00	38.49

Table H1.27
Alternative 3 Emissions by Task

				Mitigated Peak Day PM10	PM2.5	DPM	NOX	SOX	CO	VOC	CO2	CH4	N2O	CO2e
Task ID		**Construction Element/Equipment**	**Source Type 1**	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(tonnes/day)	(tonnes/day)	(tonnes/day)	(tonnes/day)
3 Approach Channel (hopper dredge 2,600,000 CY)														
3		**Marine Hopper Dredge**												
3		Hopper propulsion engine	Marine Equipment	26.63	23.70	26.63	495.89	0.29	266.32	27.4828	15.75	0.00	0.00	15.98
3		Hopper propulsion engine	Marine Equipment	50.31	44.77	50.31	936.68	0.56	503.05	51.9119	29.76	0.00	0.00	30.19
3		Hopper auxiliary engine	Marine Equipment	0.22	0.20	0.22	5.06	0.00	3.70	0.2804	0.22	0.00	0.00	0.22
3		Crew boat propulsion engine	Marine Equipment	0.28	0.25	0.28	5.40	0.00	4.06	0.2993	0.24	0.00	0.00	0.24
3		Crew boat auxiliary engine	Marine Equipment	0.01	0.01	0.01	0.43	0.00	0.46	0.0239	0.02	0.00	0.00	0.03
3		Survey boat propulsion engine	Marine Equipment	0.99	0.88	0.99	19.28	0.02	14.49	1.0683	0.86	0.00	0.00	0.87
4 Main Channel Widening (clam shell dredge 1,065,000 CY)														
4		**Marine Clamshell Dredge**												
4		Clamshell Dredge hoist	Marine Equipment	0.44	0.44	0.44	13.27	0.01	7.57	0.7354	0.58	0.00	0.00	0.58
4		Clamshell Dredge generator	Marine Equipment	0.33	0.33	0.33	9.95	0.01	5.67	0.5516	0.32	0.00	0.00	0.32
4		Clamshell Barge dump scow	Marine Equipment	0.05	0.05	0.05	0.88	0.00	0.80	0.0488	0.04	0.00	0.00	0.04
4		Clamshell Tugboat propulsion engine	Marine Equipment	0.42	0.37	0.42	8.13	0.01	6.12	0.4508	0.36	0.00	0.00	0.37
4		Clamshell Tugboat auxiliary engine	Marine Equipment	0.03	0.03	0.03	1.13	0.00	1.21	0.0627	0.07	0.00	0.00	0.07
4		Clamshell Tugboat propulsion engine	Marine Equipment	7.49	6.66	7.49	146.41	0.12	110.08	8.1140	6.51	0.00	0.00	6.61
4		Clamshell Tugboat auxiliary engine	Marine Equipment	0.56	0.49	0.56	20.37	0.02	21.83	1.13	1.17	0.00	0.00	1.19
4		Clamshell Crew boat propulsion engine	Marine Equipment	0.2761194	0.2457462	0.2761194	5.4005702	0.0044829	4.0605791	0.2993053	0.240181	2.57863E-06	1.14196E-05	0.2436485
4		Clamshell Crew boat auxiliary engine	Marine Equipment	0.0117839	0.0104877	0.0117839	0.4317957	0.0004646	0.4629389	0.0239306	0.0248933	2.06171E-07	1.18357E-06	0.0252511
4		Clamshell Survey boat propulsion engine	Marine Equipment	0.25	0.22	0.25	4.82	0.00	3.62	0.2671	0.21	0.00	0.00	0.22

Note: clamshell dredge would be electric with mitigation; assume 90 percent reduction in diesel exhaust emissions.

Table H1.27
Alternative 3 Emissions by Task

				Mitigated Emissions										
				Total										
				PM10	PM2.5	DPM	NOX	SOX	CO	VOC	CO2	CH4	N2O	CO2e
Task ID		**Construction Element/Equipment**	**Source Type 1**	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(tonnes)	(tonnes)
3 Approach Channel (hopper dredge 2,600,000 CY)														
3		**Marine Hopper Dredge**												
3		Hopper propulsion engine	Marine Equipment	3994.82	3555.39	3994.82	74383.56	44.10	39948.21	4122.42	2362.91	0.04	0.11	2397.28
3		Hopper propulsion engine	Marine Equipment	7545.77	6715.74	7545.77	140502.28	83.31	75457.73	7786.78	4463.282182	0.067086143	0.212211269	4528.198294
3		Hopper auxiliary engine	Marine Equipment	33.29	29.63	33.29	759.02	0.61	554.84	42.07	32.81825134	0.00036241	0.001560377	33.29230393
3		Crew boat propulsion engine	Marine Equipment	41.42	36.86	41.42	810.09	0.67	609.09	44.90	36.02714702	0.000386795	0.001712947	36.54727515
3		Crew boat auxiliary engine	Marine Equipment	1.77	1.57	1.77	64.77	0.07	69.44	3.59	3.733987708	3.09257E-05	0.000177536	3.787666645
3		Survey boat propulsion engine	Marine Equipment	147.83	131.57	147.83	2891.38	2.40	2173.97	160.24	128.5892017	0.001380559	0.006113904	130.445659
4 Main Channel Widening (clam shell dredge 1,065,000 CY)														
4		**Marine Clamshell Dredge**												
4		Clamshell Dredge hoist	Marine Equipment	77.26	77.26	77.26	2348.76	2.57	1339.21	130.17	102.4011648	0	0	102.4011648
4		Clamshell Dredge generator	Marine Equipment	57.95	57.95	57.95	1761.57	1.93	1004.40	97.63	56.57711647	0	0	56.57711647
4		Clamshell Barge dump scow	Marine Equipment	8.19	8.19	8.19	155.69	0.27	142.04	8.63	6.766310242	0	0	6.766310242
4		Clamshell Tugboat propulsion engine	Marine Equipment	73.61	65.51	73.61	1439.66	1.20	1082.45	79.79	64.02622048	0.000687398	0.003044191	64.95057449
4		Clamshell Tugboat auxiliary engine	Marine Equipment	5.47	4.86	5.47	200.26	0.22	214.71	11.10	11.54537331	9.56212E-05	0.000548936	11.7113469
4		Clamshell Tugboat propulsion engine	Marine Equipment	1324.92	1179.18	1324.92	25913.82	21.51	19484.07	1436.17	1152.471969	0.012373165	0.054795446	1169.110341
4		Clamshell Tugboat auxiliary engine	Marine Equipment	98.38	87.55	98.38	3604.77	3.88	3864.76	199.78	207.8167195	0.001721181	0.009880856	210.8042442
4		Clamshell Crew boat propulsion engine	Marine Equipment	48.87313	43.497086	48.87313	955.900927	0.7934696	718.7225	52.977036	42.51203349	0.000456418	0.002021278	43.12578467
4		Clamshell Crew boat auxiliary engine	Marine Equipment	2.0857502	1.8563176	2.0857502	76.4278451	0.0822381	81.94	4.2357116	4.406105495	3.64923E-05	0.000209493	4.469446641
4		Clamshell Survey boat propulsion engine	Marine Equipment	43.61	38.81	43.61	852.96	0.71	641.32	47.27	37.93	0.00	0.00	38.48

Note: clamshell dredge would be electric with mitigation; assume 90 percent reduction in diesel exhaust emissions.

Table H1.27
Alternative 3 Emissions by Task

							Unmitigated Emissions										
							Peak Day										
							PM10	PM2.5	DPM	NOX	SOX	CO	VOC	CO2	CH4	N2O	CO2e
Task ID		**Construction Element/Equipment**	**Source Type 1**	**Source Type 2**	**Onsite/Offsite**	**Days Total**	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(tonnes/day)	(tonnes/day)	(tonnes/day)	(tonnes/day)
5	**West Basin (clam shell dredge 717,000 CY)**																
5		**Marine Clamshell Dredge**															
5		Clamshell Dredge hoist	Marine Equipment	dredging	onsite	120.00	4.37	4.37	4.37	132.70	0.15	75.66	7.35	5.79	0.0000	0.00	5.79
5		Clamshell Dredge generator	Marine Equipment	dredging	onsite	120.00	3.27	3.27	3.27	99.52	0.11	56.75	5.52	3.20	0.0000	0.00	3.20
5		Clamshell Barge dump scow	Marine Equipment	disposal	near shore	120.00	0.05	0.05	0.05	0.88	0.00	0.80	0.05	0.04	0.0000	0.00	0.04
5		Clamshell Tugboat propulsion engine	Marine Equipment	dredging	onsite	120.00	0.61	0.54	0.61	11.39	0.01	6.12	0.63	0.36	0.0000	0.00	0.37
5		Clamshell Tugboat auxiliary engine	Marine Equipment	dredging	onsite	120.00	0.09	0.08	0.09	1.57	0.00	1.10	0.09	0.07	0.0000	0.00	0.07
5		Clamshell Tugboat propulsion engine	Marine Equipment	transit	offsite	120.00	11.01	9.80	11.01	204.97	0.12	110.08	11.36	6.51	0.0001	0.00	6.61
5		Clamshell Tugboat auxiliary engine	Marine Equipment	transit	offsite	120.00	1.59	1.41	1.59	28.29	0.02	19.85	1.57	1.17	0.00	0.00	1.19
5		Clamshell Crew boat propulsion engine	Marine Equipment	support	onsite	120	0.4060579	0.3613915	0.4060579	8.0237043	0.0044829	4.0605791	0.4446821	0.240181	3.83111E-06	1.14196E-05	0.2436798
5		Clamshell Crew boat auxiliary engine	Marine Equipment	support	onsite	120.0000	0.0336683	0.0300	0.0336683	0.5997163	0.0004646	0.4208535	0.0332369	0.0248933	2.86349E-07	1.18357E-06	0.0252531
5		Clamshell Survey boat propulsion engine	Marine Equipment	dredging	onsite	120.00	0.36	0.32	0.36	7.16	0.00	3.62	0.40	0.21	0.0000	0.00	0.22
6	**Pier J Basin (clam shell dredge 258,000 CY)**																
6		**Marine Clamshell Dredge**															
6		Clamshell Dredge hoist	Marine Equipment	dredging	onsite	43.00	4.37	4.37	4.37	132.70	0.15	75.66	7.35	5.79	0.0000	0.00	5.79
6		Clamshell Dredge generator	Marine Equipment	dredging	onsite	43.00	3.27	3.27	3.27	99.52	0.11	56.75	5.52	3.20	0.0000	0.00	3.20
6		Clamshell Barge dump scow	Marine Equipment	disposal	offsite	43.00	0.05	0.05	0.05	0.88	0.00	0.80	0.05	0.04	0.0000	0.00	0.04
6		Clamshell Tugboat propulsion engine	Marine Equipment	dredging	onsite	43.00	0.61	0.54	0.61	11.39	0.01	6.12	0.63	0.36	0.0000	0.00	0.37
6		Clamshell Tugboat auxiliary engine	Marine Equipment	dredging	onsite	43.00	0.09	0.08	0.09	1.57	0.00	1.10	0.09	0.07	0.0000	0.00	0.07
6		Clamshell Tugboat propulsion engine	Marine Equipment	transit	offsite	43.00	11.01	9.80	11.01	204.97	0.12	110.08	11.36	6.51	0.0001	0.00	6.61
6		Clamshell Tugboat auxiliary engine	Marine Equipment	transit	offsite	43.00	1.59	1.41	1.59	28.29	0.02	19.85	1.57	1.17	0.0000	0.00	1.19
6		Clamshell Crew boat propulsion engine	Marine Equipment	support	onsite	43	0.4060579	0.3613915	0.4060579	8.0237043	0.0044829	4.0605791	0.4446821	0.240181	3.83111E-06	1.14196E-05	0.2436798
6		Clamshell Crew boat auxiliary engine	Marine Equipment	support	onsite	43.0000	0.0336683	0.0300	0.0336683	0.5997163	0.0004646	0.4208535	0.0332369	0.0248933	2.86349E-07	1.18357E-06	0.0252531
6		Clamshell Survey boat propulsion engine	Marine Equipment	dredging	onsite	43.00	0.36	0.32	0.36	7.16	0.00	3.62	0.40	0.21	0.0000	0.00	0.22

Table H1.27
Alternative 3 Emissions by Task

				Unmitigated Emissions										
				Total										
				PM10	PM2.5	DPM	NOX	SOX	CO	VOC	CO2	CH4	N2O	CO2e
Task ID		**Construction Element/Equipment**	**Source Type 1**	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(tonnes)	(tonnes)	(tonnes)	(tonnes)
5	**West Basin (clam shell dredge 717,000 CY)**													
5		**Marine Clamshell Dredge**												
5		Clamshell Dredge hoist	Marine Equipment	523.81	523.81	523.81	15923.81	17.44	9079.37	882.51	694.25	0.00	0.00	694.25
5		Clamshell Dredge generator	Marine Equipment	392.86	392.86	392.86	11942.86	13.08	6809.52	661.89	383.57	0.00	0.00	383.57
5		Clamshell Barge dump scow	Marine Equipment	5.56	5.56	5.56	105.56	0.18	96.30	5.85	4.59	0.00	0.00	4.59
5		Clamshell Tugboat propulsion engine	Marine Equipment	73.39	65.31	73.39	1366.45	0.81	733.86	75.73	43.41	0.00	0.00	44.04
5		Clamshell Tugboat auxiliary engine	Marine Equipment	10.59	9.42	10.59	188.57	0.15	132.33	10.45	7.83	0.00	0.00	7.94
5		Clamshell Tugboat propulsion engine	Marine Equipment	1320.95	1175.65	1320.95	24596.16	14.58	13209.54	1363.15	781.34	0.01	0.04	792.70
5		Clamshell Tugboat auxiliary engine	Marine Equipment	190.56	169.60	190.56	3394.32	2.63	2381.98	188.12	140.89	0.00	0.01	142.93
5		Clamshell Crew boat propulsion engine	Marine Equipment	48.726949	43.366985	48.726949	962.844517	0.5379455	487.26949	53.361857	28.821718	0.000459733	0.001370358	29.241578
5		Clamshell Crew boat auxiliary engine	Marine Equipment	4.040194	3.5957727	4.040194	71.9659558	0.0557547	50.50	3.988429	2.9871902	0.00	0.0001	3.0303738
5		Clamshell Survey boat propulsion engine	Marine Equipment	43.48	38.70	43.48	859.15	0.48	434.79	47.62	25.72	0.00	0.00	26.09
6	**Pier J Basin (clam shell dredge 258,000 CY)**													
6		**Marine Clamshell Dredge**												
6		Clamshell Dredge hoist	Marine Equipment	187.70	187.70	187.70	5706.03	6.25	3253.44	316.23	248.77	0.00	0.00	248.77
6		Clamshell Dredge generator	Marine Equipment	140.77	140.77	140.77	4279.52	4.69	2440.08	237.18	137.45	0.00	0.00	137.45
6		Clamshell Barge dump scow	Marine Equipment	1.99	1.99	1.99	37.82	0.07	34.51	2.10	1.64	0.00	0.00	1.64
6		Clamshell Tugboat propulsion engine	Marine Equipment	26.30	23.40	26.30	489.65	0.29	262.97	27.14	15.55	0.00	0.00	15.78
6		Clamshell Tugboat auxiliary engine	Marine Equipment	3.79	3.38	3.79	67.57	0.05	47.42	3.74	2.80	0.00	0.00	2.85
6		Clamshell Tugboat propulsion engine	Marine Equipment	473.34	421.27	473.34	8813.63	5.23	4733.42	488.46	279.98	0.00	0.01	284.05
6		Clamshell Tugboat auxiliary engine	Marine Equipment	68.28	60.77	68.28	1216.30	0.94	853.54	67.41	50.49	0.00	0.00	51.22
6		Clamshell Crew boat propulsion engine	Marine Equipment	17.46049	15.539836	17.46049	345.019285	0.1927638	174.6049	19.121332	10.327782	0.000164738	0.000491045	10.478232
6		Clamshell Crew boat auxiliary engine	Marine Equipment	1.4477362	1.2884852	1.4477362	25.7878008	0.0199788	18.10	1.4291871	1.0704098	0.00	0.0001	1.085884
6		Clamshell Survey boat propulsion engine	Marine Equipment	15.58	13.87	15.58	307.86	0.17	155.80	17.06	9.22	0.00	0.00	9.35

Table H1.27
Alternative 3 Emissions by Task

				Mitigated										
				Peak Day										
				PM10	PM2.5	DPM	NOX	SOX	CO	VOC	CO2	CH4	N2O	CO2e
Task ID		**Construction Element/Equipment**	**Source Type 1**	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(tonnes/day)	(tonnes/day)	(tonnes/day)	(tonnes/day)
5	**West Basin (clam shell dredge 717,000 CY)**													
5		**Marine Clamshell Dredge**												
5		Clamshell Dredge hoist	Marine Equipment	0.44	0.44	0.44	13.27	0.01	7.57	0.7354	0.58	0.00	0.00	0.58
5		Clamshell Dredge generator	Marine Equipment	0.33	0.33	0.33	9.95	0.01	5.67	0.5516	0.32	0.00	0.00	0.32
5		Clamshell Barge dump scow	Marine Equipment	0.05	0.05	0.05	0.88	0.00	0.80	0.0488	0.04	0.00	0.00	0.04
5		Clamshell Tugboat propulsion engine	Marine Equipment	0.42	0.37	0.42	8.13	0.01	6.12	0.4508	0.36	0.00	0.00	0.37
5		Clamshell Tugboat auxiliary engine	Marine Equipment	0.03	0.03	0.03	1.13	0.00	1.21	0.0627	0.07	0.00	0.00	0.07
5		Clamshell Tugboat propulsion engine	Marine Equipment	7.49	6.66	7.49	146.41	0.12	110.08	8.1140	6.51	0.00	0.00	6.61
5		Clamshell Tugboat auxiliary engine	Marine Equipment	0.56	0.49	0.56	20.37	0.02	21.83	1.13	1.17	0.00	0.00	1.19
5		Clamshell Crew boat propulsion engine	Marine Equipment	0.2761194	0.2457462	0.2761194	5.4005702	0.0044829	4.0605791	0.2993053	0.240181	2.57863E-06	1.14196E-05	0.2436485
5		Clamshell Crew boat auxiliary engine	Marine Equipment	0.0117839	0.0104877	0.0117839	0.4317957	0.0004646	0.4629389	0.0239306	0.0248933	2.06171E-07	1.18357E-06	0.0252511
5		Clamshell Survey boat propulsion engine	Marine Equipment	0.25	0.22	0.25	4.82	0.00	3.62	0.2671	0.21	0.00	0.00	0.22
6	**Pier J Basin (clam shell dredge 258,000 CY)**													
6		**Marine Clamshell Dredge**												
6		Clamshell Dredge hoist	Marine Equipment	0.44	0.44	0.44	13.27	0.01	7.57	0.7354	0.58	0.00	0.00	0.58
6		Clamshell Dredge generator	Marine Equipment	0.33	0.33	0.33	9.95	0.01	5.67	0.5516	0.32	0.00	0.00	0.32
6		Clamshell Barge dump scow	Marine Equipment	0.05	0.05	0.05	0.88	0.00	0.80	0.0488	0.04	0.00	0.00	0.04
6		Clamshell Tugboat propulsion engine	Marine Equipment	0.42	0.37	0.42	8.13	0.01	6.12	0.4508	0.36	0.00	0.00	0.37
6		Clamshell Tugboat auxiliary engine	Marine Equipment	0.03	0.03	0.03	1.13	0.00	1.21	0.0627	0.07	0.00	0.00	0.07
6		Clamshell Tugboat propulsion engine	Marine Equipment	7.49	6.66	7.49	146.41	0.12	110.08	8.1140	6.51	0.00	0.00	6.61
6		Clamshell Tugboat auxiliary engine	Marine Equipment	0.56	0.49	0.56	20.37	0.02	21.83	1.1287	1.17	0.00	0.00	1.19
6		Clamshell Crew boat propulsion engine	Marine Equipment	0.2761194	0.2457462	0.2761194	5.4005702	0.0044829	4.0605791	0.2993053	0.240181	2.57863E-06	1.14196E-05	0.2436485
6		Clamshell Crew boat auxiliary engine	Marine Equipment	0.0117839	0.0104877	0.0117839	0.4317957	0.0004646	0.4629389	0.0239306	0.0248933	2.06171E-07	1.18357E-06	0.0252511
6		Clamshell Survey boat propulsion engine	Marine Equipment	0.25	0.22	0.25	4.82	0.00	3.62	0.2671	0.21	0.00	0.00	0.22

Note: clamshell dredge would be electric with mitigation; assume 90 percent reduction in diesel exhaust emissions.

Table H1.27
Alternative 3 Emissions by Task

				Mitigated Emissions										
				Total										
				PM10	PM2.5	DPM	NOX	SOX	CO	VOC	CO2	CH4	N2O	CO2e
Task ID		**Construction Element/Equipment**	**Source Type 1**	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(tonnes)	(tonnes)
5	**West Basin (clam shell dredge 717,000 CY)**													
5		**Marine Clamshell Dredge**												
5		Clamshell Dredge hoist	Marine Equipment	52.38	52.38	52.38	1592.38	1.74	907.94	88.25	69.42451853	0	0	69.42451853
5		Clamshell Dredge generator	Marine Equipment	39.29	39.29	39.29	1194.29	1.31	680.95	66.19	38.3573671	0	0	38.3573671
5		Clamshell Barge dump scow	Marine Equipment	5.56	5.56	5.56	105.56	0.18	96.30	5.85	4.587328978	0	0	4.587328978
5		Clamshell Tugboat propulsion engine	Marine Equipment	49.90	44.41	49.90	976.04	0.81	733.86	54.09	43.4076071	0.000466033	0.002063859	44.03428779
5		Clamshell Tugboat auxiliary engine	Marine Equipment	3.71	3.30	3.71	135.77	0.15	145.57	7.52	7.827371733	6.48279E-05	0.00037216	7.939896204
5		Clamshell Tugboat propulsion engine	Marine Equipment	898.25	799.44	898.25	17568.69	14.58	13209.54	973.68	781.3369279	0.008388587	0.037149455	792.6171802
5		Clamshell Tugboat auxiliary engine	Marine Equipment	66.70	59.36	66.70	2443.91	2.63	2620.18	135.44	140.8926912	0.001166903	0.006698886	142.9181317
5		Clamshell Crew boat propulsion engine	Marine Equipment	33.134326	29.48955	33.134326	648.068425	0.5379455	487.26949	35.916634	28.82171762	0.000309436	0.001370358	29.23782012
5		Clamshell Crew boat auxiliary engine	Marine Equipment	1.4140679	1.2585204	1.4140679	51.82	0.0557547	55.552668	2.87	2.987190166	2.47405E-05	0.000142029	3.030133316
5		Clamshell Survey boat propulsion engine	Marine Equipment	29.57	26.31	29.57	578.28	0.48	434.79	32.05	25.72	0.00	0.00	26.09
6	**Pier J Basin (clam shell dredge 258,000 CY)**													
6		**Marine Clamshell Dredge**												
6		Clamshell Dredge hoist	Marine Equipment	18.77	18.77	18.77	570.60	0.62	325.34	31.62	24.87711914	0	0	24.87711914
6		Clamshell Dredge generator	Marine Equipment	14.08	14.08	14.08	427.95	0.47	244.01	23.72	13.74472321	0	0	13.74472321
6		Clamshell Barge dump scow	Marine Equipment	1.99	1.99	1.99	37.82	0.07	34.51	2.10	1.643792884	0	0	1.643792884
6		Clamshell Tugboat propulsion engine	Marine Equipment	17.88	15.91	17.88	349.75	0.29	262.97	19.38	15.55439255	0.000166995	0.000739549	15.77895312
6		Clamshell Tugboat auxiliary engine	Marine Equipment	1.33	1.18	1.33	48.65	0.05	52.16	2.70	2.804808204	2.323E-05	0.000133357	2.845129473
6		Clamshell Tugboat propulsion engine	Marine Equipment	321.87	286.47	321.87	6295.45	5.23	4733.42	348.90	279.9790658	0.00300591	0.013311888	284.0211562
6		Clamshell Tugboat auxiliary engine	Marine Equipment	23.90	21.27	23.90	875.73	0.94	938.90	48.53	50.48654767	0.00041814	0.002400434	51.21233051
6		Clamshell Crew boat propulsion engine	Marine Equipment	11.873133	10.567089	11.873133	232.224519	0.1927638	174.6049	12.870127	10.32778215	0.000110881	0.000491045	10.47688554
6		Clamshell Crew boat auxiliary engine	Marine Equipment	0.5067077	0.4509698	0.5067077	18.57	0.0199788	19.906373	1.03	1.07040981	8.86536E-06	5.08937E-05	1.085797771
6		Clamshell Survey boat propulsion engine	Marine Equipment	10.59	9.43	10.59	207.22	0.17	155.80	11.48	9.22	0.00	0.00	9.35

Note: clamshell dredge would be electric with mitigation; assume 90 percent reduction in diesel exhaust emissions.

Table H1.27
Alternative 3 Emissions by Task

							Unmitigated Emissions										
							Peak Day										
							PM10	PM2.5	DPM	NOX	SOX	CO	VOC	CO2	CH4	N2O	CO2e
Task ID		**Construction Element/Equipment**	**Source Type 1**	**Source Type 2**	**Onsite/Offsite**	**Days Total**	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(tonnes/day)	(tonnes/day)	(tonnes/day)	(tonnes/day)
7	**Pier J Basin (clam shell dredge 46,000 CY)**																
7		**Marine Clamshell Dredge**															
7		Clamshell Dredge hoist	Marine Equipment	dredging	onsite	8.00	4.37	4.37	4.37	132.70	0.15	75.66	7.35	5.79	0.0000	0.00	5.79
7		Clamshell Dredge generator	Marine Equipment	dredging	onsite	8.00	3.27	3.27	3.27	99.52	0.11	56.75	5.52	3.20	0.0000	0.00	3.20
7		Clamshell Barge dump scow	Marine Equipment	disposal	offsite	8.00	0.05	0.05	0.05	0.88	0.00	0.80	0.05	0.04	0.0000	0.00	0.04
7		Clamshell Tugboat propulsion engine	Marine Equipment	dredging	onsite	8.00	0.61	0.54	0.61	11.39	0.01	6.12	0.63	0.36	0.0000	0.00	0.37
7		Clamshell Tugboat auxiliary engine	Marine Equipment	dredging	onsite	8.00	0.09	0.08	0.09	1.57	0.00	1.10	0.09	0.07	0.0000	0.00	0.07
7		Clamshell Tugboat propulsion engine	Marine Equipment	transit	offsite	8.00	11.01	9.80	11.01	204.97	0.12	110.08	11.36	6.51	0.0001	0.00	6.61
7		Clamshell Tugboat auxiliary engine	Marine Equipment	transit	offsite	8.00	1.59	1.41	1.59	28.29	0.02	19.85	1.57	1.17	0.0000	0.00	1.19
7		Clamshell Crew boat propulsion engine	Marine Equipment	support	onsite	8	0.4060579	0.3613915	0.4060579	8.0237043	0.0044829	4.0605791	0.4446821	0.240181	3.83111E-06	1.14196E-05	0.2436798
7		Clamshell Crew boat auxiliary engine	Marine Equipment	support	onsite	8.0000	0.0336683	0.0300	0.0336683	0.5997163	0.0004646	0.4208535	0.0332369	0.0248933	2.86349E-07	1.18357E-06	0.0252531
7		Clamshell Survey boat propulsion engine	Marine Equipment	dredging	onsite	8.00	0.36	0.32	0.36	7.16	0.00	3.62	0.40	0.21	0.0000	0.00	0.22
8	**Pier J Approach (clam shell dredge 1,994,000 CY)**																
8		**Marine Clamshell Dredge**															
8		Clamshell Dredge hoist	Marine Equipment	dredging	onsite	332.00	4.37	4.37	4.37	132.70	0.15	75.66	7.35	5.79	0.0000	0.00	5.79
8		Clamshell Dredge generator	Marine Equipment	dredging	onsite	332.00	3.27	3.27	3.27	99.52	0.11	56.75	5.52	3.20	0.0000	0.00	3.20
8		Clamshell Barge dump scow	Marine Equipment	disposal	offsite	332.00	0.05	0.05	0.05	0.88	0.00	0.80	0.05	0.04	0.0000	0.00	0.04
8		Clamshell Tugboat propulsion engine	Marine Equipment	dredging	onsite	332.00	0.61	0.54	0.61	11.39	0.01	6.12	0.63	0.36	0.0000	0.00	0.37
8		Clamshell Tugboat auxiliary engine	Marine Equipment	dredging	onsite	332.00	0.09	0.08	0.09	1.57	0.00	1.10	0.09	0.07	0.0000	0.00	0.07
8		Clamshell Tugboat propulsion engine	Marine Equipment	transit	offsite	332.00	11.01	9.80	11.01	204.97	0.12	110.08	11.36	6.51	0.0001	0.00	6.61
8		Clamshell Tugboat auxiliary engine	Marine Equipment	transit	offsite	332.00	1.59	1.41	1.59	28.29	0.02	19.85	1.57	1.17	0.0000	0.00	1.19
8		Clamshell Crew boat propulsion engine	Marine Equipment	support	onsite	332	0.4060579	0.3613915	0.4060579	8.0237043	0.0044829	4.0605791	0.4446821	0.240181	3.83111E-06	1.14196E-05	0.2436798
8		Clamshell Crew boat auxiliary engine	Marine Equipment	support	onsite	332	0.0336683	0.0299648	0.0336683	0.5997163	0.0004646	0.4208535	0.0332369	0.0248933	2.86349E-07	1.18357E-06	0.0252531
8		Clamshell Survey boat propulsion engine	Marine Equipment	dredging	onsite	332	0.3623286	0.3224725	0.3623286	7.1596131	0.0040001	3.623286	0.3967933	0.2143153	3.41853E-06	1.01898E-05	0.2174374

Table H1.27
Alternative 3 Emissions by Task

				Unmitigated Emissions										
				Total										
				PM10	PM2.5	DPM	NOX	SOX	CO	VOC	CO2	CH4	N2O	CO2e
Task ID		**Construction Element/Equipment**	**Source Type 1**	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(tonnes)	(tonnes)	(tonnes)	(tonnes)
7 Pier J Basin (clam shell dredge 46,000 CY)														
7		**Marine Clamshell Dredge**												
7		Clamshell Dredge hoist	Marine Equipment	34.92	34.92	34.92	1061.59	1.16	605.29	58.83	46.28	0.00	0.00	46.28
7		Clamshell Dredge generator	Marine Equipment	26.19	26.19	26.19	796.19	0.87	453.97	44.13	25.57	0.00	0.00	25.57
7		Clamshell Barge dump scow	Marine Equipment	0.37	0.37	0.37	7.04	0.01	6.42	0.39	0.31	0.00	0.00	0.31
7		Clamshell Tugboat propulsion engine	Marine Equipment	4.89	4.35	4.89	91.10	0.05	48.92	5.05	2.89	0.00	0.00	2.94
7		Clamshell Tugboat auxiliary engine	Marine Equipment	0.71	0.63	0.71	12.57	0.01	8.82	0.70	0.52	0.00	0.00	0.53
7		Clamshell Tugboat propulsion engine	Marine Equipment	88.06	78.38	88.06	1639.74	0.97	880.64	90.88	52.09	0.00	0.00	52.85
7		Clamshell Tugboat auxiliary engine	Marine Equipment	12.70	11.31	12.70	226.29	0.18	158.80	12.54	9.39	0.00	0.00	9.53
7		Clamshell Crew boat propulsion engine	Marine Equipment	3.2484633	2.8911323	3.2484633	64.1896345	0.035863	32.484633	3.5574571	1.9214478	3.06489E-05	9.13572E-05	1.9494385
7		Clamshell Crew boat auxiliary engine	Marine Equipment	0.2693463	0.24	0.2693463	4.79773039	0.003717	3.37	0.2658953	0.199146	0.00	0.0000	0.2020249
7		Clamshell Survey boat propulsion engine	Marine Equipment	2.90	2.58	2.90	57.28	0.03	28.99	3.17	1.71	0.00	0.00	1.74
8 Pier J Approach (clam shell dredge 1,994,000 CY)														
8		**Marine Clamshell Dredge**												
8		Clamshell Dredge hoist	Marine Equipment	1449.21	1449.21	1449.21	44055.87	48.25	25119.58	2441.62	1920.75	0.00	0.00	1920.75
8		Clamshell Dredge generator	Marine Equipment	1086.90	1086.90	1086.90	33041.90	36.19	18839.68	1831.22	1061.22	0.00	0.00	1061.22
8		Clamshell Barge dump scow	Marine Equipment	15.37	15.37	15.37	292.04	0.51	266.42	16.19	12.69	0.00	0.00	12.69
8		Clamshell Tugboat propulsion engine	Marine Equipment	203.04	180.70	203.04	3780.52	2.24	2030.36	209.52	120.09	0.00	0.01	121.84
8		Clamshell Tugboat auxiliary engine	Marine Equipment	29.29	26.07	29.29	521.72	0.40	366.12	28.91	21.66	0.00	0.00	21.97
8		Clamshell Tugboat propulsion engine	Marine Equipment	3654.64	3252.63	3654.64	68049.39	40.35	36546.40	3771.37	2161.70	0.03	0.10	2193.14
8		Clamshell Tugboat auxiliary engine	Marine Equipment	527.21	469.22	527.21	9390.95	7.28	6590.14	520.46	389.80	0.00	0.02	395.44
8		Clamshell Crew boat propulsion engine	Marine Equipment	134.81123	119.98199	134.81123	2663.86983	1.4883159	1348.1123	147.63447	79.740085	0.001271928	0.003791323	80.901698
8		Clamshell Crew boat auxiliary engine	Marine Equipment	11.17787	9.9483044	11.17787	199.105811	0.1542546	139.72338	11.034654	8.2645595	9.50678E-05	0.000392947	8.3840343
8		Clamshell Survey boat propulsion engine	Marine Equipment	120.29309	107.06085	120.29309	2376.99154	1.3280358	1202.9309	131.73537	71.152692	0.001134951	0.003383027	72.189207

Table H1.27
Alternative 3 Emissions by Task

				Mitigated										
				Peak Day										
				PM10	PM2.5	DPM	NOX	SOX	CO	VOC	CO2	CH4	N2O	CO2e
Task ID		**Construction Element/Equipment**	**Source Type 1**	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(tonnes/day)	(tonnes/day)	(tonnes/day)	(tonnes/day)
7 Pier J Basin (clam shell dredge 46,000 CY)														
7		**Marine Clamshell Dredge**												
7		Clamshell Dredge hoist	Marine Equipment	0.44	0.44	0.44	13.27	0.01	7.57	0.7354	0.58	0.00	0.00	0.58
7		Clamshell Dredge generator	Marine Equipment	0.33	0.33	0.33	9.95	0.01	5.67	0.5516	0.32	0.00	0.00	0.32
7		Clamshell Barge dump scow	Marine Equipment	0.05	0.05	0.05	0.88	0.00	0.80	0.0488	0.04	0.00	0.00	0.04
7		Clamshell Tugboat propulsion engine	Marine Equipment	0.42	0.37	0.42	8.13	0.01	6.12	0.4508	0.36	0.00	0.00	0.37
7		Clamshell Tugboat auxiliary engine	Marine Equipment	0.03	0.03	0.03	1.13	0.00	1.21	0.0627	0.07	0.00	0.00	0.07
7		Clamshell Tugboat propulsion engine	Marine Equipment	7.49	6.66	7.49	146.41	0.12	110.08	8.1140	6.51	0.00	0.00	6.61
7		Clamshell Tugboat auxiliary engine	Marine Equipment	0.56	0.49	0.56	20.37	0.02	21.83	1.1287	1.17	0.00	0.00	1.19
7		Clamshell Crew boat propulsion engine	Marine Equipment	0.2761194	0.2457462	0.2761194	5.4005702	0.0044829	4.0605791	0.2993053	0.240181	2.57863E-06	1.14196E-05	0.2436485
7		Clamshell Crew boat auxiliary engine	Marine Equipment	0.0117839	0.0104877	0.0117839	0.4317957	0.0004646	0.4629389	0.0239306	0.0248933	2.06171E-07	1.18357E-06	0.0252511
7		Clamshell Survey boat propulsion engine	Marine Equipment	0.25	0.22	0.25	4.82	0.00	3.62	0.2671	0.21	0.00	0.00	0.22
8 Pier J Approach (clam shell dredge 1,994,000 CY)														
8		**Marine Clamshell Dredge**												
8		Clamshell Dredge hoist	Marine Equipment	0.44	0.44	0.44	13.27	0.01	7.57	0.7354	0.58	0.00	0.00	0.58
8		Clamshell Dredge generator	Marine Equipment	0.33	0.33	0.33	9.95	0.01	5.67	0.5516	0.32	0.00	0.00	0.32
8		Clamshell Barge dump scow	Marine Equipment	0.05	0.05	0.05	0.88	0.00	0.80	0.0488	0.04	0.00	0.00	0.04
8		Clamshell Tugboat propulsion engine	Marine Equipment	0.42	0.37	0.42	8.13	0.01	6.12	0.4508	0.36	0.00	0.00	0.37
8		Clamshell Tugboat auxiliary engine	Marine Equipment	0.03	0.03	0.03	1.13	0.00	1.21	0.0627	0.07	0.00	0.00	0.07
8		Clamshell Tugboat propulsion engine	Marine Equipment	7.49	6.66	7.49	146.41	0.12	110.08	8.1140	6.51	0.00	0.00	6.61
8		Clamshell Tugboat auxiliary engine	Marine Equipment	0.56	0.49	0.5558	20.37	0.02	21.83	1.13	1.17	0.00	0.00	1.19
8		Clamshell Crew boat propulsion engine	Marine Equipment	0.2761194	0.2457462	0.2761194	5.4005702	0.0044829	4.0605791	0.2993053	0.240181	2.57863E-06	1.14196E-05	0.2436485
8		Clamshell Crew boat auxiliary engine	Marine Equipment	0.0117839	0.0104877	0.0117839	0.4317957	0.0004646	0.4629389	0.0239306	0.0248933	2.06171E-07	1.18357E-06	0.0252511
8		Clamshell Survey boat propulsion engine	Marine Equipment	0.2463834	0.2192813	0.2463834	4.8189703	0.0040001	3.623286	0.2670724	0.2143153	2.30093E-06	1.01898E-05	0.2174094

Note: clamshell dredge would be electric with mitigation; assume 90 percent reduction in diesel exhaust emissions.

Table H1.27
Alternative 3 Emissions by Task

				Mitigated Emissions Total										
				PM10	PM2.5	DPM	NOX	SOX	CO	VOC	CO2	CH4	N2O	CO2e
Task ID		**Construction Element/Equipment**	**Source Type 1**	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(tonnes)	(tonnes)
7 Pier J Basin (clam shell dredge 46,000 CY)														
7		**Marine Clamshell Dredge**												
7		Clamshell Dredge hoist	Marine Equipment	3.49	3.49	3.49	106.16	0.12	60.53	5.88	4.628301236	0	0	4.628301236
7		Clamshell Dredge generator	Marine Equipment	2.62	2.62	2.62	79.62	0.09	45.40	4.41	2.557157807	0	0	2.557157807
7		Clamshell Barge dump scow	Marine Equipment	0.37	0.37	0.37	7.04	0.01	6.42	0.39	0.305821932	0	0	0.305821932
7		Clamshell Tugboat propulsion engine	Marine Equipment	3.33	2.96	3.33	65.07	0.05	48.92	3.61	2.893840474	3.10688E-05	0.000137591	2.935619186
7		Clamshell Tugboat auxiliary engine	Marine Equipment	0.25	0.22	0.25	9.05	0.01	9.70	0.50	0.521824782	4.32186E-06	2.48107E-05	0.529326414
7		Clamshell Tugboat propulsion engine	Marine Equipment	59.88	53.30	59.88	1171.25	0.97	880.64	64.91	52.08912852	0.000559239	0.00247663	52.84114534
7		Clamshell Tugboat auxiliary engine	Marine Equipment	4.45	3.96	4.45	162.93	0.18	174.68	9.03	9.392846079	7.77935E-05	0.000446592	9.527875445
7		Clamshell Crew boat propulsion engine	Marine Equipment	2.208955	1.96597	2.208955	43.2045617	0.035863	32.484633	2.3944423	1.921447841	2.0629E-05	9.13572E-05	1.949188008
7		Clamshell Crew boat auxiliary engine	Marine Equipment	0.0942712	0.0839014	0.0942712	3.45	0.003717	3.7035112	0.19	0.199146011	1.64937E-06	9.4686E-06	0.202008888
7		Clamshell Survey boat propulsion engine	Marine Equipment	1.97	1.75	1.97	38.55	0.03	28.99	2.14	1.71	0.00	0.00	1.74
8 Pier J Approach (clam shell dredge 1,994,000 CY)														
8		**Marine Clamshell Dredge**												
8		Clamshell Dredge hoist	Marine Equipment	144.92	144.92	144.92	4405.59	4.83	2511.96	244.16	192.0745013	0	0	192.0745013
8		Clamshell Dredge generator	Marine Equipment	108.69	108.69	108.69	3304.19	3.62	1883.97	183.12	106.122049	0	0	106.122049
8		Clamshell Barge dump scow	Marine Equipment	15.37	15.37	15.37	292.04	0.51	266.42	16.19	12.69161017	0	0	12.69161017
8		Clamshell Tugboat propulsion engine	Marine Equipment	138.06	122.88	138.06	2700.37	2.24	2030.36	149.66	120.0943797	0.001289357	0.005710009	121.8281962
8		Clamshell Tugboat auxiliary engine	Marine Equipment	10.25	9.12	10.25	375.64	0.40	402.73	20.82	21.65572846	0.000179357	0.001029644	21.96704616
8		Clamshell Tugboat propulsion engine	Marine Equipment	2485.15	2211.79	2485.15	48606.71	40.35	36546.40	2693.83	2161.698834	0.023208423	0.102780159	2192.907532
8		Clamshell Tugboat auxiliary engine	Marine Equipment	184.52	164.23	184.52	6761.48	7.28	7249.15	374.73	389.8031123	0.003228431	0.018533584	395.4068309
8		Clamshell Crew boat propulsion engine	Marine Equipment	91.671634	81.587754	91.671634	1792.98931	1.4883159	1348.1123	99.369355	79.74008541	0.000856105	0.003791323	80.89130232
8		Clamshell Crew boat auxiliary engine	Marine Equipment	3.9122545	3.4819065	3.9122545	143.356184	0.1542546	153.69571	7.9449506	8.26455946	6.84488E-05	0.000392947	8.38336884
8		Clamshell Survey boat propulsion engine	Marine Equipment	81.799304	72.801381	81.799304	1599.89815	1.3280358	1202.9309	88.66804	71.1526916	0.000763909	0.003383027	72.1799313

Note: clamshell dredge would be electric with mitigation; assume 90 percent reduction in diesel exhaust emissions.

Table H1.27
Alternative 3 Emissions by Task

							Unmitigated Emissions										
							Peak Day										
							PM10	PM2.5	DPM	NOX	SOX	CO	VOC	CO2	CH4	N2O	CO2e
Task ID		**Construction Element/Equipment**	**Source Type 1**	**Source Type 2**	**Onsite/Offsite**	**Days Total**	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(tonnes/day)	(tonnes/day)	(tonnes/day)	(tonnes/day)
9 Pier J Approach (clam shell dredge 679,000 CY)																	
9		**Marine Clamshell Dredge**															
9		Clamshell Dredge hoist	Marine Equipment	dredging	onsite	113	4.3650794	4.3650794	4.3650794	132.69841	0.145332	75.661376	7.3542857	5.7853765	0	0	5.7853765
9		Clamshell Dredge generator	Marine Equipment	dredging	onsite	113	3.2738095	3.2738095	3.2738095	99.52381	0.108999	56.746032	5.5157143	3.1964473	0	0	3.1964473
9		Clamshell Barge dump scow	Marine Equipment	disposal	offsite	113	0.0462963	0.0462963	0.0462963	0.8796296	0.0015414	0.8024691	0.04875	0.0382277	0	0	0.0382277
9		Clamshell Tugboat propulsion engine	Marine Equipment	dredging	onsite	113	0.6115528	0.544282	0.6115528	11.387113	0.0067515	6.115528	0.6310858	0.3617301	5.43705E-06	1.71988E-05	0.3669912
9		Clamshell Tugboat auxiliary engine	Marine Equipment	dredging	onsite	113	0.0882214	0.0785171	0.0882214	1.5714441	0.0012175	1.1027678	0.0870911	0.0652281	7.50323E-07	3.10134E-06	0.0661711
9		Clamshell Tugboat propulsion engine	Marine Equipment	transit	offsite	113	11.00795	9.7970759	11.00795	204.96804	0.1215278	110.0795	11.359544	6.5111411	9.78668E-05	0.000309579	6.6058422
9		Clamshell Tugboat auxiliary engine	Marine Equipment	transit	offsite	113	1.5879856	1.4133072	1.5879856	28.285994	0.0219142	19.84982	1.5676396	1.1741058	1.35058E-05	5.5824E-05	1.191079
9		Clamshell Crew boat propulsion engine	Marine Equipment	support	onsite	113	0.4060579	0.3613915	0.4060579	8.0237043	0.0044829	4.0605791	0.4446821	0.240181	3.83111E-06	1.14196E-05	0.2436798
9		Clamshell Crew boat auxiliary engine	Marine Equipment	support	onsite	113	0.0336683	0.0299648	0.0336683	0.5997163	0.0004646	0.4208535	0.0332369	0.0248933	2.86349E-07	1.18357E-06	0.0252531
9		Clamshell Survey boat propulsion engine	Marine Equipment	dredging	onsite	113	0.3623286	0.3224725	0.3623286	7.1596131	0.0040001	3.623286	0.3967933	0.2143153	3.41853E-06	1.01898E-05	0.2174374

Table H1.27
Alternative 3 Emissions by Task

				Unmitigated Emissions										
				Total										
				PM10	PM2.5	DPM	NOX	SOX	CO	VOC	CO2	CH4	N2O	CO2e
Task ID		**Construction Element/Equipment**	**Source Type 1**	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(tonnes)	(tonnes)	(tonnes)	(tonnes)
9	**Pier J Approach (clam shell dredge 679,000 CY)**													
9		**Marine Clamshell Dredge**												
9		Clamshell Dredge hoist	Marine Equipment	493.25397	493.25397	493.25397	14994.9206	16.422516	8549.7354	831.03429	653.74755	0	0	653.74755
9		Clamshell Dredge generator	Marine Equipment	369.94048	369.94048	369.94048	11246.1905	12.316887	6412.3016	623.27571	361.19854	0	0	361.19854
9		Clamshell Barge dump scow	Marine Equipment	5.2314815	5.2314815	5.2314815	99.3981481	0.1741782	90.679012	5.50875	4.3197348	0	0	4.3197348
9		Clamshell Tugboat propulsion engine	Marine Equipment	69.105467	61.503866	69.105467	1286.74379	0.7629244	691.05467	71.312696	40.875497	0.000614386	0.001943467	41.470009
9		Clamshell Tugboat auxiliary engine	Marine Equipment	9.9690209	8.8724286	9.9690209	177.573185	0.1375725	124.61276	9.8412928	7.370775	8.47865E-05	0.000350451	7.4773291
9		Clamshell Tugboat propulsion engine	Marine Equipment	1243.8984	1107.0696	1243.8984	23161.3883	13.732638	12438.984	1283.6285	735.75894	0.011058953	0.034982404	746.46017
9		Clamshell Tugboat auxiliary engine	Marine Equipment	179.44238	159.70371	179.44238	3196.31733	2.4763048	2243.0297	177.14327	132.67395	0.001526157	0.006308117	134.59192
9		Clamshell Crew boat propulsion engine	Marine Equipment	45.884544	40.837244	45.884544	906.678587	0.5065654	458.84544	50.249082	27.140451	0.000432915	0.00129042	27.535819
9		Clamshell Crew boat auxiliary engine	Marine Equipment	3.804516	3.3860193	3.804516	67.7679417	0.0525023	47.55645	3.7557707	2.8129374	3.23574E-05	0.000133744	2.853602
9		Clamshell Survey boat propulsion engine	Marine Equipment	40.943131	36.439387	40.943131	809.036278	0.4520122	409.43131	44.837642	24.217633	0.000386294	0.001151452	24.570423

Table H1.27
Alternative 3 Emissions by Task

				Mitigated										
				Peak Day										
				PM10	PM2.5	DPM	NOX	SOX	CO	VOC	CO2	CH4	N2O	CO2e
Task ID		**Construction Element/Equipment**	**Source Type 1**	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(tonnes/day)	(tonnes/day)	(tonnes/day)	(tonnes/day)
9 Pier J Approach (clam shell dredge 679,000 CY)														
9		**Marine Clamshell Dredge**												
9		Clamshell Dredge hoist	Marine Equipment	0.4365079	0.4365079	0.4365079	13.269841	0.0145332	7.5661376	0.7354286	0.5785377	0	0	0.5785377
9		Clamshell Dredge generator	Marine Equipment	0.327381	0.327381	0.327381	9.952381	0.0108999	5.6746032	0.5515714	0.3196447	0	0	0.3196447
9		Clamshell Barge dump scow	Marine Equipment	0.0462963	0.0462963	0.0462963	0.8796296	0.0015414	0.8024691	0.04875	0.0382277	0	0	0.0382277
9		Clamshell Tugboat propulsion engine	Marine Equipment	0.4158559	0.3701118	0.4158559	8.1336523	0.0067515	6.115528	0.4507756	0.3617301	3.8836E-06	1.71988E-05	0.3669524
9		Clamshell Tugboat auxiliary engine	Marine Equipment	0.0308775	0.027481	0.0308775	1.1314398	0.0012175	1.2130446	0.0627056	0.0652281	5.40233E-07	3.10134E-06	0.0661658
9		Clamshell Tugboat propulsion engine	Marine Equipment	7.4854063	6.6620116	7.4854063	146.40574	0.1215278	110.0795	8.1139603	6.5111411	6.99049E-05	0.000309579	6.6051432
9		Clamshell Tugboat auxiliary engine	Marine Equipment	0.555795	0.4946575	0.555795	20.365916	0.0219142	21.834802	1.1287005	1.1741058	9.72419E-06	5.5824E-05	1.1909844
9		Clamshell Crew boat propulsion engine	Marine Equipment	0.2761194	0.2457462	0.2761194	5.4005702	0.0044829	4.0605791	0.2993053	0.240181	2.57863E-06	1.14196E-05	0.2436485
9		Clamshell Crew boat auxiliary engine	Marine Equipment	0.0117839	0.0104877	0.0117839	0.4317957	0.0004646	0.4629389	0.0239306	0.0248933	2.06171E-07	1.18357E-06	0.0252511
9		Clamshell Survey boat propulsion engine	Marine Equipment	0.2463834	0.2192813	0.2463834	4.8189703	0.0040001	3.623286	0.2670724	0.2143153	2.30093E-06	1.01898E-05	0.2174094

Note: clamshell dredge would be electric with mitigation; assume 90 percent reduction in diesel exhaust emissions.

Table H1.27
Alternative 3 Emissions by Task

				Mitigated Emissions										
				Total										
				PM10	PM2.5	DPM	NOX	SOX	CO	VOC	CO2	CH4	N2O	CO2e
Task ID		**Construction Element/Equipment**	**Source Type 1**	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(tonnes)	(tonnes)
9 Pier J Approach (clam shell dredge 679,000 CY)														
9		**Marine Clamshell Dredge**												
9		Clamshell Dredge hoist	Marine Equipment	49.325397	49.325397	49.325397	1499.49206	1.6422516	854.97354	83.103429	65.37475495	0	0	65.37475495
9		Clamshell Dredge generator	Marine Equipment	36.994048	36.994048	36.994048	1124.61905	1.2316887	641.23016	62.327571	36.11985402	0	0	36.11985402
9		Clamshell Barge dump scow	Marine Equipment	5.2314815	5.2314815	5.2314815	99.3981481	0.1741782	90.679012	5.50875	4.319734787	0	0	4.319734787
9		Clamshell Tugboat propulsion engine	Marine Equipment	46.991718	41.822629	46.991718	919.10271	0.7629244	691.05467	50.93764	40.87549669	0.000438847	0.001943467	41.465621
9		Clamshell Tugboat auxiliary engine	Marine Equipment	3.4891573	3.10535	3.4891573	127.852693	0.1375725	137.07404	7.0857308	7.370775048	6.10463E-05	0.000350451	7.476735592
9		Clamshell Tugboat propulsion engine	Marine Equipment	845.85092	752.80731	845.85092	16543.8488	13.732638	12438.984	916.87751	735.7589404	0.007899252	0.034982404	746.381178
9		Clamshell Tugboat auxiliary engine	Marine Equipment	62.804832	55.8963	62.804832	2301.34848	2.4763048	2467.3327	127.54316	132.6739509	0.001098833	0.006308117	134.5812407
9		Clamshell Crew boat propulsion engine	Marine Equipment	31.20149	27.769326	31.20149	610.264434	0.5065654	458.84544	33.821497	27.14045076	0.000291385	0.00129042	27.53228061
9		Clamshell Crew boat auxiliary engine	Marine Equipment	1.3315806	1.1851067	1.3315806	48.7929181	0.0525023	52.312095	2.7041549	2.812937407	2.32973E-05	0.000133744	2.853375539
9		Clamshell Survey boat propulsion engine	Marine Equipment	27.841329	24.778783	27.841329	544.543649	0.4520122	409.43131	30.179182	24.21763298	0.000260005	0.001151452	24.56726578

Note: clamshell dredge would be electric with mitigation; assume 90 percent reduction in diesel exhaust emissions.

Table H1.28
Alternative 4 Emissions by Task

							Unmitigated Emissions										
							Peak Day										
							PM10	PM2.5	DPM	NOX	SOX	CO	VOC	CO2	CH4	N2O	CO2e
Task ID		**Construction Element/Equipment**	**Source Type 1**	**Source Type 2**	**Onsite/Offsite**	**Days Total**	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(tonnes/day)	(tonnes/day)	(tonnes/day)	(tonnes/day)
1	**Electrical Substation Construction at Pier J (mitigation only)**																
1		**Off-Road Equipment**															
1		Caterpillar 320 excavator	Offroad Construction Equipment		onsite	20	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1		Small asphalt roller	Offroad Construction Equipment		onsite	26	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1		Water truck	Offroad Construction Equipment		onsite	20	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1		Forklift	Offroad Construction Equipment		onsite	22	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1		Mobile crane (35 ton)	Offroad Construction Equipment		onsite	2	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1		On-Road Vehicles															
1		Haul trucks	Onroad Construction Vehicles		onsite	5	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1		Supply trucks	Onroad Construction Vehicles		onsite	5	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1		Haul trucks	Onroad Construction Vehicles		offsite	5	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1		Supply trucks	Onroad Construction Vehicles		offsite	5	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1		Workers	Onroad Construction Vehicles		offsite	60	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1		Fugitive Dust															
1		Soil handling	Fugitive Emissions		onsite	20	n/a	n/a									
1		Asphalting	Fugitive Emissions		onsite												
2	**Pier J Breakwater Construction**																
2		**Marine Activities**															
2		Pier J Breakwater Construction Tugboat propulsion engine	Marine Equipment		onsite	54	5.810	5.171	5.810	108.178	0.064	58.098	5.995	3.436	0.000	0.000	3.486
2		Pier J Breakwater ConstructionTugboat auxiliary engine	Marine Equipment		onsite	54	1.059	0.942	1.059	18.857	0.015	13.233	1.045	0.783	0.000	0.000	0.794
2		Pier J Breakwater Construction Crew boat propulsion engine	Marine Equipment		onsite	54	0.406	0.361	0.406	8.024	0.004	4.061	0.445	0.240	0.000	0.000	0.244
2		Pier J Breakwater Construction Crew boat auxiliary engine	Marine Equipment		onsite	54	0.034	0.030	0.034	0.600	0.000	0.421	0.033	0.025	0.000	0.000	0.025
2		Pier J Breakwater Construction Survey boat propulsion engine	Marine Equipment		onsite	54	0.362	0.322	0.362	7.160	0.004	3.623	0.397	0.214	0.000	0.000	0.217
2		**Off-Road Equipment**															
2		Piling crane	Offroad Construction Equipment		onsite	54	0.209	0.192	0.209	5.002	0.008	2.675	0.467	0.380	0.000	0.000	0.380
2		Long arm excavator	Offroad Construction Equipment		onsite	54	0.075	0.069	0.075	2.188	0.013	2.775	0.321	0.634	0.000	0.000	0.634
2		On-Road Vehicles															
2		Delivery Trucks	Onroad Construction Vehicles		onsite	5	0.147	0.037	0.000	0.079	0.000	0.009	0.001	0.012	0.000	0.000	0.012
2		Delivery Trucks	Onroad Construction Vehicles		offsite	5	0.486	0.189	0.022	3.217	0.019	0.185	0.026	0.919	0.000	0.000	0.962
2		Workers	Onroad Construction Vehicles		offsite	54	0.159	0.050	0.000	0.058	0.004	0.959	0.015	0.169	0.000	0.000	0.170

Table H1.28
Alternative 4 Emissions by Task

				Unmitigated Emissions										
				Total										
				PM10	PM2.5	DPM	NOX	SOX	CO	VOC	CO2	CH4	N2O	CO2e
Task ID		**Construction Element/Equipment**	**Source Type 1**	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(tonnes)	(tonnes)	(tonnes)	(tonnes)
1	**Electrical Substation Construction at Pier J (mitigation only)**													
1		**Off-Road Equipment**												
1		Caterpillar 320 excavator	Offroad Construction Equipment	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1		Small asphalt roller	Offroad Construction Equipment	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1		Water truck	Offroad Construction Equipment	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1		Forklift	Offroad Construction Equipment	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1		Mobile crane (35 ton)	Offroad Construction Equipment	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1		On-Road Vehicles												
1		Haul trucks	Onroad Construction Vehicles	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1		Supply trucks	Onroad Construction Vehicles	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1		Haul trucks	Onroad Construction Vehicles	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1		Supply trucks	Onroad Construction Vehicles	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1		Workers	Onroad Construction Vehicles	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1		Fugitive Dust												
1		Soil handling	Fugitive Emissions	n/a	n/a									
1		Asphalting	Fugitive Emissions											
2	**Pier J Breakwater Construction**													
2		**Marine Activities**												
2		Pier J Breakwater Construction Tugboat propulsion engine	Marine Equipment	313.727	279.217	313.727	5841.589	3.464	3137.266	323.747	185.568	0.003	0.009	188.267
2		Pier J Breakwater ConstructionTugboat auxiliary engine	Marine Equipment	57.167	50.879	57.167	1018.296	0.789	714.594	56.435	42.268	0.000	0.002	42.879
2		Pier J Breakwater Construction Crew boat propulsion engine	Marine Equipment	21.927	19.515	21.927	433.280	0.242	219.271	24.013	12.970	0.000	0.001	13.159
2		Pier J Breakwater Construction Crew boat auxiliary engine	Marine Equipment	1.818	1.618	1.818	32.385	0.025	22.726	1.795	1.344	0.000	0.000	1.364
2		Pier J Breakwater Construction Survey boat propulsion engine	Marine Equipment	19.566	17.414	19.566	386.619	0.216	195.657	21.427	11.573	0.000	0.001	11.742
2		**Off-Road Equipment**												
2		Piling crane	Offroad Construction Equipment	11.266	10.365	11.266	270.124	0.418	144.427	25.201	20.519	0.000	0.000	20.519
2		Long arm excavator	Offroad Construction Equipment	4.061	3.736	4.061	118.133	0.697	149.866	17.327	34.235	0.000	0.000	34.235
2		On-Road Vehicles												
2		Delivery Trucks	Onroad Construction Vehicles	0.736	0.185	0.001	0.394	0.001	0.046	0.005	0.059	0.000	0.000	0.062
2		Delivery Trucks	Onroad Construction Vehicles	2.431	0.943	0.111	16.084	0.096	0.924	0.128	4.596	0.000	0.001	4.811
2		Workers	Onroad Construction Vehicles	8.583	2.719	0.000	3.143	0.199	51.794	0.809	9.128	0.000	0.000	9.178

Table H1.28
Alternative 4 Emissions by Task

				Mitigated Peak Day										
				PM10	PM2.5	DPM	NOX	SOX	CO	VOC	CO2	CH4	N2O	CO2e
Task ID		**Construction Element/Equipment**	**Source Type 1**	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(tonnes/day)	(tonnes/day)	(tonnes/day)	(tonnes/day)
1	**Electrical Substation Construction at Pier J (mitigation only)**													
1		**Off-Road Equipment**												
1		Caterpillar 320 excavator	Offroad Construction Equipment	0.016	0.016	0.016	0.330	0.005	1.226	0.156	0.265	0.000	0.000	0.265
1		Small asphalt roller	Offroad Construction Equipment	0.005	0.005	0.005	0.735	0.001	0.907	0.041	0.058	0.000	0.000	0.058
1		Water truck	Offroad Construction Equipment	0.030	0.030	0.030	0.603	0.010	2.587	0.296	0.482	0.000	0.000	0.482
1		Forklift	Offroad Construction Equipment	0.001	0.001	0.001	0.147	0.000	0.163	0.008	0.012	0.000	0.000	0.012
1		Mobile crane (35 ton)	Offroad Construction Equipment	0.022	0.022	0.022	0.433	0.007	2.414	0.213	0.343	0.000	0.000	0.343
1		On-Road Vehicles												
1		Haul trucks	Onroad Construction Vehicles	0.088	0.022	0.000	0.047	0.000	0.006	0.001	0.007	0.000	0.000	0.007
1		Supply trucks	Onroad Construction Vehicles	0.206	0.052	0.000	0.110	0.000	0.013	0.001	0.016	0.000	0.000	0.017
1		Haul trucks	Onroad Construction Vehicles	0.016	0.006	0.001	0.113	0.002	0.006	0.004	0.030	0.000	0.000	0.032
1		Supply trucks	Onroad Construction Vehicles	0.068	0.026	0.003	0.514	0.019	0.026	0.038	0.129	0.000	0.000	0.135
1		Workers	Onroad Construction Vehicles	0.151	0.048	0.000	0.055	0.004	0.913	0.014	0.161	0.000	0.000	0.162
1		Fugitive Dust												
1		Soil handling	Fugitive Emissions	2.006	0.304									
1		Asphalting	Fugitive Emissions											
2	**Pier J Breakwater Construction**													
2		**Marine Activities**												
2		Pier J Breakwater Construction Tugboat propulsion engine	Marine Equipment	3.951	3.516	3.951	77.270	0.064	58.098	4.282	3.436	0.000	0.000	3.486
2		Pier J Breakwater ConstructionTugboat auxiliary engine	Marine Equipment	0.371	0.330	0.371	13.577	0.015	14.557	0.752	0.783	0.000	0.000	0.794
2		Pier J Breakwater Construction Crew boat propulsion engine	Marine Equipment	0.276	0.246	0.276	5.401	0.004	4.061	0.299	0.240	0.000	0.000	0.244
2		Pier J Breakwater Construction Crew boat auxiliary engine	Marine Equipment	0.012	0.010	0.012	0.432	0.000	0.463	0.024	0.025	0.000	0.000	0.025
2		Pier J Breakwater Construction Survey boat propulsion engine	Marine Equipment	0.246	0.219	0.246	4.819	0.004	3.623	0.267	0.214	0.000	0.000	0.217
2		**Off-Road Equipment**												
2		Piling crane	Offroad Construction Equipment	0.024	0.024	0.024	0.479	0.008	2.675	0.236	0.380	0.000	0.000	0.380
2		Long arm excavator	Offroad Construction Equipment	0.040	0.040	0.040	0.792	0.013	2.775	0.321	0.634	0.000	0.000	0.634
2		On-Road Vehicles												
2		Delivery Trucks	Onroad Construction Vehicles	0.147	0.037	0.000	0.079	0.000	0.009	0.001	0.012	0.000	0.000	0.012
2		Delivery Trucks	Onroad Construction Vehicles	0.486	0.189	0.022	3.541	0.101	0.185	0.199	0.919	0.000	0.000	0.962
2		Workers	Onroad Construction Vehicles	0.159	0.050	0.000	0.058	0.004	0.959	0.015	0.169	0.000	0.000	0.170

Table H1.28
Alternative 4 Emissions by Task

				Mitigated Emissions										
				Total										
				PM10	PM2.5	DPM	NOX	SOX	CO	VOC	CO2	CH4	N2O	CO2e
Task ID		**Construction Element/Equipment**	**Source Type 1**	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(tonnes)	(tonnes)
1	**Electrical Substation Construction at Pier J (mitigation only)**													
1		**Off-Road Equipment**												
1		Caterpillar 320 excavator	Offroad Construction Equipment	0.330	0.330	0.330	6.595	0.108	24.518	3.122	5.296	0.000	0.000	5.296
1		Small asphalt roller	Offroad Construction Equipment	0.127	0.127	0.127	19.120	0.031	23.576	1.060	1.511	0.000	0.000	1.511
1		Water truck	Offroad Construction Equipment	0.603	0.603	0.603	12.063	0.196	51.747	5.928	9.642	0.000	0.000	9.642
1		Forklift	Offroad Construction Equipment	0.021	0.021	0.021	3.225	0.005	3.589	0.179	0.260	0.000	0.000	0.260
1		Mobile crane (35 ton)	Offroad Construction Equipment	0.043	0.043	0.043	0.865	0.014	4.827	0.425	0.686	0.000	0.000	0.686
1		On-Road Vehicles												
1		Haul trucks	Onroad Construction Vehicles	0.442	0.111	0.000	0.236	0.001	0.028	0.003	0.035	0.000	0.000	0.037
1		Supply trucks	Onroad Construction Vehicles	1.030	0.258	0.001	0.552	0.002	0.064	0.007	0.082	0.000	0.000	0.086
1		Haul trucks	Onroad Construction Vehicles	0.080	0.031	0.004	0.563	0.011	0.031	0.021	0.152	0.000	0.000	0.159
1		Supply trucks	Onroad Construction Vehicles	0.340	0.132	0.016	2.570	0.093	0.130	0.188	0.643	0.000	0.000	0.674
1		Workers	Onroad Construction Vehicles	9.083	2.877	0.000	3.326	0.211	54.809	0.856	9.659	0.000	0.000	9.712
1		Fugitive Dust												
1		Soil handling	Fugitive Emissions	40.118	6.075									
1		Asphalting	Fugitive Emissions											
2	**Pier J Breakwater Construction**													
2		**Marine Activities**												
2		Pier J Breakwater Construction Tugboat propulsion engine	Marine Equipment	213.334	189.867	213.334	4172.564	3.464	3137.266	231.248	185.568	0.002	0.009	188.247
2		Pier J Breakwater ConstructionTugboat auxiliary engine	Marine Equipment	20.009	17.808	20.009	733.173	0.789	786.053	40.633	42.268	0.000	0.002	42.875
2		Pier J Breakwater Construction Crew boat propulsion engine	Marine Equipment	14.910	13.270	14.910	291.631	0.242	219.271	16.162	12.970	0.000	0.001	13.157
2		Pier J Breakwater Construction Crew boat auxiliary engine	Marine Equipment	0.636	0.566	0.636	23.317	0.025	24.999	1.292	1.344	0.000	0.000	1.364
2		Pier J Breakwater Construction Survey boat propulsion engine	Marine Equipment	13.305	11.841	13.305	260.224	0.216	195.657	14.422	11.573	0.000	0.001	11.740
2		**Off-Road Equipment**												
2		Piling crane	Offroad Construction Equipment	1.295	1.295	1.295	25.893	0.418	144.427	12.724	20.519	0.000	0.000	20.519
2		Long arm excavator	Offroad Construction Equipment	2.138	2.138	2.138	42.750	0.697	149.866	17.327	34.235	0.000	0.000	34.235
2		On-Road Vehicles												
2		Delivery Trucks	Onroad Construction Vehicles	0.736	0.185	0.001	0.394	0.001	0.046	0.005	0.059	0.000	0.000	0.062
2		Delivery Trucks	Onroad Construction Vehicles	2.431	0.943	0.111	17.707	0.503	0.926	0.996	4.596	0.000	0.001	4.811
2		Workers	Onroad Construction Vehicles	8.583	2.719	0.000	3.143	0.199	51.794	0.809	9.128	0.000	0.000	9.178

Table H1.28
Alternative 4 Emissions by Task

							Unmitigated Emissions										
							Peak Day										
							PM10	PM2.5	DPM	NOX	SOX	CO	VOC	CO2	CH4	N2O	CO2e
Task ID		**Construction Element/Equipment**	**Source Type 1**	**Source Type 2**	**Onsite/Offsite**	**Days Total**	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(tonnes/day)	(tonnes/day)	(tonnes/day)	(tonnes/day)
3	**Pier J Wharf Upgrade**																
3		**Marine Activities**															
3		Pier J Wharf Tugboat propulsion engine	Marine Equipment		onsite	175	6.116	5.443	6.116	113.871	0.068	61.155	6.311	3.617	0.000	0.000	3.670
3		Pier J Wharf Tugboat auxiliary engine	Marine Equipment		onsite	175	0.529	0.471	0.529	9.429	0.007	6.617	0.523	0.391	0.000	0.000	0.397
3		Pier J Wharf Crew boat propulsion engine	Marine Equipment		onsite	175	0.500	0.445	0.500	9.306	0.006	4.998	0.516	0.296	0.000	0.000	0.300
3		Pier J Wharf Crew boat auxiliary engine	Marine Equipment		**onsite**	175	0.034	0.030	0.034	0.600	0.000	0.421	0.033	0.025	0.000	0.000	0.025
3		Pier J Wharf Survey boat propulsion engine	Marine Equipment		onsite	175	0.250	0.222	0.250	4.653	0.003	2.499	0.258	0.148	0.000	0.000	0.150
3		**Off-Road Equipment**															
3		Const Barge - piling crane	Offroad Construction Equipment		onsite	170	0.209	0.192	0.209	5.002	0.008	2.675	0.467	0.380	0.000	0.000	0.380
3		Cong Barge - long arm excavator	Offroad Construction Equipment		onsite	170	0.075	0.069	0.075	2.188	0.013	2.775	0.321	0.634	0.000	0.000	0.634
3		Const barge - deck equipment	Offroad Construction Equipment		onsite	170	0.192	0.177	0.192	2.758	0.004	2.819	0.327	0.181	0.000	0.000	0.181
3		Sheet pile barge - deck equipment	Offroad Construction Equipment		onsite	170	0.192	0.177	0.192	2.758	0.004	2.819	0.327	0.181	0.000	0.000	0.181
3		On-Road Vehicles															
3		Workers	Onroad Construction Vehicles		offsite	175	0.144	0.046	0.000	0.053	0.003	0.868	0.014	0.153	0.000	0.000	0.154
4	**Pier T Wharf Upgrade**																
4		**Marine Activities**															
4		Pier T Wharf Tugboat propulsion engine	Marine Equipment		onsite	320	6.116	5.443	6.116	113.871	0.068	61.155	6.311	3.617	0.000	0.000	3.670
4		Pier T Wharf Tugboat auxiliary engine	Marine Equipment		onsite	320	0.529	0.471	0.529	9.429	0.007	6.617	0.523	0.391	0.000	0.000	0.397
4		Pier T Wharf Crew boat propulsion engine	Marine Equipment		onsite	320	0.500	0.445	0.500	9.306	0.006	4.998	0.516	0.296	0.000	0.000	0.300
4		Pier T Wharf Crew boat auxiliary engine	Marine Equipment		onsite	320	0.034	0.030	0.034	0.600	0.000	0.421	0.033	0.025	0.000	0.000	0.025
4		Pier T Wharf Survey boat propulsion engine	Marine Equipment		onsite	320	0.250	0.222	0.250	4.653	0.003	2.499	0.258	0.148	0.000	0.000	0.150
4		**Off-Road Equipment**															
4		Const Barge - piling crane	Offroad Construction Equipment		onsite	310	0.209	0.192	0.209	5.002	0.008	2.675	0.467	0.380	0.000	0.000	0.380
4		Cong Barge - long arm excavator	Offroad Construction Equipment		onsite	310	0.075	0.069	0.075	2.188	0.013	2.775	0.321	0.634	0.000	0.000	0.634
4		Const barge - deck equipment	Offroad Construction Equipment		onsite	310	0.192	0.177	0.192	2.758	0.004	2.819	0.327	0.181	0.000	0.000	0.181
4		Sheet pile barge - deck equipment	Offroad Construction Equipment		onsite	310	0.192	0.177	0.192	2.758	0.004	2.819	0.327	0.181	0.000	0.000	0.181
4		On-Road Vehicles															
4		Workers	Onroad Construction Vehicles		offsite	320	0.144	0.046	0.000	0.053	0.003	0.868	0.014	0.153	0.000	0.000	0.154

Table H1.28
Alternative 4 Emissions by Task

				Unmitigated Emissions Total										
				PM10	PM2.5	DPM	NOX	SOX	CO	VOC	CO2	CH4	N2O	CO2e
Task ID		**Construction Element/Equipment**	**Source Type 1**	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(tonnes)	(tonnes)	(tonnes)	(tonnes)
3	**Pier J Wharf Upgrade**													
3		**Marine Activities**												
3		Pier J Wharf Tugboat propulsion engine	Marine Equipment	1070.217	952.493	1070.217	19927.448	11.815	10702.174	1104.400	633.028	0.010	0.030	642.235
3		Pier J Wharf Tugboat auxiliary engine	Marine Equipment	92.632	82.443	92.632	1650.016	1.278	1157.906	91.446	68.490	0.001	0.003	69.480
3		Pier J Wharf Crew boat propulsion engine	Marine Equipment	87.459	77.838	87.459	1628.480	0.966	874.586	90.252	51.731	0.001	0.002	52.484
3		Pier J Wharf Crew boat auxiliary engine	Marine Equipment	5.892	5.244	5.892	104.950	0.081	73.649	5.816	4.356	0.000	0.000	4.419
3		Pier J Wharf Survey boat propulsion engine	Marine Equipment	43.729	38.919	43.729	814.240	0.483	437.293	45.126	25.866	0.000	0.001	26.242
3		**Off-Road Equipment**												
3		Const Barge - piling crane	Offroad Construction Equipment	35.467	32.630	35.467	850.389	1.315	454.676	79.338	64.597	0.000	0.000	64.597
3		Cong Barge - long arm excavator	Offroad Construction Equipment	12.784	11.761	12.784	371.901	2.195	471.801	54.548	107.776	0.000	0.000	107.776
3		Const barge - deck equipment	Offroad Construction Equipment	32.705	30.088	32.705	468.878	0.625	479.240	55.642	30.730	0.000	0.000	30.730
3		Sheet pile barge - deck equipment	Offroad Construction Equipment	32.705	30.088	32.705	468.878	0.625	479.240	55.642	30.730	0.000	0.000	30.730
3		On-Road Vehicles												
3		Workers	Onroad Construction Vehicles	25.167	7.972	0.000	9.217	0.584	151.865	2.372	26.764	0.000	0.000	26.911
4	**Pier T Wharf Upgrade**													
4		**Marine Activities**												
4		Pier T Wharf Tugboat propulsion engine	Marine Equipment	1956.969	1741.702	1956.969	36438.762	21.605	19569.690	2019.475	1157.536	0.017	0.055	1174.372
4		Pier T Wharf Tugboat auxiliary engine	Marine Equipment	169.385	150.753	169.385	3017.173	2.338	2117.314	167.215	125.238	0.001	0.006	127.048
4		Pier T Wharf Crew boat propulsion engine	Marine Equipment	159.924	142.333	159.924	2977.791	1.766	1599.243	165.032	94.594	0.001	0.004	95.970
4		Pier T Wharf Crew boat auxiliary engine	Marine Equipment	10.774	9.589	10.774	191.909	0.149	134.673	10.636	7.966	0.000	0.000	8.081
4		Pier T Wharf Survey boat propulsion engine	Marine Equipment	79.962	71.166	79.962	1488.896	0.883	799.622	82.516	47.297	0.001	0.002	47.985
4		**Off-Road Equipment**												
4		Const Barge - piling crane	Offroad Construction Equipment	64.675	59.501	64.675	1550.709	2.397	829.115	144.674	117.794	0.000	0.000	117.794
4		Cong Barge - long arm excavator	Offroad Construction Equipment	23.312	21.447	23.312	678.172	4.003	860.342	99.471	196.533	0.000	0.000	196.533
4		Const barge - deck equipment	Offroad Construction Equipment	59.638	54.867	59.638	855.012	1.140	873.908	101.465	56.037	0.000	0.000	56.037
4		Sheet pile barge - deck equipment	Offroad Construction Equipment	59.638	54.867	59.638	855.012	1.140	873.908	101.465	56.037	0.000	0.000	56.037
4		On-Road Vehicles												
4		Workers	Onroad Construction Vehicles	46.019	14.578	0.000	16.854	1.067	277.697	4.337	48.939	0.001	0.001	49.208

Table H1.28
Alternative 4 Emissions by Task

				Mitigated										
				Peak Day										
				PM10	PM2.5	DPM	NOX	SOX	CO	VOC	CO2	CH4	N2O	CO2e
Task ID		**Construction Element/Equipment**	**Source Type 1**	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(tonnes/day)	(tonnes/day)	(tonnes/day)	(tonnes/day)
3	**Pier J Wharf Upgrade**													
3		**Marine Activities**												
3		Pier J Wharf Tugboat propulsion engine	Marine Equipment	4.159	3.701	4.159	81.337	0.068	61.155	4.508	3.617	0.000	0.000	3.670
3		Pier J Wharf Tugboat auxiliary engine	Marine Equipment	0.185	0.165	0.185	6.789	0.007	7.278	0.376	0.391	0.000	0.000	0.397
3		Pier J Wharf Crew boat propulsion engine	Marine Equipment	0.340	0.302	0.340	6.647	0.006	4.998	0.368	0.296	0.000	0.000	0.300
3		Pier J Wharf Crew boat auxiliary engine	Marine Equipment	0.012	0.010	0.012	0.432	0.000	0.463	0.024	0.025	0.000	0.000	0.025
3		Pier J Wharf Survey boat propulsion engine	Marine Equipment	0.170	0.151	0.170	3.323	0.003	2.499	0.184	0.148	0.000	0.000	0.150
3		**Off-Road Equipment**												
3		Const Barge - piling crane	Offroad Construction Equipment	0.024	0.024	0.024	0.479	0.008	2.675	0.236	0.380	0.000	0.000	0.380
3		Cong Barge - long arm excavator	Offroad Construction Equipment	0.040	0.040	0.040	0.792	0.013	2.775	0.321	0.634	0.000	0.000	0.634
3		Const barge - deck equipment	Offroad Construction Equipment	0.014	0.014	0.014	0.278	0.004	2.819	0.137	0.181	0.000	0.000	0.181
3		Sheet pile barge - deck equipment	Offroad Construction Equipment	0.014	0.014	0.014	0.278	0.004	2.819	0.137	0.181	0.000	0.000	0.181
3		On-Road Vehicles												
3		Workers	Onroad Construction Vehicles	0.144	0.046	0.000	0.053	0.003	0.868	0.014	0.153	0.000	0.000	0.154
4	**Pier T Wharf Upgrade**													
4		**Marine Activities**												
4		Pier T Wharf Tugboat propulsion engine	Marine Equipment	4.159	3.701	4.159	81.337	0.068	61.155	4.508	3.617	0.000	0.000	3.670
4		Pier T Wharf Tugboat auxiliary engine	Marine Equipment	0.185	0.165	0.185	6.789	0.007	7.278	0.376	0.391	0.000	0.000	0.397
4		Pier T Wharf Crew boat propulsion engine	Marine Equipment	0.340	0.302	0.340	6.647	0.006	4.998	0.368	0.296	0.000	0.000	0.300
4		Pier T Wharf Crew boat auxiliary engine	Marine Equipment	0.012	0.010	0.012	0.432	0.000	0.463	0.024	0.025	0.000	0.000	0.025
4		Pier T Wharf Survey boat propulsion engine	Marine Equipment	0.170	0.151	0.170	3.323	0.003	2.499	0.184	0.148	0.000	0.000	0.150
4		**Off-Road Equipment**												
4		Const Barge - piling crane	Offroad Construction Equipment	0.024	0.024	0.024	0.479	0.008	2.675	0.236	0.380	0.000	0.000	0.380
4		Cong Barge - long arm excavator	Offroad Construction Equipment	0.040	0.040	0.040	0.792	0.013	2.775	0.321	0.634	0.000	0.000	0.634
4		Const barge - deck equipment	Offroad Construction Equipment	0.014	0.014	0.014	0.278	0.004	2.819	0.137	0.181	0.000	0.000	0.181
4		Sheet pile barge - deck equipment	Offroad Construction Equipment	0.014	0.014	0.014	0.278	0.004	2.819	0.137	0.181	0.000	0.000	0.181
4		On-Road Vehicles												
4		Workers	Onroad Construction Vehicles	0.144	0.046	0.000	0.053	0.003	0.868	0.014	0.153	0.000	0.000	0.154

Table H1.28
Alternative 4 Emissions by Task

Task ID		Construction Element/Equipment	Source Type 1	Mitigated Emissions Total PM10 (lb)	PM2.5 (lb)	DPM (lb)	NOX (lb)	SOX (lb)	CO (lb)	VOC (lb)	CO2 (lb)	CH4 (lb)	N2O (tonnes)	CO2e (tonnes)
3	**Pier J Wharf Upgrade**													
3		**Marine Activities**												
3		Pier J Wharf Tugboat propulsion engine	Marine Equipment	727.748	647.696	727.748	14233.892	11.815	10702.174	788.857	633.028	0.007	0.030	642.167
3		Pier J Wharf Tugboat auxiliary engine	Marine Equipment	32.421	28.855	32.421	1188.012	1.278	1273.697	65.841	68.490	0.001	0.003	69.474
3		Pier J Wharf Crew boat propulsion engine	Marine Equipment	59.472	52.930	59.472	1163.200	0.966	874.586	64.466	51.731	0.001	0.002	52.478
3		Pier J Wharf Crew boat auxiliary engine	Marine Equipment	2.062	1.835	2.062	75.564	0.081	81.014	4.188	4.356	0.000	0.000	4.419
3		Pier J Wharf Survey boat propulsion engine	Marine Equipment	29.736	26.465	29.736	581.600	0.483	437.293	32.233	25.866	0.000	0.001	26.239
3		**Off-Road Equipment**												
3		Const Barge - piling crane	Offroad Construction Equipment	4.076	4.076	4.076	81.515	1.315	454.676	40.056	64.597	0.000	0.000	64.597
3		Cong Barge - long arm excavator	Offroad Construction Equipment	6.729	6.729	6.729	134.583	2.195	471.801	54.548	107.776	0.000	0.000	107.776
3		Const barge - deck equipment	Offroad Construction Equipment	2.361	2.361	2.361	47.222	0.625	479.240	23.205	30.730	0.000	0.000	30.730
3		Sheet pile barge - deck equipment	Offroad Construction Equipment	2.361	2.361	2.361	47.222	0.625	479.240	23.205	30.730	0.000	0.000	30.730
3		On-Road Vehicles												
3		Workers	Onroad Construction Vehicles	25.167	7.972	0.000	9.217	0.584	151.865	2.372	26.764	0.000	0.000	26.911
4	**Pier T Wharf Upgrade**													
4		**Marine Activities**												
4		Pier T Wharf Tugboat propulsion engine	Marine Equipment	1330.739	1184.358	1330.739	26027.687	21.605	19569.690	1442.482	1157.536	0.012	0.055	1174.248
4		Pier T Wharf Tugboat auxiliary engine	Marine Equipment	59.285	52.763	59.285	2172.364	2.338	2329.046	120.395	125.238	0.001	0.006	127.038
4		Pier T Wharf Crew boat propulsion engine	Marine Equipment	108.749	96.786	108.749	2126.994	1.766	1599.243	117.880	94.594	0.001	0.004	95.960
4		Pier T Wharf Crew boat auxiliary engine	Marine Equipment	3.771	3.356	3.771	138.175	0.149	148.140	7.658	7.966	0.000	0.000	8.080
4		Pier T Wharf Survey boat propulsion engine	Marine Equipment	54.374	48.393	54.374	1063.497	0.883	799.622	58.940	47.297	0.001	0.002	47.980
4		**Off-Road Equipment**												
4		Const Barge - piling crane	Offroad Construction Equipment	7.432	7.432	7.432	148.644	2.397	829.115	73.044	117.794	0.000	0.000	117.794
4		Cong Barge - long arm excavator	Offroad Construction Equipment	12.271	12.271	12.271	245.417	4.003	860.342	99.471	196.533	0.000	0.000	196.533
4		Const barge - deck equipment	Offroad Construction Equipment	4.306	4.306	4.306	86.111	1.140	873.908	42.315	56.037	0.000	0.000	56.037
4		Sheet pile barge - deck equipment	Offroad Construction Equipment	4.306	4.306	4.306	86.111	1.140	873.908	42.315	56.037	0.000	0.000	56.037
4		On-Road Vehicles												
4		Workers	Onroad Construction Vehicles	46.019	14.578	0.000	16.854	1.067	277.697	4.337	48.939	0.001	0.001	49.208

Table H1.28
Alternative 4 Emissions by Task

							Unmitigated Emissions										
							Peak Day										
							PM10	PM2.5	DPM	NOX	SOX	CO	VOC	CO2	CH4	N2O	CO2e
Task ID		**Construction Element/Equipment**	**Source Type 1**	**Source Type 2**	**Onsite/Offsite**	**Days Total**	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(tonnes/day)	(tonnes/day)	(tonnes/day)	(tonnes/day)
5	**Approach Channel (hopper dredge 5,447,000 CY)**																
5		**Marine Hopper Dredge**															
5		Hopper propulsion engine	Marine Equipment	dredging	onsite	399	26.632	23.703	26.632	495.890	0.294	266.321	27.483	15.753	0.000	0.001	15.982
5		Hopper propulsion engine	Marine Equipment	transit	offsite	399	50.305	44.772	50.305	936.682	0.555	503.052	51.912	29.755	0.000	0.001	30.188
5		Hopper auxiliary engine	Marine Equipment	disposal	offsite	399	0.222	0.198	0.222	5.060	0.004	3.699	0.280	0.219	0.000	0.000	0.222
5		Crew boat propulsion engine	Marine Equipment	support	onsite	399	0.406	0.361	0.406	8.024	0.004	4.061	0.445	0.240	0.000	0.000	0.244
5		Crew boat auxiliary engine	Marine Equipment	support	onsite	399	0.034	0.030	0.034	0.600	0.000	0.421	0.033	0.025	0.000	0.000	0.025
5		Survey boat propulsion engine	Marine Equipment	dredging	onsite	399	1.449	1.290	1.449	28.638	0.016	14.493	1.587	0.857	0.000	0.000	0.870
6	**Main Channel Widening (clam shell dredge 1,065,000 CY)**																
6		**Marine Clamshell Dredge**															
6		Clamshell Dredge hoist	Marine Equipment	dredging	onsite	178	4.365	4.365	4.365	132.698	0.145	75.661	7.354	5.785	0.000	0.000	5.785
6		Clamshell Dredge generator	Marine Equipment	dredging	onsite	178	3.274	3.274	3.274	99.524	0.109	56.746	5.516	3.196	0.000	0.000	3.196
6		Clamshell Barge dump scow	Marine Equipment	disposal	offsite	178	0.046	0.046	0.046	0.880	0.002	0.802	0.049	0.032	0.000	0.000	0.032
6		Clamshell Tugboat propulsion engine	Marine Equipment	dredging	onsite	178	0.612	0.544	0.612	11.387	0.007	6.116	0.631	0.362	0.000	0.000	0.367
6		Clamshell Tugboat auxiliary engine	Marine Equipment	dredging	onsite	178	0.088	0.079	0.088	1.571	0.001	1.103	0.087	0.065	0.000	0.000	0.066
6		Clamshell Tugboat propulsion engine	Marine Equipment	transit	offsite	178	11.008	9.797	11.008	204.968	0.122	110.080	11.360	6.511	0.000	0.000	6.606
6		Clamshell Tugboat auxiliary engine	Marine Equipment	transit	offsite	178	1.588	1.413	1.588	28.286	0.022	19.850	1.568	1.174	0.000	0.000	1.191
6		Clamshell Crew boat propulsion engine	Marine Equipment	support	onsite	178	0.406	0.361	0.406	8.024	0.004	4.061	0.445	0.240	0.000	0.000	0.244
6		Clamshell Crew boat auxiliary engine	Marine Equipment	support	onsite	178	0.034	0.030	0.034	0.600	0.000	0.421	0.033	0.025	0.000	0.000	0.025
6		Clamshell Survey boat propulsion engine	Marine Equipment	dredging	onsite	178	0.362	0.322	0.362	7.160	0.004	3.623	0.397	0.214	0.000	0.000	0.217

Table H1.28
Alternative 4 Emissions by Task

				Unmitigated Emissions										
				Total										
				PM10	PM2.5	DPM	NOX	SOX	CO	VOC	CO2	CH4	N2O	CO2e
Task ID		**Construction Element/Equipment**	**Source Type 1**	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(tonnes)	(tonnes)	(tonnes)	(tonnes)
5	**Approach Channel (hopper dredge 5,447,000 CY)**													
5		**Marine Hopper Dredge**												
5		Hopper propulsion engine	Marine Equipment	10626.223	9457.339	10626.223	197860.275	117.314	106262.232	10965.625	6285.351	0.094	0.299	6376.769
5		Hopper propulsion engine	Marine Equipment	20071.755	17863.862	20071.755	373736.076	221.592	200717.549	20712.847	11872.331	0.178	0.564	12045.007
5		Hopper auxiliary engine	Marine Equipment	88.552	78.811	88.552	2018.982	1.629	1475.864	111.894	87.297	0.001	0.004	88.558
5		Crew boat propulsion engine	Marine Equipment	162.017	144.195	162.017	3201.458	1.789	1620.171	177.428	95.832	0.002	0.005	97.228
5		Crew boat auxiliary engine	Marine Equipment	13.434	11.956	13.434	239.287	0.185	167.921	13.262	9.932	0.000	0.000	10.076
5		Survey boat propulsion engine	Marine Equipment	578.276	514.666	578.276	11426.742	6.384	5782.764	633.282	342.047	0.005	0.016	347.030
6	**Main Channel Widening (clam shell dredge 1,065,000 CY)**													
6		**Marine Clamshell Dredge**												
6		Clamshell Dredge hoist	Marine Equipment	776.984	776.984	776.984	23620.317	25.869	13467.725	1309.063	1029.797	0.000	0.000	1029.797
6		Clamshell Dredge generator	Marine Equipment	582.738	582.738	582.738	17715.238	19.402	10100.794	981.797	568.968	0.000	0.000	568.968
6		Clamshell Barge dump scow	Marine Equipment	8.241	8.241	8.241	156.574	0.274	142.840	8.678	5.631	0.000	0.000	5.631
6		Clamshell Tugboat propulsion engine	Marine Equipment	108.856	96.882	108.856	2026.906	1.202	1088.564	112.333	64.388	0.001	0.003	65.324
6		Clamshell Tugboat auxiliary engine	Marine Equipment	15.703	13.976	15.703	279.717	0.217	196.293	15.502	11.611	0.000	0.001	11.778
6		Clamshell Tugboat propulsion engine	Marine Equipment	1959.415	1743.880	1959.415	36484.311	21.632	19594.152	2021.999	1158.983	0.017	0.055	1175.840
6		Clamshell Tugboat auxiliary engine	Marine Equipment	282.661	251.569	282.661	5034.907	3.901	3533.268	279.040	208.991	0.002	0.010	212.012
6		Clamshell Crew boat propulsion engine	Marine Equipment	72.278	64.328	72.278	1428.219	0.798	722.783	79.153	42.752	0.001	0.002	43.375
6		Clamshell Crew boat auxiliary engine	Marine Equipment	5.993	5.334	5.993	106.750	0.083	74.912	5.916	4.431	0.000	0.000	4.495
6		Clamshell Survey boat propulsion engine	Marine Equipment	64.494	57.400	64.494	1274.411	0.712	644.945	70.629	38.148	0.001	0.002	38.704

Table H1.28
Alternative 4 Emissions by Task

				Mitigated										
				Peak Day										
				PM10	PM2.5	DPM	NOX	SOX	CO	VOC	CO2	CH4	N2O	CO2e
Task ID		**Construction Element/Equipment**	**Source Type 1**	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(tonnes/day)	(tonnes/day)	(tonnes/day)	(tonnes/day)
5	**Approach Channel (hopper dredge 5,447,000 CY)**													
5		**Marine Hopper Dredge**												
5		Hopper propulsion engine	Marine Equipment	26.632	23.703	26.632	495.890	0.294	266.321	27.483	15.753	0.000	0.001	15.982
5		Hopper propulsion engine	Marine Equipment	50.305	44.772	50.305	936.682	0.555	503.052	51.912	29.755	0.000	0.001	30.188
5		Hopper auxiliary engine	Marine Equipment	0.222	0.198	0.222	5.060	0.004	3.699	0.280	0.219	0.000	0.000	0.222
5		Crew boat propulsion engine	Marine Equipment	0.276	0.246	0.276	5.401	0.004	4.061	0.299	0.240	0.000	0.000	0.244
5		Crew boat auxiliary engine	Marine Equipment	0.012	0.010	0.012	0.432	0.000	0.463	0.024	0.025	0.000	0.000	0.025
5		Survey boat propulsion engine	Marine Equipment	0.986	0.877	0.986	19.276	0.016	14.493	1.068	0.857	0.000	0.000	0.870
6	**Main Channel Widening (clam shell dredge 1,065,000 CY)**													
6		**Marine Clamshell Dredge**												
6		Clamshell Dredge hoist	Marine Equipment	0.437	0.437	0.437	13.270	0.015	7.566	0.735	0.579	0.000	0.000	0.579
6		Clamshell Dredge generator	Marine Equipment	0.327	0.327	0.327	9.952	0.011	5.675	0.552	0.320	0.000	0.000	0.320
6		Clamshell Barge dump scow	Marine Equipment	0.046	0.046	0.046	0.880	0.002	0.802	0.049	0.032	0.000	0.000	0.032
6		Clamshell Tugboat propulsion engine	Marine Equipment	0.416	0.370	0.416	8.134	0.007	6.116	0.451	0.362	0.000	0.000	0.367
6		Clamshell Tugboat auxiliary engine	Marine Equipment	0.031	0.027	0.031	1.131	0.001	1.213	0.063	0.065	0.000	0.000	0.066
6		Clamshell Tugboat propulsion engine	Marine Equipment	7.485	6.662	7.485	146.406	0.122	110.080	8.114	6.511	0.000	0.000	6.605
6		Clamshell Tugboat auxiliary engine	Marine Equipment	0.556	0.495	0.556	20.366	0.022	21.835	1.129	1.174	0.000	0.000	1.191
6		Clamshell Crew boat propulsion engine	Marine Equipment	0.276	0.246	0.276	5.401	0.004	4.061	0.299	0.240	0.000	0.000	0.244
6		Clamshell Crew boat auxiliary engine	Marine Equipment	0.012	0.010	0.012	0.432	0.000	0.463	0.024	0.025	0.000	0.000	0.025
6		Clamshell Survey boat propulsion engine	Marine Equipment	0.246	0.219	0.246	4.819	0.004	3.623	0.267	0.214	0.000	0.000	0.217
				Note: clamshell dredge would be electric with mitigation; assume 90 percent reduction in diesel exhaust emissions.										

Table H1.28
Alternative 4 Emissions by Task

				Mitigated Emissions										
				Total										
				PM10	PM2.5	DPM	NOX	SOX	CO	VOC	CO2	CH4	N2O	CO2e
Task ID		**Construction Element/Equipment**	**Source Type 1**	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(tonnes)	(tonnes)
5	**Approach Channel (hopper dredge 5,447,000 CY)**													
5		**Marine Hopper Dredge**												
5		Hopper propulsion engine	Marine Equipment	10626.223	9457.339	10626.223	197860.275	117.314	106262.232	10965.625	6285.351	0.094	0.299	6376.769
5		Hopper propulsion engine	Marine Equipment	20071.755	17863.862	20071.755	373736.076	221.592	200717.549	20712.847	11872.331	0.178	0.564	12045.007
5		Hopper auxiliary engine	Marine Equipment	88.552	78.811	88.552	2018.982	1.629	1475.864	111.894	87.297	0.001	0.004	88.558
5		Crew boat propulsion engine	Marine Equipment	110.172	98.053	110.172	2154.828	1.789	1620.171	119.423	95.832	0.001	0.005	97.216
5		Crew boat auxiliary engine	Marine Equipment	4.702	4.185	4.702	172.286	0.185	184.713	9.548	9.932	0.000	0.000	10.075
5		Survey boat propulsion engine	Marine Equipment	393.228	349.973	393.228	7691.077	6.384	5782.764	426.248	342.047	0.004	0.016	346.985
6	**Main Channel Widening (clam shell dredge 1,065,000 CY)**													
6		**Marine Clamshell Dredge**												
6		Clamshell Dredge hoist	Marine Equipment	77.698	77.698	77.698	2362.032	2.587	1346.772	130.906	102.980	0.000	0.000	102.980
6		Clamshell Dredge generator	Marine Equipment	58.274	58.274	58.274	1771.524	1.940	1010.079	98.180	56.897	0.000	0.000	56.897
6		Clamshell Barge dump scow	Marine Equipment	8.241	8.241	8.241	156.574	0.274	142.840	8.678	5.631	0.000	0.000	5.631
6		Clamshell Tugboat propulsion engine	Marine Equipment	74.022	65.880	74.022	1447.790	1.202	1088.564	80.238	64.388	0.001	0.003	65.318
6		Clamshell Tugboat auxiliary engine	Marine Equipment	5.496	4.892	5.496	201.396	0.217	215.922	11.162	11.611	0.000	0.001	11.778
6		Clamshell Tugboat propulsion engine	Marine Equipment	1332.402	1185.838	1332.402	26060.222	21.632	19594.152	1444.285	1158.983	0.012	0.055	1175.715
6		Clamshell Tugboat auxiliary engine	Marine Equipment	98.932	88.049	98.932	3625.133	3.901	3886.595	200.909	208.991	0.002	0.010	211.995
6		Clamshell Crew boat propulsion engine	Marine Equipment	49.149	43.743	49.149	961.301	0.798	722.783	53.276	42.752	0.000	0.002	43.369
6		Clamshell Crew boat auxiliary engine	Marine Equipment	2.098	1.867	2.098	76.860	0.083	82.403	4.260	4.431	0.000	0.000	4.495
6		Clamshell Survey boat propulsion engine	Marine Equipment	43.856	39.032	43.856	857.777	0.712	644.945	47.539	38.148	0.000	0.002	38.699
				Note: clamshell dredge would be electric with mitigation; assume 90 percent reduction in diesel exhaust emissions.										

Table H1.28
Alternative 4 Emissions by Task

							Unmitigated Emissions										
							Peak Day										
							PM10	PM2.5	DPM	NOX	SOX	CO	VOC	CO2	CH4	N2O	CO2e
Task ID		**Construction Element/Equipment**	**Source Type 1**	**Source Type 2**	**Onsite/Offsite**	**Days Total**	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(tonnes/day)	(tonnes/day)	(tonnes/day)	(tonnes/day)
7	**West Basin (clam shell dredge 975,000 CY)**																
7		**Marine Clamshell Dredge**															
7		Clamshell Dredge hoist	Marine Equipment	dredging	onsite	163	4.365	4.365	4.365	132.698	0.145	75.661	7.354	5.785	0.000	0.000	5.785
7		Clamshell Dredge generator	Marine Equipment	dredging	onsite	163	3.274	3.274	3.274	99.524	0.109	56.746	5.516	3.196	0.000	0.000	3.196
7		Clamshell Barge dump scow	Marine Equipment	disposal	offsite	163	0.046	0.046	0.046	0.880	0.002	0.802	0.049	0.032	0.000	0.000	0.032
7		Clamshell Tugboat propulsion engine	Marine Equipment	dredging	onsite	163	0.612	0.544	0.612	11.387	0.007	6.116	0.631	0.362	0.000	0.000	0.367
7		Clamshell Tugboat auxiliary engine	Marine Equipment	dredging	onsite	163	0.088	0.079	0.088	1.571	0.001	1.103	0.087	0.065	0.000	0.000	0.066
7		Clamshell Tugboat propulsion engine	Marine Equipment	transit	offsite	163	11.008	9.797	11.008	204.968	0.122	110.080	11.360	6.511	0.000	0.000	6.606
7		Clamshell Tugboat auxiliary engine	Marine Equipment	transit	offsite	163	1.588	1.413	1.588	28.286	0.022	19.850	1.568	1.174	0.000	0.000	1.191
7		Clamshell Crew boat propulsion engine	Marine Equipment	support	onsite	163	0.406	0.361	0.406	8.024	0.004	4.061	0.445	0.240	0.000	0.000	0.244
7		Clamshell Crew boat auxiliary engine	Marine Equipment	support	onsite	163	0.034	0.030	0.034	0.600	0.000	0.421	0.033	0.025	0.000	0.000	0.025
7		Clamshell Survey boat propulsion engine	Marine Equipment	dredging	onsite	163	0.362	0.322	0.362	7.160	0.004	3.623	0.397	0.214	0.000	0.000	0.217
8	**West Basin (clam shell dredge 513,000 CY)**																
8		**Marine Clamshell Dredge**															
8		Clamshell Dredge hoist	Marine Equipment	dredging	onsite	86	4.365	4.365	4.365	132.698	0.145	75.661	7.354	5.785	0.000	0.000	5.785
8		Clamshell Dredge generator	Marine Equipment	dredging	onsite	86	3.274	3.274	3.274	99.524	0.109	56.746	5.516	3.196	0.000	0.000	3.196
8		Clamshell Barge dump scow	Marine Equipment	disposal	offsite	86	0.046	0.046	0.046	0.880	0.002	0.802	0.049	0.032	0.000	0.000	0.032
8		Clamshell Tugboat propulsion engine	Marine Equipment	dredging	onsite	86	0.612	0.544	0.612	11.387	0.007	6.116	0.631	0.362	0.000	0.000	0.367
8		Clamshell Tugboat auxiliary engine	Marine Equipment	dredging	onsite	86	0.088	0.079	0.088	1.571	0.001	1.103	0.087	0.065	0.000	0.000	0.066
8		Clamshell Tugboat propulsion engine	Marine Equipment	transit	offsite	86	11.008	9.797	11.008	204.968	0.122	110.080	11.360	6.511	0.000	0.000	6.606
8		Clamshell Tugboat auxiliary engine	Marine Equipment	transit	offsite	86	1.588	1.413	1.588	28.286	0.022	19.850	1.568	1.174	0.000	0.000	1.191
8		Clamshell Crew boat propulsion engine	Marine Equipment	support	onsite	86	0.406	0.361	0.406	8.024	0.004	4.061	0.445	0.240	0.000	0.000	0.244
8		Clamshell Crew boat auxiliary engine	Marine Equipment	support	onsite	86	0.034	0.030	0.034	0.600	0.000	0.421	0.033	0.025	0.000	0.000	0.025
8		Clamshell Survey boat propulsion engine	Marine Equipment	dredging	onsite	86	0.362	0.322	0.362	7.160	0.004	3.623	0.397	0.214	0.000	0.000	0.217

Table H1.28
Alternative 4 Emissions by Task

				Unmitigated Emissions										
				Total										
				PM10	PM2.5	DPM	NOX	SOX	CO	VOC	CO2	CH4	N2O	CO2e
Task ID		**Construction Element/Equipment**	**Source Type 1**	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(tonnes)	(tonnes)	(tonnes)	(tonnes)
7	**West Basin (clam shell dredge 975,000 CY)**													
7		**Marine Clamshell Dredge**												
7		Clamshell Dredge hoist	Marine Equipment	711.508	711.508	711.508	21629.841	23.689	12332.804	1198.749	943.016	0.000	0.000	943.016
7		Clamshell Dredge generator	Marine Equipment	533.631	533.631	533.631	16222.381	17.767	9249.603	899.061	521.021	0.000	0.000	521.021
7		Clamshell Barge dump scow	Marine Equipment	7.546	7.546	7.546	143.380	0.251	130.802	7.946	5.156	0.000	0.000	5.156
7		Clamshell Tugboat propulsion engine	Marine Equipment	99.683	88.718	99.683	1856.099	1.101	996.831	102.867	58.962	0.001	0.003	59.820
7		Clamshell Tugboat auxiliary engine	Marine Equipment	14.380	12.798	14.380	256.145	0.198	179.751	14.196	10.632	0.000	0.001	10.786
7		Clamshell Tugboat propulsion engine	Marine Equipment	1794.296	1596.923	1794.296	33409.790	19.809	17942.959	1851.606	1061.316	0.016	0.050	1076.752
7		Clamshell Tugboat auxiliary engine	Marine Equipment	258.842	230.369	258.842	4610.617	3.572	3235.521	255.525	191.379	0.002	0.009	194.146
7		Clamshell Crew boat propulsion engine	Marine Equipment	66.187	58.907	66.187	1307.864	0.731	661.874	72.483	39.149	0.001	0.002	39.720
7		Clamshell Crew boat auxiliary engine	Marine Equipment	5.488	4.884	5.488	97.754	0.076	68.599	5.418	4.058	0.000	0.000	4.116
7		Clamshell Survey boat propulsion engine	Marine Equipment	59.060	52.563	59.060	1167.017	0.652	590.596	64.677	34.933	0.001	0.002	35.442
8	**West Basin (clam shell dredge 513,000 CY)**													
8		**Marine Clamshell Dredge**												
8		Clamshell Dredge hoist	Marine Equipment	375.397	375.397	375.397	11412.063	12.499	6506.878	632.469	497.542	0.000	0.000	497.542
8		Clamshell Dredge generator	Marine Equipment	281.548	281.548	281.548	8559.048	9.374	4880.159	474.351	274.894	0.000	0.000	274.894
8		Clamshell Barge dump scow	Marine Equipment	3.981	3.981	3.981	75.648	0.133	69.012	4.193	2.720	0.000	0.000	2.720
8		Clamshell Tugboat propulsion engine	Marine Equipment	52.594	46.808	52.594	979.292	0.581	525.935	54.273	31.109	0.000	0.001	31.561
8		Clamshell Tugboat auxiliary engine	Marine Equipment	7.587	6.752	7.587	135.144	0.105	94.838	7.490	5.610	0.000	0.000	5.691
8		Clamshell Tugboat propulsion engine	Marine Equipment	946.684	842.549	946.684	17627.251	10.451	9466.837	976.921	559.958	0.008	0.027	568.102
8		Clamshell Tugboat auxiliary engine	Marine Equipment	136.567	121.544	136.567	2432.595	1.885	1707.085	134.817	100.973	0.001	0.005	102.433
8		Clamshell Crew boat propulsion engine	Marine Equipment	34.921	31.080	34.921	690.039	0.386	349.210	38.243	20.656	0.000	0.001	20.956
8		Clamshell Crew boat auxiliary engine	Marine Equipment	2.895	2.577	2.895	51.576	0.040	36.193	2.858	2.141	0.000	0.000	2.172
8		Clamshell Survey boat propulsion engine	Marine Equipment	31.160	27.733	31.160	615.727	0.344	311.603	34.124	18.431	0.000	0.001	18.700

Table H1.28
Alternative 4 Emissions by Task

				Mitigated										
				Peak Day										
				PM10	PM2.5	DPM	NOX	SOX	CO	VOC	CO2	CH4	N2O	CO2e
Task ID		**Construction Element/Equipment**	**Source Type 1**	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(tonnes/day)	(tonnes/day)	(tonnes/day)	(tonnes/day)
7	**West Basin (clam shell dredge 975,000 CY)**													
7		**Marine Clamshell Dredge**												
7		Clamshell Dredge hoist	Marine Equipment	0.437	0.437	0.437	13.270	0.015	7.566	0.735	0.579	0.000	0.000	0.579
7		Clamshell Dredge generator	Marine Equipment	0.327	0.327	0.327	9.952	0.011	5.675	0.552	0.320	0.000	0.000	0.320
7		Clamshell Barge dump scow	Marine Equipment	0.046	0.046	0.046	0.880	0.002	0.802	0.049	0.032	0.000	0.000	0.032
7		Clamshell Tugboat propulsion engine	Marine Equipment	0.416	0.370	0.416	8.134	0.007	6.116	0.451	0.362	0.000	0.000	0.367
7		Clamshell Tugboat auxiliary engine	Marine Equipment	0.031	0.027	0.031	1.131	0.001	1.213	0.063	0.065	0.000	0.000	0.066
7		Clamshell Tugboat propulsion engine	Marine Equipment	7.485	6.662	7.485	146.406	0.122	110.080	8.114	6.511	0.000	0.000	6.605
7		Clamshell Tugboat auxiliary engine	Marine Equipment	0.556	0.495	0.556	20.366	0.022	21.835	1.129	1.174	0.000	0.000	1.191
7		Clamshell Crew boat propulsion engine	Marine Equipment	0.276	0.246	0.276	5.401	0.004	4.061	0.299	0.240	0.000	0.000	0.244
7		Clamshell Crew boat auxiliary engine	Marine Equipment	0.012	0.010	0.012	0.432	0.000	0.463	0.024	0.025	0.000	0.000	0.025
7		Clamshell Survey boat propulsion engine	Marine Equipment	0.246	0.219	0.246	4.819	0.004	3.623	0.267	0.214	0.000	0.000	0.217
8	**West Basin (clam shell dredge 513,000 CY)**													
8		**Marine Clamshell Dredge**												
8		Clamshell Dredge hoist	Marine Equipment	0.437	0.437	0.437	13.270	0.015	7.566	0.735	0.579	0.000	0.000	0.579
8		Clamshell Dredge generator	Marine Equipment	0.327	0.327	0.327	9.952	0.011	5.675	0.552	0.320	0.000	0.000	0.320
8		Clamshell Barge dump scow	Marine Equipment	0.046	0.046	0.046	0.880	0.002	0.802	0.049	0.032	0.000	0.000	0.032
8		Clamshell Tugboat propulsion engine	Marine Equipment	0.416	0.370	0.416	8.134	0.007	6.116	0.451	0.362	0.000	0.000	0.367
8		Clamshell Tugboat auxiliary engine	Marine Equipment	0.031	0.027	0.031	1.131	0.001	1.213	0.063	0.065	0.000	0.000	0.066
8		Clamshell Tugboat propulsion engine	Marine Equipment	7.485	6.662	7.485	146.406	0.122	110.080	8.114	6.511	0.000	0.000	6.605
8		Clamshell Tugboat auxiliary engine	Marine Equipment	0.556	0.495	0.556	20.366	0.022	21.835	1.129	1.174	0.000	0.000	1.191
8		Clamshell Crew boat propulsion engine	Marine Equipment	0.276	0.246	0.276	5.401	0.004	4.061	0.299	0.240	0.000	0.000	0.244
8		Clamshell Crew boat auxiliary engine	Marine Equipment	0.012	0.010	0.012	0.432	0.000	0.463	0.024	0.025	0.000	0.000	0.025
8		Clamshell Survey boat propulsion engine	Marine Equipment	0.246	0.219	0.246	4.819	0.004	3.623	0.267	0.214	0.000	0.000	0.217
				Note: clamshell dredge would be electric with mitigation; assume 90 percent reduction in diesel exhaust emissions.										

Table H1.28
Alternative 4 Emissions by Task

				Mitigated Emissions										
				Total										
				PM10	PM2.5	DPM	NOX	SOX	CO	VOC	CO2	CH4	N2O	CO2e
Task ID		**Construction Element/Equipment**	**Source Type 1**	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(tonnes)	(tonnes)
7	**West Basin (clam shell dredge 975,000 CY)**													
7		**Marine Clamshell Dredge**												
7		Clamshell Dredge hoist	Marine Equipment	71.151	71.151	71.151	2162.984	2.369	1233.280	119.875	94.302	0.000	0.000	94.302
7		Clamshell Dredge generator	Marine Equipment	53.363	53.363	53.363	1622.238	1.777	924.960	89.906	52.102	0.000	0.000	52.102
7		Clamshell Barge dump scow	Marine Equipment	7.546	7.546	7.546	143.380	0.251	130.802	7.946	5.156	0.000	0.000	5.156
7		Clamshell Tugboat propulsion engine	Marine Equipment	67.785	60.328	67.785	1325.785	1.101	996.831	73.476	58.962	0.001	0.003	59.813
7		Clamshell Tugboat auxiliary engine	Marine Equipment	5.033	4.479	5.033	184.425	0.198	197.726	10.221	10.632	0.000	0.001	10.785
7		Clamshell Tugboat propulsion engine	Marine Equipment	1220.121	1085.908	1220.121	23864.136	19.809	17942.959	1322.576	1061.316	0.011	0.050	1076.638
7		Clamshell Tugboat auxiliary engine	Marine Equipment	90.595	80.629	90.595	3319.644	3.572	3559.073	183.978	191.379	0.002	0.009	194.130
7		Clamshell Crew boat propulsion engine	Marine Equipment	45.007	40.057	45.007	880.293	0.731	661.874	48.787	39.149	0.000	0.002	39.715
7		Clamshell Crew boat auxiliary engine	Marine Equipment	1.921	1.709	1.921	70.383	0.076	75.459	3.901	4.058	0.000	0.000	4.116
7		Clamshell Survey boat propulsion engine	Marine Equipment	40.161	35.743	40.161	785.492	0.652	590.596	43.533	34.933	0.000	0.002	35.438
8	**West Basin (clam shell dredge 513,000 CY)**													
8		**Marine Clamshell Dredge**												
8		Clamshell Dredge hoist	Marine Equipment	37.540	37.540	37.540	1141.206	1.250	650.688	63.247	49.754	0.000	0.000	49.754
8		Clamshell Dredge generator	Marine Equipment	28.155	28.155	28.155	855.905	0.937	488.016	47.435	27.489	0.000	0.000	27.489
8		Clamshell Barge dump scow	Marine Equipment	3.981	3.981	3.981	75.648	0.133	69.012	4.193	2.720	0.000	0.000	2.720
8		Clamshell Tugboat propulsion engine	Marine Equipment	35.764	31.830	35.764	699.494	0.581	525.935	38.767	31.109	0.000	0.001	31.558
8		Clamshell Tugboat auxiliary engine	Marine Equipment	2.655	2.363	2.655	97.304	0.105	104.322	5.393	5.610	0.000	0.000	5.690
8		Clamshell Tugboat propulsion engine	Marine Equipment	643.745	572.933	643.745	12590.894	10.451	9466.837	697.801	559.958	0.006	0.027	568.042
8		Clamshell Tugboat auxiliary engine	Marine Equipment	47.798	42.541	47.798	1751.469	1.885	1877.793	97.068	100.973	0.001	0.005	102.425
8		Clamshell Crew boat propulsion engine	Marine Equipment	23.746	21.134	23.746	464.449	0.386	349.210	25.740	20.656	0.000	0.001	20.954
8		Clamshell Crew boat auxiliary engine	Marine Equipment	1.013	0.902	1.013	37.134	0.040	39.813	2.058	2.141	0.000	0.000	2.172
8		Clamshell Survey boat propulsion engine	Marine Equipment	21.189	18.858	21.189	414.431	0.344	311.603	22.968	18.431	0.000	0.001	18.697
				Note: clamshell dredge would be electric with mitigation; assume 90 percent reduction in diesel exhaust emissions.										

Table H1.28
Alternative 4 Emissions by Task

							Unmitigated Emissions										
							Peak Day										
							PM10	PM2.5	DPM	NOX	SOX	CO	VOC	CO2	CH4	N2O	CO2e
Task ID		**Construction Element/Equipment**	**Source Type 1**	**Source Type 2**	**Onsite/Offsite**	**Days Total**	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(tonnes/day)	(tonnes/day)	(tonnes/day)	(tonnes/day)
9	**Pier T Berths (clam shell dredge Berths T132 to T140, 44,000 CY)**																
9		**Marine Clamshell Dredge**															
9		Clamshell Dredge hoist	Marine Equipment	dredging	onsite	7	4.365	4.365	4.365	132.698	0.145	75.661	7.354	5.785	0.000	0.000	5.785
9		Clamshell Dredge generator	Marine Equipment	dredging	onsite	7	3.274	3.274	3.274	99.524	0.109	56.746	5.516	3.196	0.000	0.000	3.196
9		Clamshell Barge dump scow	Marine Equipment	disposal	offsite	7	0.046	0.046	0.046	0.880	0.002	0.802	0.049	0.032	0.000	0.000	0.032
9		Clamshell Tugboat propulsion engine	Marine Equipment	dredging	onsite	7	0.612	0.544	0.612	11.387	0.007	6.116	0.631	0.362	0.000	0.000	0.367
9		Clamshell Tugboat auxiliary engine	Marine Equipment	dredging	onsite	7	0.088	0.079	0.088	1.571	0.001	1.103	0.087	0.065	0.000	0.000	0.066
9		Clamshell Tugboat propulsion engine	Marine Equipment	transit	offsite	7	11.008	9.797	11.008	204.968	0.122	110.080	11.360	6.511	0.000	0.000	6.606
9		Clamshell Tugboat auxiliary engine	Marine Equipment	transit	offsite	7	1.588	1.413	1.588	28.286	0.022	19.850	1.568	1.174	0.000	0.000	1.191
9		Clamshell Crew boat propulsion engine	Marine Equipment	support	onsite	7	0.406	0.361	0.406	8.024	0.004	4.061	0.445	0.240	0.000	0.000	0.244
9		Clamshell Crew boat auxiliary engine	Marine Equipment	support	onsite	7	0.034	0.030	0.034	0.600	0.000	0.421	0.033	0.025	0.000	0.000	0.025
9		Clamshell Survey boat propulsion engine	Marine Equipment	dredging	onsite	7	0.362	0.322	0.362	7.160	0.004	3.623	0.397	0.214	0.000	0.000	0.217
10	**Pier J Basin (clam shell dredge 408,000 CY)**																
10		**Marine Clamshell Dredge**															
10		Clamshell Dredge hoist	Marine Equipment	dredging	onsite	68	4.365	4.365	4.365	132.698	0.145	75.661	7.354	5.785	0.000	0.000	5.785
10		Clamshell Dredge generator	Marine Equipment	dredging	onsite	68	3.274	3.274	3.274	99.524	0.109	56.746	5.516	3.196	0.000	0.000	3.196
10		Clamshell Barge dump scow	Marine Equipment	disposal	offsite	68	0.046	0.046	0.046	0.880	0.002	0.802	0.049	0.032	0.000	0.000	0.032
10		Clamshell Tugboat propulsion engine	Marine Equipment	dredging	onsite	68	0.612	0.544	0.612	11.387	0.007	6.116	0.631	0.362	0.000	0.000	0.367
10		Clamshell Tugboat auxiliary engine	Marine Equipment	dredging	onsite	68	0.088	0.079	0.088	1.571	0.001	1.103	0.087	0.065	0.000	0.000	0.066
10		Clamshell Tugboat propulsion engine	Marine Equipment	transit	offsite	68	11.008	9.797	11.008	204.968	0.122	110.080	11.360	6.511	0.000	0.000	6.606
10		Clamshell Tugboat auxiliary engine	Marine Equipment	transit	offsite	68	1.588	1.413	1.588	28.286	0.022	19.850	1.568	1.174	0.000	0.000	1.191
10		Clamshell Crew boat propulsion engine	Marine Equipment	support	onsite	68	0.406	0.361	0.406	8.024	0.004	4.061	0.445	0.240	0.000	0.000	0.244
10		Clamshell Crew boat auxiliary engine	Marine Equipment	support	onsite	68	0.034	0.030	0.034	0.600	0.000	0.421	0.033	0.025	0.000	0.000	0.025
10		Clamshell Survey boat propulsion engine	Marine Equipment	dredging	onsite	68	0.362	0.322	0.362	7.160	0.004	3.623	0.397	0.214	0.000	0.000	0.217

Table H1.28
Alternative 4 Emissions by Task

				Unmitigated Emissions										
				Total										
				PM10	PM2.5	DPM	NOX	SOX	CO	VOC	CO2	CH4	N2O	CO2e
Task ID		**Construction Element/Equipment**	**Source Type 1**	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(tonnes)	(tonnes)	(tonnes)	(tonnes)
9	**Pier T Berths (clam shell dredge Berths T132 to T140, 44,000 CY)**													
9		**Marine Clamshell Dredge**												
9		Clamshell Dredge hoist	Marine Equipment	30.556	30.556	30.556	928.889	1.017	529.630	51.480	40.498	0.000	0.000	40.498
9		Clamshell Dredge generator	Marine Equipment	22.917	22.917	22.917	696.667	0.763	397.222	38.610	22.375	0.000	0.000	22.375
9		Clamshell Barge dump scow	Marine Equipment	0.324	0.324	0.324	6.157	0.011	5.617	0.341	0.221	0.000	0.000	0.221
9		Clamshell Tugboat propulsion engine	Marine Equipment	4.281	3.810	4.281	79.710	0.047	42.809	4.418	2.532	0.000	0.000	2.569
9		Clamshell Tugboat auxiliary engine	Marine Equipment	0.618	0.550	0.618	11.000	0.009	7.719	0.610	0.457	0.000	0.000	0.463
9		Clamshell Tugboat propulsion engine	Marine Equipment	77.056	68.580	77.056	1434.776	0.851	770.557	79.517	45.578	0.001	0.002	46.241
9		Clamshell Tugboat auxiliary engine	Marine Equipment	11.116	9.893	11.116	198.002	0.153	138.949	10.973	8.219	0.000	0.000	8.338
9		Clamshell Crew boat propulsion engine	Marine Equipment	2.842	2.530	2.842	56.166	0.031	28.424	3.113	1.681	0.000	0.000	1.706
9		Clamshell Crew boat auxiliary engine	Marine Equipment	0.236	0.210	0.236	4.198	0.003	2.946	0.233	0.174	0.000	0.000	0.177
9		Clamshell Survey boat propulsion engine	Marine Equipment	2.536	2.257	2.536	50.117	0.028	25.363	2.778	1.500	0.000	0.000	1.522
10	**Pier J Basin (clam shell dredge 408,000 CY)**													
10		**Marine Clamshell Dredge**												
10		Clamshell Dredge hoist	Marine Equipment	296.825	296.825	296.825	9023.492	9.883	5144.974	500.091	393.406	0.000	0.000	393.406
10		Clamshell Dredge generator	Marine Equipment	222.619	222.619	222.619	6767.619	7.412	3858.730	375.069	217.358	0.000	0.000	217.358
10		Clamshell Barge dump scow	Marine Equipment	3.148	3.148	3.148	59.815	0.105	54.568	3.315	2.151	0.000	0.000	2.151
10		Clamshell Tugboat propulsion engine	Marine Equipment	41.586	37.011	41.586	774.324	0.459	415.856	42.914	24.598	0.000	0.001	24.955
10		Clamshell Tugboat auxiliary engine	Marine Equipment	5.999	5.339	5.999	106.858	0.083	74.988	5.922	4.436	0.000	0.000	4.500
10		Clamshell Tugboat propulsion engine	Marine Equipment	748.541	666.201	748.541	13937.827	8.264	7485.406	772.449	442.758	0.007	0.021	449.197
10		Clamshell Tugboat auxiliary engine	Marine Equipment	107.983	96.105	107.983	1923.448	1.490	1349.788	106.599	79.839	0.001	0.004	80.993
10		Clamshell Crew boat propulsion engine	Marine Equipment	27.612	24.575	27.612	545.612	0.305	276.119	30.238	16.332	0.000	0.001	16.570
10		Clamshell Crew boat auxiliary engine	Marine Equipment	2.289	2.038	2.289	40.781	0.032	28.618	2.260	1.693	0.000	0.000	1.717
10		Clamshell Survey boat propulsion engine	Marine Equipment	24.638	21.928	24.638	486.854	0.272	246.383	26.982	14.573	0.000	0.001	14.786

Table H1.28
Alternative 4 Emissions by Task

				Mitigated Peak Day PM10	PM2.5	DPM	NOX	SOX	CO	VOC	CO2	CH4	N2O	CO2e
Task ID		**Construction Element/Equipment**	**Source Type 1**	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(tonnes/day)	(tonnes/day)	(tonnes/day)	(tonnes/day)
9	**Pier T Berths (clam shell dredge Berths T132 to T140, 44,000 CY)**													
9		**Marine Clamshell Dredge**												
9		Clamshell Dredge hoist	Marine Equipment	0.437	0.437	0.437	13.270	0.015	7.566	0.735	0.579	0.000	0.000	0.579
9		Clamshell Dredge generator	Marine Equipment	0.327	0.327	0.327	9.952	0.011	5.675	0.552	0.320	0.000	0.000	0.320
9		Clamshell Barge dump scow	Marine Equipment	0.046	0.046	0.046	0.880	0.002	0.802	0.049	0.032	0.000	0.000	0.032
9		Clamshell Tugboat propulsion engine	Marine Equipment	0.416	0.370	0.416	8.134	0.007	6.116	0.451	0.362	0.000	0.000	0.367
9		Clamshell Tugboat auxiliary engine	Marine Equipment	0.031	0.027	0.031	1.131	0.001	1.213	0.063	0.065	0.000	0.000	0.066
9		Clamshell Tugboat propulsion engine	Marine Equipment	7.485	6.662	7.485	146.406	0.122	110.080	8.114	6.511	0.000	0.000	6.605
9		Clamshell Tugboat auxiliary engine	Marine Equipment	0.556	0.495	0.556	20.366	0.022	21.835	1.129	1.174	0.000	0.000	1.191
9		Clamshell Crew boat propulsion engine	Marine Equipment	0.276	0.246	0.276	5.401	0.004	4.061	0.299	0.240	0.000	0.000	0.244
9		Clamshell Crew boat auxiliary engine	Marine Equipment	0.012	0.010	0.012	0.432	0.000	0.463	0.024	0.025	0.000	0.000	0.025
9		Clamshell Survey boat propulsion engine	Marine Equipment	0.246	0.219	0.246	4.819	0.004	3.623	0.267	0.214	0.000	0.000	0.217
10	**Pier J Basin (clam shell dredge 408,000 CY)**													
10		**Marine Clamshell Dredge**												
10		Clamshell Dredge hoist	Marine Equipment	0.437	0.437	0.437	13.270	0.015	7.566	0.735	0.579	0.000	0.000	0.579
10		Clamshell Dredge generator	Marine Equipment	0.327	0.327	0.327	9.952	0.011	5.675	0.552	0.320	0.000	0.000	0.320
10		Clamshell Barge dump scow	Marine Equipment	0.046	0.046	0.046	0.880	0.002	0.802	0.049	0.032	0.000	0.000	0.032
10		Clamshell Tugboat propulsion engine	Marine Equipment	0.416	0.370	0.416	8.134	0.007	6.116	0.451	0.362	0.000	0.000	0.367
10		Clamshell Tugboat auxiliary engine	Marine Equipment	0.031	0.027	0.031	1.131	0.001	1.213	0.063	0.065	0.000	0.000	0.066
10		Clamshell Tugboat propulsion engine	Marine Equipment	7.485	6.662	7.485	146.406	0.122	110.080	8.114	6.511	0.000	0.000	6.605
10		Clamshell Tugboat auxiliary engine	Marine Equipment	0.556	0.495	0.556	20.366	0.022	21.835	1.129	1.174	0.000	0.000	1.191
10		Clamshell Crew boat propulsion engine	Marine Equipment	0.276	0.246	0.276	5.401	0.004	4.061	0.299	0.240	0.000	0.000	0.244
10		Clamshell Crew boat auxiliary engine	Marine Equipment	0.012	0.010	0.012	0.432	0.000	0.463	0.024	0.025	0.000	0.000	0.025
10		Clamshell Survey boat propulsion engine	Marine Equipment	0.246	0.219	0.246	4.819	0.004	3.623	0.267	0.214	0.000	0.000	0.217
				Note: clamshell dredge would be electric with mitigation; assume 90 percent reduction in diesel exhaust emissions.										

Table H1.28
Alternative 4 Emissions by Task

				Mitigated Emissions										
				Total										
				PM10	PM2.5	DPM	NOX	SOX	CO	VOC	CO2	CH4	N2O	CO2e
Task ID		**Construction Element/Equipment**	**Source Type 1**	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(tonnes)	(tonnes)
9	**Pier T Berths (clam shell dredge Berths T132 to T140, 44,000 CY)**													
9		**Marine Clamshell Dredge**												
9		Clamshell Dredge hoist	Marine Equipment	3.056	3.056	3.056	92.889	0.102	52.963	5.148	4.050	0.000	0.000	4.050
9		Clamshell Dredge generator	Marine Equipment	2.292	2.292	2.292	69.667	0.076	39.722	3.861	2.238	0.000	0.000	2.238
9		Clamshell Barge dump scow	Marine Equipment	0.324	0.324	0.324	6.157	0.011	5.617	0.341	0.221	0.000	0.000	0.221
9		Clamshell Tugboat propulsion engine	Marine Equipment	2.911	2.591	2.911	56.936	0.047	42.809	3.155	2.532	0.000	0.000	2.569
9		Clamshell Tugboat auxiliary engine	Marine Equipment	0.216	0.192	0.216	7.920	0.009	8.491	0.439	0.457	0.000	0.000	0.463
9		Clamshell Tugboat propulsion engine	Marine Equipment	52.398	46.634	52.398	1024.840	0.851	770.557	56.798	45.578	0.000	0.002	46.236
9		Clamshell Tugboat auxiliary engine	Marine Equipment	3.891	3.463	3.891	142.561	0.153	152.844	7.901	8.219	0.000	0.000	8.337
9		Clamshell Crew boat propulsion engine	Marine Equipment	1.933	1.720	1.933	37.804	0.031	28.424	2.095	1.681	0.000	0.000	1.706
9		Clamshell Crew boat auxiliary engine	Marine Equipment	0.082	0.073	0.082	3.023	0.003	3.241	0.168	0.174	0.000	0.000	0.177
9		Clamshell Survey boat propulsion engine	Marine Equipment	1.725	1.535	1.725	33.733	0.028	25.363	1.870	1.500	0.000	0.000	1.522
10	**Pier J Basin (clam shell dredge 408,000 CY)**													
10		**Marine Clamshell Dredge**												
10		Clamshell Dredge hoist	Marine Equipment	29.683	29.683	29.683	902.349	0.988	514.497	50.009	39.341	0.000	0.000	39.341
10		Clamshell Dredge generator	Marine Equipment	22.262	22.262	22.262	676.762	0.741	385.873	37.507	21.736	0.000	0.000	21.736
10		Clamshell Barge dump scow	Marine Equipment	3.148	3.148	3.148	59.815	0.105	54.568	3.315	2.151	0.000	0.000	2.151
10		Clamshell Tugboat propulsion engine	Marine Equipment	28.278	25.168	28.278	553.088	0.459	415.856	30.653	24.598	0.000	0.001	24.953
10		Clamshell Tugboat auxiliary engine	Marine Equipment	2.100	1.869	2.100	76.938	0.083	82.487	4.264	4.436	0.000	0.000	4.499
10		Clamshell Tugboat propulsion engine	Marine Equipment	509.008	453.017	509.008	9955.590	8.264	7485.406	551.749	442.758	0.005	0.021	449.150
10		Clamshell Tugboat auxiliary engine	Marine Equipment	37.794	33.637	37.794	1384.882	1.490	1484.767	76.752	79.839	0.001	0.004	80.987
10		Clamshell Crew boat propulsion engine	Marine Equipment	18.776	16.711	18.776	367.239	0.305	276.119	20.353	16.332	0.000	0.001	16.568
10		Clamshell Crew boat auxiliary engine	Marine Equipment	0.801	0.713	0.801	29.362	0.032	31.480	1.627	1.693	0.000	0.000	1.717
10		Clamshell Survey boat propulsion engine	Marine Equipment	16.754	14.911	16.754	327.690	0.272	246.383	18.161	14.573	0.000	0.001	14.784
				Note: clamshell dredge would be electric with mitigation; assume 90 percent reduction in diesel exhaust emissions.										

Table H1.28
Alternative 4 Emissions by Task

							Unmitigated Emissions Peak Day										
							PM10	PM2.5	DPM	NOX	SOX	CO	VOC	CO2	CH4	N2O	CO2e
Task ID		**Construction Element/Equipment**	**Source Type 1**	**Source Type 2**	**Onsite/Offsite**	**Days Total**	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(tonnes/day)	(tonnes/day)	(tonnes/day)	(tonnes/day)
11	**Pier J Approach (clam shell dredge 1,066,000 CY)**																
11		**Marine Clamshell Dredge**															
11		Clamshell Dredge hoist	Marine Equipment	dredging	onsite	178	4.365	4.365	4.365	132.698	0.145	75.661	7.354	5.785	0.000	0.000	5.785
11		Clamshell Dredge generator	Marine Equipment	dredging	onsite	178	3.274	3.274	3.274	99.524	0.109	56.746	5.516	3.196	0.000	0.000	3.196
11		Clamshell Barge dump scow	Marine Equipment	disposal	offsite	178	0.046	0.046	0.046	0.880	0.002	0.802	0.049	0.032	0.000	0.000	0.032
11		Clamshell Tugboat propulsion engine	Marine Equipment	dredging	onsite	178	0.612	0.544	0.612	11.387	0.007	6.116	0.631	0.362	0.000	0.000	0.367
11		Clamshell Tugboat auxiliary engine	Marine Equipment	dredging	onsite	178	0.088	0.079	0.088	1.571	0.001	1.103	0.087	0.065	0.000	0.000	0.066
11		Clamshell Tugboat propulsion engine	Marine Equipment	transit	offsite	178	11.008	9.797	11.008	204.968	0.122	110.080	11.360	6.511	0.000	0.000	6.606
11		Clamshell Tugboat auxiliary engine	Marine Equipment	transit	offsite	178	1.588	1.413	1.588	28.286	0.022	19.850	1.568	1.174	0.000	0.000	1.191
11		Clamshell Crew boat propulsion engine	Marine Equipment	support	onsite	178	0.406	0.361	0.406	8.024	0.004	4.061	0.445	0.240	0.000	0.000	0.244
11		Clamshell Crew boat auxiliary engine	Marine Equipment	support	onsite	178	0.034	0.030	0.034	0.600	0.000	0.421	0.033	0.025	0.000	0.000	0.025
11		Clamshell Survey boat propulsion engine	Marine Equipment	dredging	onsite	178	0.362	0.322	0.362	7.160	0.004	3.623	0.397	0.214	0.000	0.000	0.217
12	**Pier J Approach (clam shell dredge 2,040,000 CY)**																
12		**Marine Clamshell Dredge**															
12		Clamshell Dredge hoist	Marine Equipment	dredging	onsite	340	4.365	4.365	4.365	132.698	0.145	75.661	7.354	5.785	0.000	0.000	5.785
12		Clamshell Dredge generator	Marine Equipment	dredging	onsite	340	3.274	3.274	3.274	99.524	0.109	56.746	5.516	3.196	0.000	0.000	3.196
12		Clamshell Barge dump scow	Marine Equipment	disposal	offsite	340	0.046	0.046	0.046	0.880	0.002	0.802	0.049	0.032	0.000	0.000	0.032
12		Clamshell Tugboat propulsion engine	Marine Equipment	dredging	onsite	340	0.612	0.544	0.612	11.387	0.007	6.116	0.631	0.362	0.000	0.000	0.367
12		Clamshell Tugboat auxiliary engine	Marine Equipment	dredging	onsite	340	0.088	0.079	0.088	1.571	0.001	1.103	0.087	0.065	0.000	0.000	0.066
12		Clamshell Tugboat propulsion engine	Marine Equipment	transit	offsite	340	11.008	9.797	11.008	204.968	0.122	110.080	11.360	6.511	0.000	0.000	6.606
12		Clamshell Tugboat auxiliary engine	Marine Equipment	transit	offsite	340	1.588	1.413	1.588	28.286	0.022	19.850	1.568	1.174	0.000	0.000	1.191
12		Clamshell Crew boat propulsion engine	Marine Equipment	support	onsite	340	0.406	0.361	0.406	8.024	0.004	4.061	0.445	0.240	0.000	0.000	0.244
12		Clamshell Crew boat auxiliary engine	Marine Equipment	support	onsite	340	0.034	0.030	0.034	0.600	0.000	0.421	0.033	0.025	0.000	0.000	0.025
12		Clamshell Survey boat propulsion engine	Marine Equipment	dredging	onsite	340	0.362	0.322	0.362	7.160	0.004	3.623	0.397	0.214	0.000	0.000	0.217

Table H1.28
Alternative 4 Emissions by Task

				Unmitigated Emissions										
				Total										
				PM10	PM2.5	DPM	NOX	SOX	CO	VOC	CO2	CH4	N2O	CO2e
Task ID		**Construction Element/Equipment**	**Source Type 1**	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(tonnes)	(tonnes)	(tonnes)	(tonnes)
11	**Pier J Approach (clam shell dredge 1,066,000 CY)**													
11		**Marine Clamshell Dredge**												
11		Clamshell Dredge hoist	Marine Equipment	776.984	776.984	776.984	23620.317	25.869	13467.725	1309.063	1029.797	0.000	0.000	1029.797
11		Clamshell Dredge generator	Marine Equipment	582.738	582.738	582.738	17715.238	19.402	10100.794	981.797	568.968	0.000	0.000	568.968
11		Clamshell Barge dump scow	Marine Equipment	8.241	8.241	8.241	156.574	0.274	142.840	8.678	5.631	0.000	0.000	5.631
11		Clamshell Tugboat propulsion engine	Marine Equipment	108.856	96.882	108.856	2026.906	1.202	1088.564	112.333	64.388	0.001	0.003	65.324
11		Clamshell Tugboat auxiliary engine	Marine Equipment	15.703	13.976	15.703	279.717	0.217	196.293	15.502	11.611	0.000	0.001	11.778
11		Clamshell Tugboat propulsion engine	Marine Equipment	1959.415	1743.880	1959.415	36484.311	21.632	19594.152	2021.999	1158.983	0.017	0.055	1175.840
11		Clamshell Tugboat auxiliary engine	Marine Equipment	282.661	251.569	282.661	5034.907	3.901	3533.268	279.040	208.991	0.002	0.010	212.012
11		Clamshell Crew boat propulsion engine	Marine Equipment	72.278	64.328	72.278	1428.219	0.798	722.783	79.153	42.752	0.001	0.002	43.375
11		Clamshell Crew boat auxiliary engine	Marine Equipment	5.993	5.334	5.993	106.750	0.083	74.912	5.916	4.431	0.000	0.000	4.495
11		Clamshell Survey boat propulsion engine	Marine Equipment	64.494	57.400	64.494	1274.411	0.712	644.945	70.629	38.148	0.001	0.002	38.704
12	**Pier J Approach (clam shell dredge 2,040,000 CY)**													
12		**Marine Clamshell Dredge**												
12		Clamshell Dredge hoist	Marine Equipment	1484.127	1484.127	1484.127	45117.460	49.413	25724.868	2500.457	1967.028	0.000	0.000	1967.028
12		Clamshell Dredge generator	Marine Equipment	1113.095	1113.095	1113.095	33838.095	37.060	19293.651	1875.343	1086.792	0.000	0.000	1086.792
12		Clamshell Barge dump scow	Marine Equipment	15.741	15.741	15.741	299.074	0.524	272.840	16.575	10.755	0.000	0.000	10.755
12		Clamshell Tugboat propulsion engine	Marine Equipment	207.928	185.056	207.928	3871.618	2.296	2079.280	214.569	122.988	0.002	0.006	124.777
12		Clamshell Tugboat auxiliary engine	Marine Equipment	29.995	26.696	29.995	534.291	0.414	374.941	29.611	22.178	0.000	0.001	22.498
12		Clamshell Tugboat propulsion engine	Marine Equipment	3742.703	3331.006	3742.703	69689.133	41.319	37427.032	3862.245	2213.788	0.033	0.105	2245.986
12		Clamshell Tugboat auxiliary engine	Marine Equipment	539.915	480.524	539.915	9617.238	7.451	6748.939	532.997	399.196	0.005	0.019	404.967
12		Clamshell Crew boat propulsion engine	Marine Equipment	138.060	122.873	138.060	2728.059	1.524	1380.597	151.192	81.662	0.001	0.004	82.851
12		Clamshell Crew boat auxiliary engine	Marine Equipment	11.447	10.188	11.447	203.904	0.158	143.090	11.301	8.464	0.000	0.000	8.586
12		Clamshell Survey boat propulsion engine	Marine Equipment	123.192	109.641	123.192	2434.268	1.360	1231.917	134.910	72.867	0.001	0.003	73.929

Table H1.28
Alternative 4 Emissions by Task

				Mitigated Peak Day										
				PM10	PM2.5	DPM	NOX	SOX	CO	VOC	CO2	CH4	N2O	CO2e
Task ID		**Construction Element/Equipment**	**Source Type 1**	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(tonnes/day)	(tonnes/day)	(tonnes/day)	(tonnes/day)
11	**Pier J Approach (clam shell dredge 1,066,000 CY)**													
11		**Marine Clamshell Dredge**												
11		Clamshell Dredge hoist	Marine Equipment	0.437	0.437	0.437	13.270	0.015	7.566	0.735	0.579	0.000	0.000	0.579
11		Clamshell Dredge generator	Marine Equipment	0.327	0.327	0.327	9.952	0.011	5.675	0.552	0.320	0.000	0.000	0.320
11		Clamshell Barge dump scow	Marine Equipment	0.046	0.046	0.046	0.880	0.002	0.802	0.049	0.032	0.000	0.000	0.032
11		Clamshell Tugboat propulsion engine	Marine Equipment	0.416	0.370	0.416	8.134	0.007	6.116	0.451	0.362	0.000	0.000	0.367
11		Clamshell Tugboat auxiliary engine	Marine Equipment	0.031	0.027	0.031	1.131	0.001	1.213	0.063	0.065	0.000	0.000	0.066
11		Clamshell Tugboat propulsion engine	Marine Equipment	7.485	6.662	7.485	146.406	0.122	110.080	8.114	6.511	0.000	0.000	6.605
11		Clamshell Tugboat auxiliary engine	Marine Equipment	0.556	0.495	0.556	20.366	0.022	21.835	1.129	1.174	0.000	0.000	1.191
11		Clamshell Crew boat propulsion engine	Marine Equipment	0.276	0.246	0.276	5.401	0.004	4.061	0.299	0.240	0.000	0.000	0.244
11		Clamshell Crew boat auxiliary engine	Marine Equipment	0.012	0.010	0.012	0.432	0.000	0.463	0.024	0.025	0.000	0.000	0.025
11		Clamshell Survey boat propulsion engine	Marine Equipment	0.246	0.219	0.246	4.819	0.004	3.623	0.267	0.214	0.000	0.000	0.217
12	**Pier J Approach (clam shell dredge 2,040,000 CY)**													
12		**Marine Clamshell Dredge**												
12		Clamshell Dredge hoist	Marine Equipment	0.437	0.437	0.437	13.270	0.015	7.566	0.735	0.579	0.000	0.000	0.579
12		Clamshell Dredge generator	Marine Equipment	0.327	0.327	0.327	9.952	0.011	5.675	0.552	0.320	0.000	0.000	0.320
12		Clamshell Barge dump scow	Marine Equipment	0.046	0.046	0.046	0.880	0.002	0.802	0.049	0.032	0.000	0.000	0.032
12		Clamshell Tugboat propulsion engine	Marine Equipment	0.416	0.370	0.416	8.134	0.007	6.116	0.451	0.362	0.000	0.000	0.367
12		Clamshell Tugboat auxiliary engine	Marine Equipment	0.031	0.027	0.031	1.131	0.001	1.213	0.063	0.065	0.000	0.000	0.066
12		Clamshell Tugboat propulsion engine	Marine Equipment	7.485	6.662	7.485	146.406	0.122	110.080	8.114	6.511	0.000	0.000	6.605
12		Clamshell Tugboat auxiliary engine	Marine Equipment	0.556	0.495	0.556	20.366	0.022	21.835	1.129	1.174	0.000	0.000	1.191
12		Clamshell Crew boat propulsion engine	Marine Equipment	0.276	0.246	0.276	5.401	0.004	4.061	0.299	0.240	0.000	0.000	0.244
12		Clamshell Crew boat auxiliary engine	Marine Equipment	0.012	0.010	0.012	0.432	0.000	0.463	0.024	0.025	0.000	0.000	0.025
12		Clamshell Survey boat propulsion engine	Marine Equipment	0.246	0.219	0.246	4.819	0.004	3.623	0.267	0.214	0.000	0.000	0.217
				Note: clamshell dredge would be electric with mitigation; assume 90 percent reduction in diesel exhaust emissions.										

Table H1.28
Alternative 4 Emissions by Task

				Mitigated Emissions										
				Total										
				PM10	PM2.5	DPM	NOX	SOX	CO	VOC	CO2	CH4	N2O	CO2e
Task ID		**Construction Element/Equipment**	**Source Type 1**	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(tonnes)	(tonnes)
11	**Pier J Approach (clam shell dredge 1,066,000 CY)**													
11		**Marine Clamshell Dredge**												
11		Clamshell Dredge hoist	Marine Equipment	77.698	77.698	77.698	2362.032	2.587	1346.772	130.906	102.980	0.000	0.000	102.980
11		Clamshell Dredge generator	Marine Equipment	58.274	58.274	58.274	1771.524	1.940	1010.079	98.180	56.897	0.000	0.000	56.897
11		Clamshell Barge dump scow	Marine Equipment	8.241	8.241	8.241	156.574	0.274	142.840	8.678	5.631	0.000	0.000	5.631
11		Clamshell Tugboat propulsion engine	Marine Equipment	74.022	65.880	74.022	1447.790	1.202	1088.564	80.238	64.388	0.001	0.003	65.318
11		Clamshell Tugboat auxiliary engine	Marine Equipment	5.496	4.892	5.496	201.396	0.217	215.922	11.162	11.611	0.000	0.001	11.778
11		Clamshell Tugboat propulsion engine	Marine Equipment	1332.402	1185.838	1332.402	26060.222	21.632	19594.152	1444.285	1158.983	0.012	0.055	1175.715
11		Clamshell Tugboat auxiliary engine	Marine Equipment	98.932	88.049	98.932	3625.133	3.901	3886.595	200.909	208.991	0.002	0.010	211.995
11		Clamshell Crew boat propulsion engine	Marine Equipment	49.149	43.743	49.149	961.301	0.798	722.783	53.276	42.752	0.000	0.002	43.369
11		Clamshell Crew boat auxiliary engine	Marine Equipment	2.098	1.867	2.098	76.860	0.083	82.403	4.260	4.431	0.000	0.000	4.495
11		Clamshell Survey boat propulsion engine	Marine Equipment	43.856	39.032	43.856	857.777	0.712	644.945	47.539	38.148	0.000	0.002	38.699
12	**Pier J Approach (clam shell dredge 2,040,000 CY)**													
12		**Marine Clamshell Dredge**												
12		Clamshell Dredge hoist	Marine Equipment	148.413	148.413	148.413	4511.746	4.941	2572.487	250.046	196.703	0.000	0.000	196.703
12		Clamshell Dredge generator	Marine Equipment	111.310	111.310	111.310	3383.810	3.706	1929.365	187.534	108.679	0.000	0.000	108.679
12		Clamshell Barge dump scow	Marine Equipment	15.741	15.741	15.741	299.074	0.524	272.840	16.575	10.755	0.000	0.000	10.755
12		Clamshell Tugboat propulsion engine	Marine Equipment	141.391	125.838	141.391	2765.442	2.296	2079.280	153.264	122.988	0.001	0.006	124.764
12		Clamshell Tugboat auxiliary engine	Marine Equipment	10.498	9.344	10.498	384.690	0.414	412.435	21.320	22.178	0.000	0.001	22.496
12		Clamshell Tugboat propulsion engine	Marine Equipment	2545.038	2265.084	2545.038	49777.952	41.319	37427.032	2758.747	2213.788	0.024	0.105	2245.749
12		Clamshell Tugboat auxiliary engine	Marine Equipment	188.970	168.184	188.970	6924.411	7.451	7423.833	383.758	399.196	0.003	0.019	404.935
12		Clamshell Crew boat propulsion engine	Marine Equipment	93.881	83.554	93.881	1836.194	1.524	1380.597	101.764	81.662	0.001	0.004	82.840
12		Clamshell Crew boat auxiliary engine	Marine Equipment	4.007	3.566	4.007	146.811	0.158	157.399	8.136	8.464	0.000	0.000	8.585
12		Clamshell Survey boat propulsion engine	Marine Equipment	83.770	74.556	83.770	1638.450	1.360	1231.917	90.805	72.867	0.001	0.003	73.919
				Note: clamshell dredge would be electric with mitigation; assume 90 percent reduction in diesel exhaust emissions.										

Table H1.28
Alternative 4 Emissions by Task

							Unmitigated Emissions										
							Peak Day										
							PM10	PM2.5	DPM	NOX	SOX	CO	VOC	CO2	CH4	N2O	CO2e
Task ID		**Construction Element/Equipment**	**Source Type 1**	**Source Type 2**	**Onsite/Offsite**	**Days Total**	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(tonnes/day)	(tonnes/day)	(tonnes/day)	(tonnes/day)
13	**Pier J Approach (clam shell dredge 297,000 CY)**																
13		**Marine Clamshell Dredge**															
13		Clamshell Dredge hoist	Marine Equipment	dredging	onsite	50	4.365	4.365	4.365	132.698	0.145	75.661	7.354	5.785	0.000	0.000	5.785
13		Clamshell Dredge generator	Marine Equipment	dredging	onsite	50	3.274	3.274	3.274	99.524	0.109	56.746	5.516	3.196	0.000	0.000	3.196
13		Clamshell Barge dump scow	Marine Equipment	disposal	offsite	50	0.046	0.046	0.046	0.880	0.002	0.802	0.049	0.032	0.000	0.000	0.032
13		Clamshell Tugboat propulsion engine	Marine Equipment	dredging	onsite	50	0.612	0.544	0.612	11.387	0.007	6.116	0.631	0.362	0.000	0.000	0.367
13		Clamshell Tugboat auxiliary engine	Marine Equipment	dredging	onsite	50	0.088	0.079	0.088	1.571	0.001	1.103	0.087	0.065	0.000	0.000	0.066
13		Clamshell Tugboat propulsion engine	Marine Equipment	transit	offsite	50	11.008	9.797	11.008	204.968	0.122	110.080	11.360	6.511	0.000	0.000	6.606
13		Clamshell Tugboat auxiliary engine	Marine Equipment	transit	offsite	50	1.588	1.413	1.588	28.286	0.022	19.850	1.568	1.174	0.000	0.000	1.191
13		Clamshell Crew boat propulsion engine	Marine Equipment	support	onsite	50	0.406	0.361	0.406	8.024	0.004	4.061	0.445	0.240	0.000	0.000	0.244
13		Clamshell Crew boat auxiliary engine	Marine Equipment	support	onsite	50	0.034	0.030	0.034	0.600	0.000	0.421	0.033	0.025	0.000	0.000	0.025
13		Clamshell Survey boat propulsion engine	Marine Equipment	dredging	onsite	50	0.362	0.322	0.362	7.160	0.004	3.623	0.397	0.214	0.000	0.000	0.217

Table H1.28
Alternative 4 Emissions by Task

				Unmitigated Emissions										
				Total										
				PM10	PM2.5	DPM	NOX	SOX	CO	VOC	CO2	CH4	N2O	CO2e
Task ID		**Construction Element/Equipment**	**Source Type 1**	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(tonnes)	(tonnes)	(tonnes)	(tonnes)
13	**Pier J Approach (clam shell dredge 297,000 CY)**													
13		**Marine Clamshell Dredge**												
13		Clamshell Dredge hoist	Marine Equipment	218.254	218.254	218.254	6634.921	7.267	3783.069	367.714	289.269	0.000	0.000	289.269
13		Clamshell Dredge generator	Marine Equipment	163.690	163.690	163.690	4976.190	5.450	2837.302	275.786	159.822	0.000	0.000	159.822
13		Clamshell Barge dump scow	Marine Equipment	2.315	2.315	2.315	43.981	0.077	40.123	2.438	1.582	0.000	0.000	1.582
13		Clamshell Tugboat propulsion engine	Marine Equipment	30.578	27.214	30.578	569.356	0.338	305.776	31.554	18.087	0.000	0.001	18.350
13		Clamshell Tugboat auxiliary engine	Marine Equipment	4.411	3.926	4.411	78.572	0.061	55.138	4.355	3.261	0.000	0.000	3.309
13		Clamshell Tugboat propulsion engine	Marine Equipment	550.398	489.854	550.398	10248.402	6.076	5503.975	567.977	325.557	0.005	0.015	330.292
13		Clamshell Tugboat auxiliary engine	Marine Equipment	79.399	70.665	79.399	1414.300	1.096	992.491	78.382	58.705	0.001	0.003	59.554
13		Clamshell Crew boat propulsion engine	Marine Equipment	20.303	18.070	20.303	401.185	0.224	203.029	22.234	12.009	0.000	0.001	12.184
13		Clamshell Crew boat auxiliary engine	Marine Equipment	1.683	1.498	1.683	29.986	0.023	21.043	1.662	1.245	0.000	0.000	1.263
13		Clamshell Survey boat propulsion engine	Marine Equipment	18.116	16.124	18.116	357.981	0.200	181.164	19.840	10.716	0.000	0.001	10.872

Table H1.28
Alternative 4 Emissions by Task

				Mitigated										
				Peak Day										
				PM10	PM2.5	DPM	NOX	SOX	CO	VOC	CO2	CH4	N2O	CO2e
Task ID		**Construction Element/Equipment**	**Source Type 1**	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(tonnes/day)	(tonnes/day)	(tonnes/day)	(tonnes/day)
13	**Pier J Approach (clam shell dredge 297,000 CY)**													
13		**Marine Clamshell Dredge**												
13		Clamshell Dredge hoist	Marine Equipment	0.437	0.437	0.437	13.270	0.015	7.566	0.735	0.579	0.000	0.000	0.579
13		Clamshell Dredge generator	Marine Equipment	0.327	0.327	0.327	9.952	0.011	5.675	0.552	0.320	0.000	0.000	0.320
13		Clamshell Barge dump scow	Marine Equipment	0.046	0.046	0.046	0.880	0.002	0.802	0.049	0.032	0.000	0.000	0.032
13		Clamshell Tugboat propulsion engine	Marine Equipment	0.416	0.370	0.416	8.134	0.007	6.116	0.451	0.362	0.000	0.000	0.367
13		Clamshell Tugboat auxiliary engine	Marine Equipment	0.031	0.027	0.031	1.131	0.001	1.213	0.063	0.065	0.000	0.000	0.066
13		Clamshell Tugboat propulsion engine	Marine Equipment	7.485	6.662	7.485	146.406	0.122	110.080	8.114	6.511	0.000	0.000	6.605
13		Clamshell Tugboat auxiliary engine	Marine Equipment	0.556	0.495	0.556	20.366	0.022	21.835	1.129	1.174	0.000	0.000	1.191
13		Clamshell Crew boat propulsion engine	Marine Equipment	0.276	0.246	0.276	5.401	0.004	4.061	0.299	0.240	0.000	0.000	0.244
13		Clamshell Crew boat auxiliary engine	Marine Equipment	0.012	0.010	0.012	0.432	0.000	0.463	0.024	0.025	0.000	0.000	0.025
13		Clamshell Survey boat propulsion engine	Marine Equipment	0.246	0.219	0.246	4.819	0.004	3.623	0.267	0.214	0.000	0.000	0.217

Note: clamshell dredge would be electric with mitigation; assume 90 percent reduction in diesel exhaust emissions.

Table H1.28
Alternative 4 Emissions by Task

				Mitigated Emissions Total										
				PM10	PM2.5	DPM	NOX	SOX	CO	VOC	CO2	CH4	N2O	CO2e
Task ID		**Construction Element/Equipment**	**Source Type 1**	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(tonnes)	(tonnes)
13	**Pier J Approach (clam shell dredge 297,000 CY)**													
13		**Marine Clamshell Dredge**												
13		Clamshell Dredge hoist	Marine Equipment	21.825	21.825	21.825	663.492	0.727	378.307	36.771	28.927	0.000	0.000	28.927
13		Clamshell Dredge generator	Marine Equipment	16.369	16.369	16.369	497.619	0.545	283.730	27.579	15.982	0.000	0.000	15.982
13		Clamshell Barge dump scow	Marine Equipment	2.315	2.315	2.315	43.981	0.077	40.123	2.438	1.582	0.000	0.000	1.582
13		Clamshell Tugboat propulsion engine	Marine Equipment	20.793	18.506	20.793	406.683	0.338	305.776	22.539	18.087	0.000	0.001	18.348
13		Clamshell Tugboat auxiliary engine	Marine Equipment	1.544	1.374	1.544	56.572	0.061	60.652	3.135	3.261	0.000	0.000	3.308
13		Clamshell Tugboat propulsion engine	Marine Equipment	374.270	333.101	374.270	7320.287	6.076	5503.975	405.698	325.557	0.003	0.015	330.257
13		Clamshell Tugboat auxiliary engine	Marine Equipment	27.790	24.733	27.790	1018.296	1.096	1091.740	56.435	58.705	0.000	0.003	59.549
13		Clamshell Crew boat propulsion engine	Marine Equipment	13.806	12.287	13.806	270.029	0.224	203.029	14.965	12.009	0.000	0.001	12.182
13		Clamshell Crew boat auxiliary engine	Marine Equipment	0.589	0.524	0.589	21.590	0.023	23.147	1.197	1.245	0.000	0.000	1.263
13		Clamshell Survey boat propulsion engine	Marine Equipment	12.319	10.964	12.319	240.949	0.200	181.164	13.354	10.716	0.000	0.001	10.870

Note: clamshell dredge would be electric with mitigation; assume 90 percent reduction in diesel exhaust emissions.

Table H1.29
Alternative 5 Emissions by Task

						Unmitigated Emissions										
						Peak Day										
						PM10	**PM2.5**	**DPM**	**NOX**	**SOX**	**CO**	**VOC**	**CO2**	**CH4**	**N2O**	**CO2e**
Task ID	Construction Element/Equipment	Source Type 1	Source Type 2	Onsite/Offsite	Days Total	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(tonnes/day)	(tonnes/day)	(tonnes/day)	(tonnes/day)
1	**Electrical Substation Construction at Pier J (mitigation only)**															
1	**Off-Road Equipment**															
1	Caterpillar 320 excavator	Offroad Construction Equipment		onsite	20	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1	Small asphalt roller	Offroad Construction Equipment		onsite	26	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1	Water truck	Offroad Construction Equipment		onsite	20	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1	Forklift	Offroad Construction Equipment		onsite	22	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1	Mobile crane (35 ton)	Offroad Construction Equipment		onsite	2	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1	On-Road Vehicles															
1	Haul trucks	Onroad Construction Vehicles		onsite	5	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1	Supply trucks	Onroad Construction Vehicles		onsite	5	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1	Haul trucks	Onroad Construction Vehicles		offsite	5	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1	Supply trucks	Onroad Construction Vehicles		offsite	5	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1	Workers	Onroad Construction Vehicles		offsite	60	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1	Fugitive Dust															
1	Soil handling	Fugitive Emissions		onsite	20	n/a	n/a									
1	Asphalting	Fugitive Emissions		onsite												
2	**Pier J Breakwater Construction**															
2	**Marine Activities**															
2	Pier J Breakwater Tugboat propulsion engine	Marine Equipment		onsite	54	5.8097516	5.170679	5.80975164	108.17758	0.0641397	58.097516	5.9953151	3.4364356	5.16519E-05	0.000163389	3.4864167
2	Pier J Breakwater Tugboat auxiliary engine	Marine Equipment		onsite	54	1.0586571	0.9422048	1.05865709	18.857329	0.0146095	13.233214	1.045093	0.7827372	9.00388E-06	3.7216E-05	0.7940526
2	Pier J Breakwater Crew boat propulsion engine	Marine Equipment		onsite	54	0.4060579	0.3613915	0.40605791	8.0237043	0.0044829	4.0605791	0.4446821	0.240181	3.83111E-06	1.14196E-05	0.2436798
2	Pier J Breakwater Crew boat auxiliary engine	Marine Equipment		onsite	54	0.0336683	0.0299648	0.03366828	0.5997163	0.0004646	0.4208535	0.0332369	0.0248933	2.86349E-07	1.18357E-06	0.0252531
2	Pier J Breakwater Survey boat propulsion engine	Marine Equipment		onsite	54	0.3623286	0.3224725	0.3623286	7.1596131	0.0040001	3.623286	0.3967933	0.2143153	3.41853E-06	1.01898E-05	0.2174374
2	Off-Road Equipment															
2	Piling crane	Offroad Construction Equipment		onsite	54	0.208629	0.1919387	0.208629	5.0022874	0.0077334	2.6745656	0.4666913	0.3799798	0	0	0.3799798
2	Long arm excavator	Offroad Construction Equipment		onsite	54	0.0752002	0.0691842	0.07520024	2.1876515	0.0129141	2.7752975	0.3208734	0.6339765	0	0	0.6339765
2	On-Road Vehicles															
2	Delivery Trucks	Onroad Construction Vehicles		onsite	5	0.1472023	0.0369081	0.00015221	0.0787952	0.0002454	0.0091846	0.0010522	0.0117847	2.21692E-08	1.85239E-06	0.0123372
2	Delivery Trucks	Onroad Construction Vehicles		offsite	5	0.3360402	0.1510393	0.0222394	3.216786	0.0191435	0.1848032	0.0255705	0.919133	5.38734E-07	0.000144475	0.9622
2	Workers	Onroad Construction Vehicles		offsite	54	0.0643898	0.0267123	0	0.0582129	0.0036865	0.9591501	0.0149813	0.1690333	1.73503E-06	2.96976E-06	0.1699616
3	**Approach Channel (hopper dredge 2,600,000 CY)**															
3	**Marine Hopper Dredge**															
3	Hopper propulsion engine	Marine Equipment	dredging	onsite	150	26.632138	23.702603	26.6321383	495.89041	0.2940188	266.32138	27.482769	15.752761	0.000236775	0.000748981	15.981876
3	Hopper propulsion engine	Marine Equipment	transit	offsite	150	50.30515	44.771584	50.3051501	936.68189	0.5553689	503.0515	51.911897	29.755215	0.000447241	0.001414742	30.187989
3	Hopper auxiliary engine	Marine Equipment	disposal	near shore	150	0.2219345	0.1975217	0.22193449	5.0601063	0.0040836	3.6989081	0.2804364	0.2187883	2.41607E-06	1.04025E-05	0.2219487
3	Hopper Crew boat propulsion engine	Marine Equipment	support	onsite	150	0.4060579	0.3613915	0.40605791	8.0237043	0.0044829	4.0605791	0.4446821	0.240181	3.83111E-06	1.14196E-05	0.2436798
3	Hopper Crew boat auxiliary engine	Marine Equipment	support	onsite	150	0.0336683	0.0299648	0.03366828	0.5997163	0.0004646	0.4208535	0.0332369	0.0248933	2.86349E-07	1.18357E-06	0.0252531
3	Hopper Survey boat propulsion engine	Marine Equipment	dredging	onsite	150	1.4493144	1.2898898	1.44931439	28.638452	0.0160004	14.493144	1.5871732	0.8572613	1.36741E-05	4.07594E-05	0.8697495

Table H1.29
Alternative 5 Emissions by Task

			Unmitigated Emissions										
			Total										
			PM10	PM2.5	DPM	NOX	SOX	CO	VOC	CO2	CH4	N2O	CO2e
Task ID		Construction Element/Equipment	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(tonnes)	(tonnes)	(tonnes)	(tonnes)
1	**Electrical Substation Construction at Pier J (mitigation on**												
1		**Off-Road Equipment**											
1		Caterpillar 320 excavator	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1		Small asphalt roller	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1		Water truck	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1		Forklift	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1		Mobile crane (35 ton)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1		On-Road Vehicles											
1		Haul trucks	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1		Supply trucks	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1		Haul trucks	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1		Supply trucks	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1		Workers	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1		Fugitive Dust											
1		Soil handling	n/a	n/a									
1		Asphalting											
2	**Pier J Breakwater Construction**												
2		**Marine Activities**											
2		Pier J Breakwater Tugboat propulsion engine	313.72659	279.21666	313.72659	5841.5891	3.4635415	3137.2659	323.74702	185.56752	0.002789205	0.008822996	188.2665
2		Pier J Breakwater Tugboat auxiliary engine	57.167483	50.87906	57.167483	1018.2958	0.7889113	714.59353	56.435024	42.267807	0.000486209	0.002009666	42.878843
2		Pier J Breakwater Crew boat propulsion engine	21.927127	19.515143	21.927127	433.28003	0.2420755	219.27127	24.012836	12.969773	0.00020688	0.000616661	13.15871
2		Pier J Breakwater Crew boat auxiliary engine	1.8180873	1.6180977	1.8180873	32.38468	0.0250896	22.726091	1.7947931	1.3442356	1.54628E-05	6.3913E-05	1.3636682
2		Pier J Breakwater Survey boat propulsion engine	19.565744	17.413512	19.565744	386.61911	0.2160058	195.65744	21.426838	11.573028	0.0001846	0.000550251	11.741618
2		Off-Road Equipment											
2		Piling crane	11.265966	10.364689	11.265966	270.12352	0.4176015	144.42654	25.20133	20.518908	0	0	20.518908
2		Long arm excavator	4.0608129	3.7359478	4.0608129	118.13318	0.6973593	149.86606	17.327165	34.234729	0	0	34.234729
2		On-Road Vehicles											
2		Delivery Trucks	0.7360113	0.1845407	0.0007611	0.3939759	0.0012272	0.0459231	0.0052612	0.0589233	1.10846E-07	9.26193E-06	0.0616862
2		Delivery Trucks	1.680201	0.7551964	0.111197	16.08393	0.0957177	0.924016	0.1278527	4.595665	2.69367E-06	0.000722375	4.811
2		Workers	3.4770481	1.4424651	0	3.1434973	0.199072	51.794108	0.8089905	9.1277972	9.36918E-05	0.000160367	9.1779288
3	**Approach Channel (hopper dredge 2,600,000 CY)**												
3		**Marine Hopper Dredge**											
3		Hopper propulsion engine	3994.8207	3555.3905	3994.8207	74383.562	44.102821	39948.207	4122.4153	2362.9141	0.035516193	0.112347143	2397.2814
3		Hopper propulsion engine	7545.7725	6715.7375	7545.7725	140502.28	83.305328	75457.725	7786.7845	4463.2822	0.067086143	0.212211269	4528.1983
3		Hopper auxiliary engine	33.290173	29.628254	33.290173	759.01594	0.6125392	554.83621	42.065462	32.818251	0.00036241	0.001560377	33.292304
3		Hopper Crew boat propulsion engine	60.908687	54.208731	60.908687	1203.5556	0.6724319	609.08687	66.702321	36.027147	0.000574666	0.001712947	36.551972
3		Hopper Crew boat auxiliary engine	5.0502425	4.4947158	5.0502425	89.957445	0.0696933	63.128031	4.9855363	3.7339877	4.29523E-05	0.000177536	3.7879673
3		Hopper Survey boat propulsion engine	217.39716	193.48347	217.39716	4295.7678	2.4000646	2173.9716	238.07598	128.5892	0.002051116	0.006113904	130.46242

Table H1.29
Alternative 5 Emissions by Task

		Mitigated										
		Peak Day										
		PM10	PM2.5	DPM	NOX	SOX	CO	VOC	CO2	CH4	N2O	CO2e
Task ID	Construction Element/Equipment	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(tonnes/day)	(tonnes/day)	(tonnes/day)	(tonnes/day)
1	**Electrical Substation Construction at Pier J (mitigation on**											
1	**Off-Road Equipment**											
1	Caterpillar 320 excavator	0.0164868	0.0164868	0.01648677	0.3297354	0.005393	1.2259134	0.1560831	0.2647818	0	0	0.2647818
1	Small asphalt roller	0.0048656	0.0048656	0.00486561	0.7353704	0.0011814	0.9067725	0.040755	0.058124	0	0	0.058124
1	Water truck	0.0301587	0.0301587	0.03015873	0.6031746	0.0098162	2.5873661	0.2964	0	0	0	0
1	Forklift	0.00097	0.00097	0.00097002	0.1466049	0.0002398	0.1631393	0.008125	0	0	0	0
1	Mobile crane (35 ton)	0.0216349	0.0216349	0.02163492	0.4326984	0.0069786	2.413528	0.212628	0	0	0	0
1	On-Road Vehicles											
1	Haul trucks	0.0883214	0.0221449	9.1328E-05	0.0472771	0.0001473	0.0055108	0.0006313	0.0070708	1.33015E-08	1.11143E-06	0.0074023
1	Supply trucks	0.2060832	0.0516714	0.0002131	0.1103132	0.0003436	0.0128585	0.0014731	0.0164985	3.10369E-08	2.59334E-06	0.0172721
1	Haul trucks	0.0110893	0.0049843	0.0007339	0.1061539	0.0006317	0.0060985	0.0008438	0.0303314	1.77782E-08	4.76767E-06	0.0317526
1	Supply trucks	0.0470456	0.0211455	0.00311352	0.45035	0.0026801	0.0258724	0.0035799	0.1286786	7.54228E-08	2.02265E-05	0.134708
1	Workers	0.0613236	0.0254403	0	0.0554409	0.003511	0.9134763	0.0142679	0.1609841	1.65241E-06	2.82834E-06	0.1618682
1	Fugitive Dust											
1	Soil handling	2.0058916	0.3037493									
1	Asphalting											
2	**Pier J Breakwater Construction**											
2	**Marine Activities**											
2	Pier J Breakwater Tugboat propulsion engine	3.9506311	3.5160617	3.95063112	77.269697	0.0641397	58.097516	4.2823679	3.4364356	3.68942E-05	0.000163389	3.4860478
2	Pier J Breakwater Tugboat auxiliary engine	0.37053	0.3297717	0.37052998	13.577277	0.0146095	14.556535	0.752467	0.7827372	6.48279E-06	3.7216E-05	0.7939896
2	Pier J Breakwater Crew boat propulsion engine	0.2761194	0.2457462	0.27611938	5.4005702	0.0044829	4.0605791	0.2993053	0.240181	2.57863E-06	1.14196E-05	0.2436485
2	Pier J Breakwater Crew boat auxiliary engine	0.0117839	0.0104877	0.0117839	0.4317957	0.0004646	0.4629389	0.0239306	0.0248933	2.06171E-07	1.18357E-06	0.0252511
2	Pier J Breakwater Survey boat propulsion engine	0.2463834	0.2192813	0.24638345	4.8189703	0.0040001	3.623286	0.2670724	0.2143153	2.30093E-06	1.01898E-05	0.2174094
2	Off-Road Equipment											
2	Piling crane	0.0239749	0.0239749	0.02397487	0.4794974	0.0077334	2.6745656	0.235625	0.3799798	0	0	0.3799798
2	Long arm excavator	0.0395833	0.0395833	0.03958333	0.7916667	0.0129141	2.7752975	0.3208734	0.6339765	0	0	0.6339765
2	On-Road Vehicles											
2	Delivery Trucks	0.1472023	0.0369081	0.00015221	0.0787952	0.0002454	0.0091846	0.0010522	0.0117847	2.21692E-08	1.85239E-06	0.0123372
2	Delivery Trucks	0.3360402	0.1510393	0.0222394	3.216786	0.0191435	0.1848032	0.0255705	0.919133	5.38734E-07	0.000144475	0.9622
2	Workers	0.0643898	0.0267123	0	0.0582129	0.0036865	0.9591501	0.0149813	0.1690333	1.73503E-06	2.96976E-06	0.1699616
3	**Approach Channel (hopper dredge 2,600,000 CY)**											
3	**Marine Hopper Dredge**											
3	Hopper propulsion engine	26.632138	23.702603	26.6321383	495.89041	0.2940188	266.32138	27.482769	15.752761	0.000236775	0.000748981	15.981876
3	Hopper propulsion engine	50.30515	44.771584	50.3051501	936.68189	0.5553689	503.0515	51.911897	29.755215	0.000447241	0.001414742	30.187989
3	Hopper auxiliary engine	0.2219345	0.1975217	0.22193449	5.0601063	0.0040836	3.6989081	0.2804364	0.2187883	2.41607E-06	1.04025E-05	0.2219487
3	Hopper Crew boat propulsion engine	0.2761194	0.2457462	0.27611938	5.4005702	0.0044829	4.0605791	0.2993053	0.240181	2.57863E-06	1.14196E-05	0.2436485
3	Hopper Crew boat auxiliary engine	0.0117839	0.0104877	0.0117839	0.4317957	0.0004646	0.4629389	0.0239306	0.0248933	2.06171E-07	1.18357E-06	0.0252511
3	Hopper Survey boat propulsion engine	0.9855338	0.8771251	0.98553378	19.275881	0.0160004	14.493144	1.0682896	0.8572613	9.20373E-06	4.07594E-05	0.8696377

Table H1.29
Alternative 5 Emissions by Task

		Mitigated Emissions										
		Total										
		PM10	PM2.5	DPM	NOX	SOX	CO	VOC	CO2	CH4	N2O	CO2e
Task ID	Construction Element/Equipment	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(tonnes)	(tonnes)
1	**Electrical Substation Construction at Pier J (mitigation on**											
1	**Off-Road Equipment**											
1	Caterpillar 320 excavator	0.3297354	0.3297354	0.3297354	6.594709	0.1078608	24.518268	3.1216628	5.2956351	0	0	5.2956351
1	Small asphalt roller	0.1265058	0.1265058	0.1265058	19.11963	0.0307154	23.576085	1.05963	1.5112234	0	0	1.5112234
1	Water truck	0.6031746	0.6031746	0.6031746	12.063492	0.1963245	51.747323	5.928	0	0	0	0
1	Forklift	0.0213404	0.0213404	0.0213404	3.2253086	0.0052753	3.5890653	0.17875	0	0	0	0
1	Mobile crane (35 ton)	0.0432698	0.0432698	0.0432698	0.8653968	0.0139572	4.827056	0.425256	0	0	0	0
1	On-Road Vehicles											
1	Haul trucks	0.4416068	0.1107244	0.0004566	0.2363855	0.0007363	0.0275539	0.0031567	0.035354	6.65075E-08	5.55716E-06	0.0370117
1	Supply trucks	1.0304159	0.258357	0.0010655	0.5515662	0.0017181	0.0642924	0.0073657	0.0824927	1.55184E-07	1.29667E-05	0.0863606
1	Haul trucks	0.0554466	0.0249215	0.0036695	0.5307697	0.0031587	0.0304925	0.0042191	0.1516569	8.88911E-08	2.38384E-05	0.158763
1	Supply trucks	0.2352281	0.1057275	0.0155676	2.2517502	0.0134005	0.1293622	0.0178994	0.6433931	3.77114E-07	0.000101132	0.67354
1	Workers	3.679416	1.526418	0	3.3264522	0.2106582	54.80858	0.8560746	9.6590447	9.91447E-05	0.0001697	9.712094
1	Fugitive Dust											
1	Soil handling	40.117832	6.074986									
1	Asphalting											
2	**Pier J Breakwater Construction**											
2	**Marine Activities**											
2	Pier J Breakwater Tugboat propulsion engine	213.33408	189.86733	213.33408	4172.5636	3.4635415	3137.2659	231.24787	185.56752	0.001992289	0.008822996	188.24658
2	Pier J Breakwater Tugboat auxiliary engine	20.008619	17.807671	20.008619	733.17297	0.7889113	786.05289	40.633218	42.267807	0.000350071	0.002009666	42.87544
2	Pier J Breakwater Crew boat propulsion engine	14.910446	13.270297	14.910446	291.63079	0.2420755	219.27127	16.162485	12.969773	0.000139246	0.000616661	13.157019
2	Pier J Breakwater Crew boat auxiliary engine	0.6363306	0.5663342	0.6363306	23.31697	0.0250896	24.9987	1.292251	1.3442356	1.11332E-05	6.3913E-05	1.36356
2	Pier J Breakwater Survey boat propulsion engine	13.304706	11.841188	13.304706	260.2244	0.2160058	195.65744	14.42191	11.573028	0.00012425	0.000550251	11.740109
2	Off-Road Equipment											
2	Piling crane	1.2946429	1.2946429	1.2946429	25.892857	0.4176015	144.42654	12.72375	20.518908	0	0	20.518908
2	Long arm excavator	2.1375	2.1375	2.1375	42.75	0.6973593	149.86606	17.327165	34.234729	0	0	34.234729
2	On-Road Vehicles											
2	Delivery Trucks	0.7360113	0.1845407	0.0007611	0.3939759	0.0012272	0.0459231	0.0052612	0.0589233	1.10846E-07	9.26193E-06	0.0616862
2	Delivery Trucks	1.680201	0.7551964	0.111197	16.08393	0.0957177	0.924016	0.1278527	4.595665	2.69367E-06	0.000722375	4.811
2	Workers	3.4770481	1.4424651	0	3.1434973	0.199072	51.794108	0.8089905	9.1277972	9.36918E-05	0.000160367	9.1779288
3	**Approach Channel (hopper dredge 2,600,000 CY)**											
3	**Marine Hopper Dredge**											
3	Hopper propulsion engine	3994.8207	3555.3905	3994.8207	74383.562	44.102821	39948.207	4122.4153	2362.9141	0.035516193	0.112347143	2397.2814
3	Hopper propulsion engine	7545.7725	6715.7375	7545.7725	140502.28	83.305328	75457.725	7786.7845	4463.2822	0.067086143	0.212211269	4528.1983
3	Hopper auxiliary engine	33.290173	29.628254	33.290173	759.01594	0.6125392	554.83621	42.065462	32.818251	0.00036241	0.001560377	33.292304
3	Hopper Crew boat propulsion engine	41.417907	36.861937	41.417907	810.08553	0.6724319	609.08687	44.895793	36.027147	0.000386795	0.001712947	36.547275
3	Hopper Crew boat auxiliary engine	1.7675849	1.5731505	1.7675849	64.76936	0.0696933	69.440835	3.5895861	3.7339877	3.09257E-05	0.000177536	3.7876666
3	Hopper Survey boat propulsion engine	147.83007	131.56876	147.83007	2891.3822	2.4000646	2173.9716	160.24345	128.5892	0.001380559	0.006113904	130.44566

Table H1.29
Alternative 5 Emissions by Task

						Unmitigated Emissions Peak Day PM10										
Task ID	Construction Element/Equipment	Source Type 1	Source Type 2	Onsite/Offsite	Days Total	PM10 (lb/day)	PM2.5 (lb/day)	DPM (lb/day)	NOX (lb/day)	SOX (lb/day)	CO (lb/day)	VOC (lb/day)	CO2 (tonnes/day)	CH4 (tonnes/day)	N2O (tonnes/day)	CO2e (tonnes/day)
4	**Main Channel Widening (clam shell dredge 1,065,000 CY)**															
4	**Marine Clamshell Dredge**															
4	Clamshell Dredge hoist	Marine Equipment	dredging	onsite	177	4.3650794	4.3650794	4.36507937	132.69841	0.145332	75.661376	7.3542857	5.7853765	0	0	5.7853765
4	Clamshell Dredge generator	Marine Equipment	dredging	onsite	177	3.2738095	3.2738095	3.27380952	99.52381	0.108999	56.746032	5.5157143	3.1964473	0	0	3.1964473
4	Clamshell Barge dump scow	Marine Equipment	disposal	offsite	177	0.0462963	0.0462963	0.0462963	0.8796296	0.0015414	0.8024691	0.04875	0.0382277	0	0	0.0382277
4	Clamshell Tugboat propulsion engine	Marine Equipment	dredging	onsite	177	0.6115528	0.544282	0.6115528	11.387113	0.0067515	6.115528	0.6310858	0.3617301	5.43705E-06	1.71988E-05	0.3669912
4	Clamshell Tugboat auxiliary engine	Marine Equipment	dredging	onsite	177	0.0882214	0.0785171	0.08822142	1.5714441	0.0012175	1.1027678	0.0870911	0.0652281	7.50323E-07	3.10134E-06	0.0661711
4	Clamshell Tugboat propulsion engine	Marine Equipment	transit	offsite	177	11.00795	9.7970759	11.0079505	204.96804	0.1215278	110.0795	11.359544	6.5111411	9.78668E-05	0.000309579	6.6058422
4	Clamshell Tugboat auxiliary engine	Marine Equipment	transit	offsite	177	1.5879856	1.4133072	1.58798563	28.285994	0.0219142	19.84982	1.5676396	1.1741058	1.35058E-05	5.5824E-05	1.191079
4	Clamshell Crew boat propulsion engine	Marine Equipment	support	onsite	177	0.4060579	0.3613915	0.40605791	8.0237043	0.0044829	4.0605791	0.4446821	0.240181	3.83111E-06	1.14196E-05	0.2436798
4	Clamshell Crew boat auxiliary engine	Marine Equipment	support	onsite	177	0.0336683	0.0299648	0.03366828	0.5997163	0.0004646	0.4208535	0.0332369	0.0248933	2.86349E-07	1.18357E-06	0.0252531
4	Clamshell Survey boat propulsion engine	Marine Equipment	dredging	onsite	177	0.3623286	0.3224725	0.3623286	7.1596131	0.0040001	3.623286	0.3967933	0.2143153	3.41853E-06	1.01898E-05	0.2174374
5	**West Basin (clam shell dredge 717,000 CY)**															
5	**Marine Clamshell Dredge**															
5	Clamshell Dredge hoist	Marine Equipment	dredging	onsite	120	4.3650794	4.3650794	4.36507937	132.69841	0.145332	75.661376	7.3542857	5.7853765	0	0	5.7853765
5	Clamshell Dredge generator	Marine Equipment	dredging	onsite	120	3.2738095	3.2738095	3.27380952	99.52381	0.108999	56.746032	5.5157143	3.1964473	0	0	3.1964473
5	Clamshell Barge dump scow	Marine Equipment	disposal	offsite	120	0.0462963	0.0462963	0.0462963	0.8796296	0.0015414	0.8024691	0.04875	0.0382277	0	0	0.0382277
5	Clamshell Tugboat propulsion engine	Marine Equipment	dredging	onsite	120	0.6115528	0.544282	0.6115528	11.387113	0.0067515	6.115528	0.6310858	0.3617301	5.43705E-06	1.71988E-05	0.3669912
5	Clamshell Tugboat auxiliary engine	Marine Equipment	dredging	onsite	120	0.0882214	0.0785171	0.08822142	1.5714441	0.0012175	1.1027678	0.0870911	0.0652281	7.50323E-07	3.10134E-06	0.0661711
5	Clamshell Tugboat propulsion engine	Marine Equipment	transit	offsite	120	11.00795	9.7970759	11.0079505	204.96804	0.1215278	110.0795	11.359544	6.5111411	9.78668E-05	0.000309579	6.6058422
5	Clamshell Tugboat auxiliary engine	Marine Equipment	transit	offsite	120	1.5879856	1.4133072	1.58798563	28.285994	0.0219142	19.84982	1.5676396	1.1741058	1.35058E-05	5.5824E-05	1.191079
5	Clamshell Crew boat propulsion engine	Marine Equipment	support	onsite	120	0.4060579	0.3613915	0.40605791	8.0237043	0.0044829	4.0605791	0.4446821	0.240181	3.83111E-06	1.14196E-05	0.2436798
5	Clamshell Crew boat auxiliary engine	Marine Equipment	support	onsite	120	0.0336683	0.0299648	0.03366828	0.5997163	0.0004646	0.4208535	0.0332369	0.0248933	2.86349E-07	1.18357E-06	0.0252531
5	Clamshell Survey boat propulsion engine	Marine Equipment	dredging	onsite	120	0.3623286	0.3224725	0.3623286	7.1596131	0.0040001	3.623286	0.3967933	0.2143153	3.41853E-06	1.01898E-05	0.2174374
6	**Pier J Basin (clam shell dredge 258,000 CY)**															
6	**Marine Clamshell Dredge**															
6	Clamshell Dredge hoist	Marine Equipment	dredging	onsite	43	4.3650794	4.3650794	4.36507937	132.69841	0.145332	75.661376	7.3542857	5.7853765	0	0	5.7853765
6	Clamshell Dredge generator	Marine Equipment	dredging	onsite	43	3.2738095	3.2738095	3.27380952	99.52381	0.108999	56.746032	5.5157143	3.1964473	0	0	3.1964473
6	Clamshell Barge dump scow	Marine Equipment	disposal	offsite	43	0.0462963	0.0462963	0.0462963	0.8796296	0.0015414	0.8024691	0.04875	0.0382277	0	0	0.0382277
6	Clamshell Tugboat propulsion engine	Marine Equipment	dredging	onsite	43	0.6115528	0.544282	0.6115528	11.387113	0.0067515	6.115528	0.6310858	0.3617301	5.43705E-06	1.71988E-05	0.3669912
6	Clamshell Tugboat auxiliary engine	Marine Equipment	dredging	onsite	43	0.0882214	0.0785171	0.08822142	1.5714441	0.0012175	1.1027678	0.0870911	0.0652281	7.50323E-07	3.10134E-06	0.0661711
6	Clamshell Tugboat propulsion engine	Marine Equipment	transit	offsite	43	11.00795	9.7970759	11.0079505	204.96804	0.1215278	110.0795	11.359544	6.5111411	9.78668E-05	0.000309579	6.6058422
6	Clamshell Tugboat auxiliary engine	Marine Equipment	transit	offsite	43	1.5879856	1.4133072	1.58798563	28.285994	0.0219142	19.84982	1.5676396	1.1741058	1.35058E-05	5.5824E-05	1.191079
6	Clamshell Crew boat propulsion engine	Marine Equipment	support	onsite	43	0.4060579	0.3613915	0.40605791	8.0237043	0.0044829	4.0605791	0.4446821	0.240181	3.83111E-06	1.14196E-05	0.2436798
6	Clamshell Crew boat auxiliary engine	Marine Equipment	support	onsite	43	0.0336683	0.0299648	0.03366828	0.5997163	0.0004646	0.4208535	0.0332369	0.0248933	2.86349E-07	1.18357E-06	0.0252531
6	Clamshell Survey boat propulsion engine	Marine Equipment	dredging	onsite	43	0.3623286	0.3224725	0.3623286	7.1596131	0.0040001	3.623286	0.3967933	0.2143153	3.41853E-06	1.01898E-05	0.2174374
7	**Pier J Basin (clam shell dredge 46,000 CY)**															
7	**Marine Clamshell Dredge**															
7	Clamshell Dredge hoist	Marine Equipment	dredging	onsite	8	4.3650794	4.3650794	4.36507937	132.69841	0.145332	75.661376	7.3542857	5.7853765	0	0	5.7853765
7	Clamshell Dredge generator	Marine Equipment	dredging	onsite	8	3.2738095	3.2738095	3.27380952	99.52381	0.108999	56.746032	5.5157143	3.1964473	0	0	3.1964473
7	Clamshell Barge dump scow	Marine Equipment	disposal	offsite	8	0.0462963	0.0462963	0.0462963	0.8796296	0.0015414	0.8024691	0.04875	0.0382277	0	0	0.0382277
7	Clamshell Tugboat propulsion engine	Marine Equipment	dredging	onsite	8	0.6115528	0.544282	0.6115528	11.387113	0.0067515	6.115528	0.6310858	0.3617301	5.43705E-06	1.71988E-05	0.3669912
7	Clamshell Tugboat auxiliary engine	Marine Equipment	dredging	onsite	8	0.0882214	0.0785171	0.08822142	1.5714441	0.0012175	1.1027678	0.0870911	0.0652281	7.50323E-07	3.10134E-06	0.0661711
7	Clamshell Tugboat propulsion engine	Marine Equipment	transit	offsite	8	11.00795	9.7970759	11.0079505	204.96804	0.1215278	110.0795	11.359544	6.5111411	9.78668E-05	0.000309579	6.6058422
7	Clamshell Tugboat auxiliary engine	Marine Equipment	transit	offsite	8	1.5879856	1.4133072	1.58798563	28.285994	0.0219142	19.84982	1.5676396	1.1741058	1.35058E-05	5.5824E-05	1.191079
7	Clamshell Crew boat propulsion engine	Marine Equipment	support	onsite	8	0.4060579	0.3613915	0.40605791	8.0237043	0.0044829	4.0605791	0.4446821	0.240181	3.83111E-06	1.14196E-05	0.2436798
7	Clamshell Crew boat auxiliary engine	Marine Equipment	support	onsite	8	0.0336683	0.0299648	0.03366828	0.5997163	0.0004646	0.4208535	0.0332369	0.0248933	2.86349E-07	1.18357E-06	0.0252531
7	Clamshell Survey boat propulsion engine	Marine Equipment	dredging	onsite	8	0.3623286	0.3224725	0.3623286	7.1596131	0.0040001	3.623286	0.3967933	0.2143153	3.41853E-06	1.01898E-05	0.2174374

Table H1.29
Alternative 5 Emissions by Task

			Unmitigated Emissions										
			Total										
			PM10	PM2.5	DPM	NOX	SOX	CO	VOC	CO2	CH4	N2O	CO2e
Task ID		Construction Element/Equipment	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(tonnes)	(tonnes)	(tonnes)	(tonnes)
4	**Main Channel Widening (clam shell dredge 1,065,000 CY)**												
4		**Marine Clamshell Dredge**											
4		Clamshell Dredge hoist	772.61905	772.61905	772.61905	23487.619	25.723764	13392.063	1301.7086	1024.0116	0	0	1024.0116
4		Clamshell Dredge generator	579.46429	579.46429	579.46429	17615.714	19.292823	10044.048	976.28143	565.77116	0	0	565.77116
4		Clamshell Barge dump scow	8.1944444	8.1944444	8.1944444	155.69444	0.2728278	142.03704	8.62875	6.7663102	0	0	6.7663102
4		Clamshell Tugboat propulsion engine	108.24485	96.337913	108.24485	2015.519	1.1950231	1082.4485	111.70219	64.02622	0.000962357	0.003044191	64.957448
4		Clamshell Tugboat auxiliary engine	15.615192	13.897521	15.615192	278.14561	0.2154897	195.1899	15.415122	11.545373	0.000132807	0.000548936	11.712277
4		Clamshell Tugboat propulsion engine	1948.4072	1734.0824	1948.4072	36279.343	21.510416	19484.072	2010.6394	1152.472	0.017322431	0.054795446	1169.2341
4		Clamshell Tugboat auxiliary engine	281.07346	250.15538	281.07346	5006.6209	3.8788137	3513.4182	277.4722	207.81672	0.00239053	0.009880856	210.82098
4		Clamshell Crew boat propulsion engine	71.87225	63.966303	71.87225	1420.1957	0.7934696	718.7225	78.708739	42.512033	0.000678106	0.002021278	43.131327
4		Clamshell Crew boat auxiliary engine	5.9592862	5.3037647	5.9592862	106.14978	0.0822381	74.491077	5.8829328	4.4061055	5.06837E-05	0.000209493	4.4698014
4		Clamshell Survey boat propulsion engine	64.132162	57.077624	64.132162	1267.2515	0.7080191	641.32162	70.232413	37.933814	0.000605079	0.001803602	38.486415
5	**West Basin (clam shell dredge 717,000 CY)**												
5		**Marine Clamshell Dredge**											
5		Clamshell Dredge hoist	523.80952	523.80952	523.80952	15923.81	17.43984	9079.3651	882.51429	694.24519	0	0	694.24519
5		Clamshell Dredge generator	392.85714	392.85714	392.85714	11942.857	13.07988	6809.5238	661.88571	383.57367	0	0	383.57367
5		Clamshell Barge dump scow	5.5555556	5.5555556	5.5555556	105.55556	0.184968	96.296296	5.85	4.587329	0	0	4.587329
5		Clamshell Tugboat propulsion engine	73.386337	65.31384	73.386337	1366.4536	0.8101852	733.86337	75.730296	43.407607	0.000652446	0.002063859	44.038948
5		Clamshell Tugboat auxiliary engine	10.586571	9.4220481	10.586571	188.57329	0.1460947	132.33214	10.45093	7.8273717	9.00388E-05	0.00037216	7.9405265
5		Clamshell Tugboat propulsion engine	1320.9541	1175.6491	1320.9541	24596.165	14.583333	13209.541	1363.1453	781.33693	0.011744021	0.037149455	792.70107
5		Clamshell Tugboat auxiliary engine	190.55828	169.59687	190.55828	3394.3193	2.6297042	2381.9784	188.11675	140.89269	0.001620698	0.006698886	142.92948
5		Clamshell Crew boat propulsion engine	48.726949	43.366985	48.726949	962.84452	0.5379455	487.26949	53.361857	28.821718	0.000459733	0.001370358	29.241578
5		Clamshell Crew boat auxiliary engine	4.040194	3.5957727	4.040194	71.965956	0.0557547	50.502425	3.988429	2.9871902	3.43619E-05	0.000142029	3.0303738
5		Clamshell Survey boat propulsion engine	43.479432	38.696694	43.479432	859.15357	0.4800129	434.79432	47.615195	25.71784	0.000410223	0.001222781	26.092485
6	**Pier J Basin (clam shell dredge 258,000 CY)**												
6		**Marine Clamshell Dredge**											
6		Clamshell Dredge hoist	187.69841	187.69841	187.69841	5706.0317	6.249276	3253.4392	316.23429	248.77119	0	0	248.77119
6		Clamshell Dredge generator	140.77381	140.77381	140.77381	4279.5238	4.686957	2440.0794	237.17571	137.44723	0	0	137.44723
6		Clamshell Barge dump scow	1.9907407	1.9907407	1.9907407	37.824074	0.0662802	34.506173	2.09625	1.6437929	0	0	1.6437929
6		Clamshell Tugboat propulsion engine	26.296771	23.404126	26.296771	489.64587	0.2903163	262.96771	27.136689	15.554393	0.000233793	0.000739549	15.780623
6		Clamshell Tugboat auxiliary engine	3.7935212	3.3762339	3.7935212	67.572097	0.0523506	47.419015	3.7449167	2.8048082	3.22639E-05	0.000133357	2.8453553
6		Clamshell Tugboat propulsion engine	473.34187	421.27426	473.34187	8813.6256	5.2256943	4733.4187	488.46041	279.97907	0.004208274	0.013311888	284.05122
6		Clamshell Tugboat auxiliary engine	68.283382	60.77221	68.283382	1216.2977	0.9423107	853.54228	67.408501	50.486548	0.00058075	0.002400434	51.216396
6		Clamshell Crew boat propulsion engine	17.46049	15.539836	17.46049	345.01929	0.1927638	174.6049	19.121332	10.327782	0.000164738	0.000491045	10.478232
6		Clamshell Crew boat auxiliary engine	1.4477362	1.2884852	1.4477362	25.787801	0.0199788	18.096702	1.4291871	1.0704098	1.2313E-05	5.08937E-05	1.085884
6		Clamshell Survey boat propulsion engine	15.58013	13.866315	15.58013	307.86336	0.1720046	155.8013	17.062112	9.2155595	0.000146997	0.000438163	9.349807
7	**Pier J Basin (clam shell dredge 46,000 CY)**												
7		**Marine Clamshell Dredge**											
7		Clamshell Dredge hoist	34.920635	34.920635	34.920635	1061.5873	1.162656	605.29101	58.834286	46.283012	0	0	46.283012
7		Clamshell Dredge generator	26.190476	26.190476	26.190476	796.19048	0.871992	453.96825	44.125714	25.571578	0	0	25.571578
7		Clamshell Barge dump scow	0.3703704	0.3703704	0.3703704	7.037037	0.0123312	6.4197531	0.39	0.3058219	0	0	0.3058219
7		Clamshell Tugboat propulsion engine	4.8924224	4.354256	4.8924224	91.096906	0.0540123	48.924224	5.0486864	2.8938405	4.34964E-05	0.000137591	2.9359299
7		Clamshell Tugboat auxiliary engine	0.7057714	0.6281365	0.7057714	12.571553	0.0097396	8.8221424	0.6967287	0.5218248	6.00259E-06	2.48107E-05	0.5293684
7		Clamshell Tugboat propulsion engine	88.063604	78.376607	88.063604	1639.7443	0.9722222	880.63604	90.876355	52.089129	0.000782935	0.00247663	52.846738
7		Clamshell Tugboat auxiliary engine	12.703885	11.306458	12.703885	226.28795	0.1753136	158.79856	12.541117	9.3928461	0.000108047	0.000446592	9.5286318
7		Clamshell Crew boat propulsion engine	3.2484633	2.8911323	3.2484633	64.189634	0.035863	32.484633	3.5574571	1.9214478	3.06489E-05	9.13572E-05	1.9494385
7		Clamshell Crew boat auxiliary engine	0.2693463	0.2397182	0.2693463	4.7977304	0.003717	3.3668283	0.2658953	0.199146	2.29079E-06	9.4686E-06	0.2020249
7		Clamshell Survey boat propulsion engine	2.8986288	2.5797796	2.8986288	57.276905	0.0320009	28.986288	3.1743463	1.7145227	2.73482E-05	8.15187E-05	1.739499

Table H1.29
Alternative 5 Emissions by Task

			Mitigated										
			Peak Day										
			PM10	PM2.5	DPM	NOX	SOX	CO	VOC	CO2	CH4	N2O	CO2e
Task ID		Construction Element/Equipment	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(tonnes/day)	(tonnes/day)	(tonnes/day)	(tonnes/day)
4	**Main Channel Widening (clam shell dredge 1,065,000 CY)**												
4		**Marine Clamshell Dredge**											
4		Clamshell Dredge hoist	0.4365079	0.4365079	0.43650794	13.269841	0.0145332	7.5661376	0.7354286	0.5785377	0	0	0.5785377
4		Clamshell Dredge generator	0.327381	0.327381	0.32738095	9.952381	0.0108999	5.6746032	0.5515714	0.3196447	0	0	0.3196447
4		Clamshell Barge dump scow	0.0462963	0.0462963	0.0462963	0.8796296	0.0015414	0.8024691	0.04875	0.0382277	0	0	0.0382277
4		Clamshell Tugboat propulsion engine	0.4158559	0.3701118	0.41585591	8.1336523	0.0067515	6.115528	0.4507756	0.3617301	3.8836E-06	1.71988E-05	0.3669524
4		Clamshell Tugboat auxiliary engine	0.0308775	0.027481	0.0308775	1.1314398	0.0012175	1.2130446	0.0627056	0.0652281	5.40233E-07	3.10134E-06	0.0661658
4		Clamshell Tugboat propulsion engine	7.4854063	6.6620116	7.48540633	146.40574	0.1215278	110.0795	8.1139603	6.5111411	6.99049E-05	0.000309579	6.6051432
4		Clamshell Tugboat auxiliary engine	0.555795	0.4946575	0.55579497	20.365916	0.0219142	21.834802	1.1287005	1.1741058	9.72419E-06	5.5824E-05	1.1909844
4		Clamshell Crew boat propulsion engine	0.2761194	0.2457462	0.27611938	5.4005702	0.0044829	4.0605791	0.2993053	0.240181	2.57863E-06	1.14196E-05	0.2436485
4		Clamshell Crew boat auxiliary engine	0.0117839	0.0104877	0.0117839	0.4317957	0.0004646	0.4629389	0.0239306	0.0248933	2.06171E-07	1.18357E-06	0.0252511
4		Clamshell Survey boat propulsion engine	0.2463834	0.2192813	0.24638345	4.8189703	0.0040001	3.623286	0.2670724	0.2143153	2.30093E-06	1.01898E-05	0.2174094
5	**West Basin (clam shell dredge 717,000 CY)**												
5		**Marine Clamshell Dredge**											
5		Clamshell Dredge hoist	0.4365079	0.4365079	0.43650794	13.269841	0.0145332	7.5661376	0.7354286	0.5785377	0	0	0.5785377
5		Clamshell Dredge generator	0.327381	0.327381	0.32738095	9.952381	0.0108999	5.6746032	0.5515714	0.3196447	0	0	0.3196447
5		Clamshell Barge dump scow	0.0462963	0.0462963	0.0462963	0.8796296	0.0015414	0.8024691	0.04875	0.0382277	0	0	0.0382277
5		Clamshell Tugboat propulsion engine	0.4158559	0.3701118	0.41585591	8.1336523	0.0067515	6.115528	0.4507756	0.3617301	3.8836E-06	1.71988E-05	0.3669524
5		Clamshell Tugboat auxiliary engine	0.0308775	0.027481	0.0308775	1.1314398	0.0012175	1.2130446	0.0627056	0.0652281	5.40233E-07	3.10134E-06	0.0661658
5		Clamshell Tugboat propulsion engine	7.4854063	6.6620116	7.48540633	146.40574	0.1215278	110.0795	8.1139603	6.5111411	6.99049E-05	0.000309579	6.6051432
5		Clamshell Tugboat auxiliary engine	0.555795	0.4946575	0.55579497	20.365916	0.0219142	21.834802	1.1287005	1.1741058	9.72419E-06	5.5824E-05	1.1909844
5		Clamshell Crew boat propulsion engine	0.2761194	0.2457462	0.27611938	5.4005702	0.0044829	4.0605791	0.2993053	0.240181	2.57863E-06	1.14196E-05	0.2436485
5		Clamshell Crew boat auxiliary engine	0.0117839	0.0104877	0.0117839	0.4317957	0.0004646	0.4629389	0.0239306	0.0248933	2.06171E-07	1.18357E-06	0.0252511
5		Clamshell Survey boat propulsion engine	0.2463834	0.2192813	0.24638345	4.8189703	0.0040001	3.623286	0.2670724	0.2143153	2.30093E-06	1.01898E-05	0.2174094
6	**Pier J Basin (clam shell dredge 258,000 CY)**												
6		**Marine Clamshell Dredge**											
6		Clamshell Dredge hoist	0.4365079	0.4365079	0.43650794	13.269841	0.0145332	7.5661376	0.7354286	0.5785377	0	0	0.5785377
6		Clamshell Dredge generator	0.327381	0.327381	0.32738095	9.952381	0.0108999	5.6746032	0.5515714	0.3196447	0	0	0.3196447
6		Clamshell Barge dump scow	0.0462963	0.0462963	0.0462963	0.8796296	0.0015414	0.8024691	0.04875	0.0382277	0	0	0.0382277
6		Clamshell Tugboat propulsion engine	0.4158559	0.3701118	0.41585591	8.1336523	0.0067515	6.115528	0.4507756	0.3617301	3.8836E-06	1.71988E-05	0.3669524
6		Clamshell Tugboat auxiliary engine	0.0308775	0.027481	0.0308775	1.1314398	0.0012175	1.2130446	0.0627056	0.0652281	5.40233E-07	3.10134E-06	0.0661658
6		Clamshell Tugboat propulsion engine	7.4854063	6.6620116	7.48540633	146.40574	0.1215278	110.0795	8.1139603	6.5111411	6.99049E-05	0.000309579	6.6051432
6		Clamshell Tugboat auxiliary engine	0.555795	0.4946575	0.55579497	20.365916	0.0219142	21.834802	1.1287005	1.1741058	9.72419E-06	5.5824E-05	1.1909844
6		Clamshell Crew boat propulsion engine	0.2761194	0.2457462	0.27611938	5.4005702	0.0044829	4.0605791	0.2993053	0.240181	2.57863E-06	1.14196E-05	0.2436485
6		Clamshell Crew boat auxiliary engine	0.0117839	0.0104877	0.0117839	0.4317957	0.0004646	0.4629389	0.0239306	0.0248933	2.06171E-07	1.18357E-06	0.0252511
6		Clamshell Survey boat propulsion engine	0.2463834	0.2192813	0.24638345	4.8189703	0.0040001	3.623286	0.2670724	0.2143153	2.30093E-06	1.01898E-05	0.2174094
7	**Pier J Basin (clam shell dredge 46,000 CY)**												
7		**Marine Clamshell Dredge**											
7		Clamshell Dredge hoist	0.4365079	0.4365079	0.43650794	13.269841	0.0145332	7.5661376	0.7354286	0.5785377	0	0	0.5785377
7		Clamshell Dredge generator	0.327381	0.327381	0.32738095	9.952381	0.0108999	5.6746032	0.5515714	0.3196447	0	0	0.3196447
7		Clamshell Barge dump scow	0.0462963	0.0462963	0.0462963	0.8796296	0.0015414	0.8024691	0.04875	0.0382277	0	0	0.0382277
7		Clamshell Tugboat propulsion engine	0.4158559	0.3701118	0.41585591	8.1336523	0.0067515	6.115528	0.4507756	0.3617301	3.8836E-06	1.71988E-05	0.3669524
7		Clamshell Tugboat auxiliary engine	0.0308775	0.027481	0.0308775	1.1314398	0.0012175	1.2130446	0.0627056	0.0652281	5.40233E-07	3.10134E-06	0.0661658
7		Clamshell Tugboat propulsion engine	7.4854063	6.6620116	7.48540633	146.40574	0.1215278	110.0795	8.1139603	6.5111411	6.99049E-05	0.000309579	6.6051432
7		Clamshell Tugboat auxiliary engine	0.555795	0.4946575	0.55579497	20.365916	0.0219142	21.834802	1.1287005	1.1741058	9.72419E-06	5.5824E-05	1.1909844
7		Clamshell Crew boat propulsion engine	0.2761194	0.2457462	0.27611938	5.4005702	0.0044829	4.0605791	0.2993053	0.240181	2.57863E-06	1.14196E-05	0.2436485
7		Clamshell Crew boat auxiliary engine	0.0117839	0.0104877	0.0117839	0.4317957	0.0004646	0.4629389	0.0239306	0.0248933	2.06171E-07	1.18357E-06	0.0252511
7		Clamshell Survey boat propulsion engine	0.2463834	0.2192813	0.24638345	4.8189703	0.0040001	3.623286	0.2670724	0.2143153	2.30093E-06	1.01898E-05	0.2174094
			Note: clamshell dredge would be electric with mitigation; assume 90 percent reduction in diesel exhaust emissions.										

Table H1.29
Alternative 5 Emissions by Task

		Mitigated Emissions										
		Total										
		PM10	PM2.5	DPM	NOX	SOX	CO	VOC	CO2	CH4	N2O	CO2e
Task ID	Construction Element/Equipment	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(tonnes)	(tonnes)
4	**Main Channel Widening (clam shell dredge 1,065,000 CY)**											
4	**Marine Clamshell Dredge**											
4	Clamshell Dredge hoist	77.261905	77.261905	77.261905	2348.7619	2.5723764	1339.2063	130.17086	102.40116	0	0	102.40116
4	Clamshell Dredge generator	57.946429	57.946429	57.946429	1761.5714	1.9292823	1004.4048	97.628143	56.577116	0	0	56.577116
4	Clamshell Barge dump scow	8.1944444	8.1944444	8.1944444	155.69444	0.2728278	142.03704	8.62875	6.7663102	0	0	6.7663102
4	Clamshell Tugboat propulsion engine	73.606496	65.509781	73.606496	1439.6565	1.1950231	1082.4485	79.787276	64.02622	0.000687398	0.003044191	64.950574
4	Clamshell Tugboat auxiliary engine	5.4653172	4.8641323	5.4653172	200.26484	0.2154897	214.70889	11.098888	11.545373	9.56212E-05	0.000548936	11.711347
4	Clamshell Tugboat propulsion engine	1324.9169	1179.1761	1324.9169	25913.816	21.510416	19484.072	1436.171	1152.472	0.012373165	0.054795446	1169.1103
4	Clamshell Tugboat auxiliary engine	98.37571	87.554382	98.37571	3604.7671	3.8788137	3864.76	199.77999	207.81672	0.001721181	0.009880856	210.80424
4	Clamshell Crew boat propulsion engine	48.87313	43.497086	48.87313	955.90093	0.7934696	718.7225	52.977036	42.512033	0.000456418	0.002021278	43.125785
4	Clamshell Crew boat auxiliary engine	2.0857502	1.8563176	2.0857502	76.427845	0.0822381	81.940185	4.2357116	4.4061055	3.64923E-05	0.000209493	4.4694466
4	Clamshell Survey boat propulsion engine	43.60987	38.812784	43.60987	852.95775	0.7080191	641.32162	47.271816	37.933814	0.000407265	0.001803602	38.481469
5	**West Basin (clam shell dredge 717,000 CY)**											
5	**Marine Clamshell Dredge**											
5	Clamshell Dredge hoist	52.380952	52.380952	52.380952	1592.381	1.743984	907.93651	88.251429	69.424519	0	0	69.424519
5	Clamshell Dredge generator	39.285714	39.285714	39.285714	1194.2857	1.307988	680.95238	66.188571	38.357367	0	0	38.357367
5	Clamshell Barge dump scow	5.5555556	5.5555556	5.5555556	105.55556	0.184968	96.296296	5.85	4.587329	0	0	4.587329
5	Clamshell Tugboat propulsion engine	49.902709	44.413411	49.902709	976.03828	0.8101852	733.86337	54.093069	43.407607	0.000466033	0.002063859	44.034288
5	Clamshell Tugboat auxiliary engine	3.7052998	3.2977168	3.7052998	135.77277	0.1460947	145.56535	7.5246699	7.8273717	6.48279E-05	0.00037216	7.9398962
5	Clamshell Tugboat propulsion engine	898.24876	799.4414	898.24876	17568.689	14.583333	13209.541	973.67524	781.33693	0.008388587	0.037149455	792.61718
5	Clamshell Tugboat auxiliary engine	66.695396	59.358903	66.695396	2443.9099	2.6297042	2620.1763	135.44406	140.89269	0.001166903	0.006698886	142.91813
5	Clamshell Crew boat propulsion engine	33.134326	29.48955	33.134326	648.06843	0.5379455	487.26949	35.916634	28.821718	0.000309436	0.001370358	29.23782
5	Clamshell Crew boat auxiliary engine	1.4140679	1.2585204	1.4140679	51.815488	0.0557547	55.552668	2.8716689	2.9871902	2.47405E-05	0.000142029	3.0301333
5	Clamshell Survey boat propulsion engine	29.566014	26.313752	29.566014	578.27644	0.4800129	434.79432	32.048689	25.71784	0.000276112	0.001222781	26.089132
6	**Pier J Basin (clam shell dredge 258,000 CY)**											
6	**Marine Clamshell Dredge**											
6	Clamshell Dredge hoist	18.769841	18.769841	18.769841	570.60317	0.6249276	325.34392	31.623429	24.877119	0	0	24.877119
6	Clamshell Dredge generator	14.077381	14.077381	14.077381	427.95238	0.4686957	244.00794	23.717571	13.744723	0	0	13.744723
6	Clamshell Barge dump scow	1.9907407	1.9907407	1.9907407	37.824074	0.0662802	34.506173	2.09625	1.6437929	0	0	1.6437929
6	Clamshell Tugboat propulsion engine	17.881804	15.914806	17.881804	349.74705	0.2903163	262.96771	19.38335	15.554393	0.000166995	0.000739549	15.778953
6	Clamshell Tugboat auxiliary engine	1.3277324	1.1816819	1.3277324	48.65191	0.0523506	52.160917	2.6963401	2.8048082	2.323E-05	0.000133357	2.8451295
6	Clamshell Tugboat propulsion engine	321.87247	286.4665	321.87247	6295.4469	5.2256943	4733.4187	348.90029	279.97907	0.00300591	0.013311888	284.02116
6	Clamshell Tugboat auxiliary engine	23.899184	21.270274	23.899184	875.73438	0.9423107	938.8965	48.534121	50.486548	0.00041814	0.002400434	51.212331
6	Clamshell Crew boat propulsion engine	11.873133	10.567089	11.873133	232.22452	0.1927638	174.6049	12.870127	10.327782	0.000110881	0.000491045	10.476886
6	Clamshell Crew boat auxiliary engine	0.5067077	0.4509698	0.5067077	18.567217	0.0199788	19.906373	1.0290147	1.0704098	8.86536E-06	5.08937E-05	1.0857978
6	Clamshell Survey boat propulsion engine	10.594488	9.4290945	10.594488	207.21572	0.1720046	155.8013	11.484114	9.2155595	9.89401E-05	0.000438163	9.3486056
7	**Pier J Basin (clam shell dredge 46,000 CY)**											
7	**Marine Clamshell Dredge**											
7	Clamshell Dredge hoist	3.4920635	3.4920635	3.4920635	106.15873	0.1162656	60.529101	5.8834286	4.6283012	0	0	4.6283012
7	Clamshell Dredge generator	2.6190476	2.6190476	2.6190476	79.619048	0.0871992	45.396825	4.4125714	2.5571578	0	0	2.5571578
7	Clamshell Barge dump scow	0.3703704	0.3703704	0.3703704	7.037037	0.0123312	6.4197531	0.39	0.3058219	0	0	0.3058219
7	Clamshell Tugboat propulsion engine	3.3268473	2.9608941	3.3268473	65.069218	0.0540123	48.924224	3.6062046	2.8938405	3.10688E-05	0.000137591	2.9356192
7	Clamshell Tugboat auxiliary engine	0.24702	0.2198478	0.24702	9.0515181	0.0097396	9.7043566	0.5016447	0.5218248	4.32186E-06	2.48107E-05	0.5293264
7	Clamshell Tugboat propulsion engine	59.883251	53.296093	59.883251	1171.2459	0.9722222	880.63604	64.911682	52.089129	0.000559239	0.00247663	52.841145
7	Clamshell Tugboat auxiliary engine	4.4463598	3.9572602	4.4463598	162.92733	0.1753136	174.67842	9.0296039	9.3928461	7.77935E-05	0.000446592	9.5278754
7	Clamshell Crew boat propulsion engine	2.208955	1.96597	2.208955	43.204562	0.035863	32.484633	2.3944423	1.9214478	2.0629E-05	9.13572E-05	1.949188
7	Clamshell Crew boat auxiliary engine	0.0942712	0.0839014	0.0942712	3.4543659	0.003717	3.7035112	0.1914446	0.199146	1.64937E-06	9.4686E-06	0.2020089
7	Clamshell Survey boat propulsion engine	1.9710676	1.7542501	1.9710676	38.551763	0.0320009	28.986288	2.1365793	1.7145227	1.84075E-05	8.15187E-05	1.7392755
		Note: clamshell dredge would be electric with mitigation; assume 90 percent reduction in diesel exhaust emissions.										

Table H1.29
Alternative 5 Emissions by Task

							Unmitigated Emissions										
							Peak Day										
							PM10	PM2.5	DPM	NOX	SOX	CO	VOC	CO2	CH4	N2O	CO2e
Task ID		Construction Element/Equipment	Source Type 1	Source Type 2	Onsite/Offsite	Days Total	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(tonnes/day)	(tonnes/day)	(tonnes/day)	(tonnes/day)
8	**Pier J Approach (clam shell dredge 1,994,000 CY)**																
8		**Marine Clamshell Dredge**															
8		Clamshell Dredge hoist	Marine Equipment	dredging	onsite	332	4.3650794	4.3650794	4.36507937	132.69841	0.145332	75.661376	7.3542857	5.7853765	0	0	5.7853765
8		Clamshell Dredge generator	Marine Equipment	dredging	onsite	332	3.2738095	3.2738095	3.27380952	99.52381	0.108999	56.746032	5.5157143	3.1964473	0	0	3.1964473
8		Clamshell Barge dump scow	Marine Equipment	disposal	offsite	332	0.0462963	0.0462963	0.0462963	0.8796296	0.0015414	0.8024691	0.04875	0.0382277	0	0	0.0382277
8		Clamshell Tugboat propulsion engine	Marine Equipment	dredging	onsite	332	0.6115528	0.544282	0.6115528	11.387113	0.0067515	6.115528	0.6310858	0.3617301	5.43705E-06	1.71988E-05	0.3669912
8		Clamshell Tugboat auxiliary engine	Marine Equipment	dredging	onsite	332	0.0882214	0.0785171	0.08822142	1.5714441	0.0012175	1.1027678	0.0870911	0.0652281	7.50323E-07	3.10134E-06	0.0661711
8		Clamshell Tugboat propulsion engine	Marine Equipment	transit	offsite	332	11.00795	9.7970759	11.0079505	204.96804	0.1215278	110.0795	11.359544	6.5111411	9.78668E-05	0.000309579	6.6058422
8		Clamshell Tugboat auxiliary engine	Marine Equipment	transit	offsite	332	1.5879856	1.4133072	1.58798563	28.285994	0.0219142	19.84982	1.5676396	1.1741058	1.35058E-05	5.5824E-05	1.191079
8		Clamshell Crew boat propulsion engine	Marine Equipment	support	onsite	332	0.4060579	0.3613915	0.40605791	8.0237043	0.0044829	4.0605791	0.4446821	0.240181	3.83111E-06	1.14196E-05	0.2436798
8		Clamshell Crew boat auxiliary engine	Marine Equipment	support	onsite	332	0.0336683	0.0299648	0.03366828	0.5997163	0.0004646	0.4208535	0.0332369	0.0248933	2.86349E-07	1.18357E-06	0.0252531
8		Clamshell Survey boat propulsion engine	Marine Equipment	dredging	onsite	332	0.3623286	0.3224725	0.3623286	7.1596131	0.0040001	3.623286	0.3967933	0.2143153	3.41853E-06	1.01898E-05	0.2174374
9	**Pier J Approach (clam shell dredge 679,000 CY)**																
9		**Marine Clamshell Dredge**															
9		Clamshell Dredge hoist	Marine Equipment	dredging	onsite	113	4.3650794	4.3650794	4.36507937	132.69841	0.145332	75.661376	7.3542857	5.7853765	0	0	5.7853765
9		Clamshell Dredge generator	Marine Equipment	dredging	onsite	113	3.2738095	3.2738095	3.27380952	99.52381	0.108999	56.746032	5.5157143	3.1964473	0	0	3.1964473
9		Clamshell Barge dump scow	Marine Equipment	disposal	offsite	113	0.0462963	0.0462963	0.0462963	0.8796296	0.0015414	0.8024691	0.04875	0.0382277	0	0	0.0382277
9		Clamshell Tugboat propulsion engine	Marine Equipment	dredging	onsite	113	0.6115528	0.544282	0.6115528	11.387113	0.0067515	6.115528	0.6310858	0.3617301	5.43705E-06	1.71988E-05	0.3669912
9		Clamshell Tugboat auxiliary engine	Marine Equipment	dredging	onsite	113	0.0882214	0.0785171	0.08822142	1.5714441	0.0012175	1.1027678	0.0870911	0.0652281	7.50323E-07	3.10134E-06	0.0661711
9		Clamshell Tugboat propulsion engine	Marine Equipment	transit	offsite	113	11.00795	9.7970759	11.0079505	204.96804	0.1215278	110.0795	11.359544	6.5111411	9.78668E-05	0.000309579	6.6058422
9		Clamshell Tugboat auxiliary engine	Marine Equipment	transit	offsite	113	1.5879856	1.4133072	1.58798563	28.285994	0.0219142	19.84982	1.5676396	1.1741058	1.35058E-05	5.5824E-05	1.191079
9		Clamshell Crew boat propulsion engine	Marine Equipment	support	onsite	113	0.4060579	0.3613915	0.40605791	8.0237043	0.0044829	4.0605791	0.4446821	0.240181	3.83111E-06	1.14196E-05	0.2436798
9		Clamshell Crew boat auxiliary engine	Marine Equipment	support	onsite	113	0.0336683	0.0299648	0.03366828	0.5997163	0.0004646	0.4208535	0.0332369	0.0248933	2.86349E-07	1.18357E-06	0.0252531
9		Clamshell Survey boat propulsion engine	Marine Equipment	dredging	onsite	113	0.3623286	0.3224725	0.3623286	7.1596131	0.0040001	3.623286	0.3967933	0.2143153	3.41853E-06	1.01898E-05	0.2174374
10	**Standby Area (clam shell dredge 921,000 CY)**																
10		**Marine Clamshell Dredge**															
10		Clamshell Dredge hoist	Marine Equipment	dredging	onsite	227	4.3650794	4.3650794	4.36507937	132.69841	0.145332	75.661376	7.3542857	5.7853765	0	0	5.7853765
10		Clamshell Dredge generator	Marine Equipment	dredging	onsite	227	3.2738095	3.2738095	3.27380952	99.52381	0.108999	56.746032	5.5157143	3.1964473	0	0	3.1964473
10		Clamshell Barge dump scow	Marine Equipment	disposal	offsite	227	0.0462963	0.0462963	0.0462963	0.8796296	0.0015414	0.8024691	0.04875	0.0382277	0	0	0.0382277
10		Clamshell Tugboat propulsion engine	Marine Equipment	dredging	onsite	227	0.6115528	0.544282	0.6115528	11.387113	0.0067515	6.115528	0.6310858	0.3617301	5.43705E-06	1.71988E-05	0.3669912
10		Clamshell Tugboat auxiliary engine	Marine Equipment	dredging	onsite	227	0.0882214	0.0785171	0.08822142	1.5714441	0.0012175	1.1027678	0.0870911	0.0652281	7.50323E-07	3.10134E-06	0.0661711
10		Clamshell Tugboat propulsion engine	Marine Equipment	transit	offsite	227	11.00795	9.7970759	11.0079505	204.96804	0.1215278	110.0795	11.359544	6.5111411	9.78668E-05	0.000309579	6.6058422
10		Clamshell Tugboat auxiliary engine	Marine Equipment	transit	offsite	227	1.5879856	1.4133072	1.58798563	28.285994	0.0219142	19.84982	1.5676396	1.1741058	1.35058E-05	5.5824E-05	1.191079
10		Clamshell Crew boat propulsion engine	Marine Equipment	support	onsite	227	0.4060579	0.3613915	0.40605791	8.0237043	0.0044829	4.0605791	0.4446821	0.240181	3.83111E-06	1.14196E-05	0.2436798
10		Clamshell Crew boat auxiliary engine	Marine Equipment	support	onsite	227	0.0336683	0.0299648	0.03366828	0.5997163	0.0004646	0.4208535	0.0332369	0.0248933	2.86349E-07	1.18357E-06	0.0252531
10		Clamshell Survey boat propulsion engine	Marine Equipment	dredging	onsite	227	0.3623286	0.3224725	0.3623286	7.1596131	0.0040001	3.623286	0.3967933	0.2143153	3.41853E-06	1.01898E-05	0.2174374
11	**Standby Area (clam shell dredge 118,000 CY)**																
11		**Marine Clamshell Dredge**															
11		Clamshell Dredge hoist	Marine Equipment	dredging	onsite	54	4.3650794	4.3650794	4.36507937	132.69841	0.145332	75.661376	7.3542857	5.7853765	0	0	5.7853765
11		Clamshell Dredge generator	Marine Equipment	dredging	onsite	54	3.2738095	3.2738095	3.27380952	99.52381	0.108999	56.746032	5.5157143	3.1964473	0	0	3.1964473
11		Clamshell Barge dump scow	Marine Equipment	disposal	offsite	54	0.0462963	0.0462963	0.0462963	0.8796296	0.0015414	0.8024691	0.04875	0.0382277	0	0	0.0382277
11		Clamshell Tugboat propulsion engine	Marine Equipment	dredging	onsite	54	0.6115528	0.544282	0.6115528	11.387113	0.0067515	6.115528	0.6310858	0.3617301	5.43705E-06	1.71988E-05	0.3669912
11		Clamshell Tugboat auxiliary engine	Marine Equipment	dredging	onsite	54	0.0882214	0.0785171	0.08822142	1.5714441	0.0012175	1.1027678	0.0870911	0.0652281	7.50323E-07	3.10134E-06	0.0661711
11		Clamshell Tugboat propulsion engine	Marine Equipment	transit	offsite	54	11.00795	9.7970759	11.0079505	204.96804	0.1215278	110.0795	11.359544	6.5111411	9.78668E-05	0.000309579	6.6058422
11		Clamshell Tugboat auxiliary engine	Marine Equipment	transit	offsite	54	1.5879856	1.4133072	1.58798563	28.285994	0.0219142	19.84982	1.5676396	1.1741058	1.35058E-05	5.5824E-05	1.191079
11		Clamshell Crew boat propulsion engine	Marine Equipment	support	onsite	54	0.4060579	0.3613915	0.40605791	8.0237043	0.0044829	4.0605791	0.4446821	0.240181	3.83111E-06	1.14196E-05	0.2436798
11		Clamshell Crew boat auxiliary engine	Marine Equipment	support	onsite	54	0.0336683	0.0299648	0.03366828	0.5997163	0.0004646	0.4208535	0.0332369	0.0248933	2.86349E-07	1.18357E-06	0.0252531
11		Clamshell Survey boat propulsion engine	Marine Equipment	dredging	onsite	54	0.3623286	0.3224725	0.3623286	7.1596131	0.0040001	3.623286	0.3967933	0.2143153	3.41853E-06	1.01898E-05	0.2174374

Table H1.29
Alternative 5 Emissions by Task

		Unmitigated Emissions										
		Total										
		PM10	**PM2.5**	**DPM**	**NOX**	**SOX**	**CO**	**VOC**	**CO2**	**CH4**	**N2O**	**CO2e**
Task ID	Construction Element/Equipment	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(tonnes)	(tonnes)	(tonnes)	(tonnes)
8	**Pier J Approach (clam shell dredge 1,994,000 CY)**											
8	**Marine Clamshell Dredge**											
8	Clamshell Dredge hoist	1449.2063	1449.2063	1449.2063	44055.873	48.250224	25119.577	2441.6229	1920.745	0	0	1920.745
8	Clamshell Dredge generator	1086.9048	1086.9048	1086.9048	33041.905	36.187668	18839.683	1831.2171	1061.2205	0	0	1061.2205
8	Clamshell Barge dump scow	15.37037	15.37037	15.37037	292.03704	0.5117448	266.41975	16.185	12.69161	0	0	12.69161
8	Clamshell Tugboat propulsion engine	203.03553	180.70162	203.03553	3780.5216	2.2415123	2030.3553	209.52049	120.09438	0.0018051	0.005710009	121.84109
8	Clamshell Tugboat auxiliary engine	29.289513	26.067666	29.289513	521.71945	0.4041953	366.11891	28.914241	21.655728	0.000249107	0.001029644	21.96879
8	Clamshell Tugboat propulsion engine	3654.6396	3252.6292	3654.6396	68049.389	40.347221	36546.396	3771.3687	2161.6988	0.032491792	0.102780159	2193.1396
8	Clamshell Tugboat auxiliary engine	527.21123	469.21799	527.21123	9390.95	7.275515	6590.1404	520.45634	389.80311	0.004483932	0.018533584	395.43822
8	Clamshell Crew boat propulsion engine	134.81123	119.98199	134.81123	2663.8698	1.4883159	1348.1123	147.63447	79.740085	0.001271928	0.003791323	80.901698
8	Clamshell Crew boat auxiliary engine	11.17787	9.9483044	11.17787	199.10581	0.1542546	139.72338	11.034654	8.2645595	9.50678E-05	0.000392947	8.3840343
8	Clamshell Survey boat propulsion engine	120.29309	107.06085	120.29309	2376.9915	1.3280358	1202.9309	131.73537	71.152692	0.001134951	0.003383027	72.189207
9	**Pier J Approach (clam shell dredge 679,000 CY)**											
9	**Marine Clamshell Dredge**											
9	Clamshell Dredge hoist	493.25397	493.25397	493.25397	14994.921	16.422516	8549.7354	831.03429	653.74755	0	0	653.74755
9	Clamshell Dredge generator	369.94048	369.94048	369.94048	11246.19	12.316887	6412.3016	623.27571	361.19854	0	0	361.19854
9	Clamshell Barge dump scow	5.2314815	5.2314815	5.2314815	99.398148	0.1741782	90.679012	5.50875	4.3197348	0	0	4.3197348
9	Clamshell Tugboat propulsion engine	69.105467	61.503866	69.105467	1286.7438	0.7629244	691.05467	71.312696	40.875497	0.000614386	0.001943467	41.470009
9	Clamshell Tugboat auxiliary engine	9.9690209	8.8724286	9.9690209	177.57318	0.1375725	124.61276	9.8412928	7.370775	8.47865E-05	0.000350451	7.4773291
9	Clamshell Tugboat propulsion engine	1243.8984	1107.0696	1243.8984	23161.388	13.732638	12438.984	1283.6285	735.75894	0.011058953	0.034982404	746.46017
9	Clamshell Tugboat auxiliary engine	179.44238	159.70371	179.44238	3196.3173	2.4763048	2243.0297	177.14327	132.67395	0.001526157	0.006308117	134.59192
9	Clamshell Crew boat propulsion engine	45.884544	40.837244	45.884544	906.67859	0.5065654	458.84544	50.249082	27.140451	0.000432915	0.00129042	27.535819
9	Clamshell Crew boat auxiliary engine	3.804516	3.3860193	3.804516	67.767942	0.0525023	47.55645	3.7557707	2.8129374	3.23574E-05	0.000133744	2.853602
9	Clamshell Survey boat propulsion engine	40.943131	36.439387	40.943131	809.03628	0.4520122	409.43131	44.837642	24.217633	0.000386294	0.001151452	24.570423
10	**Standby Area (clam shell dredge 921,000 CY)**											
10	**Marine Clamshell Dredge**											
10	Clamshell Dredge hoist	990.87302	990.87302	990.87302	30122.54	32.990364	17175.132	1669.4229	1313.2805	0	0	1313.2805
10	Clamshell Dredge generator	743.15476	743.15476	743.15476	22591.905	24.742773	12881.349	1252.0671	725.59353	0	0	725.59353
10	Clamshell Barge dump scow	10.509259	10.509259	10.509259	199.67593	0.3498978	182.16049	11.06625	8.6776973	0	0	8.6776973
10	Clamshell Tugboat propulsion engine	138.82249	123.55201	138.82249	2584.8747	1.5326003	1388.2249	143.25648	82.112723	0.00123421	0.003904133	83.30701
10	Clamshell Tugboat auxiliary engine	20.026263	17.823374	20.026263	356.71781	0.2763624	250.32829	19.769677	14.806778	0.000170323	0.000704003	15.020829
10	Clamshell Tugboat propulsion engine	2498.8048	2223.9362	2498.8048	46527.745	27.586805	24988.048	2578.6166	1478.029	0.022215774	0.070274386	1499.5262
10	Clamshell Tugboat auxiliary engine	360.47274	320.82074	360.47274	6420.9206	4.9745238	4505.9092	355.85418	266.52201	0.003065821	0.012672059	270.37493
10	Clamshell Crew boat propulsion engine	92.175146	82.03588	92.175146	1821.3809	1.0176136	921.75146	100.94285	54.521082	0.000869661	0.00259226	55.315318
10	Clamshell Crew boat auxiliary engine	7.6427003	6.8020033	7.6427003	136.1356	0.1054693	95.533754	7.5447782	5.6507681	6.50012E-05	0.000268671	5.7324572
10	Clamshell Survey boat propulsion engine	82.248592	73.201246	82.248592	1625.2322	0.9080245	822.48592	90.072078	48.649581	0.000776006	0.002313094	49.358283
11	**Standby Area (clam shell dredge 118,000 CY)**											
11	**Marine Clamshell Dredge**											
11	Clamshell Dredge hoist	235.71429	235.71429	235.71429	7165.7143	7.847928	4085.7143	397.13143	312.41033	0	0	312.41033
11	Clamshell Dredge generator	176.78571	176.78571	176.78571	5374.2857	5.885946	3064.2857	297.84857	172.60815	0	0	172.60815
11	Clamshell Barge dump scow	2.5	2.5	2.5	47.5	0.0832356	43.333333	2.6325	2.064298	0	0	2.064298
11	Clamshell Tugboat propulsion engine	33.023851	29.391228	33.023851	614.90411	0.3645833	330.23851	34.078633	19.533423	0.000293601	0.000928736	19.817527
11	Clamshell Tugboat auxiliary engine	4.7639569	4.2399216	4.7639569	84.857982	0.0657426	59.549461	4.7029187	3.5223173	4.05175E-05	0.000167472	3.5732369
11	Clamshell Tugboat propulsion engine	594.42933	529.0421	594.42933	11068.274	6.5624998	5944.2933	613.4154	351.60162	0.00528481	0.016717255	356.71548
11	Clamshell Tugboat auxiliary engine	85.751224	76.318589	85.751224	1527.4437	1.1833669	1071.8903	84.652537	63.401711	0.000729314	0.003014499	64.318264
11	Clamshell Crew boat propulsion engine	21.927127	19.515143	21.927127	433.28003	0.2420755	219.27127	24.012836	12.969773	0.00020688	0.000616661	13.15871
11	Clamshell Crew boat auxiliary engine	1.8180873	1.6180977	1.8180873	32.38468	0.0250896	22.726091	1.7947931	1.3442356	1.54628E-05	6.3913E-05	1.3636682
11	Clamshell Survey boat propulsion engine	19.565744	17.413512	19.565744	386.61911	0.2160058	195.65744	21.426838	11.573028	0.0001846	0.000550251	11.741618

Table H1.29
Alternative 5 Emissions by Task

			Mitigated										
			Peak Day										
			PM10	PM2.5	DPM	NOX	SOX	CO	VOC	CO2	CH4	N2O	CO2e
Task ID		Construction Element/Equipment	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(lb/day)	(tonnes/day)	(tonnes/day)	(tonnes/day)	(tonnes/day)
8	**Pier J Approach (clam shell dredge 1,994,000 CY)**												
8		**Marine Clamshell Dredge**											
8		Clamshell Dredge hoist	0.4365079	0.4365079	0.43650794	13.269841	0.0145332	7.5661376	0.7354286	0.5785377	0	0	0.5785377
8		Clamshell Dredge generator	0.327381	0.327381	0.32738095	9.952381	0.0108999	5.6746032	0.5515714	0.3196447	0	0	0.3196447
8		Clamshell Barge dump scow	0.0462963	0.0462963	0.0462963	0.8796296	0.0015414	0.8024691	0.04875	0.0382277	0	0	0.0382277
8		Clamshell Tugboat propulsion engine	0.4158559	0.3701118	0.41585591	8.1336523	0.0067515	6.115528	0.4507756	0.3617301	3.8836E-06	1.71988E-05	0.3669524
8		Clamshell Tugboat auxiliary engine	0.0308775	0.027481	0.0308775	1.1314398	0.0012175	1.2130446	0.0627056	0.0652281	5.40233E-07	3.10134E-06	0.0661658
8		Clamshell Tugboat propulsion engine	7.4854063	6.6620116	7.48540633	146.40574	0.1215278	110.0795	8.1139603	6.5111411	6.99049E-05	0.000309579	6.6051432
8		Clamshell Tugboat auxiliary engine	0.555795	0.4946575	0.55579497	20.365916	0.0219142	21.834802	1.1287005	1.1741058	9.72419E-06	5.5824E-05	1.1909844
8		Clamshell Crew boat propulsion engine	0.2761194	0.2457462	0.27611938	5.4005702	0.0044829	4.0605791	0.2993053	0.240181	2.57863E-06	1.14196E-05	0.2436485
8		Clamshell Crew boat auxiliary engine	0.0117839	0.0104877	0.0117839	0.4317957	0.0004646	0.4629389	0.0239306	0.0248933	2.06171E-07	1.18357E-06	0.0252511
8		Clamshell Survey boat propulsion engine	0.2463834	0.2192813	0.24638345	4.8189703	0.0040001	3.623286	0.2670724	0.2143153	2.30093E-06	1.01898E-05	0.2174094
9	**Pier J Approach (clam shell dredge 679,000 CY)**												
9		**Marine Clamshell Dredge**											
9		Clamshell Dredge hoist	0.4365079	0.4365079	0.43650794	13.269841	0.0145332	7.5661376	0.7354286	0.5785377	0	0	0.5785377
9		Clamshell Dredge generator	0.327381	0.327381	0.32738095	9.952381	0.0108999	5.6746032	0.5515714	0.3196447	0	0	0.3196447
9		Clamshell Barge dump scow	0.0462963	0.0462963	0.0462963	0.8796296	0.0015414	0.8024691	0.04875	0.0382277	0	0	0.0382277
9		Clamshell Tugboat propulsion engine	0.4158559	0.3701118	0.41585591	8.1336523	0.0067515	6.115528	0.4507756	0.3617301	3.8836E-06	1.71988E-05	0.3669524
9		Clamshell Tugboat auxiliary engine	0.0308775	0.027481	0.0308775	1.1314398	0.0012175	1.2130446	0.0627056	0.0652281	5.40233E-07	3.10134E-06	0.0661658
9		Clamshell Tugboat propulsion engine	7.4854063	6.6620116	7.48540633	146.40574	0.1215278	110.0795	8.1139603	6.5111411	6.99049E-05	0.000309579	6.6051432
9		Clamshell Tugboat auxiliary engine	0.555795	0.4946575	0.55579497	20.365916	0.0219142	21.834802	1.1287005	1.1741058	9.72419E-06	5.5824E-05	1.1909844
9		Clamshell Crew boat propulsion engine	0.2761194	0.2457462	0.27611938	5.4005702	0.0044829	4.0605791	0.2993053	0.240181	2.57863E-06	1.14196E-05	0.2436485
9		Clamshell Crew boat auxiliary engine	0.0117839	0.0104877	0.0117839	0.4317957	0.0004646	0.4629389	0.0239306	0.0248933	2.06171E-07	1.18357E-06	0.0252511
9		Clamshell Survey boat propulsion engine	0.2463834	0.2192813	0.24638345	4.8189703	0.0040001	3.623286	0.2670724	0.2143153	2.30093E-06	1.01898E-05	0.2174094
10	**Standby Area (clam shell dredge 921,000 CY)**												
10		**Marine Clamshell Dredge**											
10		Clamshell Dredge hoist	0.4365079	0.4365079	0.43650794	13.269841	0.0145332	7.5661376	0.7354286	0.5785377	0	0	0.5785377
10		Clamshell Dredge generator	0.327381	0.327381	0.32738095	9.952381	0.0108999	5.6746032	0.5515714	0.3196447	0	0	0.3196447
10		Clamshell Barge dump scow	0.0462963	0.0462963	0.0462963	0.8796296	0.0015414	0.8024691	0.04875	0.0382277	0	0	0.0382277
10		Clamshell Tugboat propulsion engine	0.4158559	0.3701118	0.41585591	8.1336523	0.0067515	6.115528	0.4507756	0.3617301	3.8836E-06	1.71988E-05	0.3669524
10		Clamshell Tugboat auxiliary engine	0.0308775	0.027481	0.0308775	1.1314398	0.0012175	1.2130446	0.0627056	0.0652281	5.40233E-07	3.10134E-06	0.0661658
10		Clamshell Tugboat propulsion engine	7.4854063	6.6620116	7.48540633	146.40574	0.1215278	110.0795	8.1139603	6.5111411	6.99049E-05	0.000309579	6.6051432
10		Clamshell Tugboat auxiliary engine	0.555795	0.4946575	0.55579497	20.365916	0.0219142	21.834802	1.1287005	1.1741058	9.72419E-06	5.5824E-05	1.1909844
10		Clamshell Crew boat propulsion engine	0.2761194	0.2457462	0.27611938	5.4005702	0.0044829	4.0605791	0.2993053	0.240181	2.57863E-06	1.14196E-05	0.2436485
10		Clamshell Crew boat auxiliary engine	0.0117839	0.0104877	0.0117839	0.4317957	0.0004646	0.4629389	0.0239306	0.0248933	2.06171E-07	1.18357E-06	0.0252511
10		Clamshell Survey boat propulsion engine	0.2463834	0.2192813	0.24638345	4.8189703	0.0040001	3.623286	0.2670724	0.2143153	2.30093E-06	1.01898E-05	0.2174094
11	**Standby Area (clam shell dredge 118,000 CY)**												
11		**Marine Clamshell Dredge**											
11		Clamshell Dredge hoist	0.4365079	0.4365079	0.43650794	13.269841	0.0145332	7.5661376	0.7354286	0.5785377	0	0	0.5785377
11		Clamshell Dredge generator	0.327381	0.327381	0.32738095	9.952381	0.0108999	5.6746032	0.5515714	0.3196447	0	0	0.3196447
11		Clamshell Barge dump scow	0.0462963	0.0462963	0.0462963	0.8796296	0.0015414	0.8024691	0.04875	0.0382277	0	0	0.0382277
11		Clamshell Tugboat propulsion engine	0.4158559	0.3701118	0.41585591	8.1336523	0.0067515	6.115528	0.4507756	0.3617301	3.8836E-06	1.71988E-05	0.3669524
11		Clamshell Tugboat auxiliary engine	0.0308775	0.027481	0.0308775	1.1314398	0.0012175	1.2130446	0.0627056	0.0652281	5.40233E-07	3.10134E-06	0.0661658
11		Clamshell Tugboat propulsion engine	7.4854063	6.6620116	7.48540633	146.40574	0.1215278	110.0795	8.1139603	6.5111411	6.99049E-05	0.000309579	6.6051432
11		Clamshell Tugboat auxiliary engine	0.555795	0.4946575	0.55579497	20.365916	0.0219142	21.834802	1.1287005	1.1741058	9.72419E-06	5.5824E-05	1.1909844
11		Clamshell Crew boat propulsion engine	0.2761194	0.2457462	0.27611938	5.4005702	0.0044829	4.0605791	0.2993053	0.240181	2.57863E-06	1.14196E-05	0.2436485
11		Clamshell Crew boat auxiliary engine	0.0117839	0.0104877	0.0117839	0.4317957	0.0004646	0.4629389	0.0239306	0.0248933	2.06171E-07	1.18357E-06	0.0252511
11		Clamshell Survey boat propulsion engine	0.2463834	0.2192813	0.24638345	4.8189703	0.0040001	3.623286	0.2670724	0.2143153	2.30093E-06	1.01898E-05	0.2174094

Note: clamshell dredge would be electric with mitigation; assume 90 percent reduction in diesel exhaust emissions.

Table H1.29
Alternative 5 Emissions by Task

		Mitigated Emissions										
		Total										
		PM10	PM2.5	DPM	NOX	SOX	CO	VOC	CO2	CH4	N2O	CO2e
Task ID	Construction Element/Equipment	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(tonnes)	(tonnes)
8	**Pier J Approach (clam shell dredge 1,994,000 CY)**											
8	**Marine Clamshell Dredge**											
8	Clamshell Dredge hoist	144.92063	144.92063	144.92063	4405.5873	4.8250224	2511.9577	244.16229	192.0745	0	0	192.0745
8	Clamshell Dredge generator	108.69048	108.69048	108.69048	3304.1905	3.6187668	1883.9683	183.12171	106.12205	0	0	106.12205
8	Clamshell Barge dump scow	15.37037	15.37037	15.37037	292.03704	0.5117448	266.41975	16.185	12.69161	0	0	12.69161
8	Clamshell Tugboat propulsion engine	138.06416	122.8771	138.06416	2700.3726	2.2415123	2030.3553	149.65749	120.09438	0.001289357	0.005710009	121.8282
8	Clamshell Tugboat auxiliary engine	10.251329	9.1236832	10.251329	375.638	0.4041953	402.7308	20.818253	21.655728	0.000179357	0.001029644	21.967046
8	Clamshell Tugboat propulsion engine	2485.1549	2211.7879	2485.1549	48606.706	40.347221	36546.396	2693.8348	2161.6988	0.023208423	0.102780159	2192.9075
8	Clamshell Tugboat auxiliary engine	184.52393	164.2263	184.52393	6761.484	7.275515	7249.1544	374.72856	389.80311	0.003228431	0.018533584	395.40683
8	Clamshell Crew boat propulsion engine	91.671634	81.587754	91.671634	1792.9893	1.4883159	1348.1123	99.369355	79.740085	0.000856105	0.003791323	80.891302
8	Clamshell Crew boat auxiliary engine	3.9122545	3.4819065	3.9122545	143.35618	0.1542546	153.69571	7.9449506	8.2645595	6.84488E-05	0.000392947	8.3833688
8	Clamshell Survey boat propulsion engine	81.799304	72.801381	81.799304	1599.8982	1.3280358	1202.9309	88.66804	71.152692	0.000763909	0.003383027	72.179931
9	**Pier J Approach (clam shell dredge 679,000 CY)**											
9	**Marine Clamshell Dredge**											
9	Clamshell Dredge hoist	49.325397	49.325397	49.325397	1499.4921	1.6422516	854.97354	83.103429	65.374755	0	0	65.374755
9	Clamshell Dredge generator	36.994048	36.994048	36.994048	1124.619	1.2316887	641.23016	62.327571	36.119854	0	0	36.119854
9	Clamshell Barge dump scow	5.2314815	5.2314815	5.2314815	99.398148	0.1741782	90.679012	5.50875	4.3197348	0	0	4.3197348
9	Clamshell Tugboat propulsion engine	46.991718	41.822629	46.991718	919.10271	0.7629244	691.05467	50.93764	40.875497	0.000438847	0.001943467	41.465621
9	Clamshell Tugboat auxiliary engine	3.4891573	3.10535	3.4891573	127.85269	0.1375725	137.07404	7.0857308	7.370775	6.10463E-05	0.000350451	7.4767356
9	Clamshell Tugboat propulsion engine	845.85092	752.80731	845.85092	16543.849	13.732638	12438.984	916.87751	735.75894	0.007899252	0.034982404	746.38118
9	Clamshell Tugboat auxiliary engine	62.804832	55.8963	62.804832	2301.3485	2.4763048	2467.3327	127.54316	132.67395	0.001098833	0.006308117	134.58124
9	Clamshell Crew boat propulsion engine	31.20149	27.769326	31.20149	610.26443	0.5065654	458.84544	33.821497	27.140451	0.000291385	0.00129042	27.532281
9	Clamshell Crew boat auxiliary engine	1.3315806	1.1851067	1.3315806	48.792918	0.0525023	52.312095	2.7041549	2.8129374	2.32973E-05	0.000133744	2.8533755
9	Clamshell Survey boat propulsion engine	27.841329	24.778783	27.841329	544.54365	0.4520122	409.43131	30.179182	24.217633	0.000260005	0.001151452	24.567266
10	**Standby Area (clam shell dredge 921,000 CY)**											
10	**Marine Clamshell Dredge**											
10	Clamshell Dredge hoist	99.087302	99.087302	99.087302	3012.254	3.2990364	1717.5132	166.94229	131.32805	0	0	131.32805
10	Clamshell Dredge generator	74.315476	74.315476	74.315476	2259.1905	2.4742773	1288.1349	125.20671	72.559353	0	0	72.559353
10	Clamshell Barge dump scow	10.509259	10.509259	10.509259	199.67593	0.3498978	182.16049	11.06625	8.6776973	0	0	8.6776973
10	Clamshell Tugboat propulsion engine	94.399291	84.015369	94.399291	1846.3391	1.5326003	1388.2249	102.32605	82.112723	0.000881578	0.003904133	83.298194
10	Clamshell Tugboat auxiliary engine	7.0091921	6.238181	7.0091921	256.83683	0.2763624	275.36112	14.234167	14.806778	0.000122633	0.000704003	15.019637
10	Clamshell Tugboat propulsion engine	1699.1872	1512.2766	1699.1872	33234.103	27.586805	24988.048	1841.869	1478.029	0.01586841	0.070274386	1499.3675
10	Clamshell Tugboat auxiliary engine	126.16546	112.28726	126.16546	4623.0629	4.9745238	4956.5002	256.21501	266.52201	0.002207391	0.012672059	270.35347
10	Clamshell Crew boat propulsion engine	62.679099	55.784398	62.679099	1225.9294	1.0176136	921.75146	67.9423	54.521082	0.000585349	0.00259226	55.30821
10	Clamshell Crew boat auxiliary engine	2.6749451	2.3807012	2.6749451	98.017632	0.1054693	105.08713	5.4322403	5.6507681	4.68008E-05	0.000268671	5.7320022
10	Clamshell Survey boat propulsion engine	55.929042	49.776848	55.929042	1093.9063	0.9080245	822.48592	60.625437	48.649581	0.000522311	0.002313094	49.351941
11	**Standby Area (clam shell dredge 118,000 CY)**											
11	**Marine Clamshell Dredge**											
11	Clamshell Dredge hoist	23.571429	23.571429	23.571429	716.57143	0.7847928	408.57143	39.713143	31.241033	0	0	31.241033
11	Clamshell Dredge generator	17.678571	17.678571	17.678571	537.42857	0.5885946	306.42857	29.784857	17.260815	0	0	17.260815
11	Clamshell Barge dump scow	2.5	2.5	2.5	47.5	0.0832356	43.333333	2.6325	2.064298	0	0	2.064298
11	Clamshell Tugboat propulsion engine	22.456219	19.986035	22.456219	439.21722	0.3645833	330.23851	24.341881	19.533423	0.000209715	0.000928736	19.81543
11	Clamshell Tugboat auxiliary engine	1.6673849	1.4839726	1.6673849	61.097747	0.0657426	65.504407	3.3861015	3.5223173	2.91726E-05	0.000167472	3.5729533
11	Clamshell Tugboat propulsion engine	404.21194	359.74863	404.21194	7905.91	6.5624998	5944.2933	438.15386	351.60162	0.003774864	0.016717255	356.67773
11	Clamshell Tugboat auxiliary engine	30.012928	26.711506	30.012928	1099.7594	1.1833669	1179.0793	60.949826	63.401711	0.000525106	0.003014499	64.313159
11	Clamshell Crew boat propulsion engine	14.910446	13.270297	14.910446	291.63079	0.2420755	219.27127	16.162485	12.969773	0.000139246	0.000616661	13.157019
11	Clamshell Crew boat auxiliary engine	0.6363306	0.5663342	0.6363306	23.31697	0.0250896	24.9987	1.292251	1.3442356	1.11332E-05	6.3913E-05	1.36356
11	Clamshell Survey boat propulsion engine	13.304706	11.841188	13.304706	260.2244	0.2160058	195.65744	14.42191	11.573028	0.00012425	0.000550251	11.740109

Note: clamshell dredge would be electric with mitigation; assume 90 percent reduction in diesel exhaust emissions.

Appendix H2 Criteria Pollutant Dispersion Modeling Analysis

H2.1 Introduction

This appendix describes the methods and results of the air dispersion modeling performed to evaluate ground-level concentrations of criteria pollutants resulting from construction activities of All Action Alternatives. The Action Alternatives are described in detail in Section 4 (Plan Formulation). The No Action Alternative is also described in detail in Section 4 (Plan Formulation), is assessed qualitatively in Sections 5.5 (Air Quality Environmental Consequences) and 5.6 (Greenhouse Gas Environmental Consequences) of the DEIS/DEIR, and therefore is not included in this appendix. Implementation of the No Action and Action Alternatives would not result in operational activities and would therefore not result in operational impacts.

The air dispersion modeling was performed using the U.S. Environmental Protection Agency's (USEPA) AERMOD Modeling System, version 18081 (USEPA 2019a), which was the most recent version available at the time of the analysis. The following pollutants and averaging times were modeled:

- Nitrogen dioxide (NO_2) - 1-hour and annual
- Carbon monoxide (CO) - 1-hour and 8-hour
- Sulfur dioxide (SO_2) - 1-hour and 24-hour
- Particulate matter less than 10 microns in diameter (PM_{10}) - 24-hour and annual
- Particulate matter less than 2.5 microns in diameter ($PM_{2.5}$) - 24-hour

For CEQA impacts, the predicted ground-level concentrations were compared to applicable South Coast Air Quality Management District (SCAQMD) ambient air quality thresholds (SCAQMD 2019a) and the federal 1-hour NO_2 standard (USEPA 2019b) to determine their significance. SCAQMD also has ambient air quality thresholds for sulfate and lead; however, these pollutants were not modeled because impacts from the Action Alternatives would be well below the thresholds due to the low sulfur and lead levels in modern diesel fuel used in marine and other diesel equipment. The predicted ground-level concentrations were compared to the national ambient air quality standards (NAAQS) to determine their significance under NEPA.

H2.2 Development of Emission Scenarios

Construction Emissions

The dispersion modeling analysis included emissions from the following construction sources:

- Marine sources (i.e., diesel engine exhaust from hopper dredge, clamshell dredge, tugboats, crew boats, and survey boats)
- Off-road construction equipment (diesel engine exhaust)
- On-road vehicles driving and idling onsite (diesel engine exhaust)
- Onsite fugitive dust

These construction sources are further described in Section 5.5 of the EIS/EIR. Construction emissions used in the modeling analysis were calculated using the methods described in Appendix H1. The approach to developing the emissions for the various averaging times required for the dispersion modeling analysis is described in the following paragraphs.

Annual emissions were calculated for each year of construction based on the proposed construction schedule and the number of workdays anticipated for each construction activity. Peak daily (i.e., 24-hour) emissions were calculated for each year of construction based on the construction schedule and the anticipated daily hours of operation for each construction activity and equipment type. The peak daily emissions represent the highest emissions that would occur from the various combinations of overlapping construction activities during each year of construction. Peak 8-hour and 1-hour emission rates were scaled from the peak daily emission rates in proportion to the number of operating hours for each activity or equipment type. For example, equipment that would operate 8 hours per day would have scaling factors of 1.0 (8-hr averaging time/8 hours operation per day) for peak 8-hour and 0.125 (1-hr averaging time/8 hours operation per day) for peak 1-hour emissions (applied to the peak daily emission rates). Equipment that would operate 4 hours per day would have scaling factors of 1.0 (i.e., all emissions) for peak 8-hour and 0.25 (1-hr averaging time/4 hours operation per day) for peak 1-hour emissions. This approach conservatively assumes that all equipment that operates on the peak day would also operate during the peak 8-hour and 1-hour periods.

The construction schedule and activity assumptions were developed by USACE, the Port, and the Port's engineering consultant, AECom, and are presented in Appendix H1 tables.

For the annual averaging period, the analysis year producing the highest total construction emissions within the modeling domain was selected for modeling. Specifically, the construction period when hopper dredging and clamshell dredging would occur in the same year would produce the highest emissions. For Action Alternatives 2, 3, and 5, this construction period would occur in 2025; for Action Alternative 4, this construction period would occur in 2026.

For short-term averaging periods (24-hour, 8-hour, 1-hour), the combination of overlapping construction tasks, described in Appendix H1, that would produce the highest concentrations was selected for modeling. The following three combinations were considered and evaluated via AERMOD test runs:

- Combination 1: Overlap of construction Task 1 (Electrical Substation Construction, mitigated scenario only), Task 2 (Pier J Breakwater Construction), Task 3 (Pier J Wharf Upgrade), and Task 4 (Pier T Wharf Upgrade)
- Combination 2: Overlap of construction Task 5 (Approach Channel Dredging) and Task 6 (Main Channel Widening)
- Combination 3: Construction Task 7 (Dredging of West Basin). This task would not overlap with other construction tasks but was chosen for consideration because dredging in the West Basin would be closest to land-receptors.

AERMOD test runs showed that for all Action Alternatives, the highest short-term concentrations would occur for Combination 2, during overlap of construction Task 5 (Approach Channel Dredging) and Task 6 (Main Channel Widening). Therefore, Combination 2 was selected for modeling.

The schedule and equipment utilization assumed in this analysis are anticipated to result in conservatively high emission estimates because assumptions reflect an accelerated schedule and the earliest foreseeable construction years. Postponement of construction activities from the assumed schedule would likely result in lower impacts as increasingly stringent regulatory requirements are implemented compared to those assumed in the analysis years. The anticipated construction schedule and equipment utilization for each Action Alternative are included in Appendix H1.

H2.3 Dispersion Model Selection and Inputs

Model Selection

AERMOD version 18081 (USEPA 2019a) was used to perform the dispersion modeling for the air quality impact analysis. The AERMOD model was selected for the following reasons:

- AERMOD is a USEPA regulatory default model for dispersion modeling;
- General acceptance by the modeling community and regulatory agencies of its ability to provide reasonable results for large industrial complexes with multiple emission sources;
- Ability of the model to handle the various physical characteristics of Project emission sources, including "point," "area," and "volume" source types.

Temporal Distribution

Construction emission sources were modeled with diurnal emission patterns that reflect the daily cycle of activity associated with the Action Alternatives. The diurnal emission patterns assumed in AERMOD are shown in Table H2.1.

Table H2.1. Temporal Distribution of Emissions in AERMOD

Source Category	Time Period	Hours per Day
Hopper dredge	12am-12am	24
Clamshell dredge	12am-12am	24
Tugboats	12am-12am	24
Off-road construction equipment	7am-3pm	8
Crew boats	6am-6pm	12
Construction trucks	7am-3pm	8
Fugitive dust	7am-3pm	8

Emission Source Representation

AERMOD simulated all construction emissions as a collection of line and polygon-area sources. Polygon area sources simulate emissions emanating from a flat, non-rectangular, area with no thermal buoyancy or velocity (plume rise) associated with the emissions. Polygon area sources were used to model all dredging activities, harbor craft activities during dredging activities, on-site truck emissions, and land-side on-site fugitive dust. Line sources simulate emissions from volume sources moving along a path based on a start-point, end-point, and the path width with no thermal buoyancy or velocity (plume rise) associated with the emissions. Line sources were used to model hopper dredge and tugboat activities during transit to off-shore disposal locations.

Table H2.2 provides the source parameters used in AERMOD for the polygon-area and line sources. The initial vertical dimensions for polygon-area and line sources were determined based on USEPA guidance (USEPA 2019c).

All emission sources were positioned by using the Universal Transverse Mercator 13 coordinate system (NAD-83) referenced to topographic data obtained from the United States Geological Survey (USGS).

Figure H2.1 shows the locations of the construction sources modeled in AERMOD. The figure depicts the sources used to model annual concentrations. For short-term concentrations (1-hour, 8-hour, and 24-

hour averages), the AERMOD sources associated with dredging activities were condensed into reasonable daily work areas conservatively located closest to on-land receptors. For example, the Approach Channel Dredging task ("J" in the figure) was condensed into a 200 meter by 100 meter rectangular source at the far northern end of the dredging area for the short-term modeling.

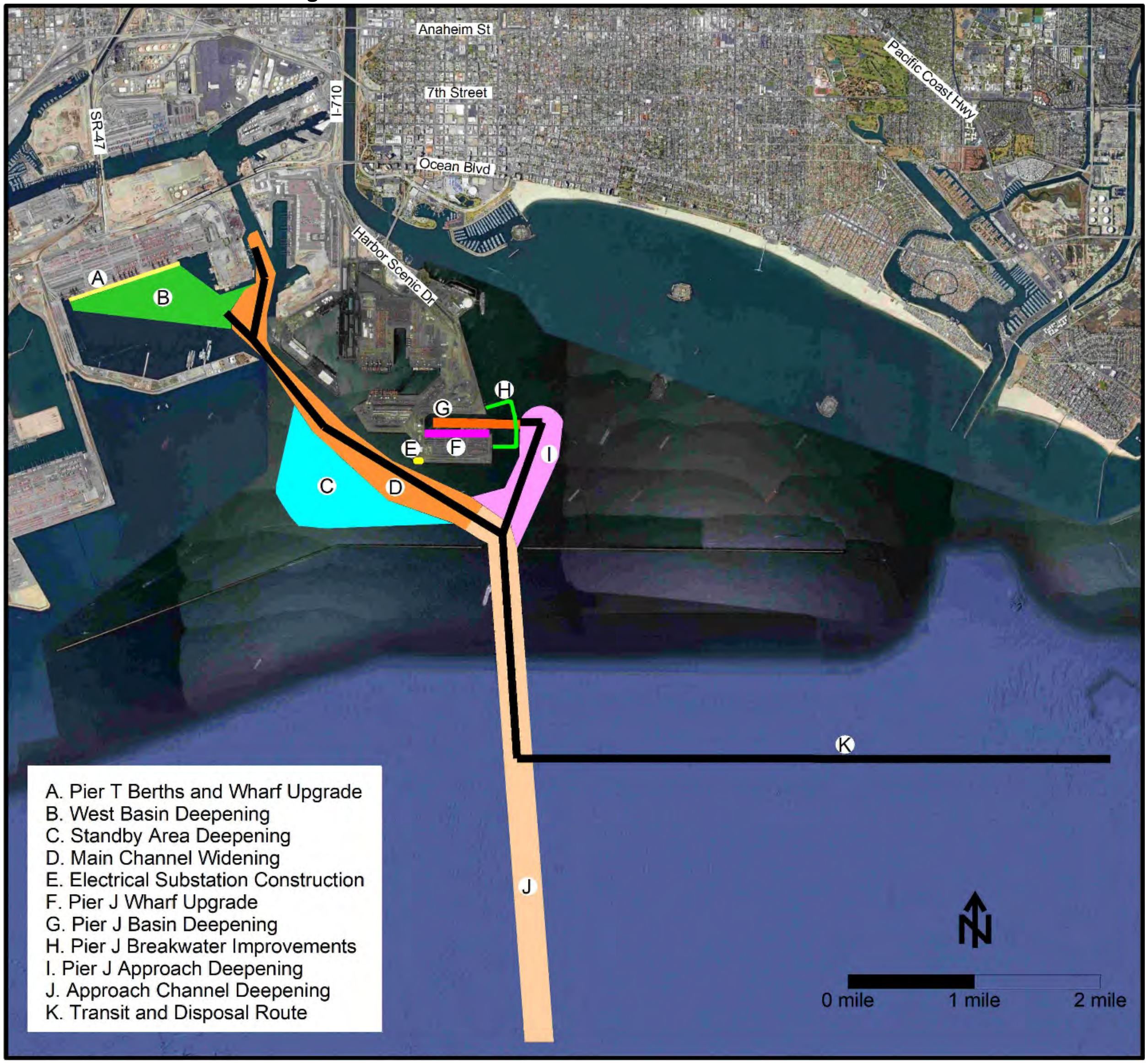
Table H2.2. Source Parameters in AERMOD

Source Category	Source Type	Source Height (m)	Vertical Dispersion Coefficient σ_z (m) [h]	Line Source Width (m)
Hopper dredge – transit [a]	Line	21.29	4.95	100
Hopper dredge – dredging [a]	Poly-area	21.29	4.95	n/a
Clamshell dredge [b]	Poly-area	24.23	5.64	n/a
Tugboats – transit [c]	Line	15.2	3.5	100
Tugboats – dredging [c]	Poly-area	15.2	3.5	n/a
Off-road construction equipment [d]	Poly-area	4.6	1.1	n/a
Crew boats [e]	Poly-area	15.2	3.5	n/a
Construction trucks [f]	Poly-area	4.6	1.1	n/a
Fugitive dust [g]	Poly-area	1.0	0.2	n/a

Notes:

a. Release height (69'10") provided by Dutra Group (dredging contractor) for Stuyvesant hopper dredge (email from Dutra to iLanco 7/26/19). Width assumed to be 100 meters (approximately 50% of channel width).
b. Release height (79'6") provided by Dutra Group (dredging contractor) for Stuyvesant hopper dredge (email from Dutra to iLanco 7/26/19).
c. Source height (50') is from the Pier S Marine Terminal + Back Channel Improvements Project FEIS/FEIR (November 2012), Appendix B, Page A-2-7; and the Middle Harbor Redevelopment Project FEIS/FEIR (April 2009), Appendix A-2, Page A-2-6. Width assumed to be 100 meters (approximately 50% of channel width).
d. Source height (15') is from the Pier S Marine Terminal + Back Channel Improvements Project FEIS/FEIR (November 2012), Appendix B, Page A-2-5; and the Middle Harbor Redevelopment Project FEIS/FEIR (April 2009), Appendix A-2, Page A-2-4.
e. Source height is assumed to be similar to tugboats and therefore was set to 50'.
f. Source height (15') is from the Pier S Marine Terminal + Back Channel Improvements Project FEIS/FEIR (November 2012), Appendix B, Page A-2-8; and the Middle Harbor Redevelopment Project FEIS/FEIR (April 2009), Appendix A-2, Page A-2-7.
g. Fugitive dust source height is set close to ground-level, at a nominal 1 meter.
h. Vertical dispersion coefficient was calculated by dividing the source height (assumed to be representative of the vertical dimension) by 4.3 in accordance with USEPA AERMOD guidelines (USEPA, 2019c).

Figure H2.1. Construction Sources Modeled in AERMOD



Meteorological Data

Meteorological data recorded at the POLB Gull Park monitoring station was selected to simulate meteorological conditions within the dispersion modeling domain because of its proximity to the dredging areas and affected terminals. The AERMOD sources for the construction modeling are located in the Middle Harbor, Outer Harbor, and Beyond the Breakwater meteorological zones as defined in Figure I-3 of the San Pedro Bay Ports' "Sphere of Influence" analysis (POLB and POLA 2010). According to the analysis, the four meteorological stations representative of those meteorological zones are Liberty Hill Plaza, Terminal Island Treatment Plant, Berth 47, and Gull Park. Figure I-3 of the analysis shows that the Gull Park station is the most centrally located station relative to the AERMOD sources. Therefore, meteorological data from the Gull Park station were selected for the AERMOD modeling.

The Gull Park meteorological data set was processed for use in AERMOD in 2018 (Leidos 2018) using the most recent available USEPA guidance (USEPA 2015; USEPA 2016). The SCAQMD provided additional input and guidance on the overall methodology, dataset choice, physical parameter characterization, and seasonality/precipitation parameters. The processing was accomplished using USEPA's AERMET processor (Version 16216) and pre-processor programs AERMINUTE (Version 15272) and AERSURFACE (Version 13016). Consistent with USEPA’s *Guideline on Air Quality Models* (USEPA 2017), the data set consists of hourly readings over a period of five calendar years. The five most recent available years meeting USEPA’s data completeness requirements for wind speed, wind direction, and temperature were selected. For Gull Park, the selected years were 2011, 2012, 2013, 2015, and 2016. Year 2014 was not selected because it did not meet the data completeness requirement. Per USEPA guidance (USEPA 2017), the five selected years of data do not have to be consecutive.

Modeling Approach

Standard control parameters were used in AERMOD, including stack-tip downwash, non-screening mode, non-flat terrain, and sequential meteorological data check. Use of these options follows the USEPA modeling guidance (USEPA 2017). Source and receptor elevations were determined using USEPA’s AERMAP terrain preprocessor (version 18081) with 1 arcsecond national elevation dataset (NED) files. As recommended by SCAQMD (SCAQMD 2019b), all sources were modeled with urban dispersion coefficients. An urban population of 9,818,605 representative of the Los Angeles County was used in AERMOD.

Consistent with USEPA AERMOD Guidance (USEPA 2019), the conversion of nitrogen oxide (NOx) to NO_2 in ambient air was simulated in AERMOD using the Ambient Ratio Method (ARM2). The ARM2 option applies an ambient ratio to the 1-hr modeled NOx concentrations based on a formula derived empirically from ambient monitored ratios of NO_2/NOx. The default upper and lower limits on the ambient ratio applied to the modeled NOx concentration are 0.9 and 0.5, respectively.

For each combination of pollutant and averaging time except for the federal 1-hour NO_2 concentration, the highest concentration of all modeled off-site receptors is reported in the results tables at the end of this appendix. To be consistent with the federal 1-hour NO_2 standard, the federal 1-hour NO_2 concentration is the 98th percentile (8th highest) of the annual distribution of the daily maximum 1-hour concentrations, averaged over all five years of meteorological data.

The CEQA significance thresholds for ambient concentrations are presented in Section 12.2.3 of the EIS/EIR. The NO_2 and CO thresholds are absolute concentration thresholds, meaning that the modeled concentrations are added to the background concentrations for the Project vicinity, and the resulting total concentrations are compared to the thresholds (SCAQMD 2011, USEPA 2019b). The PM_{10} and $PM_{2.5}$ thresholds are incremental concentration thresholds, meaning that the modeled concentrations are compared directly to the thresholds without adding the background concentrations (SCAQMD 2011).

The NEPA significance thresholds for ambient concentrations are the NAAQS, as presented in Section 5.5.1 of the EIS/EIR. Therefore, all of the thresholds are absolute concentration thresholds, meaning that the modeled concentrations are added to the background concentrations near the project area, and the resulting total concentrations are compared to the thresholds.

Table H2.3 presents the background concentrations used in the dispersion modeling. The background concentrations were derived from the monitored concentrations near the project area over the last 3 calendar years (2016, 2017, and 2018) of available data. Because it is the most representative site, the POLB Gull Park monitoring station was used for all pollutants except for $PM_{2.5}$. POLB's Superblock station was used for the $PM_{2.5}$ background concentration because the Gull Park station has no Federal Reference Method (FRM) $PM_{2.5}$ monitor (POLB 2016; POLB 2017; POLB 2018). The Superblock station is located about 2 miles north of the construction site, in a commercial/industrial area adjacent to the Port.

Table H2.3. Background Concentrations

Pollutant	Averaging Period	Monitored Concentration [a,i,j]			Background Concentration [c]	
		2016	2017	2018	(ppm)	(ug/m^3) [d]
NO_2 (ppm)	1-Hour State	0.086	0.096	0.083	0.096	181
	1-Hour Federal [b]	--	--	--	0.075	141
	Annual	0.018	0.018	0.017	0.018	34
CO (ppm)	1-Hour	2.0	2.1	1.9	2.1	2,411
	8-Hour	1.7	1.7	1.5	1.7	1,952
SO_2 (ppm)	1-Hour State	0.012	0.012	0.011	0.012	32
	1-Hour Federal [e]	--	--	--	0.009	24
	24-Hour	0.003	0.005	0.004	0.005	13
PM_{10} (ug/m3)	24-Hour Federal [f]	51.2	66.4	48.6	--	66.4
$PM_{2.5}$ (ug/m3)	24-Hour Federal [g]	--	--	--	--	27.2
	Annual Federal [h]	8.7	9.3	9.5	--	9.2

ppm = parts per million; ug/m3 = micrograms per cubic meter.

Notes:

a. All reported values represent the highest recorded concentration during the year unless otherwise noted.

b. The background concentration reported for the federal 1-hour NO_2 standard represents the three-year average (2016-2018) of the 98th percentile of the annual distribution of daily maximum 1-hour average concentrations.

c. The background concentrations for 1-hour federal NO_2, 1-hour federal SO_2, 24-hour federal $PM_{2.5}$, and annual federal $PM_{2.5}$ are three-year averages. The background concentrations for all other pollutants or averaging periods are the maximum of the concentrations for the 3 reported years.

d. The concentration in micrograms per cubic meter (ug/m3) is calculated as follows: ug/m3 = ppm x MW / 0.0244. The molecular weights (MW) are 28.01 for CO, 46.0055 for NO_2, and 64.066 for SO_2.

e. The background concentration reported for the federal 1-hour SO_2 standard represents the three-year average (2016-2018) of the 99th percentile of the annual distribution of daily maximum 1-hour average concentrations.

f. The 24-hour federal PM_{10} concentration reported for each year is the 2nd highest concentration during the year. The background concentration is the highest of the 2nd highest concentrations.

g. The background concentration reported for the federal 24-hour $PM_{2.5}$ standard represents the three-year average (2016-2018) of the 98th percentile of the annual distribution of 24-hour average concentrations.

h. The background concentration reported for the federal annual $PM_{2.5}$ concentration is the three-year average of the annual mean concentrations.

i. The concentrations in this table were recorded at POLB's Gull Park monitoring station except for $PM_{2.5}$, which was recorded at POLB's Superblock station because the Gull Park station has no Federal Reference Method (FRM) $PM_{2.5}$ monitor.

j. Source: Air Quality Monitoring Program at the Port of Long Beach. Annual Summary Reports. Calendar Years 2016, 2017, and 2018 (POLB 2016; POLB 2017; POLB 2018).

Receptor Locations

Cartesian coordinate receptor grids were used to provide adequate spatial coverage surrounding the Project area to assess ground-level pollution concentrations, identify the extent of significant impacts, and identify maximum-impact locations. Receptors over water were not considered in determining the maximum receptor locations because any human exposure would be brief and transient. The following receptor spacing was used in the modeling:

- Receptors positioned every 50 m along the site boundary, which, for this project, is considered to be the shoreline.

- Receptor grid starting at the site boundary and extending outwards to 500 m, with receptors spaced 50 m apart;
- Receptor grid starting at 500 m and extending outwards to 1 kilometer (km), with receptors placed 100 m apart; and
- Receptor grid starting at 1 km and extending outwards to 5 km, with receptors placed 250 meters (m) apart.

H2.4 Predicted Air Quality Impacts

Table H2.4 presents the maximum offsite pollutant concentrations for the CEQA analysis associated with all unmitigated Action Alternatives. This table presents the highest modeled concentrations on land. Concentrations at all other modeled on-land receptors would be less than the displayed values.

Table H2.4. Maximum Pollutant Concentrations for CEQA, Prior to Mitigation – Action Alternatives

Pollutant	Averaging Time	Maximum Modeled Project Concentration (ug/m3)	Background Concentration (ug/m3)	Total Concentration (ug/m3)	Significance Threshold (ug/m3)	Concentration Above Threshold?
Alternative 2						
NO_2	1-Hour State	173.2	181.0	354	339	**Yes**
	1-Hour Federal	133.0	141.4	274	188	**Yes**
	Annual	2.0	33.9	36	57	No
SO_2	1-Hour State	0.4	31.5	32	655	No
	1-Hour Federal	0.4	23.6	24	196	No
	24-Hour State	0.05	13.1	13	105	No
CO	1-Hour	197.1	2,410.7	2,608	23,000	No
	8-Hour	57.9	1,951.5	2,009	10,000	No
PM_{10}	24-Hour	1.9	n/a	1.9	10.4	No
	Annual	0.1	n/a	0.1	1.0	No
$PM_{2.5}$	24-Hour	1.7	n/a	1.7	10.4	No
Alternative 3						
NO_2	1-Hour State	173.2	181.0	354	339	**Yes**
	1-Hour Federal	133.0	141.4	274	188	**Yes**
	Annual	2.3	33.9	36	57	No
SO_2	1-Hour State	0.4	31.5	32	655	No
	1-Hour Federal	0.4	23.6	24	196	No
	24-Hour State	0.05	13.1	13	105	No
CO	1-Hour	197.1	2,410.7	2,608	23,000	No
	8-Hour	57.9	1,951.5	2,009	10,000	No

Pollutant	Averaging Time	Maximum Modeled Project Concentration (ug/m3)	Background Concentration (ug/m3)	Total Concentration (ug/m3)	Significance Threshold (ug/m3)	Concentration Above Threshold?
PM_{10}	24-Hour	1.9	n/a	1.9	10.4	No
	Annual	0.1	n/a	0.1	1.0	No
$PM_{2.5}$	24-Hour	1.7	n/a	1.7	10.4	No
Alternative 4						
NO_2	1-Hour State	173.2	181.0	354	339	**Yes**
	1-Hour Federal	133.0	141.4	274	188	**Yes**
	Annual	3.0	33.9	37	57	No
SO_2	1-Hour State	0.4	31.5	32	655	No
	1-Hour Federal	0.4	23.6	24	196	No
	24-Hour State	0.05	13.1	13	105	No
CO	1-Hour	197.1	2,410.7	2,608	23,000	No
	8-Hour	57.9	1,951.5	2,009	10,000	No
PM_{10}	24-Hour	1.9	n/a	1.9	10.4	No
	Annual	0.2	n/a	0.2	1.0	No
$PM_{2.5}$	24-Hour	1.7	n/a	1.7	10.4	No
Alternative 5						
NO_2	1-Hour State	173.2	181.0	354	339	**Yes**
	1-Hour Federal	133.0	141.4	274	188	**Yes**
	Annual	2.3	33.9	36	57	No
SO_2	1-Hour State	0.4	31.5	32	655	No
	1-Hour Federal	0.4	23.6	24	196	No
	24-Hour State	0.05	13.1	13	105	No
CO	1-Hour	197.1	2,410.7	2,608	23,000	No
	8-Hour	57.9	1,951.5	2,009	10,000	No
PM_{10}	24-Hour	1.9	n/a	1.9	10.4	No
	Annual	0.1	n/a	0.1	1.0	No
$PM_{2.5}$	24-Hour	1.7	n/a	1.7	10.4	No

Table H2.5 presents the maximum offsite pollutant concentrations for the NEPA analysis associated with all unmitigated Action Alternatives. This table presents the highest modeled concentrations on land. Concentrations at all other modeled on-land receptors would be less than the displayed values.

Table H2.5. Maximum Pollutant Concentrations for NEPA, Prior to Mitigation – Action Alternatives

Pollutant	Averaging Time	Maximum Modeled Project Concentration (ug/m3)	Background Concentration (ug/m3)	Total Concentration (ug/m3)	NAAQS (ug/m3)	Concentration Exceeds NAAQS?
Alternative 2						
NO_2	1-Hour	133.0	141.4	274	188	**Yes**
	Annual	2.0	33.9	36	100	No
SO_2	1-Hour	0.4	23.6	24	196	No
CO	1-Hour	197.1	2,410.7	2,608	40,000	No
	8-Hour	57.9	1,951.5	2,009	10,000	No
PM_{10}	24-Hour	1.9	66.4	68	150	No
$PM_{2.5}$	24-Hour	1.7	27.2	29	35	No
	Annual	0.09	9.2	9.3	12.0	No
Alternative 3						
NO_2	1-Hour	133.0	141.4	274	188	**Yes**
	Annual	2.3	33.9	36	100	No
SO_2	1-Hour	0.4	23.6	24	196	No
CO	1-Hour	197.1	2,410.7	2,608	40,000	No
	8-Hour	57.9	1,951.5	2,009	10,000	No
PM_{10}	24-Hour	1.9	66.4	68	150	No
$PM_{2.5}$	24-Hour	1.7	27.2	29	35	No
	Annual	0.1	9.2	9.3	12.0	No
Alternative 4						
NO_2	1-Hour	133.0	141.4	274	188	**Yes**
	Annual	3.0	33.9	37	100	No
SO_2	1-Hour	0.4	23.6	24	196	No
CO	1-Hour	197.1	2,410.7	2,608	40,000	No
	8-Hour	57.9	1,951.5	2,009	10,000	No
PM_{10}	24-Hour	1.9	66.4	68	150	No
$PM_{2.5}$	24-Hour	1.7	27.2	29	35	No
	Annual	0.1	9.2	9.3	12.0	No
Alternative 5						
NO_2	1-Hour	133.0	141.4	274	188	**Yes**
	Annual	2.3	33.9	36	100	No
SO_2	1-Hour	0.4	23.6	24	196	No
CO	1-Hour	197.1	2,410.7	2,608	40,000	No
	8-Hour	57.9	1,951.5	2,009	10,000	No
PM_{10}	24-Hour	1.9	66.4	68	150	No
$PM_{2.5}$	24-Hour	1.7	27.2	29	35	No
	Annual	0.1	9.2	9.3	12.0	No

Figure H2.2 shows the areas where the modeled 1-hour federal NO_2 concentration (presented in both Tables H2.4 and H2.5) would exceed the threshold, and the location of the maximum on-land receptor. Figure H.2.3 shows the areas where the modeled 1-hour state NO_2 concentration (presented in Table H2.4 only) would exceed the threshold, and the location of the maximum receptor. Both figures apply to all Action Alternatives because short-term activities (24-hour, 8-hour, and 1-hour) would be nearly identical and would therefore result in the same concentrations for all Action Alternatives. In all cases, the exceedance areas are over Port property and open water.

Section 5.5.5 of the EIS/EIR identifies five mitigation measures to reduce construction emissions, of which three are quantified. The following three measures were quantified in the dispersion modeling. The remaining mitigation measures were assessed qualitatively in the EIS/EIR.

MM-AQ-1: Electric clamshell dredge. The use of an electric clamshell dredge shall be required for project clamshell dredging activities during the entire construction period of the project, and the construction of an electrical substation at Pier J is also required to provide electric power to the clamshell dredge. This mitigation measure would reduce significant Impacts AQ-1, AQ-3, and AQ-4.

MM-AQ-2: Construction-Related Harbor Craft. Construction-related harbor craft (tugboats, crew boats, and survey boats) with Category 1 or Category 2 marine engines shall meet USEPA Tier 3 emission standards for marine engines. In addition, the construction contractor shall require all construction-related tugboats that home fleet in the San Pedro Bay Ports: 1) to shut down their main engines and 2) to refrain from using auxiliary engines while at dock and instead use electrical shore power, if feasible. This mitigation measure would reduce significant Impacts AQ-1, AQ-3, and AQ-4.

MM-AQ-3: Off-Road Construction Equipment. Self-propelled, diesel-fueled off-road construction equipment 25 hp or greater shall meet USEPA/CARB Tier 4 emission standards for non-road equipment. This mitigation measure would reduce significant Impacts AQ-1, AQ-3, and AQ-4.

Figure H2.2. Location of Maximum Concentration and Area of Exceedance of the 1-Hour Federal NO2 Threshold, Without Mitigation

Figure H2.2. Location of Maximum Concentration and Area of Exceedance of the 1-Hour State NO_2 Threshold, Without Mitigation

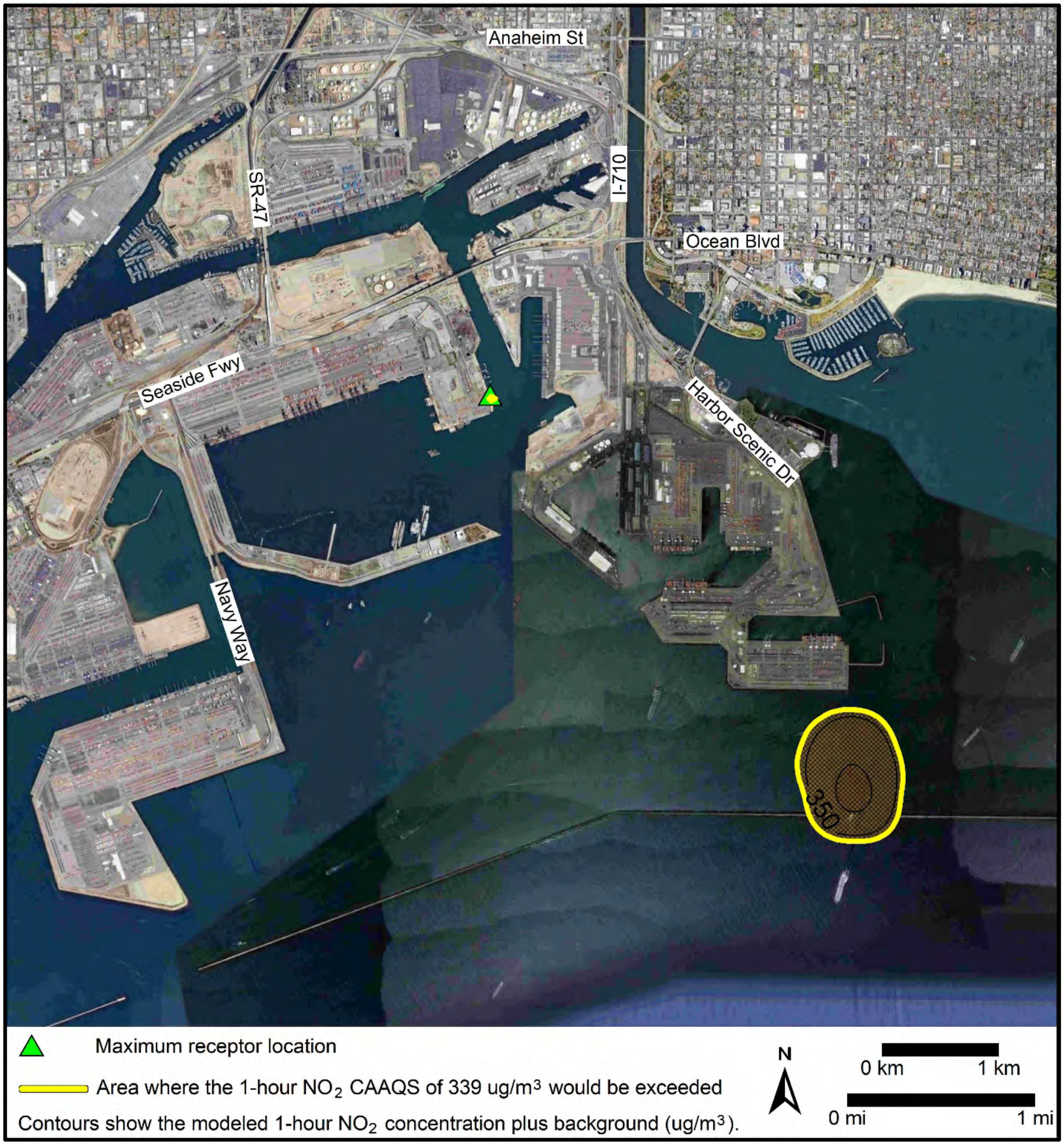


Table H2.6 presents the maximum offsite pollutant concentrations for the CEQA analysis associated with all mitigated Action Alternatives. This table presents the highest modeled concentrations on land. Concentrations at all other modeled on-land receptors would be less than the displayed values.

Table H2.6. Maximum Pollutant Concentrations for CEQA, After Mitigation – Action Alternatives

Pollutant	Averaging Time	Maximum Modeled Project Concentration (ug/m3)	Background Concentration (ug/m3)	Total Concentration (ug/m3)	Significance Threshold (ug/m3)	Concentration Above Threshold?
Alternative 2						
NO_2	1-Hour State	138.8	181.0	320	339	No
	1-Hour Federal	114.9	141.4	256	188	**Yes**
	Annual	0.9	33.9	35	57	No
SO_2	1-Hour State	0.1	31.5	32	655	No
	1-Hour Federal	0.1	23.6	24	196	No
	24-Hour State	0.02	13.1	13	105	No
CO	1-Hour	129.7	2,410.7	2,540	23,000	No
	8-Hour	44.0	1,951.5	1,995	10,000	No
PM_{10}	24-Hour	1.9	n/a	1.9	10.4	No
	Annual	0.05	n/a	0.05	1.0	No
$PM_{2.5}$	24-Hour	1.7	n/a	1.7	10.4	No
Alternative 3						
NO_2	1-Hour State	138.8	181.0	320	339	No
	1-Hour Federal	114.9	141.4	256	188	**Yes**
	Annual	1.2	33.9	35	57	No
SO_2	1-Hour State	0.1	31.5	32	655	No
	1-Hour Federal	0.1	23.6	24	196	No
	24-Hour State	0.02	13.1	13	105	No
CO	1-Hour	129.7	2,410.7	2,540	23,000	No
	8-Hour	44.0	1,951.5	1,995	10,000	No
PM_{10}	24-Hour	1.9	n/a	1.9	10.4	No
	Annual	0.06	n/a	0.06	1.0	No
$PM_{2.5}$	24-Hour	1.7	n/a	1.7	10.4	No
Alternative 4						
NO_2	1-Hour State	138.8	181.0	320	339	No
	1-Hour Federal	114.9	141.4	256	188	**Yes**

Pollutant	Averaging Time	Maximum Modeled Project Concentration (ug/m3)	Background Concentration (ug/m3)	Total Concentration (ug/m3)	Significance Threshold (ug/m3)	Concentration Above Threshold?
	Annual	1.9	33.9	36	57	No
SO_2	1-Hour State	0.1	31.5	32	655	No
	1-Hour Federal	0.1	23.6	24	196	No
	24-Hour State	0.02	13.1	13	105	No
CO	1-Hour	129.7	2,410.7	2,540	23,000	No
	8-Hour	44.0	1,951.5	1,995	10,000	No
PM_{10}	24-Hour	1.9	n/a	1.9	10.4	No
	Annual	0.1	n/a	0.1	1.0	No
$PM_{2.5}$	24-Hour	1.7	n/a	1.7	10.4	No
Alternative 5						
NO_2	1-Hour State	138.8	181.0	320	339	No
	1-Hour Federal	114.9	141.4	256	188	**Yes**
	Annual	1.2	33.9	35	57	No
SO_2	1-Hour State	0.1	31.5	32	655	No
	1-Hour Federal	0.1	23.6	24	196	No
	24-Hour State	0.02	13.1	13	105	No
CO	1-Hour	129.7	2,410.7	2,540	23,000	No
	8-Hour	44.0	1,951.5	1,995	10,000	No
PM_{10}	24-Hour	1.9	n/a	1.9	10.4	No
	Annual	0.06	n/a	0.06	1.0	No
$PM_{2.5}$	24-Hour	1.7	n/a	1.7	10.4	No

Table H2.7 presents the maximum offsite pollutant concentrations for the NEPA analysis associated with all mitigated Action Alternatives. This table presents the highest modeled concentrations on land. Concentrations at all other modeled on-land receptors would be less than the displayed values.

Table H2.7. Maximum Pollutant Concentrations for NEPA, After Mitigation – Action Alternatives

Pollutant	Averaging Time	Maximum Modeled Project Concentration (ug/m3)	Background Concentration (ug/m3)	Total Concentration (ug/m3)	NAAQS (ug/m3)	Concentration Exceeds NAAQS?
Alternative 2						
NO_2	1-Hour	114.9	141.4	256	188	**Yes**
	Annual	0.9	33.9	35	100	No
SO_2	1-Hour	0.1	23.6	24	196	No
CO	1-Hour	129.7	2,410.7	2,540	40,000	No
	8-Hour	44.0	1,951.5	1,995	10,000	No
PM_{10}	24-Hour	1.9	66.4	68	150	No
$PM_{2.5}$	24-Hour	1.7	27.2	29	35	No
	Annual	0.04	9.2	9.2	12.0	No
Alternative 3						
NO_2	1-Hour	114.9	141.4	256	188	**Yes**
	Annual	1.2	33.9	35	100	No
SO_2	1-Hour	0.1	23.6	24	196	No
CO	1-Hour	129.7	2,410.7	2,540	40,000	No
	8-Hour	44.0	1,951.5	1,995	10,000	No
PM_{10}	24-Hour	1.9	66.4	68	150	No
$PM_{2.5}$	24-Hour	1.7	27.2	29	35	No
	Annual	0.06	9.2	9.2	12.0	No
Alternative 4						
NO_2	1-Hour	114.9	141.4	256	188	**Yes**
	Annual	1.9	33.9	36	100	No
SO_2	1-Hour	0.1	23.6	24	196	No
CO	1-Hour	129.7	2,410.7	2,540	40,000	No
	8-Hour	44.0	1,951.5	1,995	10,000	No
PM_{10}	24-Hour	1.9	66.4	68	150	No
$PM_{2.5}$	24-Hour	1.7	27.2	29	35	No
	Annual	0.1	9.2	9.3	12.0	No
Alternative 5						
NO_2	1-Hour	114.9	141.4	256	188	**Yes**
	Annual	1.2	33.9	35	100	No
SO_2	1-Hour	0.1	23.6	24	196	No
CO	1-Hour	129.7	2,410.7	2,540	40,000	No
	8-Hour	44.0	1,951.5	1,995	10,000	No
PM_{10}	24-Hour	1.9	66.4	68	150	No
$PM_{2.5}$	24-Hour	1.7	27.2	29	35	No
	Annual	0.06	9.2	9.2	12.0	No

Figure H2.3 shows the area where the mitigated modeled 1-hour federal NO_2 concentration (presented in both Tables H2.6 and H2.7) would exceed the threshold, and the location of the maximum on-land receptor. The figure applies to all Action Alternatives because short-term activities (24-hour, 8-hour, and 1-hour) would be nearly identical and would therefore result in the same concentrations for all Action Alternatives. The exceedance area is over Port property and open water. There is no figure for the 1-hour state NO_2 concentration because the mitigation measures would reduce the modeled on-land concentrations to less than significant.

Figure H2.3. Location of Maximum Concentration and Area of Exceedance of the 1-Hour Federal NO_2 Threshold, With Mitigation

References for Appendix H2

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Appendix H3. Potential Impacts of Criteria Pollutant Emissions on Public Health

H3.1. Potential Impact of Significant Regional Emissions on Public Health

In *Sierra Club v. County of Fresno (2018)*, the California Supreme Court ruled that an EIR for a proposed master-planned, mixed-use development in Fresno County known as Friant Ranch did not adequately relate the expected adverse air quality impacts to likely health consequences or explain in meaningful detail why it is not feasible at the time of drafting to provide such an analysis. The specific language in the Court's decision is provided below.

> *The EIR fails to provide an adequate discussion of health and safety problems that will be caused by the rise in various pollutants resulting from the Project's development. At this point, we cannot know whether the required additional analysis will disclose that the Project's effects on air quality are less than significant or unavoidable, or whether that analysis will require reassessment of proposed mitigation measures. Absent an analysis that reasonably informs the public how anticipated air quality effects will adversely affect human health, an EIR may still be sufficient if it adequately explains why it is not scientifically feasible at the time of drafting to provide such an analysis.*

In response to the Court's decision, this section provides a discussion of the potential health effects associated with the TSP's significant construction emissions identified in Impact AQ-1.

Impact AQ-1 concluded that the TSP's mitigated construction emissions would exceed the SCAQMD's daily emission thresholds for PM2.5, NOx, CO, and VOC with mitigation. The SCAQMD's daily emission thresholds relate to *regional* air quality impacts. An exceedance of a daily emission threshold means the TSP would make a significant contribution to regional air pollutant emissions in the SCAB. However, a daily emission threshold exceedance does not necessarily mean that the TSP would contribute to a violation of the CAAQS or NAAQS or cause adverse health effects. Further analysis, discussed below, would be necessary to determine the downwind ambient concentrations of the emitted pollutant (or secondary pollutants formed from that pollutant) in the atmosphere where the general population would be exposed.

The pollutants evaluated for potential regional health effects associated with TSP construction are PM2.5, NO2, CO, and ozone. PM2.5 would be both directly emitted ("primary" PM2.5) and would form through secondary reactions of precursor pollutants NOx and VOC ("secondary" PM2.5). NO2 would be directly emitted as one of the NOx components and would form through secondary photochemical reactions between nitric oxide (NO) and other air pollutants (CARB, 2019a). CO would be directly emitted. Ozone would not be directly emitted, but would form through secondary photochemical reactions between precursor pollutant NOx and VOC. Primary pollutants typically reach their peak ambient concentrations in close proximity to the emission sources. Secondary pollutants typically reach their peak ambient concentrations farther downwind of the sources, sometimes many miles downwind, as the secondary reactions can take a considerable amount of time.

Approach and Limitations

This analysis links TSP emissions to regional health effects qualitatively because technical and scientific limitations prevent the accurate quantification of regional health effects. The quantification of regional health effects would not be possible for some pollutants and would produce an unacceptably high level of uncertainty for other pollutants.

Health effects quantification would require a two-stage process consisting of (a) regional modeling of emissions to estimate ambient pollutant concentrations in the region and to determine the exposed population; and (b) applying available methodologies to estimate the quantities of adverse health outcomes for the exposed population at the predicted concentration levels. There are modeling tools that could theoretically carry out these steps for ozone and secondary PM2.5. For example, the Community Multiscale Air Quality Modeling System (CMAQ) (USEPA 2019a) and Comprehensive Air Quality Model with Extensions (CAMx) (Ramboll Environ 2019) are air quality modeling systems that can estimate ozone and secondary PM concentrations on a regional scale. The Environmental Benefits Mapping and Analysis Program (BenMAP) (USEPA 2019b) is a regional-scale health effects estimation model for ozone and PM. CARB also developed a methodology (CARB 2010) for estimating premature mortality associated with regional exposure to PM. Currently, there is no reliable methodology available to quantify health effects associated with regional exposure to CO and NO2 concentrations.

The SCAQMD and San Joaquin Valley Air Pollution Control District (SJVAPCD) filed separate *amicus curiae* briefs with the California Supreme Court for the Friant Ranch case (SCAQMD 2015, SJVAPCD 2015). Both districts concluded that currently available regional modeling tools are not well suited to analyze relatively small changes in pollutant concentrations associated with individual projects. Regional modeling tools are generally designed to be used at the national, state, regional, and/or city levels. They are not equipped to analyze whether and to what extent the criteria pollutant emissions of an individual project directly impact human health in a particular area (SJVAPCD 2015). For example, running a photochemical grid model used for predicting ozone attainment with the emissions solely from an individual project is not likely to yield valid information given the relative scale involved (SJVAPCD 2015). SCAQMD stated that it does not currently know of a way to accurately quantify ozone-related health impacts caused by NOx or VOC emissions from relatively small projects. The primary author of the CARB methodology (CARB 2010) for PM mortality has reported that this methodology is not suited for small projects and may yield unreliable results due to various uncertainties (SCAQMD 2015). Therefore, quantification of regional health effects associated with the TSP's criteria pollutant emissions is not feasible for this analysis. As a result, this document provides a qualitative discussion of the potential for the TSP's construction emissions to cause regional adverse health effects.

The qualitative regional health effects discussion follows a two-step approach. The first step determines whether the TSP's significant regional emissions would likely contribute to a violation of the CAAQS or NAAQS outside of the local Port area. If so, then the TSP is presumed to contribute to regional adverse health effects. If not, then the TSP is presumed not to contribute to regional adverse health effects because the CAAQS and NAAQS were established by CARB and USEPA to protect public health and welfare. Specifically, the CAAQS were established to protect public health, including the most sensitive groups (CARB 2019b). The NAAQS were established to protect public health with an adequate margin of safety (Title 42 United States Code [U.S.C.] Chapter 85, Subchapter I, Part A, Section 7409). The final step describes the general types of adverse health effects that could be associated with the TSP's significant regional pollutant impacts.

A discussion of the TSP's *local* contributions to adverse health effects in the Port vicinity is provided below as part of Impact AQ-2.

Identification of Potential Regional Adverse Health Effects

PM2.5. The SCAB is currently nonattainment of the CAAQS and NAAQS for PM2.5. The state standard for PM2.5 is 12 µg/m3 for an annual average. The federal standards for PM2.5 are 35 µg/m3 for a 3-year average of the 98th percentile of the 24-hour concentrations, and 12 µg/m3 for a 3-year annual average. The highest annual PM2.5 concentration recorded in the SCAB over the last 3 available years (2016-2018) is 14.73 µg/m3, which is 1.2 times the state standard. This concentration occurred in 2016 at a station adjacent to Route 60 in Ontario. Exceedances of the annual standard occurred at several stations in the SCAB in each year of the 3-year period. The highest 3-year average of the 98th percentile of the 24-hour PM2.5 concentrations recorded in the SCAB over the last 3 available years (2016-2018) is 35.9 µg/m3, which is 1.03 times the federal standard. This concentration occurred at the Mira Loma (Jurupa Valley) station in Riverside County. The 24-hour PM2.5 concentration threshold of 35 µg/m3 was exceeded somewhere in the SCAB on 3 percent of days over the 3-year period. The highest 3-year annual average PM2.5 concentration recorded in the SCAB over the last 3 available years (2016-2018) is 14.5 µg/m3, which is 1.2 times the federal standard. This concentration occurred at a station adjacent to Route 60 in Ontario (SCAQMD 2019). Therefore, because (a) the region is nonattainment for PM2.5 and (b) construction of the TSP would exceed the SCAQMD's daily emission threshold for PM2.5, the TSP would potentially contribute to regional violations of the PM2.5 standards and to regional adverse health effects related to PM2.5.

Table 5.5-31 shows that the TSP's mitigated peak daily construction emissions would be 0.04 ton per day of PM2.5 (reported emissions were converted from pounds to tons). By comparison and for context, the most recent USEPA-approved SCAB emissions inventory estimated total anthropogenic emissions within the SCAB in 2012 to be 66 tons per day of PM2.5 (SCAQMD 2017). This estimate shows that the TSP's direct maximum regional PM2.5 contribution would be equivalent to about 0.06 percent of the total SCAB emissions. This emissions comparison shows that the TSP's contribution to regional violations of the PM2.5 standards would be relatively small. The TSP's VOC and NOx emissions, described below under ozone, would also contribute to secondary PM2.5 formation in the region.

The following summary of adverse health effects associated with PM10 and PM2.5 exposure was compiled in the 2016 AQMP (SCAQMD 2017). Appendix I of the 2016 AQMP provides an expanded discussion of the adverse health effects.

> *Several studies have found correlations between elevated ambient particulate matter levels (PM) and an increase in mortality rates, respiratory infections, number and severity of asthma attacks, and the number of hospital admissions in different parts of the United States and in various areas around the world. In recent years, studies have reported an association between long-term exposure to PM2.5 and increased total mortality (reduction in life-span and increased mortality from lung cancer). Higher levels of PM2.5 have also been related to increased mortality due to cardiovascular or respiratory diseases, hospital admissions for acute respiratory conditions, school absences, lost work days, a decrease in respiratory function in children, and increased medication*

use in children and adults with asthma. Long-term exposure to PM has been found to be associated with reduced lung function growth in children, and increased risk of cardiovascular diseases in adults. Elderly persons, young children, and people with pre-existing respiratory and/or cardiovascular disease appear to be more susceptible to the effects of PM10 and PM2.5. In its most recent review, USEPA concluded that both short-term and long-term exposures to PM2.5 are causally related to increased mortality risk (USEPA 2009).

Nitrogen Dioxide. The SCAB is currently in attainment of the CAAQS and NAAQS for NO2. The most stringent state and federal NO2 standards are 0.18 ppm for a 1-hour average (state 1-hour standard), 0.100 ppm for a 3-year average of the 98th percentile of the annual distributions of daily maximum 1-hour average concentrations (federal 1-hour standard), and 0.030 ppm for an annual average. The highest NO2 concentrations recorded anywhere in the SCAB over the last 3 available years (2016-2018) are 0.1155 ppm for the state 1-hour average, 0.079 ppm for the federal 1-hour average (3-year average), and 0.0321 ppm for an annual average (SCAQMD 2019). These pollutant levels are 64, 79, and 107 percent of the state 1-hour, federal 1-hour, and state annual standards, respectively. The exceedance of the state annual standard of 0.030 ppm occurred in all 3 years at a single monitoring station adjacent to Route 60 in Ontario. This station is one of four near-road sites in the SCAB purposely placed by the SCAQMD to capture impacts from heavily traveled roadways (SCAQMD 2016). In November 2018, CARB proposed to separate the area surrounding this monitor from the remainder of the SCAB and reclassify the area as nonattainment. CARB is currently working with the SCAQMD to define the specific boundary of the nonattainment area. The remainder of the SCAB will remain classified as attainment (CARB 2018).

Table 5.5-31 shows that the TSP’s mitigated peak daily construction emissions would be 0.8 ton per day of NOx. By comparison and for context, the most recent EPA-approved SCAB emissions inventory estimated total anthropogenic emissions within the SCAB in 2012 to be 540 tons per day of NOx (SCAQMD, 2017). This estimate shows that the TSP’s maximum regional NOx contribution would be equivalent to about 0.1 percent of the total SCAB emissions. Therefore, given (a) the attainment status of the region and (b) the relatively small increase in regional NOx emissions contributions from the TSP, the TSP would not contribute to a regional violation of the NO2 standards and would not contribute to regional adverse health effects related to NO2 outside of the local Port area. Adverse health effects related to the TSP’s NO2 emissions are also addressed on a *local* level in Impact AQ-2.

Carbon Monoxide. The SCAB is currently in attainment of the CAAQS and NAAQS for CO. The most stringent CAAQS or NAAQS for CO are 20 ppm for a 1-hour average and 9.0 ppm for an 8-hour average. The highest CO concentrations recorded anywhere in the SCAB over the last 3 available years (2016-2018) are 8.4 ppm for a 1-hour average and 4.6 ppm for an 8-hour average (SCAQMD 2019). These pollutant levels are 42 and 51 percent of the 1-hour and 8-hour standards, respectively.

Table 5.5-31 shows that the TSP’s mitigated peak daily construction emissions would be 0.5 ton per day of CO. By comparison and for context, the most recent EPA-approved SCAB emissions inventory estimated total anthropogenic emissions within the SCAB in 2012 to be 2,123 tons per day of CO (SCAQMD, 2017). This estimate shows that the TSP’s maximum regional CO contribution would be equivalent to about 0.02 percent of the total SCAB emissions. Therefore, given (a) the attainment status of the region and (b) the relatively small regional emissions contribution from the TSP, the TSP would not contribute to a regional violation of the CO standards and would not contribute to regional adverse health effects related to CO.

Ozone. VOC and NOx are precursors to ozone, for which the SCAB is currently in nonattainment of the CAAQS and NAAQS (also referred to as state and federal standards). The most stringent state and federal ozone standards are 0.09 ppm for a 1-hour average, 0.070 ppm for the 3-year average of the fourth-highest 8-hour concentration each year (known as the federal 8-hour standard), and 0.07 ppm for an 8-hour average (known as the state 8-hour standard). The highest 1-hour ozone concentration recorded in the SCAB over the last three available years (2016-2018) is 0.163 ppm, which is 1.8 times the standard. This concentration occurred in 2016 at the Crestline station in the central San Bernardino Mountains. The standard was exceeded somewhere in the SCAB on 25 percent of days during the 3-year period. The highest federal 8- hour ozone concentration (3-year average) recorded in the SCAB over the last three available years (2016-2018) is 0.112 ppm, which is 1.6 times the standard. This concentration occurred at both the Crestline and San Bernardino stations. The threshold of 0.070 ppm was exceeded somewhere in the SCAB on 38 percent of days during the 3-year period. The highest state 8-hour ozone concentration recorded in the SCAB over the last three available years (2016-2018) is 0.136 ppm, which is 1.9 times the standard. This concentration occurred in 2017 at the San Bernardino station. The standard was exceeded somewhere in the SCAB on 38 percent of days during the 3-year period (SCAQMD 2019). Therefore, because (a) the region is nonattainment for ozone and (b) construction of the TSP would exceed the SCAQMD's daily emission thresholds for NOx and VOC, the TSP would potentially contribute to regional violations of the ozone standards and to regional adverse health effects related to ozone.

Table 5.5-31 shows that the TSP's mitigated peak daily construction emissions would be 0.05 ton per day of VOC and 0.8 ton per day of NOx. By comparison and for context, the most recent EPA-approved SCAB emissions inventory estimated total anthropogenic emissions within the SCAB in 2012 to be 470 tons per day of VOC and 540 tons per day of NOx (SCAQMD, 2017). These estimates show that the TSP's maximum regional VOC and NOx contributions would be equivalent to about 0.01 and 0.1 percent, respectively, of the total SCAB emissions. These emissions comparisons show that the TSP's contribution to regional violations of the ozone standards would be relatively small.

The following summary of adverse health effects associated with ozone exposure was compiled by the SCAQMD in its Final 2016 AQMP (SCAQMD 2017). Appendix I of the 2016 AQMP provides an expanded discussion of the adverse health effects:

> *Short-term exposures (lasting for a few hours) to ozone at levels typically observed in Southern California can result in breathing pattern changes, reduction of breathing capacity, increased susceptibility to infections, inflammation of the lung tissue, and some immunological changes. Individuals working outdoors, children (including teenagers), older adults, people with pre-existing lung disease, such as asthma, and individuals with certain nutritional deficiencies are considered to be the subgroups most susceptible to ozone effects. Elevated ozone levels are associated with increased school absences and daily hospital admission rates, as well as increased mortality. An increased risk for asthma has been found in children who participate in multiple sports and live in high-ozone communities. Ozone exposure under exercising conditions is known to increase the severity of respiratory symptoms. Although lung volume and airway resistance changes observed after a single exposure diminish with repeated exposures, biochemical and cellular changes appear to persist, which can lead to subsequent lung structural changes.*

In summary, construction of the TSP would potentially contribute to regional adverse health effects associated with exposure to PM2.5 and ozone in the SCAB. The TSP would not contribute to regional adverse health effects associated with exposure to CO or NO2. Impacts would be temporary, occurring only during the construction period.

H3.2. Potential Impact of Significant Local Ambient Concentrations on Public Health

In response to the California Supreme Court's recent decision on *Sierra Club v. County of Fresno (2018)*, this section provides a discussion of the potential health effects associated with the significant local ambient pollutant concentrations identified in Impact AQ-2 for TSP construction. These pollutant concentrations are considered local impacts because they were determined through dispersion modeling of the TSP's primary pollutant emissions in the local Port area, and because the maximum pollutant concentrations predicted by the dispersion model would be located very close to the construction activities. By definition, a modeled exceedance of a SCAQMD ambient concentration threshold means that the TSP would contribute to a local violation of the CAAQS or NAAQS and therefore would contribute to local adverse health effects in the modeled exceedance area. If no modeled exceedance is predicted, the TSP is presumed not to contribute to local adverse health effects because the CAAQS and NAAQS were established by CARB and USEPA to protect public health and welfare.

Tables 5.5-32 and 5.5-33 show that construction of the TSP would produce significant local NO2 concentrations with mitigation. The local concentrations would be less than significant for SO2, CO, PM10, and PM2.5. Therefore, construction of the TSP would potentially contribute to local adverse health effects associated with exposure to NO2.

Analysis Approach and Limitations

There is currently no reliable methodology available that can quantify health effects associated with local exposure to NO2 concentrations. Therefore, this document provides a qualitative discussion of the potential for the TSP's local NO2 impacts to cause adverse health effects. The qualitative discussion (a) identifies the local area where NO2 concentrations are predicted to exceed the standards, which is presumed to be the area where project-related adverse health effects could potentially occur; and (b) describes the general types of adverse health effects that could be associated with exposure to elevated NO2 levels.

A discussion of the TSP's *regional* contributions to adverse health effects in the SCAB is provided as part of Impact AQ-1.

Identification of Potential Local Adverse Health Effects

Nitrogen Dioxide. Table 5.5-32 shows that construction of the TSP with mitigation would produce local ambient NO2 concentrations that exceed the 1-hour NAAQS. The maximum concentration on land is predicted to be 256 ug/m3 (Project plus background), which is 1.4 times the standard. Therefore, construction of the TSP would potentially contribute to local adverse health effects associated with short-term exposure to NO2.

Appendix A, Figure A2.4 shows the area where the modeled NO2 concentration would exceed the federal 1-hour NO2 standard during TSP construction, after mitigation. This is the area where the potential for adverse health effects associated with NO2 exposure during construction is presumed to exist. Most of the impact area is over water, but a portion of the area covers Pier J, which is a POLB container terminal. The significant impact area would not extend over any existing residences.

The following summary of adverse health effects associated with NO2 exposure was compiled in the 2016 AQMP. Appendix I of the 2016 AQMP provides an expanded discussion of the adverse health effects.

> *USEPA noted the respiratory effects of NO2, and evidence suggestive of impacts on cardiovascular health, mortality and cancer (USEPA 2016). Evidence for low-level nitrogen dioxide (NO2) exposure effects is derived from laboratory studies of asthmatics and from epidemiological studies. Additional evidence is derived from animal studies. USEPA cited the coherence of the results from a variety of studies, and a plausible biological mechanism to support the determination of a causal relationship between short term NO2 exposures and asthma exacerbations ("asthma attacks"). The long-term link with respiratory outcomes was strengthened by recent experimental and epidemiological studies, and the strongest evidence available is from studies of asthma development. Experimental studies have found that NO2 exposures increase responsiveness of airways, pulmonary inflammation, and oxidative stress, and can lead to the development of allergic responses. These biological responses provide evidence of a plausible mechanism for NO2 to cause asthma. Additionally, results from controlled exposure studies of asthmatics demonstrate an increase in the tendency of airways to contract in response to a chemical stimulus (airway responsiveness) or after inhaled allergens. Animal studies also provide evidence that NO2 exposures have negative effects on the immune system, and therefore increase the host's susceptibility to respiratory infections. Epidemiological studies showing associations between NO2 levels and hospital admissions for respiratory infections support such a link, although the studies examining respiratory infections in children are less consistent.*

In summary, construction of the TSP would potentially contribute to local adverse health effects associated with exposure to NO2. The area of impact would occur on POLB property. The TSP would not contribute to local adverse health effects associated with exposure to SO2, CO, PM10, or PM2.5. Impacts would be temporary, occurring only during the construction period.

H3.3. References

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Appendix H4. Health Risk Evaluation

H4.1. Introduction

This appendix describes the methods and results of a health risk evaluation of toxic air contaminant (TAC) emissions from construction activities associated with all Action Alternatives. The Action Alternatives are described in detail in Section 4 (Plan Formulation). The No Action Alternative is also described in detail in Section 4 (Plan Formulation), is assessed qualitatively in Sections 5.5 (Air Quality Environmental Consequences) and 5.6 (Greenhouse Gas Environmental Consequences) of the EIS/EIR, and therefore is not included in this appendix. TACs are compounds that are known or suspected to cause adverse carcinogenic or non-carcinogenic human health effects after short-term (acute) or long-term (chronic) exposure. This evaluation assesses the individual cancer risks and non-cancer chronic impacts associated with construction of the Action Alternatives to residential/sensitive receptors and offsite workers.[1]

Individual cancer risk represents the chance that a person would contract cancer resulting from long-term exposure to the TACs of concern. A non-cancer chronic hazard index represents the potential for non-cancer health impacts resulting from long-term exposure to TACs. An acute non-cancer hazard index represents the potential for non-cancer health impacts resulting from a short-term (i.e., one-hour) exposure to TACs. Population cancer burden is the potential increase in the number of cancer cases in the affected population.

H4.2. Health Risk Estimation Approach

Since the Action Alternatives would produce TAC emissions only during temporary construction activities and because emissions would occur at a considerable distance from the nearest residential and sensitive receptors, a detailed health risk assessment was not performed. Instead, results of the PM_{10} dispersion modeling, detailed in Appendix H2, and CARB's Hotspots Analysis and Reporting Program (HARP) were used to estimate maximum cancer risks. HARP's Risk Assessment Standalone Tool (RAST), which calculates potential health impacts using ground level TAC concentrations, was used to estimate health impacts (CARB 2019a).

TAC-related cancer risk in the Port area is dominated by emissions of diesel particulate matter (DPM), a TAC and component of diesel exhaust. This health risk evaluation used the annual PM_{10} concentrations predicted by AERMOD (Appendix H2) during construction as a proxy for DPM. Although conservative, the approach is appropriate because more than 99 percent of PM_{10} emissions associated with construction of the Action Alternatives would be from diesel exhaust. Non-exhaust PM_{10} (i.e., fugitive dust, entrained road dust, tire wear, brake wear) would be limited to the project's minimal land-based construction activities.

Cancer risk at the maximally-impacted residential/sensitive receptor was calculated by HARP assuming the exposure period would start in the receptor's third trimester of gestation ("3TM") and continue for the duration of construction. Cancer risks were calculated separately for the period of the third trimester until just before the second birthday (referred to as "3TM < 2") and the period of the second birthday until just before the sixth birthday ("2 < 6") due to different risk sensitivity assumptions in HARP. The two resulting risk values were then added together to produce the final risk result. The receptor age period 3TM < 2 was conservatively modeled with the average PM_{10} concentration during the two consecutive years with the greatest construction emissions because this age period has the greatest cancer risk sensitivity according to OEHHA guidelines (OEHHA 2015). The receptor age period 2 < 6 was modeled with the average PM_{10} concentration during all other years of construction. The average PM_{10} concentrations

[1] Sensitive receptors were conservatively evaluated with residential exposure assumptions.

during these two exposure periods were estimated by scaling the PM_{10} concentration during the year of maximum emissions (Appendix H2) by the ratio of DPM emissions from the respective periods. Residential cancer risk was calculated by HARP using the “RMP derived” option in accordance with SCAQMD's *AB 2588 and Rule 1402 Supplemental Guidelines* (SCAQMD 2018).

Cancer risk at the maximally-impacted occupational receptor was calculated by HARP assuming an average PM_{10} concentration over the entire construction period. The average PM_{10} concentration was estimated by scaling the PM_{10} concentration during the year of maximum emissions (Appendix H2) by the ratio of DPM emissions from the respective periods. Occupational cancer risk was estimated using the “OEHHA derived” option in accordance with SCAQMD's *AB 2588 and Rule 1402 Supplemental Guidelines*.

Chronic hazard indices at the maximally-impacted residential/sensitive and occupational receptors were directly calculated by dividing the PM_{10} concentration during the year of maximum emissions (Appendix H2) by the Chronic Reference Exposure Level of 5.0 ug/m3 as published in CARB's *Consolidated Table of OEHHA/ARB Approved Risk Assessment Health Values* (CARB 2019b).

Acute non-cancer impacts and population cancer burden are addressed qualitatively. Past Port projects have consistently shown that the non-cancer acute hazard index and population cancer burden would not exceed SCAQMD thresholds. For example, the residential cancer risk for the Port’s recent Pier B On-Dock Rail Support Facility project (POLB 2016) was estimated to be 8.7 in a million with mitigation, and the associated population cancer burden was estimated to be only 0.27 (POLB 2016), about one-half of the significance threshold of 0.5.

Table H4-1 shows that the Action Alternatives would produce maximum cancer risks roughly similar to Pier B; however, most activities associated with the Action Alternatives would occur over water and further from population centers than the Pier B project. Therefore, the population cancer burden for the Action Alternatives would likely be lower than 0.27 calculated for Pier B. Similarly, acute non-cancer impacts would also likely be lower than the 0.07 acute hazard index calculated for Pier B and therefore below the SCAQMD threshold of 1.

H4.3. Predicted Air Quality Impacts

Table **H4-1** presents the estimated residential cancer risk, off-site occupational cancer risk, residential chronic hazard index, and off-site occupational chronic hazard index associated with each Action Alternative using the methodology described above. The table shows that the cancer risk at the maximally-impacted residential/sensitive receptor would exceed the significance threshold for Alternative 4, both without and with mitigation. The residential/sensitive cancer risks associated with Alternatives 2, 3, and 5 would be below the threshold, both without and with mitigation. The occupational cancer risks and residential and occupational chronic hazard indices would be well below the thresholds for all Action Alternatives, both without and with mitigation.

Table H4-1. Estimated Cancer Risks Associated with Construction of the Action Alternatives

Alternative	Construction DPM Emissions [a]				Estimated DPM Concentration at the Maximum Residential Receptor			Estimated DPM Concentration at the Maximum Occupational Receptor		Estimated Individual Cancer Risk		Estimated Chronic Hazard Index [m]	
	Maximum Year (lb/yr) [b]	Average Years 1-2 (lb/yr) [c]	Average Years 3-6 (lb/yr) [d]	Average Years 1-6 (lb/yr) [e]	Maximum Year (ug/m3) [f]	Average Years 1-2 (ug/m3) [g]	Average Years 3-6 (ug/m3) [h]	Maximum Year (ug/m3) [i]	Average Years 1-6 (ug/m3) [j]	Maximum Residential Receptor [k]	Maximum Occupational Receptor [l]	Maximum Residential Receptor	Maximum Occupational Receptor
Alt 2 Unmitigated	12,645	9,405	107	3,207	2.3E-02	1.7E-02	1.9E-04	9.4E-02	2.4E-02	5.8E-06	3.7E-07	0.005	0.02
Alt 2 Mitigated	8,529	5,656	67	1,930	1.2E-02	7.7E-03	9.1E-05	4.6E-02	1.0E-02	2.6E-06	1.6E-07	0.002	0.009
Alt 3 Unmitigated	19,263	13,335	723	4,927	2.9E-02	2.0E-02	1.1E-03	1.1E-01	2.8E-02	6.9E-06	4.4E-07	0.006	0.02
Alt 3 Mitigated	15,108	9,225	344	3,305	2.0E-02	1.2E-02	4.6E-04	6.1E-02	1.3E-02	4.2E-06	2.1E-07	0.004	0.01
Alt 4 Unmitigated	27,035	19,484	5,077	9,879	5.0E-02	3.6E-02	9.4E-03	1.5E-01	5.4E-02	1.3E-05	8.4E-07	0.01	0.03
Alt 4 Mitigated	26,824	17,324	2,472	7,422	4.7E-02	3.0E-02	4.3E-03	1.0E-01	2.8E-02	1.1E-05	4.3E-07	0.009	0.02
Alt 5 Unmitigated	19,263	13,335	2,253	5,947	2.9E-02	2.0E-02	3.4E-03	1.1E-01	3.4E-02	7.2E-06	5.3E-07	0.006	0.02
Alt 5 Mitigated	15,108	9,225	1,035	3,765	2.0E-02	1.2E-02	1.4E-03	6.1E-02	1.5E-02	4.3E-06	2.4E-07	0.004	0.01
Threshold										**1.0E-05**	**1.0E-05**	**1**	**1**

Notes:

a. DPM emissions are from the emission calculations for each alternative, as described in Appendix H1.

b. This emission rate represents the maximum year of construction emissions, which occurs during dredging of the Approach Channel (hopper dredge). It is used in the chronic hazard index calculation.

c. This emission rate includes the two consecutive years with the greatest construction emissions. It is used in the residential cancer risk calculation for receptor age 3TM < 2.

d. This emission rate includes all remaining construction years except for the two consecutive years with the greatest emissions. It is used in the residential cancer risk calculation for receptor age 2 < 6.

e. This emission rate equals total construction emissions averaged over 6 years, which is the exposure duration selected in the HARP analysis to cover the alternative with the longest duration (6 years for Alternative 4). It is used in the occupational cancer risk calculation.

f. To be consistent with HARP HRA methodology, this concentration is the equivalent of the AERMOD "PERIOD" average using a 5-year meteorological data set; the emission rate modeled in AERMOD was the maximum annual PM_{10} emissions converted to g/s. This concentration is used to determine the residential chronic hazard index. The dispersion modeling methodology is described in Appendix H2.

g. The estimated Average Years 1-2 Concentration = Maximum Year Concentration x Average Years 1-2 Emissions / Maximum Year Emissions. This concentration is used in the residential cancer risk calculation for receptor age 3TM < 2.

h. The estimated Average Years 3-6 Concentration = Maximum Year Concentration x Average Years 3-6 Emissions / Maximum Year Emissions. This concentration is used in the residential cancer risk calculation for receptor age 2 < 6.

i. To be consistent with HARP HRA methodology, this concentration is the AERMOD "PERIOD" average using a 5-year meteorological data set; the emission rate modeled in AERMOD was the maximum annual PM_{10} emissions converted to grams per second. This concentration is used to determine the occupational chronic hazard index. The dispersion modeling methodology is described in Appendix H2.

j. The estimated Avg Years 1-6 Concentration = Maximum Year Concentration x Avg Years 1-6 Emissions / Maximum Year Emissions. This concentration is used in the occupational cancer risk calculation.

k. Residential cancer risk was calculated using HARP Risk Assessment Standalone Tool (RAST) (run at a unit concentration of 1 ug/m3 and scaled to the Project modeled concentration). The exposure period was assumed to start in the 3rd trimester of gestation (3TM) and continue for the duration of construction. The risks for receptor age 3TM < 2 and 2 < 6 were calculated separately due to different exposure parameters, and added together. Residential cancer risk was estimated using RMP derived methodology in accordance with SCAQMD's AB 2588 and Rule 1402 Supplemental Guidelines (September 2018). The HARP RAST residential cancer risk results at a DPM unit concentration of 1 ug/m3 are 3.42E-04 for receptor age 3TM < 2 (2-year exposure) and 1.14E-04 for receptor age 2 < 6 (4-year exposure).

l. Occupational cancer risk was calculated using HARP RAST (run at a unit concentration of 1 ug/m3 and scaled to the Project modeled concentration). The exposure period was assumed to be for the duration of construction (up to 6 years depending on the alternative). Occupational cancer risk was estimated using OEHHA derived methodology in accordance with SCAQMD's AB 2588 and Rule 1402 Supplemental Guidelines (September 2018). The HARP RAST occupational cancer risk results at a DPM unit concentration of 1 ug/m3 are 1.55E-05 (6-year exposure).

m. The chronic hazard index was directly calculated by dividing the maximum year concentration by the Chronic Reference Exposure Level of 5.0 ug/m3 as published in CARB's Consolidated Table of OEHHA/ARB Approved Risk Assessment Health Values. https://ww3.arb.ca.gov/toxics/healthval/contable.pdf. (CARB, 2019b).

Table H4-2 presents locations of sensitive receptors in the project vicinity.

Table H4-2. Sensitive Receptors

Receptor No.	UTM X (m)	UTM Y (m)	Receptor Description	Category	Street Address	City
1	389912	3738586	12th Street Head Start	Child Care	1212 Long Beach Blvd	Long Beach
2	389883	3738053	8th Street Early Head Start	Child Care	820 Long Beach Blvd	Long Beach
3	390048	3737366	A Love 4 Learning Academy	Child Care	306 Elm Avenue	Long Beach
4	389599	3738178	ABC 123 Long Beach Learning Center	Child Care	909 Pine Ave	Long Beach
5	387995	3740853	Agu Family Child Care	Child Care	4400 Boyar Ave	Long Beach
6	389600	3738360	Aspiranet Foster Family Agency	Child Care	1043 Pine Ave	Long Beach
7	390314	3739617	Atlantic Headstart	Child Care	1862 Atlantic Ave	Long Beach
8	390224	3738014	Benford Family Child Care	Child Care	530 E 8th St	Long Beach
9	388691	3740431	Briggs Family Child Care	Child Care	Golden Ave	Long Beach
10	387340	3741495	Brown Family Child Care	Child Care	1831 W Jeanette Pl	Long Beach
11	386680	3739773	Cabrillo Child Development Center	Child Care	2205 San Gabriel Ave.	Long Beach
12	388011	3741615	Carol Daycare	Child Care	2842 Easy Ave	Long Beach
13	386767	3739844	Century Villages at Cabrillo Homeless Housing Community	Child Care	2001 River Ave	Long Beach
14	390062	3738250	Child Care Center At St Mary Medical Center	Child Care	930 Elm Ave	Long Beach
15	388899	3737062	Childtime Learning Center	Child Care	1 World Trade Ctr # 199	Long Beach
16	389481	3741039	Comprehensive Child Development	Child Care	2565 Pacific Ave.	Long Beach
17	387982	3740075	Costa Family Child Care	Child Care	2085 Easy Ave	Long Beach
18	388870	3737870	Edison Child Development Center	Child Care	640 W 7th St	Long Beach
19	389981	3738882	Elm Street Head Start	Child Care	1425 & 1429 Elm Ave	Long Beach
20	388635	3741379	Fords Family Day Care	Child Care	2726 San Francisco Ave	Long Beach
21	388088	3740588	Franklin Day Care Center	Child Care	2333 Fashion Ave	Carson
22	387556	3739981	Gallegos Family Child Care	Child Care	2024 Adriatic Ave	Long Beach
23	387670	3740411	Garfield Head Start	Child Care	2240 Baltic Ave	Long Beach
24	390403	3740229	Garibay Family Child Care	Child Care	2172 Lime Ave	Long Beach
25	388688	3740334	Hernandez Family Child Care	Child Care	2200 Golden Ave	Long Beach
26	388894	3740733	Hernandez Family Child Care	Child Care	5322 Elm Ave	Long Beach
27	388832	3740311	Herrera Family Child Care	Child Care	737 W Hill St	Long Beach
28	387501	3739748	Job Corp Head Start	Child Care	1903 Santa Fe Ave.	Long Beach
29	390444	3739033	Jones Family Child Care	Child Care	2275 Baltic Ave	Long Beach
30	390594	3738247	Kelly's Care	Child Care	943 N Washington Pl	Long Beach

Receptor No.	UTM X (m)	UTM Y (m)	Receptor Description	Category	Street Address	City
31	388725	3741155	Kelly's Kids Daycare Center	Child Care	855 W Willow St	Long Beach
32	390195	3739970	Kim Family Child Care	Child Care	2035 Linden Ave	Long Beach
33	388192	3740542	Lara Family Day Care	Child Care	1303 W 253rd St	Harbor City
34	383107	3737969	Lil Cowpoke Preschool	Child Care	445 N Avalon Blvd	Wilmington
35	389577	3738176	Little Lighthouse Educational Childcare Center	Child Care	911 Pine Avenue	Long Beach
36	389940	3740373	Long Beach Blvd Head Start	Child Care	2236 Long Beach Blvd	Long Beach
37	390373	3740260	Long Beach Center for Child Development	Child Care	622 E. Hill St	Long Beach
38	390533	3740347	Long Beach Child Development Center	Child Care	2222 Olive Ave	Long Beach
39	389282	3739139	Long Beach Day Nursery - West Branch	Child Care	1548 Chestnut Ave	Long Beach
40	388917	3737693	Loves Family Child Care	Child Care	527 Daisy Ave	Long Beach
41	388856	3738266	Lucy's Baby Care	Child Care	940 Maine Ave	Long Beach
42	390021	3738204	Montessori On Elm Preschool + Kindergarten	Child Care	930 Elm Ave	Long Beach
43	389217	3739222	N2 Lil Folkz	Child Care	1624 Chestnut Ave	Long Beach
44	389533	3741212	Oakwood Children's Center	Child Care	2650 Pacific Ave	Long Beach
45	389020	3739872	P.A.L. Family Day Care	Child Care	1980 Daisy Ave	Long Beach
46	389472	3740264	Pacific Head Start	Child Care	2179 Pacific Ave	Long Beach
47	387188	3740575	Patterson Family Child Care	Child Care	2133 Canal Ave	Long Beach
48	389579	3738221	Pine Head Start	Child Care	927 Pine Ave	Long Beach
49	390399	3739915	Poole Family Child Care	Child Care	2002 Lime Ave	Long Beach
50	389621	3738176	Progressive Steps Children Center	Child Care	911 Pine Ave	Long Beach
51	389036	3741241	Ruiz Family Daycare	Child Care	2670 Daisy Ave	Long Beach
52	389765	3740701	Sandford Family Child Care	Child Care	215 E Burnett St	Long Beach
53	390098	3740230	Sar Family Child Care	Child Care	2171 Pasadena Ave	Long Beach
54	390623	3740004	Smart & Manageable	Child Care	2054 Myrtle Ave	Long Beach
55	389894	3738960	Un Mundo De Amigos Preschool	Child Care	1480 Long Beach Blvd	Long Beach
56	389193	3738664	West Anaheim Child Care Center	Child Care	440 W. Anaheim St	Long Beach
57	387505	3740187	West Child Development Center/Westside Neighborhood Clinic	Child Care	2125 Santa Fe Ave.	Long Beach
58	384704	3739154	Wilmington Park Children's Center	Child Care	1419 E Young St	Wilmington
59	390296	3737362	YMCA GLB Fairfield 3rd Street Preschool	Child Care	607 E. 3rd St	Long Beach
60	389492	3740248	YMCA Play & Learn Preschool	Child Care	2179 Pacific Ave	Long Beach
61	389517	3739600	Young Horizons Child Development Center	Child Care	1840 Pacific Ave	Long Beach
62	389536	3740757	Young Horizons Child Development Center	Child Care	2418 Pacific Ave	Long Beach

Receptor No.	UTM X (m)	UTM Y (m)	Receptor Description	Category	Street Address	City
63	390248	3737686	Young Horizons Child Development Center	Child Care	501 Atlantic Ave	Long Beach
64	389459	3737689	Young Horizons/El Jardin de la Felicidad	Child Care	507 Pacific Ave	Long Beach
65	388854	3740055	Zarate Family Child Care	Child Care	2496 Oregon Ave	Long Beach
66	390353	3741373	Akin's Post Acute Rehab Hospital; Atlantic Memorial Healthcare Center	Elder Care	2750 Atlantic Ave	Long Beach
67	383100	3738224	American AAA Health Care Center	Elder Care	629 N Avalon Blvd	Wilmington
68	387401	3740832	Aquarius Home	Elder Care	1765 Aquarius St	Long Beach
69	387445	3739252	Bay Breeze Care	Elder Care	1653 Santa Fe Ave	Long Beach
70	389740	3736892	Breakers Of Long Beach, The	Elder Care	210 E Ocean Blvd	Long Beach
71	387440	3740697	Burnett Home Care	Elder Care	1740 West Burnett St.	Long Beach
72	390386	3740307	Caruthers Royale Care	Elder Care	2204 Lime Ave.	Long Beach
73	389587	3740686	Deluxe Guest Home	Elder Care	3260 Pine Ave	Long Beach
74	389586	3740722	Deluxe Guest Home II	Elder Care	3266 Pine Ave	Long Beach
75	389401	3740862	Garden, The	Elder Care	2485 Cedar Ave	Long Beach
76	389119	3738782	Harbor View Rehabilitation Center	Elder Care	490 W. 14th Street	Long Beach
77	387192	3740865	Hayes Home	Elder Care	2470 Hayes Ave	Long Beach
78	389645	3737994	Healthview Pine Villa Assisted Living	Elder Care	117 East 8th Street	Long Beach
79	389498	3740798	Heritage Board & Care #2	Elder Care	1509 E 4th St	Long Beach
80	387231	3740475	Loram Manor	Elder Care	1925 Gemini St	Long Beach
81	390455	3738345	Olive Tree Home	Elder Care	1035 Olive Street	Long Beach
82	390278	3738221	Padua House	Elder Care	940 Atlantic Ave	Long Beach
83	387154	3741415	Pioneer Homes Of California	Elder Care	2041 W Carolyn Pl	Long Beach
84	387349	3740831	Reliable Residential Care	Elder Care	1840 Aquarius St	Long Beach
85	390005	3740389	Right At Home	Elder Care	2245 Elm Ave	Long Beach
86	389478	3741347	Royal Care Skilled Nursing Center	Elder Care	2725 Pacific Avenue	Long Beach
87	390388	3740918	Serra Project Long Beach	Elder Care	1043 Elm Ave	Long Beach
88	390475	3738176	Villa Maria Care Center	Elder Care	723 E 9th St	Long Beach
89	389978	3741459	Earl & Lorraine Miller Children's Hospital; Long Beach Memorial Medical Center and Hospital	Hospital	2801 Atlantic Ave	Long Beach
90	389449	3739338	Long Beach Doctors Hospital	Hospital	1725 Pacific Ave	Long Beach
91	389539	3741329	Pacific Hospital of Long Beach (Hospital and Convalescent/Nursing Home)	Hospital	2776 Pacific Ave	Long Beach
92	390100	3738380	St Mary Medical Center	Hospital	1050 Linden Ave	Long Beach
93	389215	3739462	Tom Redgate Memorial Hospital	Hospital	1775 Chestnut Ave	Long Beach

Receptor No.	UTM X (m)	UTM Y (m)	Receptor Description	Category	Street Address	City
94	387362	3740183	Admiral Kidd Park	Recreational	2125 Santa Fe Ave	Long Beach
95	388669	3737500	Cesar Chavez Park	Recreational	401 Golden Avenue	Long Beach
96	388060	3738639	City of Long Beach Multi-Service Center	Recreational	1301 W. 12th Street	Long Beach
97	387306	3739448	Harbor Japanese Community Cultural Center	Recreational	1766 Seabright Ave	Long Beach
98	386955	3740430	Hudson Park	Recreational	2335 Webster Ave	Long Beach
99	387067	3741097	Khemara Buddhikaram Cambodian Buddhist Temple	Recreational	2100 W Willow Street	Long Beach
100	387129	3740300	Pramuan Simsriwatna Place of Worship	Recreational	2015 W Hill Street	Long Beach
101	386856	3739792	VA Long Beach Clinic and Veteran's Support Services	Recreational	2001 River Ave, Building 28	Long Beach
102	382237	3737492	Wilmington Waterfront Park	Recreational	S. C Street	Wilmington
103	383262	3736996	Wilmington Waterfront Promenade	Recreational	Water Street	Wilmington
104	384770	3739365	Apostolic Faith Center/Apostolic Faith Academy	School	1530 E Robidoux St	Wilmington
105	389454	3738592	Artesia Well Preparatory Academy	School	1235 Pacific Ave	Long Beach
106	386739	3740042	Bethune School/Program for the Homeless	School	2101 San Gabriel Ave	Long Beach
107	390228	3740326	Burnett Elementary	School	565 East Hill St.	Long Beach
108	387438	3739936	Cabrillo High School	School	2001 Santa Fe Ave.	Long Beach
109	389562	3740833	Cambodian Christian	School	2474 Pacific Ave	Long Beach
110	388744	3737296	Cesar Chavez Elementary	School	730 West Third St.	Long Beach
111	389879	3739303	Colegio New City	School	1637 Long Beach Blvd	Long Beach
112	390505	3737788	Constellation Community Charter Middle	School	620 Olive Ave.	Long Beach
113	388749	3737794	Edison Elementary	School	625 Maine Ave.	Long Beach
114	386969	3740593	Elizabeth Hudson Elementary School and Development Center Daycare	School	2335 Webster Ave	Long Beach
115	389624	3738317	First Baptist Church School	School	1000 Pine Ave	Long Beach
116	390180	3738228	First Lutheran Day Care, Preschool and Elementary School	School	946 Linden Ave	Long Beach
117	382757	3737606	Gang Alternative Program	School	231 Island Ave	Wilmington
118	382820	3738093	George de la Torre Jr. Elementary School	School	500 Island Ave	Wilmington
119	389389	3738887	George Washington Middle School	School	1450 Cedar Ave	Long Beach
120	384377	3739369	Holy Family Preschool and Elementary School	School	1122 E Robidoux St	Wilmington
121	389544	3740927	Holy Innocents Elementary School	School	2500 Pacific Ave	Long Beach
122	387067	3740604	Hudson Development Center Daycare and Elementary School	School	2335 Webster Ave	Long Beach
123	389714	3737893	International Elementary	School	700 Locust Ave	Long Beach
124	389686	3741436	Jackie Robinson Academy	School	2750 Pine Ave	Long Beach
125	387724	3740376	James Garfield Elementary School / LBUSD Child Development Center	School	2240 Baltic Ave	Long Beach

Receptor No.	UTM X (m)	UTM Y (m)	Receptor Description	Category	Street Address	City
126	387255	3739936	Juan Rodriguez Cabrillo High School	School	2001 Santa Fe Ave	Long Beach
127	389235	3740749	Lafayette Elementary School	School	2445 Chestnut Ave	Long Beach
128	390207	3737910	Long Beach Montessori School	School	525 E. 7th St	Long Beach
129	390337	3739143	Polytechnic High School	School	1600 Atlantic Ave.	Long Beach
130	389106	3738800	Regency High School	School	490 W. 14th Street	Long Beach
131	387111	3740236	Reid Continuation High School	School	2153 W Hill St	Long Beach
132	389785	3738088	Renaissance High School for the Arts	School	235 East 8th St.	Long Beach
133	390160	3739058	Roosevelt Elementary	School	1574 Linden Ave.	Long Beach
134	390534	3737794	Saint Anthony High School	School	620 Olive Ave.	Long Beach
135	390580	3737582	Saint Anthony Preschool / Elementary	School	855 East 5th St.	Long Beach
136	387406	3740569	Saint Lucy School	School	2320 Cota Ave.	Long Beach
137	387022	3740319	Savannah Academy	School	2152 Hill St.	Long Beach
138	390248	3737371	Select Community Day School	School	5869 Atlantic Ave.	Long Beach
139	390538	3737763	St. Anthony High School/Constellation Community Charter Middle	School	620 Olive Ave.	Long Beach
140	387420	3740551	St. Lucy School	School	2320 Cota Ave	Long Beach
141	387250	3741600	Stephens Middle School	School	1830 West Columbia Street	Long Beach
142	390365	3737647	Stevenson Elementary; Stevenson Child Development Centers/Preschool	School	515 Lime Ave.	Long Beach
143	389624	3738615	The New City School	School	1230 Pine Ave	Long Beach
144	390276	3738162	True Social Justice Academy	School	630 Magnolia Ave	Long Beach
145	387129	3741587	William Logan Stephens Middle School	School	1830 W Columbia St	Long Beach
146	384625	3739124	Wilmington Park Elementary School/Mahar House	School	1140 Mahar Ave	Wilmington

Note: Individual residences are not included in the table and accompanying figure.

The locations of sensitive receptors in Table H4-2 are shown on Figure 3-4 in Section 3.5.

H4.4. References for Appendix H4

CARB 2019a. Hotspots Analysis and Reporting Program (HARP). Risk Assessment Standalone Tool (RAST). Version 19044. https://ww3.arb.ca.gov/toxics/harp/harp.htm. February 13.

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OEHHA 2015. Office of Environmental Health Hazard Assessment. *Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments.* March 2015.

POLB 2016. Port of Long Beach. *Pier B On-Dock Rail Support Facility Draft EIR*, Appendix A, Table A3-7. December 2016. Available: http://www.polb.com/environment/docs.asp. Accessed: September 2019.

SCAQMD 2018. *AB 2588 and Rule 1402 Supplemental Guidelines*. September.

FINAL INTEGRATED FEASIBILITY REPORT AND ENVIRONMENTAL IMPACT STATEMENT / ENVIRONMENTAL IMPACT REPORT (EIS/EIR)

APPENDIX G: REAL ESTATE

PORT OF LONG BEACH
DEEP DRAFT NAVIGATION STUDY
Los Angeles County, California

October 2021

US Army Corps of Engineers®

Port of LONG BEACH
THE PORT OF CHOICE

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1 STATEMENT OF PURPOSE

This Real Estate Plan (REP) is prepared in accordance with the Real Estate Handbook, ER 405- 1-12. The purpose of this REP is to provide data on lands, easements, relocations, and rights-of-way (LERR) requirements necessary to support the Port of Long Beach Deep Draft Navigation Study in determining if feasible alternatives exist to reduce transportation inefficiencies and improve navigation safety at the Port of Long Beach. The non-Federal sponsor (NFS) for the study is the Port of Long Beach (Port). The NFS shall be responsible for providing all of the LERR for the proposed project.

2 STUDY AUTHORITY

This study serves as an interim response to the Resolution of the House Committee on Public Works adopted 10 July 1968 that reads as follows:

"That the Board of Engineers for Rivers and Harbors is hereby requested to review the reports on the Los Angeles and Long Beach Harbors, California, heretofore submitted to the Congress with a view to promoting and encouraging the efficient, economic, and logical development of the harbor complex. The scope will encompass investigation of current shipping problems, adequacy of facilities, delays in intermodal transfers, channel dimensions, storage locations, and capacities, and other physical aspects affecting waterborne commerce in the San Pedro Bay region, including the conduct of model studies as necessary to establish an efficient layout of the port complex and the design of navigation facilities."

3 PROJECT LOCATION

The Port of Long Beach encompasses the eastern part of the San Pedro Bay, located in the southwestern portion of the city of Long Beach, in southern Los Angeles County, approximately 20 miles south of downtown Los Angeles. The study area includes the waters in the immediate vicinity (and shoreward) of the breakwaters through the entire port, including Outer Harbor, Inner Harbor, Cerritos Channel, West Basin, and the Back Channel. Regional access to the project site is provided by the Long Beach Freeway (Interstate 710). **Figure 3-1** provides a map of the Los Angeles region in which the Project site is located.

Figure 3-1 Location Map

The Port of Los Angeles is adjacent to the Port of Long Beach. The Los Angeles and Long Beach harbor complex consists of about 1,800 acres of water in the inner navigation channels, 5,700 acres of landfill, and 6,000 acres of water sheltered anchorages and navigation channels between the landfills and the nine miles of federally constructed and maintained breakwaters (see **Figure 3-2**).

Figure 3-2 Study Area Location Map and Current Federal Project

4 PROJECT DESCRIPTION

The Recommended Plan includes a combination of measures for container vessels (constructing the Pier J Approach Channel and Turning Basin and deepening the West Basin Channel to a new depth of -55 ft mean lower low water (MLLW)) and liquid bulk vessels (deepening the Approach Channel to -80 ft MLLW, and bend easing in portions of the Main Channel to match the currently authorized depth in the Main Channel of -76 ft MLLW) provides the greatest contribution to net benefits and has been determined as the National Economic Development (NED) Plan. When combined with the Local Service Facilities, the NED Plan has also been identified as the Recommended Plan.

General Navigation Features of the Recommended Plan for liquid bulk vessels includes:

- Deepening the Approach Channel from -76 feet MLLW to -80 ft MLLW
- Bend easing within portions of the Main Channel to -76 ft MLLW

General Navigation Features of the Recommended Plan for container ships includes:

- Constructing an approach channel to Pier J South to -55 ft MLLW
- Constructing a turning basin outside of Pier J South
- Constructing an electrical substation at Pier J South
- Deepening the West Basin from -50 ft MLLW to -55 ft MLLW

Approximately 7.1 mcy of dredged material would be placed in a nearshore site as well as 2 USEPA-designated offshore disposal sites for the General Navigation Features. **Figure 4-1** shows the location of the General Navigation Features. To support dredging by an electric clamshell dredge at the Pier J berth, the approach channel and turning basin, a new dredge electric substation is required to be constructed. This is necessary to mitigate for air quality impacts.

Local Service Facilities include channel and berth dredging within the Pier J South Slip to -55 feet MLLW. Approximately 337,000 cy of dredged material would be placed in an USEPA-designated offshore disposal site for the Local Service Facilities. In addition, structural improvement on the Pier J breakwaters at the entrance of the Pier J Slip would be necessary to accommodate deepening of the Pier J Slip and Approach Channel to -55 feet MLLW.

Figure 4-1 Potential Project Features in Final Array of Alternatives

5 NON-FEDERAL SPONSOR OWNED LANDS

The NFS owns several parcels totaling approximately 2,900 acres within and around the proposed project footprint as depicted **within the white dashed area** in **Figure 4-1**. This includes the approximate 9 acres staging area required for the project and 900 square feet at Pier J which will be the site for the construction of a new electrical substation. The NFS has agreed to make these lands available for the project

6 REAL ESTATE REQUIREMENTS

The requirements for Lands, Easements, Rights-of-Way, and Relocations (LERR) are necessary to support construction, operation and maintenance for the proposed project. It is the responsibility of the NFS to acquire real estate interest required for the project. No real estate acquisition is required for the deepening/widening for any of the proposed alternatives which will entail 100% in-water construction. All dredging for the proposed project will be below Mean High Water (MHW) and are within the navigable waters of the United States and are available to the Federal government by navigation servitude.

The proposed placement areas have been identified as follows:

1. USEPA Deep Ocean Placement sites at LA-2 and LA-3: LA-2 is located 9 miles southwest of Queens Gate – maximum cumulative allowable placement per calendar year from all sources= 1 million cubic yards. LA-3 is located 22 miles southeast of Queens Gate – maximum cumulative allowable placement per calendar year from all sources = 2.5 million cubic yards. These two sites are Ocean Dredge Material Disposal Sites (ODMDS) and the Corps is required to use the designated ODMDSs for disposal of dredged sediment to the maximum extent feasible. The sites were created in 1991 and 2005 under authority 40 CFR Part 228. No real estate interest is required for use of the site.
2. Surfside Borrow Site Nearshore Placement Area: Various sites off of Surfside-Sunset Beach have been used as sources of sand for the San Gabriel River to Newport Bay Beach Nourishment project since 1964. It is estimated that approximately 2.5 million cubic yards of capacity is available for placement of material into these sites. The nearshore placement area is under the jurisdiction of the California State Lands Commission. Assuming the material is suitable for nearshore disposal, dredge material will be placed at the Surfside Borrow Site Nearshore Placement Area. The Corps would be exercising Navigation Servitude as the suitable dredged material would be placed below the MHT line and related to navigation. The Corps will coordinate with the California State Lands Commission on the use of the nearshore disposal site (shown in Figure 6-1), however an interest in real estate would not be required.

There are three proposed staging areas: Pier T Echo (4.4 acres), Pier S (3.3 acres) and Pier D (1 acre) (shown in **Figure 4-1** in blue**)**. Pier T Echo has been identified as needed for the duration of the project which is 3 years. An additional site either Pier S or Pier D would be needed for a one-year period for the staging of the hopper dredge. The NFS has fee ownership of the proposed staging areas shown in Figure 6-2. If access to the proposed project and staging area will be by public roads and the NFS-owned lands are within the proposed project area, a Temporary Work Area Easement will not be required. As previously stated, Pier T was part of the former Long Beach Naval Shipyard which was BRACed in 1997. The NFS would not be eligible for lands that were previously transferred via BRAC if the acquisition was accomplished at no cost. Also, Pier T was used as a staging area during part of the Long Beach Channel Deepening project in 2013.

Lastly, a perpetual 900 sq. ft. Utility Easement would be necessary to fulfill the construction, operation and maintenance of the electrical substation project feature occurring on Pier J. The NFS has fee ownership of Pier J and will make 900 sq. ft. available to the project for the substation. The NFS will issue a utility easement to Southern California Edison who will Operate and Maintain the substation.

UTILITY AND/OR PIPELINE EASEMENT

A perpetual and assignable easement and right-of-way in, on, over and across (the land described in Schedule A) (Tracts Nos. _____,_____ and _____), for the location, construction, operation, maintenance, alteration; repair and patrol of (overhead) (underground) (specifically name type of utility or pipeline); together with the right to trim, cut, fell and remove therefrom all trees, underbrush, obstructions and other vegetation, structures, or obstacles within the limits of the right-of-way; reserving, however, to the landowners, their heirs and assigns, all such rights and privileges as may be used without interfering with or abridging the rights and easement hereby acquired; subject, however, to existing easements for public roads and highways, public utilities, railroads and pipelines.

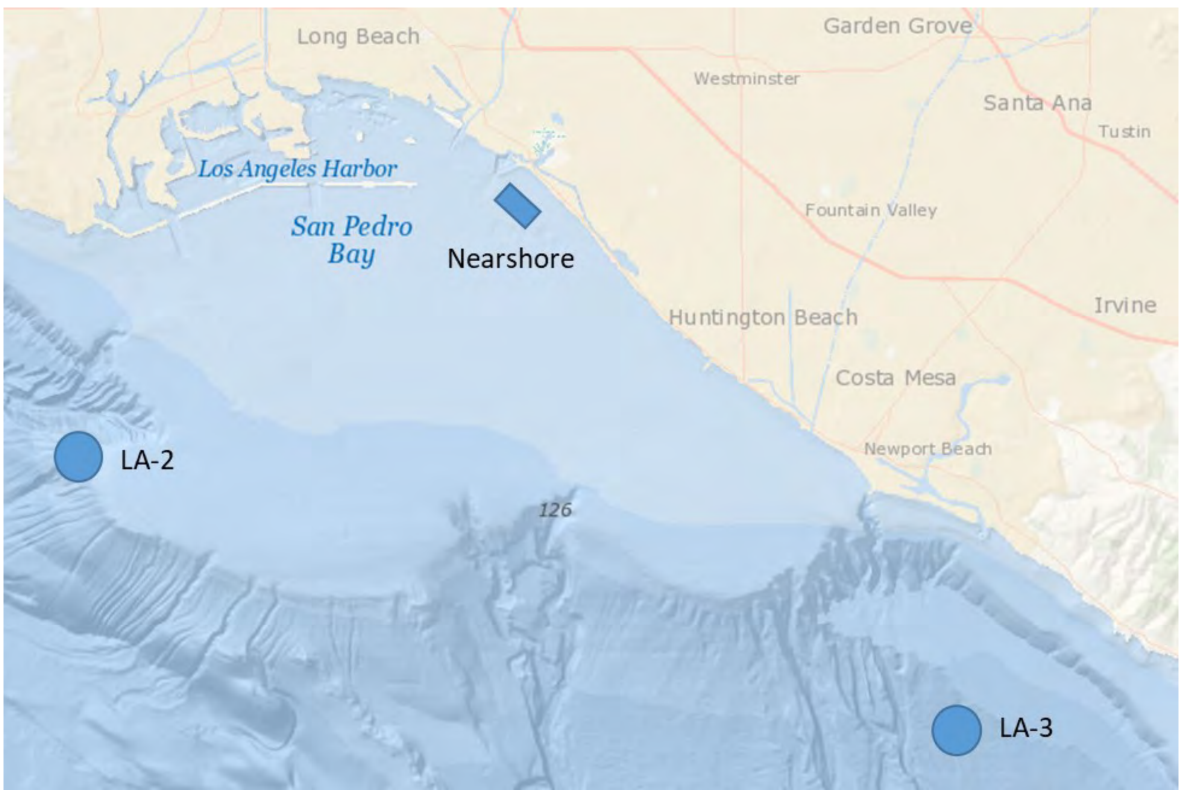

Figure 6-1 Proposed Placement Areas

7 NAVIGATION SERVITUDE

All deepening/widening for the proposed project will be below Mean High Water (MHW) and are within the navigable waters of the United States and are available to the Federal government by navigation servitude.

The Office of Counsel, Los Angeles District, has confirmed that the exercise of the navigation servitude for this project, for both dredging and for disposal at nearshore areas, is appropriate.

The Corps is not applying its navigation servitude for the use of offshore disposal sites LA-2 and LA-3 described above. According to the Final Rule in the Federal Register, under the authority of 40 CFR 228, the sites were designated as dredge material disposal sites under the jurisdiction of USEPA. The Corps is to use these sites as much as possible. Use of these sites does not require acquisition of an interest in land.

The project identifies the potential for beneficial reuse of material should good quality sand be identified. In the event good quality sand is identified, as described in the IFR Section 4.5.1, the Corps would further evaluate beneficial reuse through placement at a nearshore site.

8 INDUCED FLOODING

There will be no flooding caused by the proposed project.

9 PUBLIC LAW 91-646, RELOCATION ASSISTANCE BENEFITS

Preliminary investigations indicate that there will be no persons, farms or businesses displaced during the acquisition of lands required for any of the proposed alternatives. If necessary, the sponsor will be required to certify compliance with the requirements of PL 91-646, including landowners being properly advised of their rights under the program and appropriate benefit determinations, if any.

10 MINERAL INTEREST

There are no known outstanding mineral interests or active mining operations in the project area that may affect implementation of the project.

11 BASELINE COST ESTIMATE FOR REAL ESTATE

The baseline cost estimate includes the acquisition of a temporary work area easement for the deposition of nearshore materials at the site discussed above near surfside-sunset beach. It also includes the value for the temporary work area easements which are currently held in fee by the NFS and were not previously part of the Long Beach Naval Shipyard. Lastly, a value for the 900 sq. ft. parcel needed for the construction of an electrical substation is included, along with the administrative cost associated with the evidence needed to support the certification of Real Estate for the project and documentation needed for LERRs crediting.

Table 11-1 Baseline Cost Estimate

Baseline Cost for Real Estate			
	Federal	**Non-Federal**	**Totals**
a. Lands and Damages		$994,200	$994,200
b. Administrative Cost			
Acquisitions by NFS (01 Account)		$100,000	$100,000
District Review of LERR Crediting	$75,000		$75,000
Contingency 25%	$18,750	$273,550	$292,300
		Total	$1,461,500

12 ASSESSMENT OF NON-FEDERAL SPONSOR'S ACQUISITION CAPABILITY

An assessment of the Non-Federal Sponsor Real Estate Acquisition Capability and experience to acquire and provide the Lands, Easements and Rights of Way has been completed with input from the NFS. Based on the information provided by the NFS the Corps has determined the sponsor to be a "highly capable" sponsor. The assessment has been included to this report as Exhibit A.

13 ZONING ORDINANCE

No enactments of zoning ordinances are being proposed in lieu of or to facilitate acquisition in connection with the project.

14 ACQUISITION SCHEDULE

The NFS is responsible for acquiring any real estate interests required for the proposed project. The NFS is the fee owner of the proposed staging area and the site where the electrical substation will be constructed. They will make the lands available for the project when provided the acquisition letter for the project.

15 FACILITY/UTILITY RELOCATION

There are no relocations of utilities or facilities anticipated for the proposed project.

16 HAZARDOUS, TOXIC OR RADIOLOGICAL WASTE (HTRW)

There are no known HTRW in the proposed project area.

17 SPONSOR RISK NOTIFICATION

The Early Risk of Acquisition Letter to the NFS was sent on December 7, 2016 (see Exhibit B)

Reviewed by:

SANDOVAL.LISA.M
ARIE.[redacted]

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SANDOVAL.LISA.MARIE.[redacted]
Date: 2021.08.06 08:47:20 -07'00'

____
Lisa Sandoval
Supervisory Realty Specialist
Real Estate Division
Los Angeles District
U.S. Army Corps of Engineers

Approved by:

GATTI.JOSEPH.MIC
HAEL.[redacted]

Digitally signed by
GATTI.JOSEPH.MICHAEL.[redacted]
[redacted]: 2021.08.06 08:52:18 -07'00'

____
Joseph Michael Gatti
Deputy Chief, Real Estate Division
Los Angeles District
U.S. Army Corps of Engineers

Exhibit A: Assessment of Non-Federal Sponsor's Acquisition Capability

ASSESSMENT OF NON-FEDERAL SPONSOR'S REAL ESTATE ACQUISITION CAPABILTIES

I. Legal Authority:

a. Does the Sponsor have legal authority to acquire and hold title to real property for project purposes? (Yes/No) **Yes**

b. Does the Sponsor have the power of eminent domain for this project? (Yes/No) **Yes. Please note property acquisition (temporary of otherwise) and/or any eminent domain action would not be required for this project.**

c. Does the Sponsor have "quick-take" authority for this project? (Yes/No) **Yes.**

d. Are any of the lands/interests in land required for the project located outside the Sponsor's political boundary? (Yes/No) **Yes. The portion of Pier J approach channel and turning basin is outside of the City of Long Beach Harbor District boundary. However, this area is part of the City's trust with the State Lands Commission.**

e. Are any of the lands/interests in land required for the project owned by an entity whose property the Sponsor cannot condemn? (Yes/No) **No. As stated above, property acquisition will not be required for this project.**

II. Human Resource Requirements:

a. Will the Sponsor's in-house staff require training to become familiar with the real estate requirements of federal projects including P.L. 91-646, as amended? (Yes/No) **No**

b. If the answer to II.a. is "yes", has a reasonable plan been developed to provide such training? (Yes/No)

c. Does the Sponsor's in-house staff have sufficient real estate acquisition experience to meet its responsibilities for the project? (Yes/No) **Yes**

d. Is the Sponsor's projected in-house staffing level sufficient considering its other workload, if any, and the project schedule? (Yes/No) **Yes**

e. Can the sponsor obtain contractor support, if required in a timely fashion? (Yes/No) **Yes**

f. Will the sponsor likely request U. S. Army Corps of Engineers assistance in acquiring real estate? (Yes/No) **No**

III. Other Project Variables:

a. Will the sponsor's staff be located within reasonable proximity to the project site? (Yes/No) **Yes**

b. Has the sponsor approved the project/real estate schedule/milestones?

(Yes/No) **Yes, the sponsor has reviewed and approved the milestones for the project and will make the lands necessary for the project available when needed.**

IV. Overall Assessment:

a. Has the sponsor performed satisfactorily on other U. S. Army Corps of Engineers projects? (Yes/No/Not Applicable) **Yes**
b. With regard to this project, the sponsor is anticipated to be: (HIGHLY CAPABLE/FULLY CAPABLE/MODERATELY CAPABLE/MARIGINALLY CAPABALE/INSUFFICIENTLY CAPABLE.) (If the sponsor is believed to be "insufficiently capable", provide explanation)
HIGHLY CAPABLE

V. Coordination:

a. Has this assessment been coordinated with the sponsor?
(Yes/No) **Yes**

b. Does the sponsor concur with this assessment?
(Yes/No) (If "no," provide and explanation) **Yes**

Coordinated with:

Eamonn Killeen

Prepared by:

Lynette Ulloa

Lynette Ulloa
Real Estate Specialist

Reviewed and Approved by:

Cheryl L. Connett

Cheryl L. Connett
Chief, Real Estate Division

EXHIBIT B – Early Risk of Acquisition Letter to Sponsor

DEPARTMENT OF THE ARMY
LOS ANGELES DISTRICT, U.S. ARMY CORPS OF ENGINEERS
915 WILSHIRE BOULEVARD, SUITE 930
LOS ANGELES, CALIFORNIA 90017

December 7, 2016

Office of Chief
Asset Management Division

Subject: Port of Long Beach Deep Draft Navigation Study

Mr. Duane L. Kenagy, P.E.
Interim Chief Executive Officer
Port of Long Beach
925 Harbor Plaza
Long Beach, California 90802

Dear Mr. Kenagy:

The intent of this letter is to formally advise the Port of Long Beach, as the potential non-Federal sponsor (NFS) for the proposed Port of Long Beach Deep Draft Navigation Study, of the risks associated with land acquisition prior to the execution of the Project Partnership Agreement (PPA) or prior to the Government's formal notice to proceed with acquisition. If a NFS deems it necessary to commence acquisition prior to an executed PPA for whatever reason, the NFS assumes full and sole responsibility for any and all cost, responsibility, or liability arising out of the acquisition effort. Generally, these risks include, but may not be limited to, the following:

1. Congress may not appropriate funds to construct the proposed project;

2. The proposed project may otherwise not be funded or approved for construction;

3. A PPA mutually agreeable to the non-Federal sponsor and the Government, may not be executed and implemented;

4. The non-Federal sponsor may incur liability and expense by virtue of its ownership of contaminated lands, or interests therein, whether such liability should arise out of local, state, or Federal laws or regulations including liability arising out of CERCLA as mentioned;

5. The non-Federal sponsor may acquire interests or estates that are later determined by the Government to be inappropriate, insufficient, or otherwise not required for the project;

6. The non-Federal sponsor may incur costs or expenses in connection with its decision to acquire or perform LERRD (lands, easements, rights-of-way, relocations, disposal areas) activities in advance of the executed PPA and the Government's notice to proceed which might not be creditable under the

-2-

provisions of Public Law 99-662 or the PPA; and the non-Federal sponsor may initially acquire insufficient or excessive real property acreage which may result in additional negotiations and/or benefit payments under P.L. 91-646 as well as the payment of additional fair market value to affected landowners which could have been avoided by delaying acquisition until after PPA execution and the Government's notice to commence acquisition and performance of LERRD.

If you have any questions please contact Vicki Stephens-Allen at (213) 452-3398 or via email at vicki.k.stephens-allen@usace.army.mil.

Sincerely,

Cheryl L. Connett

Cheryl L. Connett
Chief, Asset Management Division
Real Estate Contracting Officer

FINAL INTEGRATED FEASIBILITY REPORT AND ENVIRONMENTAL IMPACT STATEMENT / ENVIRONMENTAL IMPACT REPORT (EIS/EIR)

APPENDIX I: PLANNING AID REPORT; COORDINATION ACT REPORT

PORT OF LONG BEACH
DEEP DRAFT NAVIGATION STUDY
Los Angeles County, California

October 2021

US Army Corps of Engineers®

Port of LONG BEACH THE PORT OF CHOICE

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PLANNING AID REPORT

U.S. FISH AND WILDLIFE SERVICE
30 JUNE 2016

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United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ecological Services
Carlsbad Fish and Wildlife Office
2177 Salk Avenue, Suite 250
Carlsbad, California 92008

In Reply Refer To:
FWS-LA-15B0128-16CPA0091-E00880

June 30, 2016

Colonel Kirk Gibbs
U.S. Army Corps of Engineers, Los Angeles District
915 Wilshire Boulevard, Suite 930
Los Angeles, California 90017-3409

Attention: Lawrence Smith

Subject: Final Planning Aid Report for the Proposed Port of Long Beach Deep Draft Navigation Project, Los Angeles County, California

Dear Colonel Gibbs:

The U.S. Fish and Wildlife Service (Service) has prepared this Final Planning Aid Report (PAR) for the U.S. Army Corps of Engineers (Corps) on the proposed Port of Long Beach Deep Draft Navigation Project (project) to describe issues and opportunities related to the conservation and enhancement of fish and wildlife resources. The project, as proposed, would involve dredging and deepening portions of the Port of Long Beach (Port), Los Angeles County, California. The purpose of the proposed project is to improve transportation efficiency and safety at the Port for large ships.

The proposed project area would involve portions of the Los Angeles County coast of the eastern Pacific Ocean, within about 3 miles seaward of the historic coastline near the mouth of the Los Angeles River. These existing marine and estuarine areas have been heavily modified over the last century associated with development of Long Beach Harbor/Port of Long Beach and nearby civil engineering and commercial/urban development. Most of the direct project footprint would occur within the boundaries of the Port; exceptions include proposed modifications to portions of the Pier J ship approach area (Corps 2016) and potential (currently undetermined) dredge material disposal areas, both of which are outside the Port harbor district area. The project area is located south of the City of Long Beach and east of the community of San Pedro and the Port of Los Angeles. The depths, widths, and volumes of dredge and disposal material associated with the proposed project are currently undetermined.

This PAR is provided in accordance with the Fish and Wildlife Coordination Act (FWCA) of 1958, as amended (48 Stat. 401; 16 U.S.C. 661 *et seq.*), the Endangered Species Act (ESA) of 1973, as amended (87 Stat. 884; 16 U.S.C. 1531 *et seq.*), and the scope of work agreed upon by the Corps and the Service. This PAR does not constitute the report of the Secretary of the Interior as required by section 2(b) of the FWCA, nor does it constitute a biological opinion under section 7 of the ESA.

The purpose of this PAR is to deliver recommendations for use by the Corps design team in developing goals, objectives, and alternatives for the project.

In October 2015, the Council on Environmental Quality released Memorandum M-16-01 for Executive Departments and Agencies entitled Incorporating Ecosystem Services into Federal Decision Making. The memorandum recognizes that nature provides vital contributions to human economic and social well-being that are often not traded in markets or fully considered in decisions. It directs Federal agencies to incorporate ecosystem services into Federal planning and decision making,[1] and to develop, institutionalize, and implement policies to promote consideration of ecosystem services in planning, investments, and regulatory contexts. Additionally, it calls for integration of assessments of ecosystem services into relevant programs and projects, in accordance with the agency's statutory authority.

In November 2015 the White House released a Presidential Memorandum entitled Mitigating Impacts on Natural Resources from Development and Encouraging Related Private Investment. This memorandum underscores the importance of effectively mitigating adverse impacts to land, water, wildlife, and other ecological resources (EPA 2016). It orders five federal agencies, including the Departments of the Interior and Defense, to streamline regulations for offsetting environmental harm and to promote mitigation efforts. The memorandum establishes a national policy "net benefit goal" for natural resource use from projects. The memo seeks to unify natural resource mitigation goals across agencies; at a minimum, the memorandum calls for "no net loss" of land, water, wildlife and other ecological resources from federal actions including permitting; this extends the no-net-loss national policy standard for wetlands established by the President in 1989. The memorandum also directs that compensatory mitigation is now national policy (White House 2015); the memorandum was designed to ensure consistency and transparency as agencies across the Federal government develop mitigation measures (Bean 2016). Concurrent with the release of the November 2015 Presidential Memorandum, the Department of the Interior issued formal policy and guidance to its bureaus and offices to best implement mitigation measures associated with legal and regulatory responsibilities and the management of Federal lands, waters, and other natural and cultural resources under its jurisdiction, using the best available science (Bean 2016). When assessing appropriate mitigation options, the Service relies upon a long established general mitigation hierarchy – first seeking to avoid impacts, then minimizing them, and then compensating for unavoidable impacts that could impair resource functions or values (Bean 2016).

As of March 2016, the Corps is preparing the Port of Long Beach Deep Draft Navigation Project Feasibility Study. The Corps is currently scoping project alternatives and will likely prepare an Environmental Impact Statement/Environmental Impact Report (EIS/EIR) for the project. This feasibility study phase of the project would likely conclude with the distribution of the Draft EIS/EIR for public review, reportedly scheduled by the Corps for 2018 (Corps 2015).

Repeated dredging is often necessary to maintain operations of many marine harbors. The dredging proposed herein would be implemented to increase the design water depths within the Port for ship

[1] Broadly defined, ecosystem services are the benefits that flow from nature to people, e.g., nature's contributions to the production of food and timber; life-support processes, such as water purification and coastal protection; and life-fulfilling benefits, such as places to recreate.

navigation purposes for very large ships (as compared to regular maintenance dredging). Harbor dredging often has effects on the marine environment, and dredged material disposal may affect water quality, mobilize contaminants, and bury or alter habitats, bathymetry, and physical processes (NOAA 2014).

Introduction

Vessels of increasingly larger size and deeper drafts[2] have been entering U.S. ports over the last decade-plus (NOAA 2015). The proposed project would be another increment in a series of dredge-and-fill projects over the last several decades that have modernized and reshaped the Port. This project would deepen water depths for access and navigation of very large ships within the Port. The latest generation of large cargo ships being built is twice the size of those that entered the global fleet only 15 years ago; these ships are now calling at the Port (Port 2016). These larger ships are reportedly more cost effective for ocean carriers and decrease transportation diesel consumption (Port 2016). These massive vessels, some with capacity of 14,000 Twenty-foot Equivalent Units (TEUs),[3] can be up to 1,200 feet long (Port 2016). Long Beach is one of only a handful of ports in North America capable of accommodating these larger ships, per the following features (Port 2016):

1. Deep-water main channel;
2. Deep-water terminals;
3. Berths designed to handle vessels that can exceed 156,000 tons fully loaded; and
4. Cranes that can move containers stacked 180 feet high and 24 boxes wide.

A century of harbor dredging and filling associated with development of the Port of Los Angeles and the Port of Long Beach has eliminated thousands of acres of the historic Wilmington Lagoon/Los Angeles River Estuary. In its place, behind manmade breakwaters, remains an open-water marine embayment of relatively high biological diversity and productivity.

Pacific Rim trade is increasing, along with the size of the some of the associated ships entering U.S. ports. The Port is a major center of international commerce on the west coast of the United States. Development of a permanent industrial base within the Port was gradual and began with increased harbor improvements and transportation in the early 1900s. It is the second-busiest container port in the United States, after the adjacent Port of Los Angeles. The Corps, in conjunction with the Port, are now examining options to provide additional channel depths to allow very large ships (with greater drafts than those that can currently be effectively accommodated) into the Port.

[2] The draft of a ship's hull is the vertical distance between the waterline and the bottom of the hull or keel.
[3] TEU or Twenty-Foot Equivalent Unit can be used to measure a ship's cargo carrying capacity. The dimensions of one TEU are equal to that of a standard 20-foot shipping container (20 feet long, 8.5 feet tall and 8 feet wide).

Fish and Wildlife Coordination Act

The Fish and Wildlife Coordination Act of 1934 included requirements that were the first formal expressions in U.S. law of a duty to minimize the negative environmental impacts of major water resource development projects and to compensate for those impacts that remained (Bean 2016).

The FWCA was a response to a U.S. era of big dam building and reflected a concern for the impact of those dams, particularly on anadromous fish (Bean 2016). As originally enacted in 1934, it required consultation with the Bureau of Fisheries (as the Service was then known) prior to the construction of any dam to determine if fish ladders or other aids to migration were necessary and economically practical to minimize impacts on fish populations. It required, as well, the opportunity to use the impounded waters for hatcheries to offset impacts that could not otherwise be avoided. The duties imposed by the FWCA were reinforced and expanded by the National Environmental Policy Act of 1969 (NEPA) (Bean 2016). Under NEPA and its implementing regulations, all federal agencies have a duty to assess the impacts of the major actions they propose to undertake and to consider reasonable alternatives to reduce or eliminate those impacts (Bean 2016). The Service, as the federal agency charged by Congress in the Fish and Wildlife Act of 1956 with the responsibility for management, conservation, and protection of fish and wildlife resources, routinely recommends mitigation measures to other federal agencies through the NEPA and FWCA processes (Bean 2016).

The FWCA directs and authorizes consultation, reporting, consideration, and installation/implementation of fish and wildlife conservation features. The authorities of the FWCA are considered to be “supplementary legislation” to the various Federal project authorizations, such as the Corps public works authorizations (Smalley and Mueller 2004). The FWCA conditions or supplements other water development statutes to require consideration of recommendations generated under the FWCA procedures, including portions of the Clean Water Act [*Zabel* v. *Tabb*, 430 F2d 199 (5th Cir. 1970) cert. denied 401 U.S. 910 (1972)]. For Federal water resources development projects, the FWCA requires that fish and wildlife conservation receive equal consideration by Federal agencies with other project purposes, and that such conservation be coordinated with other project features. The FWCA authorizes the project implementation of means and measures for both mitigating losses of fish and wildlife resources, and for enhancing these resources beyond the offsetting of project effects (Smalley and Mueller 2004).

Project Area History

In 1542, Juan Rodriquez Cabrillo “discovered” the "Bay of Smokes" that is now called San Pedro Bay, describing it from offshore aboard ship. The smoke he described above the bay may have originated from the several Native American villages that existed near the bay along the Los Angeles River at the time. Much of the south-facing San Pedro Bay along the coast was originally a shallow estuary and mudflat (see Figures 1 – 3).

The area currently occupied by the ports of Los Angeles and Long Beach formerly included several undeveloped islands, and likely included barrier beaches and beach/river-mouth sand spits. These islands and spits likely included unvegetated beach and open areas that historically supported what

are now sensitive species, including California least terns [*Sternula antillarum browni* (*Sterna a. b.*);[4] least tern] and western snowy plovers [*Charadrius alexandrinus nivosus* (*C. alexandrinus n.*); snowy plover].[5] The area of the northern San Pedro Bay was originally largely a marsh, with the Los Angeles River and the Bay sharing a common opening into the ocean.

In 1899 construction of the San Pedro Bay breakwater began near the project area. In 1906, the Los Angeles Dock and Terminal Company started development of Long Beach Harbor by purchasing 800 acres of sloughs and salt marshes associated with the Los Angeles River mouth estuary — an area that later became the inner portion (Inner Harbor) of Long Beach Harbor. In 1907, construction began on the Craig Shipyard in the Inner Harbor; the Craig Shipyard Company was also awarded a contract to dredge a channel from the open ocean to the new Inner Harbor. In 1911, the State of California (State) granted the tidelands areas of what is now the Port of Long Beach to the City of Long Beach (City) for port operations.[6] These tidelands were granted to the City in trust for the people of the State. This tidelands trust not only restricts the use of the tidelands, but the tidelands and tidelands-related revenues of the Port must be used for purposes related to harbor commerce, navigation, marine recreation, and fisheries. The Port currently includes more than 7,600 acres of wharves, cargo terminals, roadways, rail yards, and shipping channels, and is one of the world's busiest seaports (see Figure 3).

An 8.5 mile-long breakwater made of three rock segments stretches across most of San Pedro Bay, with two openings to allow ships to enter the harbor areas of the Ports of Los Angeles and Long Beach behind it. The initial western section of the breakwater, called the San Pedro Breakwater, was constructed between 1899 and 1911 at San Pedro; the Middle Breakwater was completed from 1911 to 1936, and the Long Beach Breakwater was completed after World War II. The San Pedro and Middle Breakwaters protect the Ports of Los Angeles and Long Beach, respectively (Long Beach 2009).

The Los Angeles River is a major river and flood management waterway for the Los Angeles watershed basin. In the 1930s, the Army Corps began channelizing the river for flood damage reduction and by 1954, the entire length of the river was channelized (Long Beach 2009).
The river is now maintained by the Corps and the Los Angeles County Department of Public Works (Long Beach 2009). The Los Angeles River continues to discharge into San Pedro Bay at the northeastern edge of the proposed Project Area.

Considerable changes have occurred in the two ports since the 1970s. Some of these changes included deepening of navigational channels and basins; construction of substantial landfills at Piers 300 and 400 in the Port of Los Angeles; construction of a transportation corridor out to Pier 400; expansion of Pier J in the Port of Long Beach; and construction the west basin of the Cabrillo Marina

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[4] The California least tern was originally and remains federally- and California State-listed under the generic name of *Sterna antillarum browni*; this original name is now otherwise invalid. The American Ornithologists Union in 2006 changed the valid generic name of the least tern to *Sternula*, with the California least tern then becoming *Sternula a. b.*) (Service 2016).

[5] California least terns typically nest in colonies on relatively open beach areas that are free of vegetation and are near fish prey (Service 2006). Sand spits, dune-backed beaches, beaches at creek and river mouths, and salt pans at lagoons and estuaries are the main coastal habitats for nesting western snowy plovers (Service 2007).

[6] Tidelands in California are defined as those lands and water areas along the coast of the Pacific Ocean seaward of the ordinary high tide line to a distance of three miles.

complex. As part of mitigation for construction and channel deepening, shallow water habitats were created in formerly deepwater areas near Pier 300, near the San Pedro Breakwater, and on the east side of Pier 400. Thus, several areas that were previously aquatic natural communities are now developed land areas, some former deep water areas are now shallow, and water circulation patterns within the Ports have been substantially altered.

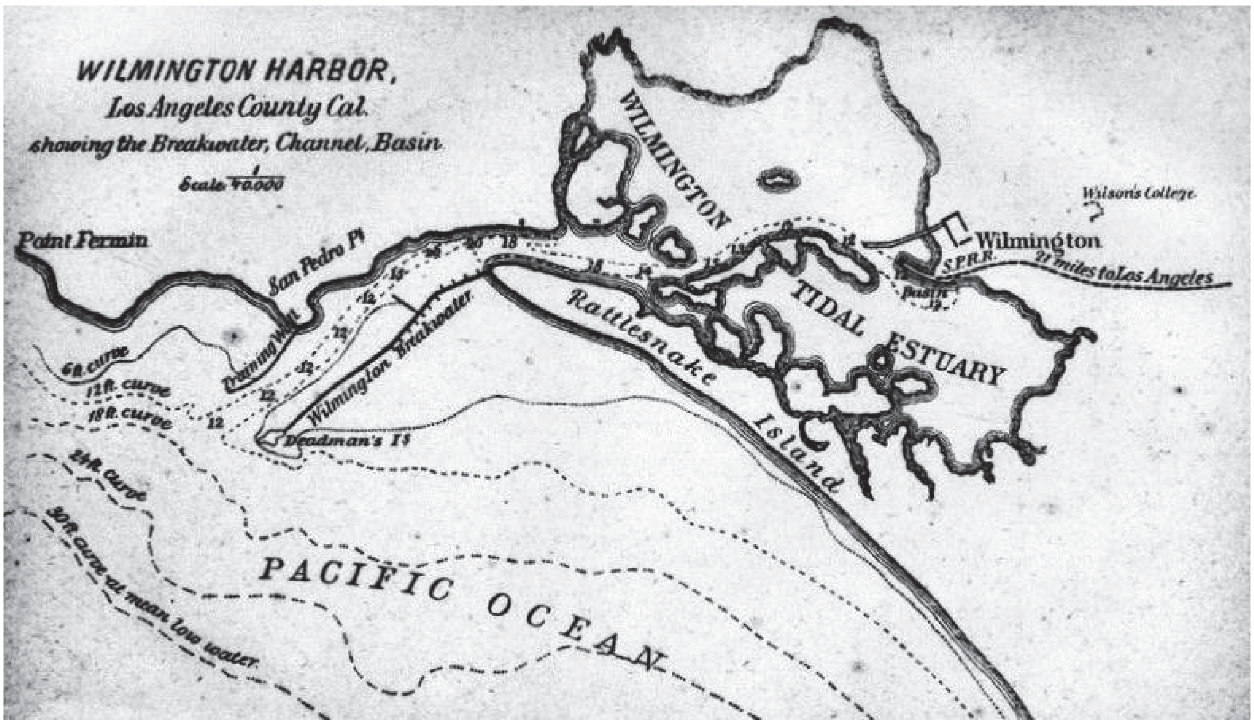

Figure 1. Circa 1880 drawing of Wilmington Harbor. The Future Port of Long Beach is on the east (right) side of the “Wilmington Tidal Estuary.” “Rattlesnake Island” would later be expanded to become Terminal Island within the ports of Los Angeles and Long Beach. Wilmington Harbor would later become the Port of Los Angeles. Note the water depths indicated. (Water Power and Associates 2014)

Figure 2. Portion of a circa 1880 drawing by William H. Hall of Los Angeles showing the San Pedro Bay coastline, estuaries, and ocean contours (Hall 1880). The future Port of Long Beach is in the center-left of the drawing.

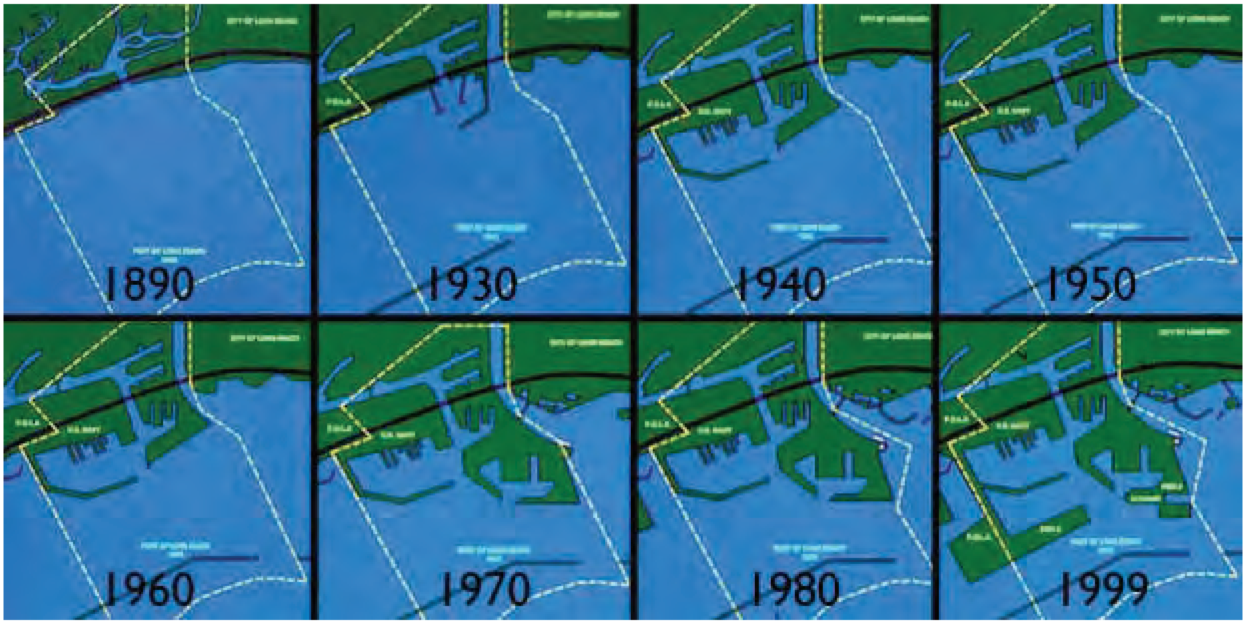

Figure 3. Drawings showing development progression of the Port since 1890 (Port 2014).

Description of the Project Area

The main project site is the Port of Long Beach and is located on the Pacific coast of southern California in western San Pedro Bay, at the southern end of the City, in southern Los Angeles County. The Port is less than 2 miles southwest of downtown Long Beach and about 25 miles south of downtown Los Angeles. To the west and northwest of San Pedro Bay are the communities of San Pedro and Wilmington, respectively, and to the east is the community of Seal Beach. Other areas that could be included in the Project area are local beaches or the open ocean for dredge disposal; the project dredge disposal areas are currently undetermined.

Two competing and independent commercial ports, the Port of Los Angeles and the Port of Long Beach, share the San Pedro Bay marine ecosystem. These man-made harbors have been created through over a century of dredging and filling of the former 3,450-acre Wilmington Lagoon and surrounding areas. The Port of Los Angeles and Port of Long Beach encompass 7,500 acres and 7,600 acres of land and water, respectively. The Port consists of: 3,000 acres of land, 4,600 acres of water, 10 piers, and 80 berths. Uses within both ports are largely industrial, although a variety of other uses (e.g., recreation, commercial fishing) are also supported.

The Port of Los Angeles and Port of Long Beach are both considered deep-water constructed ports, and do not have siltation problems like ports located in natural rivers (natural river ports) (LA/LBHSC 2016). The vast majority of sediments deposited in the ports are carried by the Los Angeles River, Dominguez Channel, and several smaller local creek/storm drains (LA/LBHSC 2016). Due to the region's Mediterranean climate, these channels carry significant quantities of storm water on rare occasions during the winter, and most of the silt settles out near the inlet mouths (LA/LBHSC 2016). As such, the ports need only to be dredged occasionally to maintain berth side design water depths (LA/LBHSC 2016).

The Port has 65 deep-water berths; all of these berths lay within three miles of the open sea, and are reached via the Port's Main Channel which has depths of minus 76 feet at Mean-Lower-Low-Water (MLLW) (LA/LBHSC 2016). The maximum ship draft in the Main Channel is currently limited to 65 feet (LA/LBHSC 2016). Dredging outside the Long Beach Breakwater Entrance Channel has deepened that area to minus 76 feet at MLLW (LA/LBHSC 2016). The Port is currently engaged in a capital development program (CDP) that includes but is not limited to dredging, terminal redevelopment, transportation, and public safety projects (LA/LBHSC 2016). Major components of the CDP include capital dredging in the West Basin and Inner Harbor Turning Basin, and in-water fill within the East Basin (LA/LBHSC 2016). The CDP includes the Middle Harbor Redevelopment Program, the replacement of the Gerald Desmond Bridge spanning the Back Channel, several rail infrastructure projects, and proposed security operations and support facilities (LA/LBHSC 2016). Though not a Port project, Caltrans is currently engaged in the replacement of the Commodore Schuyler Heim Bridge (SR-47) spanning the Cerritos Channel; it will be converted from a lift bridge to a fixed bridge (LA/LBHSC 2016).

Port of Long Beach Water Depths (LA/LBHSC 2016):

Federal Channels in the Port	Current Depth	Current Width
Main Channel	-76 feet	360 – 1500 feet
Back Channel	-52 feet	220 feet
Inner Harbor (Turning Basin)	-52 feet	960 feet
Cerritos Channel	-50 feet	325 feet
Channel 2	-37 to -55 feet	150 – 250 feet
Channel 3	-36 to -45 feet	150 – 200 feet

The outer limit of the Port is defined by breakwaters that were constructed during the early to mid 1900's (MEC 2002). The majority of the harbor waters within the Port currently range in water depth from 30 to 60 feet (MEC 2002) with navigation channels dredged to depths of 45 feet and greater (Service 2000). The adjacent Port of Los Angeles contains several hundred acres of waters currently shallower than 20 feet, primarily constructed by sub-aquatic fill of deeper areas performed to increase marine biological functions. The relative bathymetry[7] of the areas within and around the ports of Long Beach and Los Angeles can be seen in Figure 4.

[7] Bathymetry: the measurement of the depths of oceans, seas, or other large bodies of water, and the data derived from such measurement.

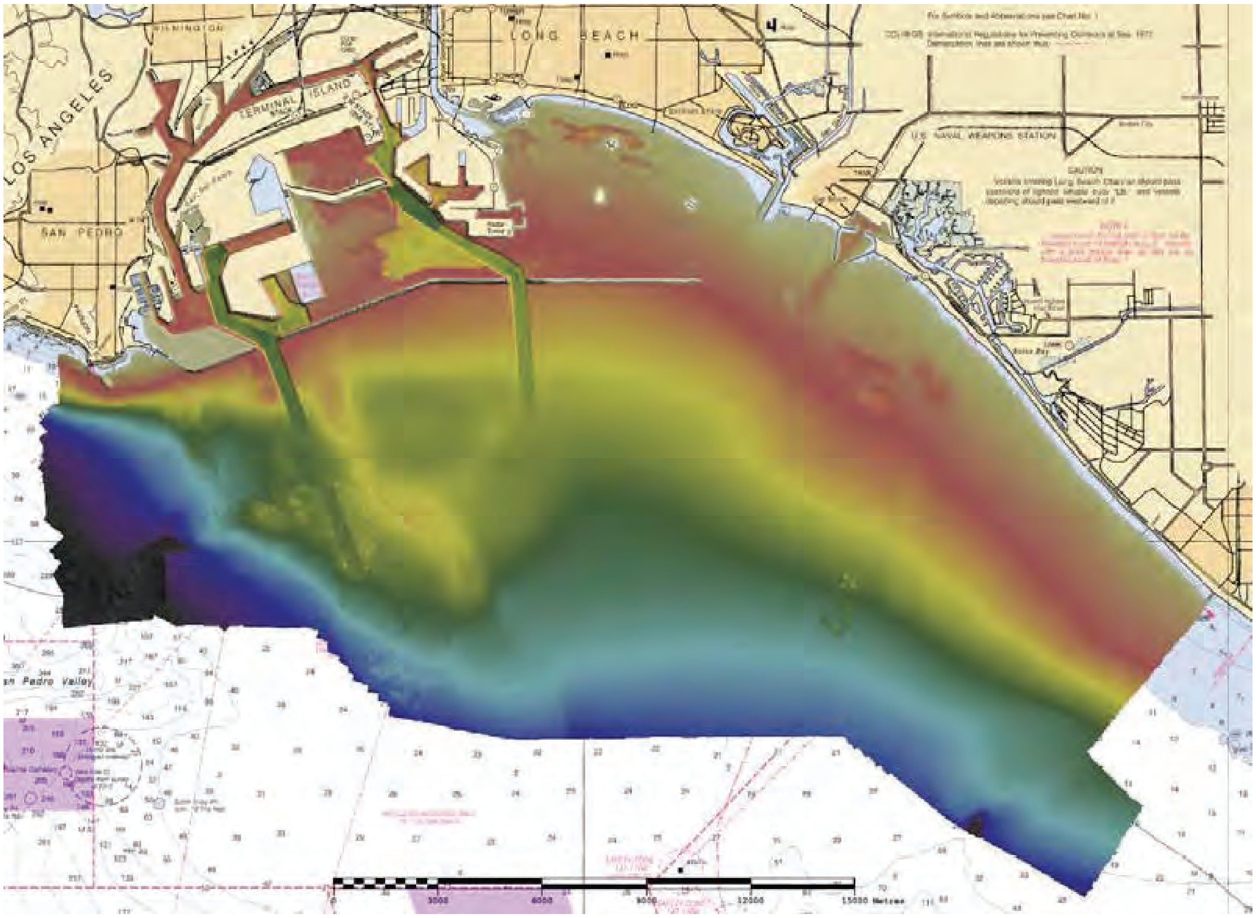

Figure 4. Relative bathymetry of the ports of Long Beach and Los Angeles and environs to highlight the deeper waters in the ports. (NOAA 2015)

Corps Study/Project Area

The Corps' study area for the proposed project includes the waters in the immediate vicinity (and shoreward) of the Port breakwaters throughout most of the Port, and the upstream reaches of the Los Angeles River that have direct impact on the San Pedro Bay, as well as the entire Port facility, including Outer Harbor, Inner Harbor, Cerritos Channel, West Basin, and the Back Channel (Corps 2015). The Corps' current Project Area is shown in Figure 5 (Corps 2016).

Project Description

The Corps, with the Port as the local sponsor, is considering the feasibility of deepening navigation channels within the harbor to increase water depths necessary to accommodate deeper draft ships in the Port. The proposed channel depths and methods to accomplish this are currently undetermined. The proposed project's proposed footprint areas are shown in Figure 5. Additional details regarding work areas have not been provided to the Service. Other project footprint areas could include areas within and/or outside the Port for dredge material disposal.

Figure 5. Corps Draft Project Area and Areas of Interest (Corps 2016)

The proposed project would require disposal site(s) for dredge materials. These sites are currently undetermined, but are expected to potentially include sites within the Port area, open-ocean, and/or nearby beach areas, depending in-part on sediment qualities and contaminant constituents in dredge materials (as determined through the testing requirements in 40 CFR §230). Re-use of dredge materials for sand replenishment on beaches near the Port is often desired by the Corps and locals where sediments are appropriate.

Background

The Port has undergone significant development and expansion in the past century (Corps 2015). In the last three decades, the ports of Los Angeles and Long Beach have undertaken accelerated long-range development efforts to increase the shipping and commercial capacity of the ports; both of the ports have become major transportation and trade centers. International commerce is almost 20 percent of the U.S. gross domestic product, and about 95 percent of these products arrive or leave the country in ships (Gray 2001). The Port provides the shipping terminals for nearly one-third of the waterborne trade moving through the west coast of the United States (Corps 2015).

The Port of Long Beach and the Port of Los Angeles are ranked sixth and eighth in tonnage in the United States respectively, moving a combined 139.2 million metric tons (DOT 2012). Trade currently valued annually at more than $155 billion moves through the Port, making financially it the

second-busiest seaport in the United States (Corps 2015). To handle this high volume of trade, Port facilities include 10 piers, 80 berths, and 66 post-Panamax gantry cranes (Corps 2015). The Port has 22 shipping terminals to process break bulk (e.g., lumber, steel), bulk (e.g., salt, cement, and gypsum), containers, and liquid bulk (e.g., petroleum) (Corps 2015). Each year the Port handles more than 6 million Twenty-foot Equivalent Units (TEUs)[8] and 75 million tons of cargo, and has over 2,000 vessels call (Corps 2015). Items from clothing and shoes to toys, furniture and consumer electronics arrive at the Port before making their way to stores throughout the country (Corps 2015). Specialized terminals also move petroleum, automobiles, cement, lumber, steel and other products (Corps 2015). The Port's top trading partners are China, South Korea, Hong Kong, and Japan. East Asian trade accounts for about 90 percent of the shipments through the Port (Corps 2015). Top imports are crude oil (16 million metric tons annually), electronics, plastics, and furniture (with inbound container tonnage on the order of 22 million tons annually), while top exports are petroleum products, chemicals, and agricultural commodities (Corps 2015). Currently, about one-third of liquid bulk and container cargo by weight is transported on vessels that could potentially experience operating constraints associated with the current channel depths in the Port (Corps 2015).

Under keel clearance for larger ships in the Port is important in terms of the depth of the seafloor and the static draft of the vessel transiting above it (NOAA 2015). This takes into play many elements: water level is the most obvious and important contributor to this equation. The term "tide" captures the astronomic contribution of the rise and fall of the sea's surface, whereas water level takes into account weather effects and riverine runoff contributions (NOAA 2015). In addition to the water levels, the other factors that must be considered include meteorological conditions, the vessel's motion induced by the prevailing sea state, the static draft of the vessel, the variation in this draft due to the vessel's motion through the water (dynamic draft), and the chemical composition of the water the vessel is sailing in, primarily salinity (NOAA 2015).

The large sizes of the many new trade ships are outsizing some of our waterways. Some Ultra Large Crude Carriers (ULCCs) entering the Port of Long Beach are carrying more than a million gallons of crude oil and are loading to drafts of 65 feet (NOAA 2015). Depending on the sea state in the approach channels of the Port, the ship's pitching may bring the hull close to the Port channel floor (NOAA 2015).

The channel leading into the Port of Long Beach currently has an authorized depth of 76 feet and local regulations allow drafts of 69 feet for ships with a displacement of up to 420,000 tons (NOAA 2015). In late 2012, at a Harbor Safety Committee meeting for the ports of Los Angeles and Long Beach, the Jacobsen Pilots[9] noted that during storms and long period swell conditions outside of the breakwater, ULCCs demonstrated significant levels of pitch[10] in high wave situations (NOAA 2015).[11] As a result, the Captain of the Port froze the maximum draft at 65 feet until they understood the effects of the swells on the ULCCs and could better predict their behavior (NOAA 2015). The effect

[8] TEU or Twenty-Foot Equivalent Unit can be used to measure a ship's cargo carrying capacity. The dimensions of one TEU are equal to that of a standard 20-foot shipping container (20 feet long, 8.5 feet tall and 8 feet wide).
[9] Jacobsen Pilots is the sole ship piloting company for the Port of Long Beach.
[10] Pitch is the up/down rotation of a vessel about its lateral/Y (side-to-side or port-starboard) axis.
[11] As a point of reference, a 1,000-foot vessel pitching just 1 degree will experience an increase in draft of more than 10 feet (NOAA 2015).

of reducing the allowed under keel clearance means that ULCCs must wait outside of the sea buoy until conditions are favorable to make the transit into the Port of Long Beach, or lighter to another vessel in order to reduce their draft; both are expensive delays (NOAA 2015).

Presently the largest containerships dock primarily at one of two piers—Pier J or Pier T West Basin (Corps 2015). Access to south berthing area of Pier J is through a secondary channel connected to the Long Beach main access channel; that secondary access channel limits drafts to about 43 feet (Corps 2016). Access to the northern berthing area of Pier J is off the Southeast Basin and does not have this depth limitation (Corps 2016). About 20 years ago a small share of container vessels had to restrict drafts, utilize tides, or both (Corps 2015). However, the impact to operations has increased in the past few years due to the increasing share of larger containerships calling on the port (Corps 2015). Today containerships docking at south berthing area of Pier J have maximum operating drafts of 52 feet and over 7.5 million of the 36.6 million tons of container cargo in 2012 was handled by vessels at or near the 43-foot limit of the secondary access channel (Corps 2016).

Currently, light loading, and tidal delays increase transportation costs for goods transported on containers, and in the future the impact is expected to worsen (Corps 2015; Corps 2016). If sufficiently dredged, containerships with capacities of over 18,000 TEUs (e.g., 1300 feet long, 176 feet beam,[12] drafts approximately 52 feet) would be capable of operating fully loaded in the Port (Corps 2016). Thus, addressing operating constraints to containerships has the potential to significantly lower transportation costs (Corps 2015).

Through agreements with the Service and other resource agencies, the Port has restored some coastal wetlands in southern California in exchange for development approvals of various Port areas. The Port has participated in substantial wetlands restoration projects, including one at the National Wildlife Refuge in Seal Beach. In addition, the Port contributed $39 million toward acquisition of 267 acres of degraded wetlands in Bolsa Chica Lagoon (Bolsa Chica Lowlands Restoration Project) in Huntington Beach (Port 2015).

Project Goals and Objectives

The proposed channel deepening project would allow large, deeper draft ships access to terminals within the Port. The Corps' stated planning goal is to provide safe, reliable, and efficient waterborne transportation improvements to the Port that address problems and opportunities as outlined herein. The Corps' planning objectives are specified as follows:

1. Reduce the cost of transporting cargo to and from the Port by improving channel dimensions, vessel operations, and other navigation features such as turning basins, waiting areas, and anchorages; and

2. Reduce expected future vessel re-routings from the Port to alternate facilities by improving channel dimensions, vessel operations, and other navigation features such as turning basins, waiting areas, and anchorages.

[12] The beam of a ship is its width at the widest point as measured at the ship's nominal waterline.

Description of Biological Resources

The Port of Long Beach represents a large harbor complex typified by extensive areas of hardened shoreline (riprap and quay wall) and dredge maintained shipping channels (SAIC 2010). The fish and wildlife resources of the Port and San Pedro Bay are reported in substantial detail in a 2000 biological baseline report entitled "Ports of Los Angeles and Long Beach Year 2000 Biological Baseline Study of San Pedro Bay" (MEC 2002). This information was updated with additional survey efforts in 2008 in a report entitled "Final 2008 Biological Surveys of Los Angeles and Long Beach Harbors" (SAIC 2010). A brief summary of the available information is provided herein, based primarily on these two baseline reports. The biological resource groups of San Pedro Bay that are typically considered the most important are the marine fishes and water-associated birds.

The benthic hard substrates in the ports are mostly artificial breakwaters and barriers of riprap (boulders and concrete rubble), and constructed shallow water areas in the ports (LA/LBHSC 2016). Kelp beds typically dominate the hard substrates, with surfgrass natural community potentially existing in waters less than 10 feet deep (LA/LBHSC 2016). Soft bottom substrates comprise the majority of acreage in the two ports (LA/LBHSC 2016). No eelgrass beds were identified within the Port of Long Beach (SAIC 2010). One area just outside the Port's boundary line northeast of Island Grissom[13] was identified as supporting a sizeable eelgrass bed (SAIC 2010). The water column within the ports provides important habitats for many fish, larvae, and plankton, seals, and sea lions (LA/LBHSC 2016).

Fish

Fish populations of San Pedro Bay (including the ports of Los Angeles and Long Beach and environs) are diverse and relatively abundant (SAIC 2010). During surveys conducted in 2000, a total of 74 species were recorded and an estimated 44 million fish occupied the 2 ports. Surveys of the 2 ports in 2008 identified total of 62 fish taxa representing 59 unique species of fish (SAIC 2010). Generally, schooling fishes were the most abundant species recorded.

Northern anchovy (*Engraulis mordax*) and white croaker (*Genyonemus lineatus*) were the most abundant species collected in 2000 surveys; white croaker was top ranked in terms of biomass (MEC 2002). From 2008 surveys in the two ports, pelagic fish from lampara[14] net collections were dominated by four species: northern anchovy, topsmelt (*Atherinops affinis*), California grunion (*Leuresthes tenuis*), and Pacific sardine (*Sardinops sagax*). These species accounted for 98 percent of the total lampara net catch in 2008. All of these species are schooling fishes that spend most of their lives in the harbor environment. From 2008 otter trawl[15] surveys, dominant species included northern anchovy, white croaker (*Genyonemus lineatus*), queenfish (*Seriphus politus*), shiner surfperch (*Cymatogaster aggregata*), and white surfperch (*Phanerodon furcatus*). Other species

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[13] One of a set of four artificial oil production islands in San Pedro Bay off the coast of Long Beach.

[14] A lampara net is a type of fishing net used for capturing certain pelagic fish, those swimming near the water's surface.

[15] In otter trawling, a large net is dragged along the bottom or up in the water column behind a towing vessel. The mouth of the net is held open by two large "doors" which are attached to either side of the net. For the noted surveys performed in 2000 and 2008, trawl surveys were performed to capture bottom-dwelling demersal fish.

caught in high abundance were specklefin midshipman (*Porichthys myriaster*), California tonguefish (*Symphurus atricauda*), and yellowchin sculpin (*Icelinus quadriseriatus*).

The five most abundant species accounted for 92 percent of the total fish populations in the ports (MEC 2002). These included northern anchovy, white croaker, queenfish, Pacific sardine, and topsmelt. Other relatively abundant species included shiner surfperch, salema (*Xenistius californiensis*), and jacksmelt (*Atherinopsis californiensis*). Less numerous but ecologically and/or recreationally important species recorded were California barracuda (*Sphyraena argentea*), California halibut (*Paralichthys californicus*), barred sand bass (*Paralabrax nebulifer*), California corbina (*Menticirrhus undulatus*), white seabass (*Atractoscion nobilis*), California grunion (*Leuresthes tenuis*), and several species of sharks and rays.

In 2000, generally fewer species were caught in the Inner Harbor than Outer Harbor (MEC 2002). Benthic invertebrates, which represent an important food source for demersal fish,[16] also exhibited a trend of decreasing function of habitats from Outer to Inner Harbor areas (MEC 2002). In 2008 surveys, few differences were observed for pelagic fish between Inner and Outer Harbor areas, with Inner Harbor stations having between 4 and 12 species and Outer Harbor stations typified by between 3 and 11 species (SAIC 2010). This likely indicates that pelagic schooling species move throughout the harbor complex (SAIC 2010). In contrast, Outer Harbor areas generally were typified by a greater number, biomass, and variety of trawl-caught (demersal) fish than Inner Harbor areas (SAIC 2010).

More species of fish were collected in the shallow waters of the ports of Los Angeles and Long Beach, including all three of the created shallow water mitigation sites within the Port of Los Angeles, than at deepwater survey stations in open water, channel, basin, and slip habitats (MEC 2002). The greater diversity is likely partially explained by the greater heterogeneity associated with the shallow water habitats, which were adjacent to rock riprap and/or vegetated areas (e.g., eelgrass beds, kelp bed); this likely results in higher fish nursery function, greater production, and generally higher abundance of fish in shallow waters. For instance, the Cabrillo Shallow Water Habitat area is located alongside the San Pedro Breakwater, which supports giant kelp and other macroalgae; the Long Beach Shallow Water Habitat area is located adjacent to the riprap shoreline along Pier 400 that supports giant kelp and other macroalgae, and extensive eelgrass beds occur within the Pier 300 Shallow Water Habitat. Studies conducted in the shallow areas of the Outer Harbor, including the Pier 300 Shallow Water Habitat (MEC 1988, 1999) created in 1984 and the Cabrillo Shallow Water Habitat (MEC 1999) constructed in 1997, have shown that these areas have both higher diversity and greater abundance of fish and invertebrates than the deeper soft bottom portions of the ports of Los Angeles and Long Beach (MEC 2002). A greater abundance of juvenile fish is also present in these shallow areas; they appear to enter these areas relatively soon after hatching/birth. Long Beach fishing experts often fish adjacent to the four manmade oil production islands located within the overall Port boundaries,[17] due to the abundance of recreational fish found there; the abundance of recreational fish in these areas is reportedly due to shallow water combined with high relief from the riprap placed around the created islands (Ballanti 2007).

[16] Fish dwelling at or near the bottom of a body of water.
[17] The islands are controlled by the City of Long Beach and are not part of the Port's Harbor District.

Forty-four unique species of fish larvae and 13 categories of fish eggs were identified in the ports of Los Angeles and Long Beach during the 2000 surveys (MEC 2002). The most abundant fish larvae were gobies [arrow goby (*Clevelandia ios*), cheekspot goby (*Ilypnus gilberti*), shadow goby (*Acentrogobius nebulosus*), and bay goby (*Lepidogobius lepidus*)], northern anchovy, California clingfish, queenfish, blennies, and white croaker. With the exception of the Pier 300 Shallow Water Habitat (in the Port of Los Angeles) that had high larval abundance and the Long Beach West Basin with low larval abundance, the abundances of larvae were generally higher on the Long Beach side of the two-port complex. This bears some similarity to the abundance pattern indicated for adult fish caught by lampara net surveys, which generally showed higher abundance in the deepwater channel, basins, and slips in the Port of Long Beach (MEC 2002). The larval catch was dominated by benthic associated gobies, which inhabit burrows. The ichthyoplankton surveys provided a good measure of the importance of species inhabiting burrows or associated with rocky and/or vegetated habitats in the Long Beach-Los Angeles port complex (MEC 2002). These species (while poorly represented in the adult fish surveys), are an important part of the overall ecology of the diverse marine habitats in the two ports. The ichthyoplankton results also demonstrate that a wide variety of fish spawn and develop within the ports of Los Angeles and Long Beach. Similar to the previous baseline study (MEC 2002), the only exotic (non-indigenous) fish species collected in the 2008 sampling surveys was the yellowfin goby (*Acanthogobius flavimanus*), collected at three Port of Los Angeles stations and six Port of Long Beach Harbor stations (SAIC 2010).

Benthic Invertebrates

Over 400 species of benthic infauna (small organisms that live on and within the sediment) and larger macroinvertebrates were collected during the Year 2000 Baseline Study; over 250 species of benthic infauna and larger macroinvertebrates were collected during the Year 2008 Baseline Study (MEC 2002; SAIC 2010). Small infaunal organisms (which tend to be less motile than larger macroinvertebrates) and larger macroinvertebrates both exhibited spatial variability in species composition that appeared to be tied to a combination of factors including water depth, years since dredging/disposal in the area, and ecological/habitats functions (MEC 2002). Studies in 2008 found little difference in species composition among deepwater stations located in basins, channels, or slips of the Inner and Outer Harbors (SAIC 2010).

Benthic invertebrate assemblages generally differed between shallow and deepwater habitats (SAIC 2010), and differences were apparent between assemblages from areas that have or have not experienced recent dredging (MEC 2002). Areas of recent dredging had fewer species and lower abundance than non-dredged areas, indicating that the recently dredged areas were still in the colonization phase (MEC 2002). Species assemblages of benthic invertebrates can be indicative of habitat function (SAIC 2010). Certain species are tolerant of adverse environmental conditions, such as low oxygen and high pollutant conditions, and others are found only in more pristine areas (SAIC 2010). In the 2008 study, species assemblages indicated that stations in the Outer Harbor had the highest habitat function as indicated by relatively greater abundance of species that typically characterize areas having background to low organic enrichment (i.e., low pollution) (SAIC 2010). The species assemblages found in the Inner Harbor, basins, and slips were indicative of low to moderate organic enrichment compared to the open-water Outer Harbor stations, suggesting that

benthic invertebrate species composition is influenced by tidal circulation in the harbors, with Outer Harbor areas having greater circulation and higher functional habitats (SAIC 2010).

Non-indigenous invertebrates comprise about 15 percent of the infauna and macroinvertebrate species occurring in the ports, with some of these species representing numerical dominants (SAIC 2010). The relative abundance of these species has increased in the harbors since the 1970s (SAIC 2010). A total of 10 non-indigenous (introduced) and 32 cryptogenic species (of unknown origin) were identified among the 313 species of infauna and macroinvertebrates collected during the 2008 study (SAIC 2010). The overall percentage of introduced and cryptogenic species identified in the present study (14 percent) is similar to the 15 percent reported by MEC (2002) in 2000 (SAIC 2010).

In general, ecological/habitats function was highest for benthic invertebrates at the created Cabrillo, Pier 300, and Long Beach Shallow Water Habitat areas and the deep open waters of both ports (MEC 2002). A gradient of decreasing ecological/habitats function was observed in basin and slip habitats and the back channels of the Inner Harbor. Similar to fish, catch abundance was higher in basin habitats in the Port than in the open waters of the Outer Harbor (SAIC 2010). The lowest catch of benthic invertebrates was obtained in the Inner Harbor (SAIC 2010).

A steady improvement in benthic ecological/habitats function within the ports of Los Angeles and Long Beach over time has occurred, as demonstrated by increased diversity and less dominance by pollution tolerant benthic infauna species over the past half century. Many areas in both ports were severely polluted in the 1950s with depauperate benthic faunal assemblages in these areas during that period (MEC 2002) (please see Contaminants below).

Birds

Southern California's coastal areas, including its shorelines, estuaries, bays, and developed harbors, provide a variety of natural and artificial communities for large numbers of waterfowl, shorebirds, wading birds, and birds that forage from the air. The predominately open water and hardscape/landscape habitats within the ports of Long Beach and Los Angeles provide opportunities for nesting, foraging, and resting by a moderate diversity of bird species, including one species listed as endangered under the ESA, the California least tern.

Birds that occur in and near the ports of Los Angeles and Long Beach are primarily water-associated species; that is, they are dependent on the marine natural communities for food and other essentials. Over 100 avian species use the various habitats within the Ports seasonally, year-round, or during migration (SAIC 2010). The areas within and near the ports provide very limited areas of trees and/or shrubs for feeding, resting, and/or nesting; most of this small area of vegetation is made up of exotic landscaping. As a result of the high numbers of small fish in the shallow water areas of the ports, substantial numbers of fish-eating birds are found foraging in these areas. The ports provide high-function habitats for many foraging, resting, and breeding birds.

During the 2000-2001 monitoring year, a total of 99 bird species, representing 31 families, were observed within San Pedro Bay (MEC 2002). A total of 96 species representing 30 families were observed within the ports during the 2008 study (SAIC 2010). Of these species from both studies,

69 are considered to be dependent on marine habitats. Gulls comprised 44.5 percent of the birds observed in 2000, with aerial foragers (22.4 percent) and waterfowl (21.4 percent) also common. The remaining 21.7 percent of the birds were small and large shorebirds, wading/marsh birds, raptors, and upland birds. The most abundant birds included several gull species [e.g., Western (*Larus occidentalis*), Heermann's (*L. heermanni*), and California (*L. californicus*)], brown pelican (*Pelecanus occidentalis*), elegant tern (*Thalasseus elegans*), western grebe (*Aechmophorus occidentalis*), Brandt's cormorant (*Phalacrocorax penicillatus*), double-crested cormorant (*Phalacrocorax auritus*), surf scoter (*Melanitta perspicillata*), and rock pigeon (*Columba livia*).

The State and Federal endangered California least tern is a piscivorous (fish eating) sea bird that makes significant breeding use of San Pedro Bay (KBC 2005). The least tern has a long history of nesting on Terminal Island and Pier 400 in the Port of Los Angeles (Figure 4). Pier 400 is near the western portion of the proposed project footprint. This least tern nesting site is typical of those used by the species in highly developed coastal California; the site is a relatively flat, open, barren sandy area near the ocean where the least terns lay and incubate their eggs and chicks fledge. The least tern nesting period extends from April through August; along the California coast least terns typically begin to arrive (from wintering grounds) in the southern most colony breeding sites (e.g., San Diego) in early April and they continue to arrive through the later part of May. During the remainder of the year, the birds are gone from the area.

Least terns nest on sparsely vegetated substrates, including sandy beaches, salt flats, and dredge spoil, in colonies of a few to several hundred nesting pairs. This species relies on sight for foraging and usually requires relatively clear water to locate its preferred baitfish food sources, northern anchovy, topsmelt, and jacksmelt (LSA 2009). Although there is some field evidence to suggest that least terns will forage in turbid waters to which fish are attracted, the majority of foraging occurs in clearer waters (LSA 2009).

The location of the tern nesting site(s) in the ports of Los Angeles and Long Beach previously varied from year to year (KBC 1998) depending largely on development activities in the ports, with most nesting on Pier 400. The Los Angeles Harbor Department manages the Pier 400 nesting site pursuant to a Memorandum of Agreement with the Service, Corps, and California Department of Fish and Wildlife (Department) (LA 2006). A 15.7-acre fenced nesting site is located at the southern tip of Pier. 400, although some nesting by least terns also often occurs outside of this designated area.

Least terns have nested within the ports since the late 1800s and have been observed within the harbor almost every year since annual monitoring studies began in the ports in 1973 (SAIC 2010). Since 1973 the least tern has utilized nesting locations on and around Terminal Island, with nesting at Reeves Field and/or Pier 300 and Pier 400 areas (LAHD 2015). Zero least tern nesting pairs were recorded for the Terminal Island area in 1992 (LAHD 2015). The greatest documented nesting activity for the least tern in the area has occurred since the birds began utilizing the then newly-constructed Pier 400 as a nesting site in 1997. The number of recorded nests at Pier 400 peaked at 1,322 in 2005, then declined to 906 in 2006, and further declined to 710 in 2007 (KBC 2007) and 126 in 2014 (State 2015). The principal foraging areas for least tern in the ports and environs vary somewhat from year to year, but during the chick rearing period, the shallow water areas of the ports are used heavily, probably due to the relatively greater abundances of appropriate prey fish (size and

species) found there (see MEC 1988, 1999). Measures to protect the least tern during channel dredging and landfill construction projects have proven successful (Service 1992). Those measures have included nesting area and predator management, shallow water area conservation/creation, and protection of water quality in the shallow water areas during breeding season.

Least tern nest numbers at Pier 400 increased from approximately 565 during the 2000–2001 to 1,332 in 2005, and then declined to 521 in 2008 (SAIC 2010). The decrease in nest numbers is opined to be related to increases both in upland vegetation and predation at the Pier 400 nesting site (KBC 2008). The majority of least tern observations during 2007–2008 surveys were of individuals foraging or flying in the vicinity of the Pier 400 nesting site; least terns also were observed foraging along the outer breakwater and open-water areas of the Outer Harbor and within Inner Harbor basin and channel areas (SAIC 2010). Least terns foraged most frequently just off the Pier 400 nesting site, off Pier 300, and near Cabrillo Beach (SAIC 2010).

The brown pelican, formerly federally listed as endangered, is found in large numbers in San Pedro Bay (MEC 2002). This bird breeds on the offshore Channel Islands, and forages widely along the southern California coast on small fishes. Brown pelicans make heavy use of the Outer Harbor breakwaters for roosting. The brown pelican is present throughout the year. The peregrine falcon (*Falco peregrinus*), also formerly federally listed as endangered, nests on bridges within the area of the ports (SAIC 2010).

Several piscivorous seabirds began nesting in the adjacent Port of Los Angeles following construction of Pier 400. The royal tern (*Thalasseus maximus*), Caspian tern (*Hydroprogne caspia*), elegant tern, and black skimmer (*Rynchops niger*) had each been recorded nesting on Pier 400 up until 2005 (KBC 2005). No nesting by these species was recorded in 2006 or 2007 (KBC 2007). The landfill area of Pier 400 (constructed in 1996) initially provided a large expanse of suitable bare-dirt nesting habitat for terns adjacent to a well-developed forage base (consisting of small fish) in the Outer Harbor. However, development of Pier 400 is now complete and undeveloped areas in the ports of Los Angeles and Long Beach outside of the Pier 400 nesting site currently contain very little suitable seabird nesting habitats.

No snowy plovers were detected within either the ports of Long Beach or Los Angeles during the 2007–2008 surveys (SAIC 2010). Snowy plovers are occasionally observed during migration at the California least tern nesting site on Pier 400 (SAIC 2010). A few snowy plovers have been observed at nearby Point Fermin and Cabrillo Beach (outside of the breakwater), both south and outside of the Port of Los Angeles (SAIC 2010).

Mammals

Most marine mammals are under the jurisdiction of the National Oceanic and Atmospheric Administration (NOAA Fisheries), including all those potentially occurring in or near the ports. All marine mammals are protected under the Marine Mammal Protection Act of 1972 (16 U.S.C. 1361 *et seq*.) and some are also protected by the ESA. Marine mammals that are known to occur sporadically in waters of the ports include pinnipeds [California sea lion (*Zalophus californianus*) and harbor seal (*Phoca vitulina*)] and cetaceans (SAIC 2010). Cetaceans that have been observed in

outer harbor locations in the ports include the gray whale (*Eschrichtius robustus*), Pacific bottlenose dolphin (*Tursiops truncatus*), short-beaked common dolphin (*Delphinus delphis*), and Pacific white-sided dolphin (*Lagenorhynchus obliquidens*) (SAIC 2010). None of these are species are known to breed in the ports (SAIC 2010).

Riprap-Associated Organisms

A total of 334 species of invertebrates were identified from three tidal zones within the riprap community in the ports (SAIC 2010). Distinct tidal zonation was observed with increasing numbers of species with increasing depth. Mean total abundance was highest in the lower intertidal, lowest in the upper intertidal, and intermediate in the subtidal zone (SAIC 2010). Across all tidal zones, crustaceans were numerically dominant, followed by polychaetes, echinoderms, molluscs, and other phyla. Past studies have noted relatively greater community development in Outer Harbor compared to Inner Harbor areas (MEC 1988, 2002). However, the 2008 study noted general similarities in these communities throughout the two ports (SAIC 2010). Exceptions were for diversity, which was somewhat greater at Outer Harbor breakwater stations compared to Inner Harbor locations, but these differences were mainly associated with the upper intertidal zone (SAIC 2010). Community summary measures did not show distinct trends among Inner and Outer Harbor stations for the lower intertidal and subtidal zones, suggesting some improvement in ecological function at Inner Harbor stations since the 2000 study (SAIC 2010).

Kelp and Macroalgae

Within the ports, the majority of kelp and macroalgae surface canopy is closely associated with the outer breakwaters and with riprap structures in the Outer Harbor and in locations facing the port entrances (SAIC 2010). While algal diversity in the ports is considered relatively low, there is a general pattern of decreasing algal diversity from Outer to Inner Harbor locations (SAIC 2010). During the 2008 study, Macrocystis canopy in the two ports totaled 77.8 acres in spring and decreased to 50.4 acres in the fall (35% decrease) (SAIC 2010). Seasonal declines in kelp canopy cover for both studies are likely due to natural die-offs between winter and fall. Dominant macroalgal communities included the genera *Sargassum*, *Ulva*, *Colpomenia*, *Chondracnathus*, and *Halymenia* (SAIC 2010).

Occurrences of invasive exotic algae within the ports include the brown algae *Sargassum muticum* and *Undaria pinnatifida*. While *Sargassum* has become a commonly observed component of the algal flora in southern California, including the ports, *Undaria* was first reported in the United States in spring 2000 during the previous baseline study of the ports (MEC 2002). Notably, *Undaria* was documented during the present study at all eight Inner Harbor sites studied and at 7 of 12 Outer Harbor locations, indicating an expanded distribution since 2000 (SAIC 2010).

Contaminants

The marine biological environment of the ports of Los Angeles and Long Beach has been periodically studied since the 1950s. Early studies documented severe pollution in several of the basins in the harbors. As recently as the late 1960s, dissolved oxygen (DO) levels at some locations

in Los Angeles Harbor were so low that little or no marine life could survive (SAIC 2010). Since that time, regulations have reduced direct waste discharges into the ports, resulting in improved DO levels throughout the port areas (MEC 2002; SAIC 2010). Comprehensive studies in the 1970s reported a dramatic improvement in marine habitats function/quality relative to the 1950s, although areas of pollution are still evident in Inner Harbor and blind-end slip areas (MEC 2002).

Results from studies in 2000 and 2008 indicate a continued trend of water quality improvement since the 1970s, with most DO concentrations in excess of 5 milligrams/liter (MEC 2002; SAIC 2010). Episodic and localized changes in some parameters, such as low DO concentrations coinciding with low transmissivity, suggested minor effects possibly associated with sediment resuspension events (MEC 2002). Water clarity (transmissivity) decreased with increasing depth and was relatively lower in bottom waters at stations with fine sediments and/or in the vicinity of dredging and/or disposal (MEC 2002). Polluted and “semi-healthy” areas still exist in the ports; however, the spatial extent of these areas of relatively poorer ecological/habitats function is not as widespread today. The most polluted area is the Consolidated Slip of the Port of Los Angeles; “semi-healthy” areas exist in the Cerritos Channel of the Inner Harbor and in confined basins and slips in both ports (MEC 2002).

Water quality conditions measured during July 2008 generally were uniform throughout the environments of the ports, with only minor differences that appeared to be unrelated to natural community (SAIC 2010). Further, water quality conditions also were consistent with values reported previously for the ports (MEC 2002), and indicative of well-mixed and well-oxygenated waters (e.g., DO greater than 5 mg/L) for almost all stations (SAIC 2010). Some localized differences, associated with comparatively warmer surface water temperatures, lower surface water salinities, and lower DO concentrations in near-bottom water, were observed, but the magnitude of the differences were considered small (SAIC 2010).

The waters of ports of Los Angeles and Long Beach (including Inner and Outer Harbor, Main Channel, Consolidated Slip, Southwest Slip, Fish Harbor, Cabrillo Marina, Inner Cabrillo Beach), San Pedro Bay, Dominguez Channel, Dominguez Channel estuary, Torrance Lateral Channel (sometimes referred to as Torrance Carson Channel), and Los Angeles River Estuary are impaired by heavy metals and organic pollutants (CRWQCB 2011). More specifically, each of these water bodies are included on the 303(d) list for one or more of the following pollutants: cadmium, chromium, copper, mercury, lead, zinc, chlordane, dieldrin, toxaphene, DDT, PCBs, and certain PAH compounds (CRWQCB 2011). These impairments may exist in one or more environmental media — water, sediments, or tissue (CRWQCB 2011).

Some site specific data are available that suggest varying levels of contamination in the sediments to be dredged. Additional testing will be required to determine what materials from which areas may be re-used for habitat creation or beach replenishment, disposed of at an ocean dumping site, or disposed of at a confined disposal facility or appropriate upland site. The Service will provide additional input on these determinations as information regarding physical and chemical characteristics of the materials to be dredged becomes available.

San Pedro Bay Landfill Mitigation History

The agency consensus mitigation goal for San Pedro Bay (ports of Los Angeles and Long Beach) landfill impacts to date has been no net loss of habitat value for in-kind resources, as near to the site of loss as feasible, and in advance of, but not later than concurrently with, the fill (Corps and LAHD 1992). For the last several years, the Service, Department, the National Marine Fisheries Service, the City of Los Angeles Harbor Department, and the Port have been designing and executing mitigation plans for development projects in the ports. The process employs a modified habitat evaluation procedure and involves evaluation of the habitat value in the affected port area and compares that to predicted habitat value increases at conceptual mitigation areas.

Following implementation of measures for avoiding and minimizing impacts to fish and wildlife resources, on-site mitigation has been conducted in the adjacent Port of Los Angeles consisting of creation of shallow water from deep areas. In 1985, as a condition of the Harbor Deepening Project in the Port of Los Angeles, the Corps created 190 acres of shallow water (i.e., water less than -20 feet MLLW) as mitigation for the filling of 190 acres of shallow water to make the land area now called Pier 300. The created shallow water area, now called the Pier 300 Shallow Water Habitat, has been the subject of several biological investigations (MEC 1988, 1999) and shown to provide highly productive habitats for fish. It is also an important foraging area for the California least tern (KBC and Aspen Environmental Group 2004).

Potential Impacts of the Proposed Project on Biological Resources

The proposed project would involve deepening of portions of the Port to currently undetermined depths with the disposal of dredge material at currently undetermined locations. The project would involve dredging of only relatively deep (i.e., greater than 20 feet) water areas of San Pedro Bay. These deeper water impacts typically do not involve what is considered significant long-term loss of habitats warranting mitigation.[18] Anticipated potential effects associated with dredging and disposal of dredge materials would depend largely on disposal location; these potentially include: 1) the permanent elimination of fish and wildlife habitats associated with any in-bay landfills; 2) a temporary reduction in available foraging habitat for piscivorous bird species, including the least tern, due to dredging or disposal-associated turbidity generated by the project (depending on locations); 3) the reduction of deep water habitats and creation of shallow water fish habitats with any in-bay subaquatic fill of deeper waters; 4) the reduction of deepwater habitats and creation of island (nesting bird) habitats with any in-bay island fill of deeper waters; and 5) temporary impacts of burying of beach- and nearshore-associated invertebrates and nearshore turbidity associated with disposal of dredge materials through local beach/nearshore replenishment.

The dredging of deeper water areas within the project footprint would impact the invertebrate benthic fauna and demersal fish communities found in these areas. These dredging impacts would be largely temporary, although the resultant areas would then be deeper in the long-term. The replacement benthic fauna that would colonize these dredged areas in the years following project

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[18] Historically, mitigation has been required for dredging that deepens shallow water areas, 20 feet deep or less, because the deepening reduces or eliminates the fish nursery and bird foraging values. No such impacts to areas less than 20 feet deep are anticipated with this project.

implementation would likely be different; this fauna would include species combinations adapted to these new deeper areas. The vast majority (if not all) of these areas have been subject to dredging in the past century, with varying levels of recovery since the last dredging event. It is undetermined what areas of the project footprint would be subject to future maintenance dredging.

The dredging and disposal of dredge materials creates temporary turbidity impacts to surrounding waters. When dredge materials are used to create shallow water or island habitats this typically creates long-term benefits due to the typically higher functions and values for fish and wildlife attributable to shallow water and sensitive species nesting areas. The size and duration of the turbidity plume generated by dredging and disposal activities is dependent on grain size of the suspended material and current velocities at the time the activity is conducted (Corps and LAHD 2000). Project dredge material qualities, disposal locations, and associated current velocities are unknown; therefore, turbidity is not readily predictable for the project. The amount of turbidity is generally greater in the immediate vicinity of the filling/disposal operations than at the dredge site because the dredge typically operates with suction, while the filling operation is often by discharge from a pipe (Corps and LAHD 2000). However, based on past dredge disposal operations, the extent of the turbidity plume is not expected to be greater than several hundred feet from the discharge point. Because several hundred acres of high-function shallow water foraging habitat are available for piscivorous bird species within the Port region (e.g., 193-acre Pier 300 Shallow Water Habitat and 326-acre Cabrillo Shallow Water Habitat), the area of disturbance from the project would likely represent a small portion of available foraging habitats for such birds.

Recommendations

The Fish and Wildlife Coordination Act states that "...wildlife conservation shall receive equal consideration and be coordinated with other features of water-resource development projects through the effectual and harmonious planning, development, maintenance, and coordination of wildlife conservation...." (16 U.S.C. 661). Consistent with Fish and Wildlife Coordination Act, should the project be implemented, we suggest incorporation of the following planning aid recommendations in order avoid, minimize, and compensate potential impacts to fish and wildlife resources, and suggest the Corps incorporate the project design elements outlined below that would improve fish and wildlife resources:

1. The Corps should use dredge materials, as contaminant levels in the dredge materials allow, to construct areas of shallow water fish habitats (areas of water less than -20 feet MLLW).

2. Within the center of the area of created shallow water fish habitats noted above, the Corps should create a least tern/snowy plover nesting island with dredge materials. We suggest that the Outer Harbor in areas of low shipping traffic would likely be a functional location for this purpose, particularly areas adjacent to (behind) the existing Middle or Long Beach breakwaters.[19] The middle of this island(s) should be at least several acres in size and relatively flat with the surface constructed of typical least tern nesting soil matrix materials.

[19] We suggest these locations so as to minimize conflict with existing shipping traffic routes in the ports. These Outer Harbor areas would likely provide high ecological function for the fish and wildlife species targeted by these measures.

A portion of the island should have a zone of low gradient shoreline slope down to the water within a protected cove(s), likely adjacent to and facing the existing breakwater within the Port for swell protection. Other features such as subaquatic reefs constructed of rock are also suggested, in part to help prevent erosion of the island cove shoreline surface materials from swells. The configuration and slope surface of the noted cove should be constructed of sand and gravel or other compatible materials for snowy plover chick foraging: the configuration should be such that the cove areas remain open to tide-borne deposition of natural beach wrack[20] and would otherwise support snowy plover chick and adult foraging. The remainder of the island (outside of the cove portion) would likely need to be edged by riprap to avoid erosion of the island by swells. Possibly waste rock from other proposed projects in the area (e.g., partial or full removal of the Long Beach Breakwater) could be used/combined for this purpose. It is preferred that the surface of this island not be utilized for human recreation and be protected from unauthorized entry.

3. The Corps should implement a construction schedule for the project that avoids the least tern breeding season, if feasible.

4. Turbidity from dredge and fill activities in the vicinity of the shallow water habitats should not extend over an area greater than 5 acres of shallow waters (i.e., areas less than 20 feet deep) at any one time during the April-to-September breeding season of the California least tern. Monitoring of project-related turbidity, as provided for in measure 5 below, should be based on visually observed differences between ambient surface water conditions and any visible dredging turbidity plume.

5. The Corps should provide a qualified least tern biologist, acceptable to the Service and Department, and approved by the Corps, to help monitor and manage project activities. This program should be carried out during project activities. The biologist should coordinate with the Service and the Department and:

    a. If the areas associated with project activities (such as staging areas) would occur within upland areas of the Port that are capable of supporting sensitive species, the Corps should provide an education program for construction crews, including the identity of the least tern and their nests, restricted areas and activities, and actions to be taken if least tern nesting sites are found outside the designated least tern nesting sites/within project activity areas.

    b. Visually monitor and report to the dredging contractor or Corps contract manager and Service/Department any turbidity from project dredging which extends over an area greater than 5 acres of shallow waters.

6. If least tern or other protected species nests are found within the project's direct footprint in upland areas during construction, then all work in the immediate area should be halted, and the Corps biologist be notified immediately. An appropriate buffer zone around the nest for

[20] Beach wrack consists of organic material such as kelp and sea grass that is cast up onto the beach by surf, tides, and wind. Beach wrack supports a wide variety and large quantity of beach invertebrates.

exclusion of project-related activities should be specified by the biologist in coordination with the Service and the Department.

If you have any questions you have regarding this letter, please contact Jon Avery, Federal Projects Coordinator, at 760-431-9440, extension 309.

Sincerely,

CAROL ROBERTS
Digitally signed by CAROL ROBERTS
Date: 2016.06.30 15:09:09 -07'00'

Scott A. Sobiech
Deputy Field Supervisor

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COORDINATION ACT REPORT

U.S. FISH AND WILDLIFE SERVICE
14 APRIL 2021

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United States Department of the Interior

U.S. FISH AND WILDLIFE SERVICE
Ecological Services
Carlsbad Fish and Wildlife Office
2177 Salk Avenue, Suite 250
Carlsbad, California 92008

In Reply Refer to:
FWS-LA-15B0128-21CPA0060

April 14, 2021
Sent Electronically

Colonel Julie A. Balten
U.S. Army Corps of Engineers – Los Angeles District
915 Wilshire Boulevard, Suite 930
Los Angeles, California 90017-3409

Attention: Larry Smith

Subject: Final Coordination Act Report for the Proposed Long Beach Project, Los Angeles County, California

Dear Colonel Balten:

The U.S. Fish and Wildlife Service (Service) has prepared this Final Coordination Act Report (Final CAR) for the U.S. Army Corps of Engineers (Corps) on the proposed Port of Long Beach Deep Draft Navigation Project (project) to describe ecological components and processes, identify opportunities to protect and improve biological resources, and provide recommendations related to the conservation and enhancement of fish and wildlife species in the project area. The Corps' Los Angeles District and the Port of Long Beach (POLB), have completed a Draft Integrated Feasibility Report and Environmental Impact Statement/Environmental Impact Report (EIS/EIR) for the Port of Long Beach Deep Draft Navigation Feasibility Study (feasibility study) located in the City of Long Beach, Los Angeles County, California. The feasibility study was published in October 2019 and provided to fulfill both federal National Environmental Policy Act (NEPA) and state California Environmental Quality Act (CEQA) environmental documentation requirements as the combined EIS/EIR (Corps 2019a).

The purpose of the proposed project is to evaluate and improve existing navigation channels within the Port of Long Beach to improve conditions for current and future container and liquid bulk vessel operations and safety (Corps 2019c). The proposed project would be located mainly at the Port of Long Beach Federal channels and berths serving Pier J and Pier T/West Basin (see Figures 1 and 2). The proposed project would deepen existing channels and construct a new Federal channel and turning basin by dredging and disposing of sediment. The total proposed dredge area is approximately 880 acres, and the project would expand the size of existing navigation channels and turning basin areas by approximately 345 acres (NOAA 2019). As proposed, dredged sediments would be placed in a nearshore disposal site off the coast of the City of Seal Beach, in Orange County, California (see the "Nearshore" site in Figure 3) and at two Environmental Protection Agency-designated offshore dredged material disposal sites (see sites LA-2 and LA-3 in Figure 3) in Los Angeles and Orange counties. The disturbance area of new dredging (areas that have not been dredged previously) from the proposed project would be approximately 241 acres (NOAA 2019).

The overall project region (the general area including and surrounding all proposed project activities) consists of nearshore and offshore areas of a portion of San Pedro Bay in Los Angeles and Orange counties within 10 miles of the coast. The main project area (the area of all proposed project activities, excluding locations for dredge materials placement and associated transit zones between dredging and dredge materials placement) encompasses portions of the Los Angeles County coast of the eastern Pacific Ocean, predominantly within about 5 miles seaward of the historical coastline near the mouth of the Los Angeles River and the coast of the City of Long Beach in San Pedro Bay. The shoreline, marine, and former estuarine areas of the main project region (Figure 1) and main project area (Figure 2) have been heavily modified over the last century, associated with port development, oil extraction, and coastal commercial/urban development. Before the 20^{th} century, the areas that are now the ports of Los Angeles and Long Beach were predominantly estuaries of the Los Angeles and San Gabriel rivers (Port of Long Beach 2011). The formerly extensive natural mudflats and marshlands of the main project area historically provided expansive habitats for birds, fish, and invertebrates, and the former barrier beaches, river mouths, and sand spits of the area served as nesting and foraging habitats for a variety of seabirds and shorebirds (Arnold 1903; POLB 2011). Very small remnants of these natural communities/habitats remain intact in the main project area.

This Final CAR is provided in accordance with the Fish and Wildlife Coordination Act (FWCA) of 1958, as amended (48 Stat. 401; 16 U.S.C. 661 *et seq*.), and the Endangered Species Act (ESA) of 1973, as amended (87 Stat. 884; 16 U.S.C. 1531 *et seq*.). The Final CAR is a report per section 2(b) of the FWCA; it does not constitute a biological opinion under section 7 of the ESA. The purpose of this Final CAR is to deliver information and recommendations for use by the Corps' design-planning team in developing goals, objectives, and alternatives/modifications to the project.

INTRODUCTION

Nearshore[1] ecosystems include many biological resources that are of high ecological, recreational, subsistence, and economic value. California's nearshore ecosystems are some of the most productive ocean areas in the world (CDFG 2001). These systems are home to a wide variety of fishes, kelp, marine invertebrates, and marine mammals, as well as a large number of sea and shorebird species (CDFG 2001). These systems also are subject to influences from natural and human-caused perturbations, which can originate in terrestrial or oceanic environments. Nearshore marine habitats are productive, while also vulnerable, owing to their connections to pelagic and terrestrial landscapes. About 450 species of fish occupy California's nearshore ecosystem within the limits of the continental shelf (CDFG 2001).

[1] The nearshore is defined as the area from the coastal high tide line offshore to a water depth of 120 feet.

Figure 1. Main Project Region (Corps 2019a).

Figure 2. Main Project Area (Corps 2019a).[2]

[2] The white solid line boundary shown in the Corps' figure above denotes the "Existing Federal Project" main channel and approach channel for the Port of Long Beach – which are both currently dredged to 76 feet below mean lower low water. The "C" represents the proposed project "General Navigation Features" that would be constructed for container ships. The "LB" represents the proposed project "General Navigation Features" that would be constructed for liquid bulk vessels. The hashed and solid light blue areas represent proposed project dredging. The dotted line denotes the Port of Long Beach boundary.

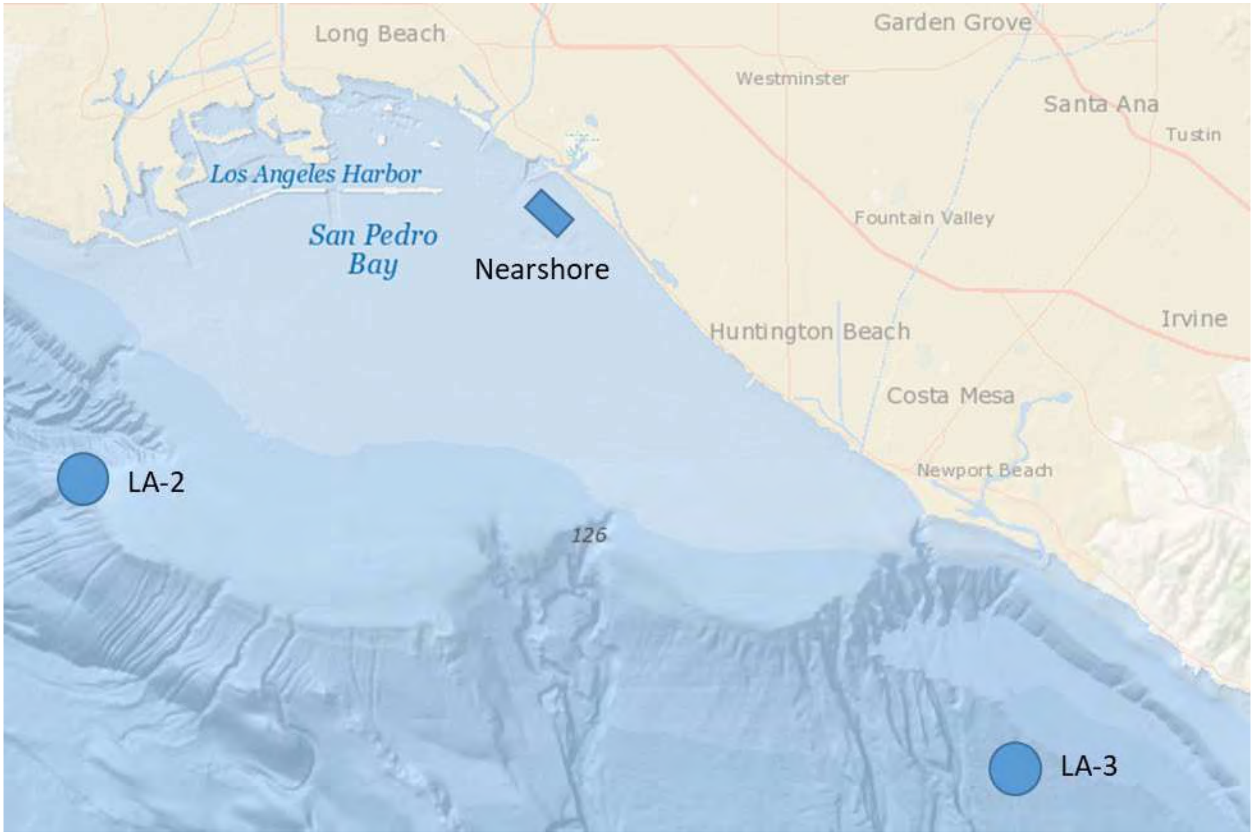

Figure 3. Full Project Region and Dredge Material Placement Portion of Project Area (Corps 2019a).

San Pedro Bay is a large inlet of the eastern Pacific Ocean along the southwestern continental United States coast, within the Southern California Bight. The Southern California Bight encompasses the marine waters from Point Conception at the northwest end of the Santa Barbara Channel, to a point just south of the border between the United States and Mexico. The Southern California Bight is notable for complex bathymetry, offshore islands, and for being adjacent to a highly developed coastal region with substantial anthropogenic inputs into the coastal ocean (Todd *et al*. 2009). More than 22 million people live along southern California's coast (Brothers 2015).

The San Pedro Bay region includes the Port of Los Angeles and the Port of Long Beach, which together form the fifth-busiest port facility in the world and the busiest port in the Americas. San Pedro Bay is bounded by the City of Los Angeles communities of San Pedro on the west, Wilmington on the north, and by the cities of Long Beach and Seal Beach on the north and east.

Coastal development of Long Beach and a century of harbor dredging and filling associated with development of the ports of Los Angeles and Long Beach eliminated thousands of acres of Los Angeles River estuary. In its place, behind manmade breakwaters, remains an open-water marine embayment of relatively high biological diversity and productivity.

Fish and Wildlife Coordination Act

The Fish and Wildlife Coordination Act of 1934 (the predecessor to the FWCA of 1958 noted above) included requirements that were the first formal expressions in U.S. law of a duty to minimize the negative environmental impacts of major water resource development projects and to compensate for those impacts that remained (Bean 2016).

The Fish and Wildlife Coordination Act of 1934 was a response to a U.S. era of big dam building and reflected a concern for the impact of those dams, particularly on anadromous fish (Bean 2016). As originally enacted, it required consultation with the Bureau of Fisheries (as the Service was then known) prior to the construction of any dam to determine if fish ladders or other aids to migration were necessary and economically practical to minimize impacts on fish populations. It required, as well, the opportunity to use the impounded waters for hatcheries to offset impacts that could not otherwise be avoided. The duties imposed by the FWCA were reinforced and expanded by the National Environmental Policy Act (NEPA) of 1969 (Bean 2016). Under NEPA and its implementing regulations, all federal agencies have a duty to assess the impacts of the major actions they propose to undertake and to consider reasonable alternatives to reduce or eliminate those impacts (Bean 2016). The Service, as the federal agency charged by Congress in the Fish and Wildlife Act of 1956 with the responsibility for management, conservation, and protection of fish and wildlife resources, routinely recommends mitigation measures to other federal agencies through the NEPA and FWCA processes (Bean 2016).

The FWCA directs and authorizes consultation, reporting, consideration, and installation/implementation of fish and wildlife conservation features. The authorities of the FWCA are considered to be “supplementary legislation” to the various Federal project authorizations, such as the Corps public works authorizations (Smalley and Mueller 2004). The FWCA conditions or supplements other water development statutes to require consideration of recommendations generated under the FWCA procedures, including portions of the Clean Water Act [*Zabel* v. *Tabb*, 430 F2d 199 (5th Cir. 1970) cert. denied 401 U.S. 910 (1972)]. For Federal water resources development projects, the FWCA requires that fish and wildlife conservation receive equal consideration by Federal agencies with other project purposes, and that such conservation be coordinated with other project features. Notably, the FWCA authorizes the Federal project implementation of these noted means and measures for both mitigating losses of fish and wildlife resources and for enhancing these resources beyond the scope of offsetting of project effects (Smalley and Mueller 2004).

PROJECT REGION HISTORY

The project region history was substantially covered in our Planning Aid Report on the subject project dated June 2016. This document is enclosed and incorporated herein by reference.

PROPOSED PROJECT

Recommended Plan – "Alternative 3"

The proposed project is termed Alternative 3 within the feasibility study. It was also the Corps' Tentatively Selected Plan (TSP) for the feasibility study, from the several project alternatives analyzed (Corps 2019a). Alternative 3 from the feasibility study is now officially the Corps' Recommended Plan (Corps 2021).

The Recommended Plan, which would be undertaken jointly by the Corps and the POLB, would deepen the entrance to the Main Channel (the Approach Channel through Queens Gate) in the POLB to a depth of -80 feet (ft) mean lower low water (MLLW), widen portions of the Main Channel (bend easing) to a depth of -76 ft MLLW, construct an approach channel and turning basin to Pier J South to a depth of -55 ft MLLW, and deepen portions of the West Basin and West Basin Approach to a depth of -55 ft MLLW. The POLB would also deepen two additional locations within the harbor to a depth of -55 ft MLLW: the Pier J Slip, including berths J266-J270, and berth T140 on Pier T. Structural improvements would also be performed on the Pier J breakwaters at the entrance of the Pier J Slip to accommodate deepening of the Pier J Slip and Approach Channel to -55 ft MLLW; these activities are considered "Local Service Facilities" and would be undertaken solely by POLB.

The total proposed dredging volume is approximately 7.4 million cubic yards (mcy) of sediment, and total dredge area is approximately 880 acres (NOAA 2019). The project would expand the size of existing navigation channels and turning basin areas in the POLB area by approximately 345 acres (NOAA 2019). Proposed construction would begin in 2024 and is anticipated to take approximately 39 months to complete (Corps 2019c).

As proposed, only project sediments dredged from the deepening of the POLB Approach Channel would be placed in a nearshore disposal site off the coast of the City of Seal Beach (see the "Nearshore" site in Figure 3). This Nearshore site is also otherwise known as the Sunset/Surfside Borrow Site for other projects in the area (e.g., Corps 2019b), and is herein termed the "Nearshore/Sunset/Surfside site." Sediments dredged from the balance of project dredging areas would be placed at two designated offshore dredged material disposal sites (see sites LA-2 and LA-3 in Figure 3) in Los Angeles and Orange counties.

The Nearshore/Sunset/Surfside placement site, approximately 5 miles from the main project area at the POLB, can accommodate about 2.5 mcy of dredged material in total (NOAA 2019). The dredge material placement sites LA-2 and LA-3 are approximately 9 miles and 22 miles, respectively, from the main project area in the POLB. Sites LA-2 and LA-3 have an allowed annual disposal volume limit of 1.0 and 2.5 mcy, respectively, from all sources (NOAA 2019). It is assumed that 0.9 mcy for LA-2 and 2.2 mcy for LA-3 would be available for use by this project each year (NOAA 2019). Vessel transit routes between the dredging locations and disposal sites are not mapped or identified in the feasibility study but are assumed to involve routes predominantly in direct lines from proposed dredging areas to noted disposal areas.

Dredging would be performed using a hopper dredge as well as an electric clamshell dredge. Disposal of material from the hopper dredge would maximize use of the Nearshore/Sunset/Surfside site, while a clamshell dredge would be utilized for sediment disposal at the disposal sites LA-2 and LA-3. The Approach Channel portion of the project would be completed in about 5 months of project-year one, utilizing the Nearshore/Sunset/Surfside placement site and LA-2 (Corps 2019a). The rest of the project activities, to be completed by the clamshell dredge, would take the remainder of the project's estimated total of 39 months (Corps 2019c). The total proposed dredging volume is approximately 7.4 mcy and total dredge area is approximately 880 acres (NOAA 2019).

The feasibility study indicates that the POLB would implement structural improvements to the Pier J breakwaters to address the need for increased structural stability associated with the deepened adjacent channels resulting from the project. As proposed, the types of structural improvements could consist of a series of project options: placing additional rock at the base of the existing breakwater structures, placing rock on the dredge slope using ground improvement methods, or submerged bulkhead walls of steel sheet pile structures. The most likely ground improvement method to be utilized would be injection of concrete grout at the base of the existing breakwater structures.[3] However, the feasibility study does not specify the location, amount, and/or type of fill associated with these improvements.

Project Dredge Equipment

The proposed project would utilize the following two types of dredges:

1. Hopper Dredge: A hopper dredge is a self-contained vessel that loads sediment from dredge sites then moves to a receiver site for placement. Approximately 17,500 cubic yards of sediment can be removed and transported to the placement site per day using a hopper dredge; although this can vary depending on the transit trip length to the placement/disposal site. The hopper dredge contains two large arms that drag along the ocean floor and collect sediment. The hopper dredge moves along the ocean surface with its arms extended, passing back and forth in the designated dredge site until the hull is fully loaded with sediment. The hopper dredge can generally reach within approximately 0.5 mile of shore to offload to a nearshore site. A single hopper dredge would be used for the project, and it would place all of its dredged material at the Nearshore/Sunset/Surfside placement site; this would involve a total of about 2.5 mcy of sediment to be removed and placed using this equipment.

2. Clamshell Dredge: The clamshell dredge consists of a derrick mounted on a barge outfitted with a clamshell bucket. Dredged materials are placed on a separate barge for transport to the placement site. Approximately 6,000 cubic yards of sediment can be removed and transported to the placement site per day using a clamshell dredge. Additional construction equipment typically required to support dredging activities

[3] The proposed ground improvement option would consist of injecting cement grout at high pressures into the soils behind a proposed sheet pile wall. The intent of the grout is to strengthen the soil behind the wall, relieving pressure on the bulk head. The injection of the grout as proposed would be accomplished by land-based equipment working on the adjacent wharf (Corps 2019a).

using a clamshell dredge include three support boats (two tugboats to move the barge and/or reposition the dredge, and a crew boat). Clamshell dredges are generally diesel-powered; however, all-electric clamshell dredges are available. An electric clamshell would be used for the proposed project as mitigation for air quality impacts. A single clamshell dredge would be used for the project, and a total of about 4.9 mcy of sediments would be removed and transported to the offshore disposal sites LA-2 and/or LA-3 using this equipment (Corps 2019a).

DESCRIPTION OF THE PROJECT REGION, PROJECT FOOTPRINT, AND PROJECT AREA

The project region, project footprint, and project area were substantially analyzed in our Planning Aid Report on the subject project in June 2016 (Enclosure).

DESCRIPTION OF BIOLOGICAL RESOURCES

The fish and wildlife resources of the POLB are reported in detail in a 2016 report entitled: *2013-2014 Biological Surveys of Long Beach and Los Angeles Harbors* (MBC 2016). The biological resources of most of the project region were analyzed within the 2019 feasibility study for the project noted above. Additionally, the biological resources of the main project area were substantially covered in our Planning Aid Report on the subject project dated June 2016 (Enclosure). Please refer to these resources.

The northern portion of San Pedro Bay is dominated by the ports of Los Angeles and Long Beach. These ports are large harbor complexes typified by extensive areas of hardened shoreline (riprap and quay wall) and dredge-maintained channels (SAIC 2010). The benthic hard substrates in the port areas are mostly artificial breakwaters and constructed walls and pilings in shallow water areas in the ports (LA/LBHSC 2016).

The physical habitats of the bottom of San Pedro Bay, with the exception of the artificial structures, is mostly natural soft bottom substrates (Allen 1985; Anchor Environmental 2001). Maximum water depths in the bay typically do not exceed 53 ft (Robbins 2006).

The main project area within POLB where dredging is proposed consists primarily of deep water soft bottom habitats. Specific to zones adjacent to the main project footprint, MBC Applied Environmental Sciences (MBC) observed kelp on both faces of the Long Beach and Middle breakwaters; both faces of Pier F and the Navy Mole; the west-, south-, and east-facing outer faces of Pier J; and both faces of the breakwaters protecting the Pier J slip (MBC 2016).

Harbor seal (*Phoca vitulina*) and California sea lion (*Zalophus californianus californianus*) are commonly observed within the port complex and surrounding areas. Cetaceans known to occur within the POLB complex area include bottlenose dolphin (*Tursiops* spp.) and common dolphin (*Delphinus* spp.). Both pinnipeds and cetaceans utilize the waters of the project region primarily to rest and forage (MBC 2016).

Sea Turtles

Pacific green sea turtles (*Chelonia mydas*; green sea turtles) have been reported from the project region about 2 miles northwest of the proposed Nearshore/Sunset/Surfside placement site since at least 2008, most frequently from the mouth of the San Gabriel River. They are the only sea turtle species likely to occur in the project region. The San Gabriel River and its associated wetland/estuarine areas comprise the northernmost known year-round habitats for the green sea turtle (Aquarium of the Pacific 2019). The green sea turtles using this area and environs are federally-listed as threatened. Green sea turtles are generally found inside reefs, bays, and inlets (except when migrating or transiting). They are attracted to lagoons and shoals with an abundance of marine grass and algae. Nesting of green sea turtles is not considered likely in the project region with the high level of human disturbance on almost all beaches. The green sea turtles observed in the project region over the last decade are reportedly predominantly of the teenage age class, with no reports of small juveniles in the area (Goldman 2016); although, a few reports of breeding-age green sea turtles have come from the San Gabriel River (Propes 2017).

The small and growing population of green sea turtles in the project region mainly persists in and around the San Gabriel River mouth (likely associated with the warm water outfall of the Haynes Generating Station) and within Anaheim Bay/Seal Beach National Wildlife Refuge (SBNWR) estuarine complex (about 1 mile north of the Nearshore/Sunset/Surfside site) (CaliforniaHerps 2018; Crear *et al*. 2016). The available information suggests that while green turtles are present in the estuarine reach of the San Gabriel River year round, their presence may be more seasonal (summer and fall) in other locations in the region when water temperatures are warmer including: Anaheim Bay and other waters in the SBNWR, Sunset/Huntington Harbor, and Alamitos Bay. Crear *et al*. (2016) showed that tagged juvenile sea turtles left SBNWR/Anaheim Bay and moved through the ocean off Seal Beach into the San Gabriel River during winter months, when ocean water temperatures dropped below 59°F/15°C. Conversely, sea turtles moved through Anaheim Bay to get to the 7th Street Basin in the SBNWR during summer and fall months. In the project region, the bay and estuarine habitat areas in which green sea turtles appear to most frequently occur are primarily adjacent and inshore of the project area (NOAA 2020). The expansion or re-expansion of the green sea turtle range and population numbers in southern California in recent years has presented additional conservation challenges for the species, including exposure to marine pollution (Barraza *et al*. 2020), vessel strikes, and potential interactions with marine development (Hanna *et al*. 2020).

Radio tracking data from green sea turtles in the project region indicate that most tagged turtles of the region spent their time in the mouth of the San Gabriel River, with a few turtles swimming into the ocean during the day and returning to the San Gabriel River mouth at night (Goldman 2016), likely crossing portions of the project footprint. The Navy, in collaboration with the National Marine Fisheries Service (NMFS), has been implementing a green sea turtle satellite tagging study to help monitor green sea turtles within the Anaheim Bay region. Preliminary results from this effort indicate that habitat utilization is highest within the SBNWR, but a number of forays have occurred in the adjacent nearshore area of the ocean (Bredvik *et al*. 2019). Of 16 green sea turtles satellite-tagged, two of the turtles went into the ocean after visiting Anaheim Bay (Hanna *et al*. 2020). One individual travelled west from Anaheim Bay along the coast, as far as Rancho Palos Verdes, while another travelled south-east to Dana Point (see Figures 4 and 5; Hanna *et al*. 2020). Both sea turtles then travelled back into Anaheim Bay (Hanna *et al*. 2020). Overall tagging study results indicate use of nearshore habitat in East San Pedro Bay including limited movements in the project footprint, within and adjacent to the Nearshore Surfside/Sunset disposal site (NOAA 2020, 2021) and likely transit zones. We conclude that green sea turtles have considerable potential to occur in the project footprint during the 39 months of proposed project activities.

Figure 4. Locations of an individual satellite-tagged green sea turtle (#PTT 152310) in San Pedro Bay and environs during the period of November 2018 to February 2019, from a study of sea turtle use of Anaheim Bay, California (Hanna *et al*. 2020).

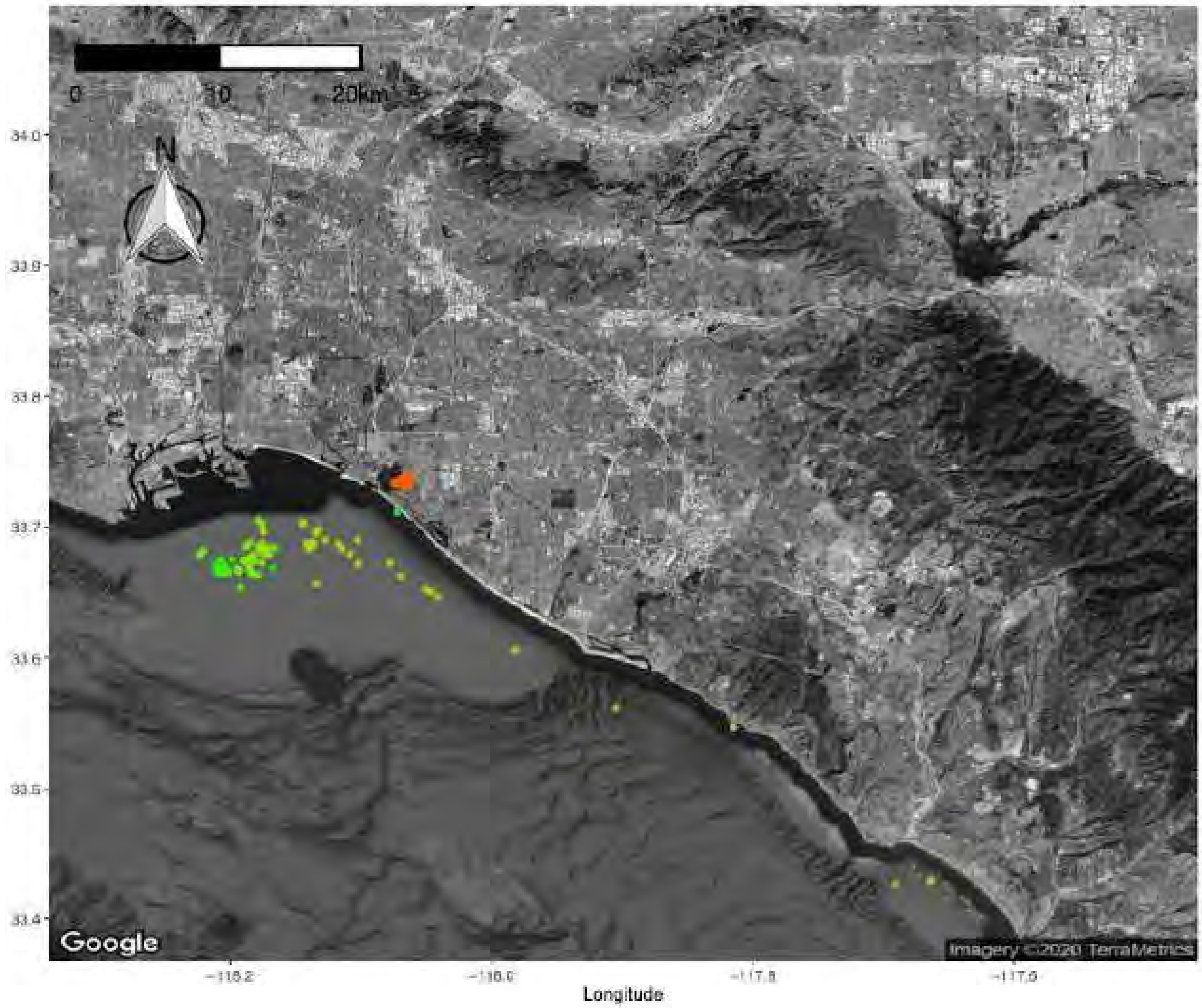

Figure 5. Locations of an individual satellite-tagged green sea turtle (#PTT 182986) in San Pedro Bay and environs during the period of July 2019 to March 2020, from a study of sea turtle use of Anaheim Bay, California (Hanna *et al*. 2020).

Potential Impacts of the Proposed Project on Biological Resources

Many of the potential impacts within the main project area were substantially analyzed in our Planning Aid Report (Enclosure). Please refer to that document.

The proposed project activities would occur predominantly within soft bottom areas within San Pedro Bay. Marine soft-bottom habitats are naturally common within the project area, including proposed dredge placement/disposal areas. The project would likely result in short term increases in turbidity and noise compared to existing levels in the immediate areas around proposed project activities.

The direct footprint of the proposed project activities would occur in areas that are predominantly unvegetated bottom habitats, likely of existing low to moderate biological productivity, depending on the history of past dredging activities at each location and ongoing ship-related propeller turbulence. Adverse impacts to adjacent soft bottom habitats from indirect effects (e.g., turbidity) from project activities would likely be short-term.

According to the feasibility study, some areas within the proposed Pier J approach channel project footprint have not previously been dredged (Corps 2019a; NOAA 2019). This area was naturally deep enough in the past to accommodate container vessels going to Pier J in the POLB without dredging. Proposed dredging of these sediments are expected to result in sediments suitable for open ocean disposal, due to their high sand content. Based upon updated information provided by the Corps subsequent to the feasibility study, the proposed dredging would include 241 acres of new dredging (NOAA 2019); these areas are likely ecologically intact soft-bottom areas of moderate function that are currently partially disturbed by ongoing vessel activities, as noted above.

The feasibility study indicated that the proposed activities related to deepening of project channels would affect some fish species/habitats in the following ways: (1) temporary disturbance and displacement of fish species, (2) increased sediment loads and turbidity in the water column, (3) temporary loss of food items to fisheries (vis-a-vis temporary loss of soft bottom habitats and associated benthic invertebrates), (4) limited sediment transport and re-deposition, and (5) temporary degradation of the water quality due to dredging and construction activities.

The Pacific Fishery Management Council (1998, 2019) has identified broad types of potential adverse effects and recommendations to consider when evaluating coastal marine dredging and disposal projects. In general, the potential adverse effects on fish from dredging and disposal include: (1) loss and alteration of habitat; (2) altered hydrology and geomorphology; (3) sedimentation, siltation, and turbidity; (4) release of contaminants; (5) direct impact to organisms; and (6) noise. Of particular concern are benthic impacts associated with dredging of new areas and potential fill impacts associated with proposed structural work, noted above for Pier J breakwaters (NOAA 2019).

Many fish species of the project area forage on infaunal and bottom-dwelling organisms, such as polychaete worms, crustaceans, and other prey types. Proposed dredging may adversely affect these prey species at the site by directly removing or burying these organisms (Pacific States Marine Fisheries Commission 2005). Recolonization studies suggest that ecological recovery[4] may not be straightforward, and the process can be regulated by physical factors including ocean-bottom matrix particle size distribution, currents, and compaction/stabilization processes following disturbance (Dernie *et al*. 2003; Kaiser *et al*. 2006). Rates of recovery for these areas range from several months to several years for estuarine muds and up to 2 to 3 years for sands

[4] In this context, recovery here generally means the later (or mature) phase of benthic community development following disturbance. Early phases of benthic community development following disturbance often predominantly involve pioneering species different from the original species. Later phases of community development involve initial re-establishment of species that inhabited the area prior to disturbance. The latter phase is what is considered the initial recovery of the community that naturally existed on the site (Rosenberg *et al*. 2002; Dernie *et al*. 2003).

and gravels (Dernie *et al*. 2003; NOAA 2019). Recolonization can take up to 1 to 3 years in areas of strong current, and up to 5 to 10 years in areas of low current (Kenny and Rees 1996; Boyd *et al*. 2005; Pacific States Marine Fisheries Commission 2005; Kaiser *et al*. 2006). Given the large dredging footprint (i.e., 880 acres) and expansion into previously undredged areas (i.e., 241 acres), the adverse effects to benthic foraging habitats (e.g., for some fish species and their predators) from project dredging are likely more than temporary and minimal (NOAA 2019) as concluded by the feasibility study (Corps 2019a).

As a result of southern California's large human population and intense economic and recreational activity, very little coastal space exists that has not been subject to construction, mineral extraction, or other form of habitat alteration. Dredge and fill activities, shoreline armoring, and overwater structures are the primary causes of habitat alteration within southern California coastal marine ecosystems. At the ports of Long Beach and Los Angeles, increasing global economic trade have resulted in the need for larger, deeper draft ships to transport cargo. This has led to a demand for new construction and dredging to widen and deepen channels, turning basins, and slips to accommodate these larger vessels. The Corps' East San Pedro Bay Ecological Restoration Project feasibility study (Corps 2019b) specifically identified habitat loss and declines in abundance and biodiversity of marine populations as the primary problems in the region, which includes the majority of the project area.

The proposed disposal of dredged material offshore may adversely affect some fish habitats by: (1) impacting or destroying benthic communities, (2) affecting adjacent habitats, (3) creating turbidity plumes, and (4) introducing contaminants and/or nutrients (NOAA 2019). Sediment disposal at the ocean disposal sites LA-2 and LA-3 has previously undergone significant environmental review during their designation as offshore disposal sites. In addition, dredged materials proposed for disposal at these areas are evaluated through the Southern California Dredged Material Management Team approval process. We expect that these environmental review processes will adequately address anticipated or potential adverse impacts to marine habitats at these two offshore disposal sites.

Another project concern is the potential project-related spread of the invasive alga *Caulerpa taxifolia*, which has been introduced to the California coastline (NOAA 2019). It is one of two algae on the list of the 100 worst invasive species compiled by the International Union for Conservation of Nature Invasive Species Specialist Group (Lowe *et al*. 2000). Evidence of the harm that can ensue as a result of an uncontrolled spread of the alga has already been seen in the Mediterranean Sea where it has largely destroyed local ecosystems and adversely affected commercial fishing, coastal navigation, and recreational opportunities (NOAA 2019). Although it is not known to be present within the project area, it had been detected in two locations in southern California; one location in Agua Hedionda Lagoon in San Diego County and another (about 7 miles south of the Port of Long Beach) in Huntington Harbour in Orange County (NOAA 2019). If the invasive alga is present within the project area, the proposed dredging-disposal activities could adversely affect local marine ecosystems by promoting its spread and increasing its negative ecosystem impacts. The feasibility study indicates that pre-construction surveys for *Caulerpa taxifolia* would be conducted in the Main Channel, proposed Pier J Channel and Turning Basin, and the Nearshore/Sunset/Surfside disposal site. In addition, project construction would not begin if *Caulerpa taxifolia* is found within the project activity footprint, until cleared to do so by the NMFS (NOAA 2019). The noted proposed environmental commitments, including to survey appropriate locations for *Caulerpa taxifolia*, adequately addresses our concerns.

The feasibility study does not fully describe or analyze the proposed structural improvements to the Pier J breakwater. It does indicate that the placement of a submerged sheet pile structure with associated rock protection to stabilize the Pier J breakwaters, if implemented, would have localized effects on marine biota, including to marine mammals. Sheet pile installation would be by either a hammer or vibratory method, to be determined during design based on sediment characteristics at the site. Likewise, other motile organisms are expected to leave the main project area during such construction activities (NOAA 2019). Proposed rock placement as part of this activity would bury extant soft bottom habitats, likely replacing them over time with rocky reef type of habitats, after eventual colonization by reef species within and on the placed stone.

Riprap supports a unique biological community associated with the rock substrate in the POLB complex (MBC 2016). In addition, it supports canopy kelp habitats (NOAA 2019). If kelp is currently present in the footprint of areas proposed for the noted structural improvements, the use of concrete grouting in such locations would likely adversely affect canopy kelp habitats via direct disturbances to the macroalgal and associated communities and may ultimately reduce habitat complexity in these areas. This riprap and canopy kelp are currently important as settlement substrate, foraging, and refuge, for various living marine resources (NOAA 2019). Given the information provided regarding the type, location, and effects of the proposed Pier J structural improvements in the feasibility study is rather general, additional information would be necessary to fully assess the effects of these proposed structural improvements and identify appropriate specific conservation recommendations. However, we offer a preliminary conservation recommendation addressing these structural improvements below.

The feasibility study and subsequent correspondence from the Corps indicate that sea turtles do not occur in the study area for the project, and thus they would not be affected by the project.[5,6] Various sightings and strandings of green sea turtles have been documented in the POLB surrounding the main project area, and preliminary green sea turtle tagging results also indicate they are present in the project area (Bredvik *et al*. 2019; NOAA 2019; NOAA 2021).[7] Green sea

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[5] This issue may have been partially caused by the Corps' apparent analysis of a study area and project area that do not include project dredge disposal areas and the associated dredge-disposal transit zones.

[6] In a March 30, 2021, letter to the Service on the project, the Corps stated: "The USACE has evaluated information provided to us by the NMFS on green sea turtles in the area. We have also consulted with the POLB, which monitors for green sea turtles during its in-water construction projects. Green sea turtles have been documented in Alamitos and Anaheim Bays. However, no green sea turtles have been documented in the project area, including the Surfside Borrow Site Nearshore Placement Area… We are confident in our position that the project would not effect this species and are maintaining the no effect determination." We note the Corps' conclusion but continue to maintain that there is a high likelihood that green sea turtles are likely to occur in the project area, as described herein.

[7] In a 2014 letter to the Corps identifying the threatened or endangered species that may be found in the project area, NMFS indicated that green sea turtles are known to reside and forage year-round in the Long Beach area, including areas within the vicinity of POLB (main project area), through observations of free-swimming and stranded animals, as well as through directed scientific research (NOAA 2019). In contrast, the Corps subsequently determined that federally-listed marine turtles do not occur in the study area, but are occasionally sighted in warm-water areas of

turtles are also known to occur in and near the Nearshore/Sunset/Surfside site portion of the project footprint, and potentially occur within what are likely the associated transit zones between project dredge locations and the Nearshore/Sunset/Surfside site (NOAA 2021). Sea turtles appear to be at risk of being harmed by the proposed activities. In 2012, a dead green sea turtle was found in Encinitas, California, with injuries reportedly consistent with contact from a hydraulic hopper dredge, similar to the dredge proposed for use in the subject project (Harris 2014; NOAA 2019, 2021). Dredging and sand placement activities for the Regional Beach Sand Project-II (RSBP-II) in 2012 were occurring in the Encinitas area before and at the time the turtle was found (SANDAG 2013).[8] The Corps recently consulted with NMFS on green sea turtles for the proposed East San Pedro Bay Ecosystem Restoration project in a portion of the same project region, including the Nearshore Sunset/Seaside disposal site as a borrow site (NOAA 2020). Based on the above, we conclude that green sea turtles likely occur in the project area/footprint and have substantial potential to be adversely affected by boat, barge, and dredge use and transit associated with the project, including vessel strikes.

Recommendations

The FWCA states that "...wildlife conservation shall receive equal consideration and be coordinated with other features of water-resource development projects through the effectual and harmonious planning, development, maintenance, and coordination of wildlife conservation..." (16 U.S.C. 661). The FWCA establishes a consultation requirement for Federal agencies that undertake any action that proposes to modify any stream or other body of water for any purpose, including navigation and drainage. The FWCA provides for the opportunity for us to offer recommendations for the conservation of species and habitats beyond those currently managed under the ESA.

The proposed project (Recommended Plan) contains a number of standard operating procedures, conservation measures, and mitigation measures to reduce the effects of the project on biological resources. Except where noted in our recommendations below, we expect the noted project mitigation and conservation measures within the feasibility study are integral components of the proposed project action and expect that all proposed activities will be completed consistent with those measures. Consistent with FWCA, should the project be implemented, we suggest incorporation of the following recommendations in order to improve project planning and avoid, minimize, and compensate for potential impacts to fish and wildlife resources; as well, we suggest the incorporation of the project elements outlined below that would improve or enhance fish and wildlife resources beyond the enhancements that could be achieved by offsetting measures alone:

1. As part of the proposed project, the Corps should create a least tern/snowy plover nesting island in the project region with rock and dredged materials. We suggest a location in San

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estuaries and bays in the region (NOAA 2019). In 2021 NMFS indicated that the agency "…disagrees with the USACE's assertion that green sea turtles are not in the project area" (NOAA 2021)."

[8] RBSP-II beach sand replenishment occurred at the Moonlight Beach receiver site from October 20 to 25, 2012, and at the Batiquitos receiver site (3 miles to the north of Moonlight Beach) from October 28 to November 24, 2012. The noted dead sea turtle was found on Moonlight Beach in Encinitas on November 4, 2012.

Pedro Bay shoreward of the existing Middle or Long Beach breakwaters.[9] Some potential sandy island locations in this area were evaluated within the Corps' East San Pedro Bay Ecosystem Restoration project. Other functional locations away from shore likely exist in the project region. This island should be at least 9 acres in size and relatively flat with the main surface of the island constructed of typical least tern nesting soil matrix materials (e.g., light-colored sand). To accommodate snowy plovers and the haul-out of some pinniped marine mammals, a portion of the island should have a zone of low gradient shoreline sloped down to the water within a protected cove, likely adjacent to and facing the existing breakwater for swell/wave energy protection. Other features such as subaquatic reefs constructed of rock are also suggested around the island, to provide shallow rocky reef habitats and to additionally help prevent erosion of the island cove shoreline surface materials (sand and gravel) through dissipation of wave energy. The configuration and slope surface of the noted island cove shore should be constructed of surface sand and gravel (possibly partially cemented or grouted in place for erosion control) or other compatible materials for snowy plover chick foraging; the configuration should be such that the cove areas remain open to tide-borne deposition of natural beach wrack and would otherwise support (e.g., shore slope angle) snowy plover chick and adult foraging. The remainder of the island (outside of the sand/gravel shore portion) would likely need to be edged by riprap or similar materials to avoid erosion of the island by wave and wind energy; similar to the four artificial THUMS islands[10] currently found off Long Beach within the project region. Dredged materials could be used for this purpose, at least in part. It is preferred that the surface/shore of this island not be utilized for human recreation and be protected from unauthorized entry.[11]

2. Consistent with the general recommendations provided by Pacific Fisheries Management Council (2019), the Corps should, to the extent feasible, offset all likely adverse effects to important marine fish habitats from new dredging. Specifically, the dredged material may provide a beneficial re-use opportunity to restore aquatic ecosystem structures and functions in East San Pedro Bay. The Corps should evaluate the feasibility of re-using the dredged material that would be provided by the project (as contaminant levels in the

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[9] We suggest these locations to minimize conflict with existing shipping traffic routes in the ports. These Outer Harbor areas would likely provide high ecological function for the fish and wildlife species targeted by this measure.

[10] The THUMS Islands are a set of four artificial islands in San Pedro Bay built in 1965 to tap into the East Wilmington Oil Field. THUMS stands for a consortium named after the parent companies who bid for the island contract: Texaco, Humble (now Exxon), Union Oil, Mobil, and Shell. The outside rim of the islands are made of 640,000 tons of boulders from Catalina Island, and the islands are filled with 3.2 mcy of dredged material from the bay (Sidel 1994).

[11] In a letter to the Service dated March 30, 2021, the Corps (2021) indicated that "Generally, the USACE would not propose to develop such an island for species as part of the navigation project unless it is justified as mitigation or offsets for adverse effects. The USACE has determined that the proposed project would not affect either California least tern or western snowy plover. In addition, there is no feasible location for such an island." We note that the FWCA directs the Service to make appropriate recommendations to action agencies such as the Corps that include measures beyond mitigation or project offsets, and it provides associated authorizations to implement those measures. Past development of the ports of Los Angeles and Long Beach, as well as urban and commercial development of the surrounding coastal communities, has eliminated almost all least tern and snowy plover nesting habitats that formerly occurred in the region. This recommendation is directed at partially replacing those historical losses, consistent with the mandates of the FWCA. The East San Pedro Bay Ecosystem Restoration project evaluated potentially feasible locations for such islands in the project region.

dredge materials allow) to support various restoration measures (e.g., to create: areas of shallow water habitats at depths less than -20 feet MLLW, nearshore wetlands, a sandy island as noted above) that would require fill material, as described in the Corps' East San Pedro Bay Ecological Restoration Project feasibility study.

3. We recommend that the Corps re-consider the risks of potential injury and disturbance impacts to green sea turtles in its determination of whether this species may be adversely affected by proposed project activities (NOAA 2019; NOAA 2021). In particular, we recommend that the Corps consider the risks of injury associated with hopper dredge activities, including transit between dredging and the Nearshore/Sunset/Surfside location outside the entrance to Anaheim Bay. Hopper dredge encounters with sea turtles known to occur in the southeastern U.S. have been formally consulted upon numerous times by Corps and NMFS (NOAA 2019). We recommend that the Corps engage in consultation pursuant to the ESA with NMFS Protected Resources Division in Long Beach, California. Appropriate project monitoring for sea turtles by qualified individuals should be incorporated into the project, including monitoring for avoidance of project vessel strikes, as well as improved understanding of sea turtle use of the project area/region and potential effects associated with temporarily increased turbidity, with guidance developed in consultation with NMFS.

4. The Corps should analyze in greater detail the potential ecological impacts associated with Pier J breakwater structural improvements. Compensatory mitigation should be developed and implemented as appropriate for any permanent loss of fish or reef habitats, such as from fill placement associated with proposed Pier J breakwater structural improvements.

If you have any questions regarding this letter, please contact Jon Avery,[12] Federal Projects Coordinator, at 760-431-9440, extension 309.

Sincerely,

KRISTINE PETERSEN

Digitally signed by KRISTINE PETERSEN
Date: 2021.04.14 12:58:03 -07'00'

for Scott A. Sobiech
Field Supervisor

Enclosure

[12] Jon_Avery@fws.gov

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ENCLOSURE

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ecological Services
Carlsbad Fish and Wildlife Office
2177 Salk Avenue, Suite 250
Carlsbad, California 92008

In Reply Refer To:
FWS-LA-15B0128-16CPA0091-E00880

June 30, 2016

Colonel Kirk Gibbs
U.S. Army Corps of Engineers, Los Angeles District
915 Wilshire Boulevard, Suite 930
Los Angeles, California 90017-3409

Attention: Lawrence Smith

Subject: Final Planning Aid Report for the Proposed Port of Long Beach Deep Draft Navigation Project, Los Angeles County, California

Dear Colonel Gibbs:

The U.S. Fish and Wildlife Service (Service) has prepared this Final Planning Aid Report (PAR) for the U.S. Army Corps of Engineers (Corps) on the proposed Port of Long Beach Deep Draft Navigation Project (project) to describe issues and opportunities related to the conservation and enhancement of fish and wildlife resources. The project, as proposed, would involve dredging and deepening portions of the Port of Long Beach (Port), Los Angeles County, California. The purpose of the proposed project is to improve transportation efficiency and safety at the Port for large ships.

The proposed project area would involve portions of the Los Angeles County coast of the eastern Pacific Ocean, within about 3 miles seaward of the historic coastline near the mouth of the Los Angeles River. These existing marine and estuarine areas have been heavily modified over the last century associated with development of Long Beach Harbor/Port of Long Beach and nearby civil engineering and commercial/urban development. Most of the direct project footprint would occur within the boundaries of the Port; exceptions include proposed modifications to portions of the Pier J ship approach area (Corps 2016) and potential (currently undetermined) dredge material disposal areas, both of which are outside the Port harbor district area. The project area is located south of the City of Long Beach and east of the community of San Pedro and the Port of Los Angeles. The depths, widths, and volumes of dredge and disposal material associated with the proposed project are currently undetermined.

This PAR is provided in accordance with the Fish and Wildlife Coordination Act (FWCA) of 1958, as amended (48 Stat. 401; 16 U.S.C. 661 *et seq*.), the Endangered Species Act (ESA) of 1973, as amended (87 Stat. 884; 16 U.S.C. 1531 *et seq*.), and the scope of work agreed upon by the Corps and the Service. This PAR does not constitute the report of the Secretary of the Interior as required by section 2(b) of the FWCA, nor does it constitute a biological opinion under section 7 of the ESA.

The purpose of this PAR is to deliver recommendations for use by the Corps design team in developing goals, objectives, and alternatives for the project.

In October 2015, the Council on Environmental Quality released Memorandum M-16-01 for Executive Departments and Agencies entitled Incorporating Ecosystem Services into Federal Decision Making. The memorandum recognizes that nature provides vital contributions to human economic and social well-being that are often not traded in markets or fully considered in decisions. It directs Federal agencies to incorporate ecosystem services into Federal planning and decision making,[1] and to develop, institutionalize, and implement policies to promote consideration of ecosystem services in planning, investments, and regulatory contexts. Additionally, it calls for integration of assessments of ecosystem services into relevant programs and projects, in accordance with the agency’s statutory authority.

In November 2015 the White House released a Presidential Memorandum entitled Mitigating Impacts on Natural Resources from Development and Encouraging Related Private Investment. This memorandum underscores the importance of effectively mitigating adverse impacts to land, water, wildlife, and other ecological resources (EPA 2016). It orders five federal agencies, including the Departments of the Interior and Defense, to streamline regulations for offsetting environmental harm and to promote mitigation efforts. The memorandum establishes a national policy "net benefit goal" for natural resource use from projects. The memo seeks to unify natural resource mitigation goals across agencies; at a minimum, the memorandum calls for “no net loss” of land, water, wildlife and other ecological resources from federal actions including permitting; this extends the no-net-loss national policy standard for wetlands established by the President in 1989. The memorandum also directs that compensatory mitigation is now national policy (White House 2015); the memorandum was designed to ensure consistency and transparency as agencies across the Federal government develop mitigation measures (Bean 2016). Concurrent with the release of the November 2015 Presidential Memorandum, the Department of the Interior issued formal policy and guidance to its bureaus and offices to best implement mitigation measures associated with legal and regulatory responsibilities and the management of Federal lands, waters, and other natural and cultural resources under its jurisdiction, using the best available science (Bean 2016). When assessing appropriate mitigation options, the Service relies upon a long established general mitigation hierarchy – first seeking to avoid impacts, then minimizing them, and then compensating for unavoidable impacts that could impair resource functions or values (Bean 2016).

As of March 2016, the Corps is preparing the Port of Long Beach Deep Draft Navigation Project Feasibility Study. The Corps is currently scoping project alternatives and will likely prepare an Environmental Impact Statement/Environmental Impact Report (EIS/EIR) for the project. This feasibility study phase of the project would likely conclude with the distribution of the Draft EIS/EIR for public review, reportedly scheduled by the Corps for 2018 (Corps 2015).

Repeated dredging is often necessary to maintain operations of many marine harbors. The dredging proposed herein would be implemented to increase the design water depths within the Port for ship

[1] Broadly defined, ecosystem services are the benefits that flow from nature to people, e.g., nature's contributions to the production of food and timber; life-support processes, such as water purification and coastal protection; and life-fulfilling benefits, such as places to recreate.

navigation purposes for very large ships (as compared to regular maintenance dredging). Harbor dredging often has effects on the marine environment, and dredged material disposal may affect water quality, mobilize contaminants, and bury or alter habitats, bathymetry, and physical processes (NOAA 2014).

Introduction

Vessels of increasingly larger size and deeper drafts[2] have been entering U.S. ports over the last decade-plus (NOAA 2015). The proposed project would be another increment in a series of dredge-and-fill projects over the last several decades that have modernized and reshaped the Port. This project would deepen water depths for access and navigation of very large ships within the Port. The latest generation of large cargo ships being built is twice the size of those that entered the global fleet only 15 years ago; these ships are now calling at the Port (Port 2016). These larger ships are reportedly more cost effective for ocean carriers and decrease transportation diesel consumption (Port 2016). These massive vessels, some with capacity of 14,000 Twenty-foot Equivalent Units (TEUs),[3] can be up to 1,200 feet long (Port 2016). Long Beach is one of only a handful of ports in North America capable of accommodating these larger ships, per the following features (Port 2016):

1. Deep-water main channel;
2. Deep-water terminals;
3. Berths designed to handle vessels that can exceed 156,000 tons fully loaded; and
4. Cranes that can move containers stacked 180 feet high and 24 boxes wide.

A century of harbor dredging and filling associated with development of the Port of Los Angeles and the Port of Long Beach has eliminated thousands of acres of the historic Wilmington Lagoon/Los Angeles River Estuary. In its place, behind manmade breakwaters, remains an open-water marine embayment of relatively high biological diversity and productivity.

Pacific Rim trade is increasing, along with the size of the some of the associated ships entering U.S. ports. The Port is a major center of international commerce on the west coast of the United States. Development of a permanent industrial base within the Port was gradual and began with increased harbor improvements and transportation in the early 1900s. It is the second-busiest container port in the United States, after the adjacent Port of Los Angeles. The Corps, in conjunction with the Port, are now examining options to provide additional channel depths to allow very large ships (with greater drafts than those that can currently be effectively accommodated) into the Port.

[2] The draft of a ship's hull is the vertical distance between the waterline and the bottom of the hull or keel.
[3] TEU or Twenty-Foot Equivalent Unit can be used to measure a ship's cargo carrying capacity. The dimensions of one TEU are equal to that of a standard 20-foot shipping container (20 feet long, 8.5 feet tall and 8 feet wide).

Fish and Wildlife Coordination Act

The Fish and Wildlife Coordination Act of 1934 included requirements that were the first formal expressions in U.S. law of a duty to minimize the negative environmental impacts of major water resource development projects and to compensate for those impacts that remained (Bean 2016).

The FWCA was a response to a U.S. era of big dam building and reflected a concern for the impact of those dams, particularly on anadromous fish (Bean 2016). As originally enacted in 1934, it required consultation with the Bureau of Fisheries (as the Service was then known) prior to the construction of any dam to determine if fish ladders or other aids to migration were necessary and economically practical to minimize impacts on fish populations. It required, as well, the opportunity to use the impounded waters for hatcheries to offset impacts that could not otherwise be avoided. The duties imposed by the FWCA were reinforced and expanded by the National Environmental Policy Act of 1969 (NEPA) (Bean 2016). Under NEPA and its implementing regulations, all federal agencies have a duty to assess the impacts of the major actions they propose to undertake and to consider reasonable alternatives to reduce or eliminate those impacts (Bean 2016). The Service, as the federal agency charged by Congress in the Fish and Wildlife Act of 1956 with the responsibility for management, conservation, and protection of fish and wildlife resources, routinely recommends mitigation measures to other federal agencies through the NEPA and FWCA processes (Bean 2016).

The FWCA directs and authorizes consultation, reporting, consideration, and installation/implementation of fish and wildlife conservation features. The authorities of the FWCA are considered to be "supplementary legislation" to the various Federal project authorizations, such as the Corps public works authorizations (Smalley and Mueller 2004). The FWCA conditions or supplements other water development statutes to require consideration of recommendations generated under the FWCA procedures, including portions of the Clean Water Act [*Zabel* v. *Tabb*, 430 F2d 199 (5th Cir. 1970) cert. denied 401 U.S. 910 (1972)]. For Federal water resources development projects, the FWCA requires that fish and wildlife conservation receive equal consideration by Federal agencies with other project purposes, and that such conservation be coordinated with other project features. The FWCA authorizes the project implementation of means and measures for both mitigating losses of fish and wildlife resources, and for enhancing these resources beyond the offsetting of project effects (Smalley and Mueller 2004).

Project Area History

In 1542, Juan Rodriquez Cabrillo "discovered" the "Bay of Smokes" that is now called San Pedro Bay, describing it from offshore aboard ship. The smoke he described above the bay may have originated from the several Native American villages that existed near the bay along the Los Angeles River at the time. Much of the south-facing San Pedro Bay along the coast was originally a shallow estuary and mudflat (see Figures 1 – 3).

The area currently occupied by the ports of Los Angeles and Long Beach formerly included several undeveloped islands, and likely included barrier beaches and beach/river-mouth sand spits. These islands and spits likely included unvegetated beach and open areas that historically supported what

are now sensitive species, including California least terns [*Sternula antillarum browni* (*Sterna a. b.*);[4] least tern] and western snowy plovers [*Charadrius alexandrinus nivosus* (*C. alexandrinus n.*); snowy plover].[5] The area of the northern San Pedro Bay was originally largely a marsh, with the Los Angeles River and the Bay sharing a common opening into the ocean.

In 1899 construction of the San Pedro Bay breakwater began near the project area. In 1906, the Los Angeles Dock and Terminal Company started development of Long Beach Harbor by purchasing 800 acres of sloughs and salt marshes associated with the Los Angeles River mouth estuary — an area that later became the inner portion (Inner Harbor) of Long Beach Harbor. In 1907, construction began on the Craig Shipyard in the Inner Harbor; the Craig Shipyard Company was also awarded a contract to dredge a channel from the open ocean to the new Inner Harbor. In 1911, the State of California (State) granted the tidelands areas of what is now the Port of Long Beach to the City of Long Beach (City) for port operations.[6] These tidelands were granted to the City in trust for the people of the State. This tidelands trust not only restricts the use of the tidelands, but the tidelands and tidelands-related revenues of the Port must be used for purposes related to harbor commerce, navigation, marine recreation, and fisheries. The Port currently includes more than 7,600 acres of wharves, cargo terminals, roadways, rail yards, and shipping channels, and is one of the world's busiest seaports (see Figure 3).

An 8.5 mile-long breakwater made of three rock segments stretches across most of San Pedro Bay, with two openings to allow ships to enter the harbor areas of the Ports of Los Angeles and Long Beach behind it. The initial western section of the breakwater, called the San Pedro Breakwater, was constructed between 1899 and 1911 at San Pedro; the Middle Breakwater was completed from 1911 to 1936, and the Long Beach Breakwater was completed after World War II. The San Pedro and Middle Breakwaters protect the Ports of Los Angeles and Long Beach, respectively (Long Beach 2009).

The Los Angeles River is a major river and flood management waterway for the Los Angeles watershed basin. In the 1930s, the Army Corps began channelizing the river for flood damage reduction and by 1954, the entire length of the river was channelized (Long Beach 2009).
The river is now maintained by the Corps and the Los Angeles County Department of Public Works (Long Beach 2009). The Los Angeles River continues to discharge into San Pedro Bay at the northeastern edge of the proposed Project Area.

Considerable changes have occurred in the two ports since the 1970s. Some of these changes included deepening of navigational channels and basins; construction of substantial landfills at Piers 300 and 400 in the Port of Los Angeles; construction of a transportation corridor out to Pier 400; expansion of Pier J in the Port of Long Beach; and construction the west basin of the Cabrillo Marina

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[4] The California least tern was originally and remains federally- and California State-listed under the generic name of *Sterna antillarum browni*; this original name is now otherwise invalid. The American Ornithologists Union in 2006 changed the valid generic name of the least tern to *Sternula*, with the California least tern then becoming *Sternula a. b.*) (Service 2016).

[5] California least terns typically nest in colonies on relatively open beach areas that are free of vegetation and are near fish prey (Service 2006). Sand spits, dune-backed beaches, beaches at creek and river mouths, and salt pans at lagoons and estuaries are the main coastal habitats for nesting western snowy plovers (Service 2007).

[6] Tidelands in California are defined as those lands and water areas along the coast of the Pacific Ocean seaward of the ordinary high tide line to a distance of three miles.

complex. As part of mitigation for construction and channel deepening, shallow water habitats were created in formerly deepwater areas near Pier 300, near the San Pedro Breakwater, and on the east side of Pier 400. Thus, several areas that were previously aquatic natural communities are now developed land areas, some former deep water areas are now shallow, and water circulation patterns within the Ports have been substantially altered.

Figure 1. Circa 1880 drawing of Wilmington Harbor. The Future Port of Long Beach is on the east (right) side of the “Wilmington Tidal Estuary.” “Rattlesnake Island” would later be expanded to become Terminal Island within the ports of Los Angeles and Long Beach. Wilmington Harbor would later become the Port of Los Angeles. Note the water depths indicated. (Water Power and Associates 2014)

Figure 2. Portion of a circa 1880 drawing by William H. Hall of Los Angeles showing the San Pedro Bay coastline, estuaries, and ocean contours (Hall 1880). The future Port of Long Beach is in the center-left of the drawing.

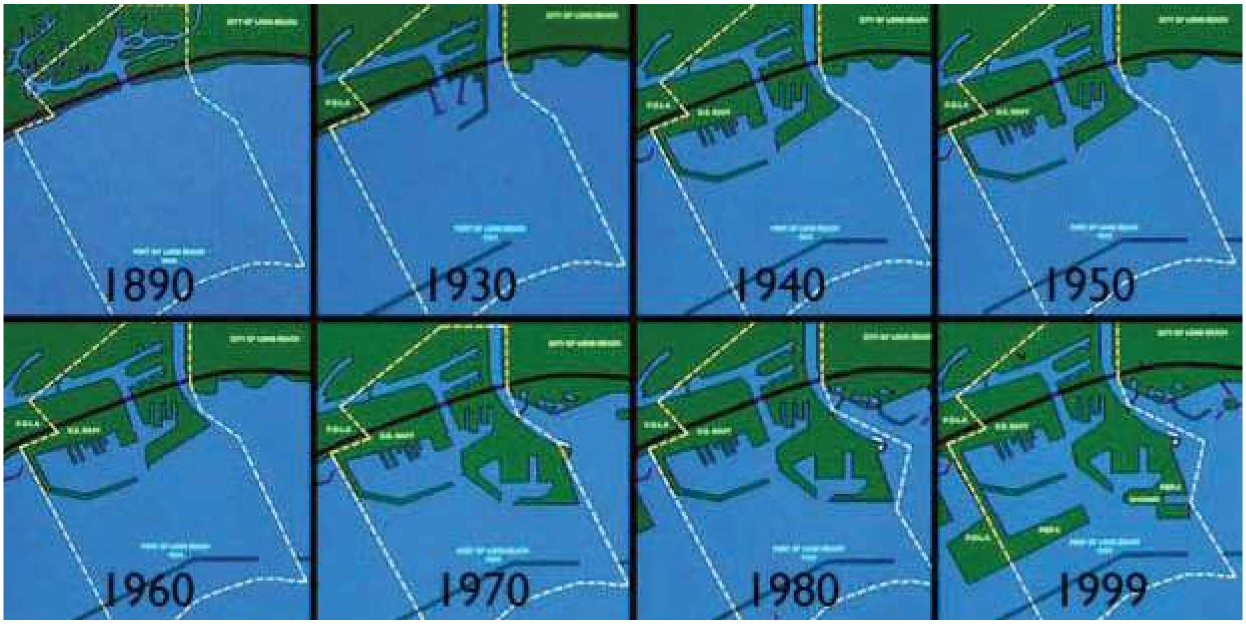

Figure 3. Drawings showing development progression of the Port since 1890 (Port 2014).

Description of the Project Area

The main project site is the Port of Long Beach and is located on the Pacific coast of southern California in western San Pedro Bay, at the southern end of the City, in southern Los Angeles County. The Port is less than 2 miles southwest of downtown Long Beach and about 25 miles south of downtown Los Angeles. To the west and northwest of San Pedro Bay are the communities of San Pedro and Wilmington, respectively, and to the east is the community of Seal Beach. Other areas that could be included in the Project area are local beaches or the open ocean for dredge disposal; the project dredge disposal areas are currently undetermined.

Two competing and independent commercial ports, the Port of Los Angeles and the Port of Long Beach, share the San Pedro Bay marine ecosystem. These man-made harbors have been created through over a century of dredging and filling of the former 3,450-acre Wilmington Lagoon and surrounding areas. The Port of Los Angeles and Port of Long Beach encompass 7,500 acres and 7,600 acres of land and water, respectively. The Port consists of: 3,000 acres of land, 4,600 acres of water, 10 piers, and 80 berths. Uses within both ports are largely industrial, although a variety of other uses (e.g., recreation, commercial fishing) are also supported.

The Port of Los Angeles and Port of Long Beach are both considered deep-water constructed ports, and do not have siltation problems like ports located in natural rivers (natural river ports) (LA/LBHSC 2016). The vast majority of sediments deposited in the ports are carried by the Los Angeles River, Dominguez Channel, and several smaller local creek/storm drains (LA/LBHSC 2016). Due to the region's Mediterranean climate, these channels carry significant quantities of storm water on rare occasions during the winter, and most of the silt settles out near the inlet mouths (LA/LBHSC 2016). As such, the ports need only to be dredged occasionally to maintain berth side design water depths (LA/LBHSC 2016).

The Port has 65 deep-water berths; all of these berths lay within three miles of the open sea, and are reached via the Port's Main Channel which has depths of minus 76 feet at Mean-Lower-Low-Water (MLLW) (LA/LBHSC 2016). The maximum ship draft in the Main Channel is currently limited to 65 feet (LA/LBHSC 2016). Dredging outside the Long Beach Breakwater Entrance Channel has deepened that area to minus 76 feet at MLLW (LA/LBHSC 2016). The Port is currently engaged in a capital development program (CDP) that includes but is not limited to dredging, terminal redevelopment, transportation, and public safety projects (LA/LBHSC 2016). Major components of the CDP include capital dredging in the West Basin and Inner Harbor Turning Basin, and in-water fill within the East Basin (LA/LBHSC 2016). The CDP includes the Middle Harbor Redevelopment Program, the replacement of the Gerald Desmond Bridge spanning the Back Channel, several rail infrastructure projects, and proposed security operations and support facilities (LA/LBHSC 2016). Though not a Port project, Caltrans is currently engaged in the replacement of the Commodore Schuyler Heim Bridge (SR-47) spanning the Cerritos Channel; it will be converted from a lift bridge to a fixed bridge (LA/LBHSC 2016).

Port of Long Beach Water Depths (LA/LBHSC 2016):

Federal Channels in the Port	Current Depth	Current Width
Main Channel	-76 feet	360 – 1500 feet
Back Channel	-52 feet	220 feet
Inner Harbor (Turning Basin)	-52 feet	960 feet
Cerritos Channel	-50 feet	325 feet
Channel 2	-37 to -55 feet	150 – 250 feet
Channel 3	-36 to -45 feet	150 – 200 feet

The outer limit of the Port is defined by breakwaters that were constructed during the early to mid 1900's (MEC 2002). The majority of the harbor waters within the Port currently range in water depth from 30 to 60 feet (MEC 2002) with navigation channels dredged to depths of 45 feet and greater (Service 2000). The adjacent Port of Los Angeles contains several hundred acres of waters currently shallower than 20 feet, primarily constructed by sub-aquatic fill of deeper areas performed to increase marine biological functions. The relative bathymetry[7] of the areas within and around the ports of Long Beach and Los Angeles can be seen in Figure 4.

[7] Bathymetry: the measurement of the depths of oceans, seas, or other large bodies of water, and the data derived from such measurement.

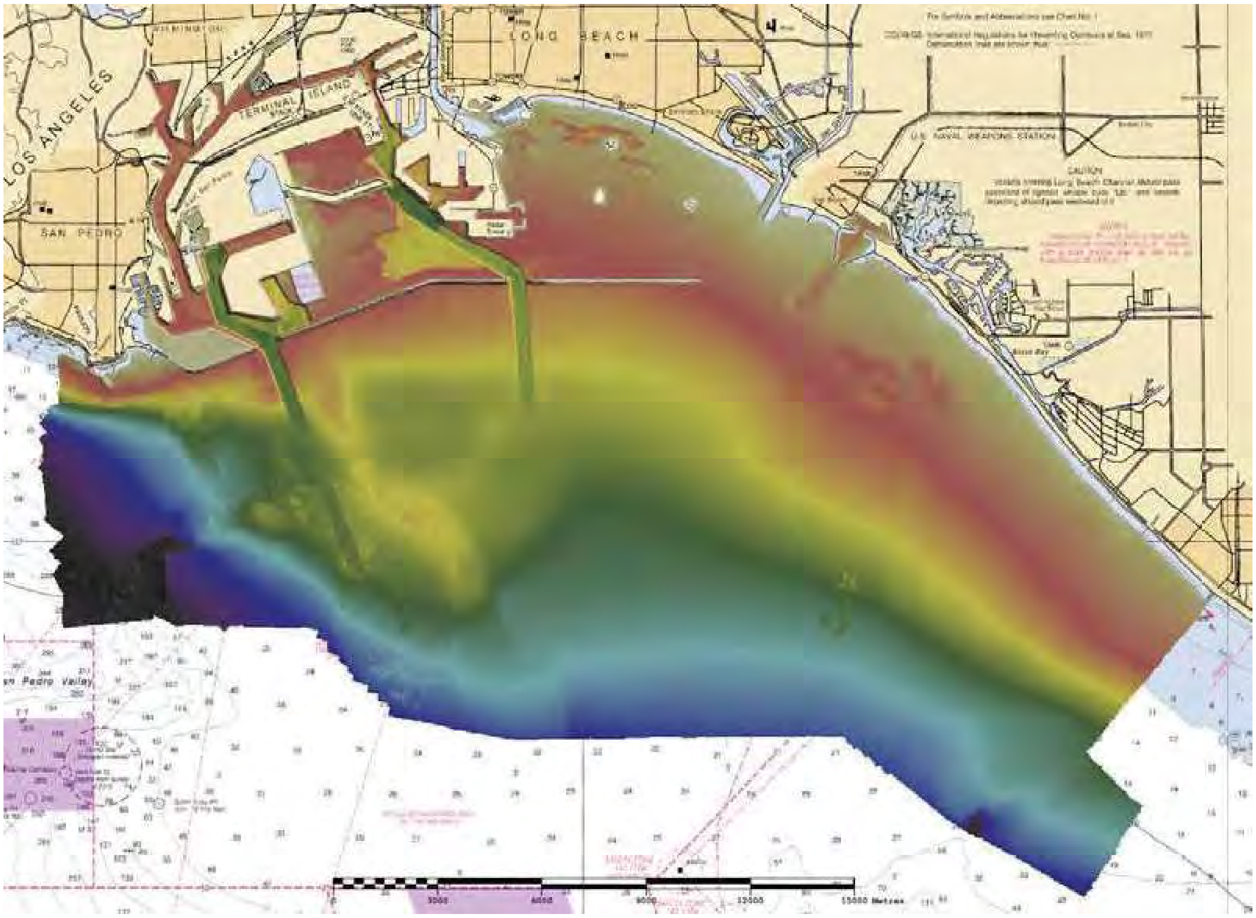

Figure 4. Relative bathymetry of the ports of Long Beach and Los Angeles and environs to highlight the deeper waters in the ports. (NOAA 2015)

Corps Study/Project Area

The Corps' study area for the proposed project includes the waters in the immediate vicinity (and shoreward) of the Port breakwaters throughout most of the Port, and the upstream reaches of the Los Angeles River that have direct impact on the San Pedro Bay, as well as the entire Port facility, including Outer Harbor, Inner Harbor, Cerritos Channel, West Basin, and the Back Channel (Corps 2015). The Corps' current Project Area is shown in Figure 5 (Corps 2016).

Project Description

The Corps, with the Port as the local sponsor, is considering the feasibility of deepening navigation channels within the harbor to increase water depths necessary to accommodate deeper draft ships in the Port. The proposed channel depths and methods to accomplish this are currently undetermined. The proposed project's proposed footprint areas are shown in Figure 5. Additional details regarding work areas have not been provided to the Service. Other project footprint areas could include areas within and/or outside the Port for dredge material disposal.

Figure 5. Corps Draft Project Area and Areas of Interest (Corps 2016)

The proposed project would require disposal site(s) for dredge materials. These sites are currently undetermined, but are expected to potentially include sites within the Port area, open-ocean, and/or nearby beach areas, depending in-part on sediment qualities and contaminant constituents in dredge materials (as determined through the testing requirements in 40 CFR §230). Re-use of dredge materials for sand replenishment on beaches near the Port is often desired by the Corps and locals where sediments are appropriate.

Background

The Port has undergone significant development and expansion in the past century (Corps 2015). In the last three decades, the ports of Los Angeles and Long Beach have undertaken accelerated long-range development efforts to increase the shipping and commercial capacity of the ports; both of the ports have become major transportation and trade centers. International commerce is almost 20 percent of the U.S. gross domestic product, and about 95 percent of these products arrive or leave the country in ships (Gray 2001). The Port provides the shipping terminals for nearly one-third of the waterborne trade moving through the west coast of the United States (Corps 2015).

The Port of Long Beach and the Port of Los Angeles are ranked sixth and eighth in tonnage in the United States respectively, moving a combined 139.2 million metric tons (DOT 2012). Trade currently valued annually at more than $155 billion moves through the Port, making financially it the

second-busiest seaport in the United States (Corps 2015). To handle this high volume of trade, Port facilities include 10 piers, 80 berths, and 66 post-Panamax gantry cranes (Corps 2015). The Port has 22 shipping terminals to process break bulk (e.g., lumber, steel), bulk (e.g., salt, cement, and gypsum), containers, and liquid bulk (e.g., petroleum) (Corps 2015). Each year the Port handles more than 6 million Twenty-foot Equivalent Units (TEUs)[8] and 75 million tons of cargo, and has over 2,000 vessels call (Corps 2015). Items from clothing and shoes to toys, furniture and consumer electronics arrive at the Port before making their way to stores throughout the country (Corps 2015). Specialized terminals also move petroleum, automobiles, cement, lumber, steel and other products (Corps 2015). The Port's top trading partners are China, South Korea, Hong Kong, and Japan. East Asian trade accounts for about 90 percent of the shipments through the Port (Corps 2015). Top imports are crude oil (16 million metric tons annually), electronics, plastics, and furniture (with inbound container tonnage on the order of 22 million tons annually), while top exports are petroleum products, chemicals, and agricultural commodities (Corps 2015). Currently, about one-third of liquid bulk and container cargo by weight is transported on vessels that could potentially experience operating constraints associated with the current channel depths in the Port (Corps 2015).

Under keel clearance for larger ships in the Port is important in terms of the depth of the seafloor and the static draft of the vessel transiting above it (NOAA 2015). This takes into play many elements: water level is the most obvious and important contributor to this equation. The term "tide" captures the astronomic contribution of the rise and fall of the sea's surface, whereas water level takes into account weather effects and riverine runoff contributions (NOAA 2015). In addition to the water levels, the other factors that must be considered include meteorological conditions, the vessel's motion induced by the prevailing sea state, the static draft of the vessel, the variation in this draft due to the vessel's motion through the water (dynamic draft), and the chemical composition of the water the vessel is sailing in, primarily salinity (NOAA 2015).

The large sizes of the many new trade ships are outsizing some of our waterways. Some Ultra Large Crude Carriers (ULCCs) entering the Port of Long Beach are carrying more than a million gallons of crude oil and are loading to drafts of 65 feet (NOAA 2015). Depending on the sea state in the approach channels of the Port, the ship's pitching may bring the hull close to the Port channel floor (NOAA 2015).

The channel leading into the Port of Long Beach currently has an authorized depth of 76 feet and local regulations allow drafts of 69 feet for ships with a displacement of up to 420,000 tons (NOAA 2015). In late 2012, at a Harbor Safety Committee meeting for the ports of Los Angeles and Long Beach, the Jacobsen Pilots[9] noted that during storms and long period swell conditions outside of the breakwater, ULCCs demonstrated significant levels of pitch[10] in high wave situations (NOAA 2015).[11] As a result, the Captain of the Port froze the maximum draft at 65 feet until they understood the effects of the swells on the ULCCs and could better predict their behavior (NOAA 2015). The effect

[8] TEU or Twenty-Foot Equivalent Unit can be used to measure a ship's cargo carrying capacity. The dimensions of one TEU are equal to that of a standard 20-foot shipping container (20 feet long, 8.5 feet tall and 8 feet wide).
[9] Jacobsen Pilots is the sole ship piloting company for the Port of Long Beach.
[10] Pitch is the up/down rotation of a vessel about its lateral/Y (side-to-side or port-starboard) axis.
[11] As a point of reference, a 1,000-foot vessel pitching just 1 degree will experience an increase in draft of more than 10 feet (NOAA 2015).

of reducing the allowed under keel clearance means that ULCCs must wait outside of the sea buoy until conditions are favorable to make the transit into the Port of Long Beach, or lighter to another vessel in order to reduce their draft; both are expensive delays (NOAA 2015).

Presently the largest containerships dock primarily at one of two piers—Pier J or Pier T West Basin (Corps 2015). Access to south berthing area of Pier J is through a secondary channel connected to the Long Beach main access channel; that secondary access channel limits drafts to about 43 feet (Corps 2016). Access to the northern berthing area of Pier J is off the Southeast Basin and does not have this depth limitation (Corps 2016). About 20 years ago a small share of container vessels had to restrict drafts, utilize tides, or both (Corps 2015). However, the impact to operations has increased in the past few years due to the increasing share of larger containerships calling on the port (Corps 2015). Today containerships docking at south berthing area of Pier J have maximum operating drafts of 52 feet and over 7.5 million of the 36.6 million tons of container cargo in 2012 was handled by vessels at or near the 43-foot limit of the secondary access channel (Corps 2016).

Currently, light loading, and tidal delays increase transportation costs for goods transported on containers, and in the future the impact is expected to worsen (Corps 2015; Corps 2016). If sufficiently dredged, containerships with capacities of over 18,000 TEUs (e.g., 1300 feet long, 176 feet beam,[12] drafts approximately 52 feet) would be capable of operating fully loaded in the Port (Corps 2016). Thus, addressing operating constraints to containerships has the potential to significantly lower transportation costs (Corps 2015).

Through agreements with the Service and other resource agencies, the Port has restored some coastal wetlands in southern California in exchange for development approvals of various Port areas. The Port has participated in substantial wetlands restoration projects, including one at the National Wildlife Refuge in Seal Beach. In addition, the Port contributed $39 million toward acquisition of 267 acres of degraded wetlands in Bolsa Chica Lagoon (Bolsa Chica Lowlands Restoration Project) in Huntington Beach (Port 2015).

Project Goals and Objectives

The proposed channel deepening project would allow large, deeper draft ships access to terminals within the Port. The Corps' stated planning goal is to provide safe, reliable, and efficient waterborne transportation improvements to the Port that address problems and opportunities as outlined herein. The Corps' planning objectives are specified as follows:

1. Reduce the cost of transporting cargo to and from the Port by improving channel dimensions, vessel operations, and other navigation features such as turning basins, waiting areas, and anchorages; and

2. Reduce expected future vessel re-routings from the Port to alternate facilities by improving channel dimensions, vessel operations, and other navigation features such as turning basins, waiting areas, and anchorages.

[12] The beam of a ship is its width at the widest point as measured at the ship's nominal waterline.

Description of Biological Resources

The Port of Long Beach represents a large harbor complex typified by extensive areas of hardened shoreline (riprap and quay wall) and dredge maintained shipping channels (SAIC 2010). The fish and wildlife resources of the Port and San Pedro Bay are reported in substantial detail in a 2000 biological baseline report entitled "Ports of Los Angeles and Long Beach Year 2000 Biological Baseline Study of San Pedro Bay" (MEC 2002). This information was updated with additional survey efforts in 2008 in a report entitled "Final 2008 Biological Surveys of Los Angeles and Long Beach Harbors" (SAIC 2010). A brief summary of the available information is provided herein, based primarily on these two baseline reports. The biological resource groups of San Pedro Bay that are typically considered the most important are the marine fishes and water-associated birds.

The benthic hard substrates in the ports are mostly artificial breakwaters and barriers of riprap (boulders and concrete rubble), and constructed shallow water areas in the ports (LA/LBHSC 2016). Kelp beds typically dominate the hard substrates, with surfgrass natural community potentially existing in waters less than 10 feet deep (LA/LBHSC 2016). Soft bottom substrates comprise the majority of acreage in the two ports (LA/LBHSC 2016). No eelgrass beds were identified within the Port of Long Beach (SAIC 2010). One area just outside the Port's boundary line northeast of Island Grissom[13] was identified as supporting a sizeable eelgrass bed (SAIC 2010). The water column within the ports provides important habitats for many fish, larvae, and plankton, seals, and sea lions (LA/LBHSC 2016).

Fish

Fish populations of San Pedro Bay (including the ports of Los Angeles and Long Beach and environs) are diverse and relatively abundant (SAIC 2010). During surveys conducted in 2000, a total of 74 species were recorded and an estimated 44 million fish occupied the 2 ports. Surveys of the 2 ports in 2008 identified total of 62 fish taxa representing 59 unique species of fish (SAIC 2010). Generally, schooling fishes were the most abundant species recorded.

Northern anchovy (*Engraulis mordax*) and white croaker (*Genyonemus lineatus*) were the most abundant species collected in 2000 surveys; white croaker was top ranked in terms of biomass (MEC 2002). From 2008 surveys in the two ports, pelagic fish from lampara[14] net collections were dominated by four species: northern anchovy, topsmelt (*Atherinops affinis*), California grunion (*Leuresthes tenuis*), and Pacific sardine (*Sardinops sagax*). These species accounted for 98 percent of the total lampara net catch in 2008. All of these species are schooling fishes that spend most of their lives in the harbor environment. From 2008 otter trawl[15] surveys, dominant species included northern anchovy, white croaker (*Genyonemus lineatus*), queenfish (*Seriphus politus*), shiner surfperch (*Cymatogaster aggregata*), and white surfperch (*Phanerodon furcatus*). Other species

[13] One of a set of four artificial oil production islands in San Pedro Bay off the coast of Long Beach.
[14] A lampara net is a type of fishing net used for capturing certain pelagic fish, those swimming near the water's surface.
[15] In otter trawling, a large net is dragged along the bottom or up in the water column behind a towing vessel. The mouth of the net is held open by two large "doors" which are attached to either side of the net. For the noted surveys performed in 2000 and 2008, trawl surveys were performed to capture bottom-dwelling demersal fish.

caught in high abundance were specklefin midshipman (*Porichthys myriaster*), California tonguefish (*Symphurus atricauda*), and yellowchin sculpin (*Icelinus quadriseriatus*).

The five most abundant species accounted for 92 percent of the total fish populations in the ports (MEC 2002). These included northern anchovy, white croaker, queenfish, Pacific sardine, and topsmelt. Other relatively abundant species included shiner surfperch, salema (*Xenistius californiensis*), and jacksmelt (*Atherinopsis californiensis*). Less numerous but ecologically and/or recreationally important species recorded were California barracuda (*Sphyraena argentea*), California halibut (*Paralichthys californicus*), barred sand bass (*Paralabrax nebulifer*), California corbina (*Menticirrhus undulatus*), white seabass (*Atractoscion nobilis*), California grunion (*Leuresthes tenuis*), and several species of sharks and rays.

In 2000, generally fewer species were caught in the Inner Harbor than Outer Harbor (MEC 2002). Benthic invertebrates, which represent an important food source for demersal fish,[16] also exhibited a trend of decreasing function of habitats from Outer to Inner Harbor areas (MEC 2002). In 2008 surveys, few differences were observed for pelagic fish between Inner and Outer Harbor areas, with Inner Harbor stations having between 4 and 12 species and Outer Harbor stations typified by between 3 and 11 species (SAIC 2010). This likely indicates that pelagic schooling species move throughout the harbor complex (SAIC 2010). In contrast, Outer Harbor areas generally were typified by a greater number, biomass, and variety of trawl-caught (demersal) fish than Inner Harbor areas (SAIC 2010).

More species of fish were collected in the shallow waters of the ports of Los Angeles and Long Beach, including all three of the created shallow water mitigation sites within the Port of Los Angeles, than at deepwater survey stations in open water, channel, basin, and slip habitats (MEC 2002). The greater diversity is likely partially explained by the greater heterogeneity associated with the shallow water habitats, which were adjacent to rock riprap and/or vegetated areas (e.g., eelgrass beds, kelp bed); this likely results in higher fish nursery function, greater production, and generally higher abundance of fish in shallow waters. For instance, the Cabrillo Shallow Water Habitat area is located alongside the San Pedro Breakwater, which supports giant kelp and other macroalgae; the Long Beach Shallow Water Habitat area is located adjacent to the riprap shoreline along Pier 400 that supports giant kelp and other macroalgae, and extensive eelgrass beds occur within the Pier 300 Shallow Water Habitat. Studies conducted in the shallow areas of the Outer Harbor, including the Pier 300 Shallow Water Habitat (MEC 1988, 1999) created in 1984 and the Cabrillo Shallow Water Habitat (MEC 1999) constructed in 1997, have shown that these areas have both higher diversity and greater abundance of fish and invertebrates than the deeper soft bottom portions of the ports of Los Angeles and Long Beach (MEC 2002). A greater abundance of juvenile fish is also present in these shallow areas; they appear to enter these areas relatively soon after hatching/birth. Long Beach fishing experts often fish adjacent to the four manmade oil production islands located within the overall Port boundaries,[17] due to the abundance of recreational fish found there; the abundance of recreational fish in these areas is reportedly due to shallow water combined with high relief from the riprap placed around the created islands (Ballanti 2007).

[16] Fish dwelling at or near the bottom of a body of water.
[17] The islands are controlled by the City of Long Beach and are not part of the Port's Harbor District.

Forty-four unique species of fish larvae and 13 categories of fish eggs were identified in the ports of Los Angeles and Long Beach during the 2000 surveys (MEC 2002). The most abundant fish larvae were gobies [arrow goby (*Clevelandia ios*), cheekspot goby (*Ilypnus gilberti*), shadow goby (*Acentrogobius nebulosus*), and bay goby (*Lepidogobius lepidus*)], northern anchovy, California clingfish, queenfish, blennies, and white croaker. With the exception of the Pier 300 Shallow Water Habitat (in the Port of Los Angeles) that had high larval abundance and the Long Beach West Basin with low larval abundance, the abundances of larvae were generally higher on the Long Beach side of the two-port complex. This bears some similarity to the abundance pattern indicated for adult fish caught by lampara net surveys, which generally showed higher abundance in the deepwater channel, basins, and slips in the Port of Long Beach (MEC 2002). The larval catch was dominated by benthic associated gobies, which inhabit burrows. The ichthyoplankton surveys provided a good measure of the importance of species inhabiting burrows or associated with rocky and/or vegetated habitats in the Long Beach-Los Angeles port complex (MEC 2002). These species (while poorly represented in the adult fish surveys), are an important part of the overall ecology of the diverse marine habitats in the two ports. The ichthyoplankton results also demonstrate that a wide variety of fish spawn and develop within the ports of Los Angeles and Long Beach. Similar to the previous baseline study (MEC 2002), the only exotic (non-indigenous) fish species collected in the 2008 sampling surveys was the yellowfin goby (*Acanthogobius flavimanus*), collected at three Port of Los Angeles stations and six Port of Long Beach Harbor stations (SAIC 2010).

Benthic Invertebrates

Over 400 species of benthic infauna (small organisms that live on and within the sediment) and larger macroinvertebrates were collected during the Year 2000 Baseline Study; over 250 species of benthic infauna and larger macroinvertebrates were collected during the Year 2008 Baseline Study (MEC 2002; SAIC 2010). Small infaunal organisms (which tend to be less motile than larger macroinvertebrates) and larger macroinvertebrates both exhibited spatial variability in species composition that appeared to be tied to a combination of factors including water depth, years since dredging/disposal in the area, and ecological/habitats functions (MEC 2002). Studies in 2008 found little difference in species composition among deepwater stations located in basins, channels, or slips of the Inner and Outer Harbors (SAIC 2010).

Benthic invertebrate assemblages generally differed between shallow and deepwater habitats (SAIC 2010), and differences were apparent between assemblages from areas that have or have not experienced recent dredging (MEC 2002). Areas of recent dredging had fewer species and lower abundance than non-dredged areas, indicating that the recently dredged areas were still in the colonization phase (MEC 2002). Species assemblages of benthic invertebrates can be indicative of habitat function (SAIC 2010). Certain species are tolerant of adverse environmental conditions, such as low oxygen and high pollutant conditions, and others are found only in more pristine areas (SAIC 2010). In the 2008 study, species assemblages indicated that stations in the Outer Harbor had the highest habitat function as indicated by relatively greater abundance of species that typically characterize areas having background to low organic enrichment (i.e., low pollution) (SAIC 2010). The species assemblages found in the Inner Harbor, basins, and slips were indicative of low to moderate organic enrichment compared to the open-water Outer Harbor stations, suggesting that

benthic invertebrate species composition is influenced by tidal circulation in the harbors, with Outer Harbor areas having greater circulation and higher functional habitats (SAIC 2010).

Non-indigenous invertebrates comprise about 15 percent of the infauna and macroinvertebrate species occurring in the ports, with some of these species representing numerical dominants (SAIC 2010). The relative abundance of these species has increased in the harbors since the 1970s (SAIC 2010). A total of 10 non-indigenous (introduced) and 32 cryptogenic species (of unknown origin) were identified among the 313 species of infauna and macroinvertebrates collected during the 2008 study (SAIC 2010). The overall percentage of introduced and cryptogenic species identified in the present study (14 percent) is similar to the 15 percent reported by MEC (2002) in 2000 (SAIC 2010).

In general, ecological/habitats function was highest for benthic invertebrates at the created Cabrillo, Pier 300, and Long Beach Shallow Water Habitat areas and the deep open waters of both ports (MEC 2002). A gradient of decreasing ecological/habitats function was observed in basin and slip habitats and the back channels of the Inner Harbor. Similar to fish, catch abundance was higher in basin habitats in the Port than in the open waters of the Outer Harbor (SAIC 2010). The lowest catch of benthic invertebrates was obtained in the Inner Harbor (SAIC 2010).

A steady improvement in benthic ecological/habitats function within the ports of Los Angeles and Long Beach over time has occurred, as demonstrated by increased diversity and less dominance by pollution tolerant benthic infauna species over the past half century. Many areas in both ports were severely polluted in the 1950s with depauperate benthic faunal assemblages in these areas during that period (MEC 2002) (please see Contaminants below).

Birds

Southern California's coastal areas, including its shorelines, estuaries, bays, and developed harbors, provide a variety of natural and artificial communities for large numbers of waterfowl, shorebirds, wading birds, and birds that forage from the air. The predominately open water and hardscape/landscape habitats within the ports of Long Beach and Los Angeles provide opportunities for nesting, foraging, and resting by a moderate diversity of bird species, including one species listed as endangered under the ESA, the California least tern.

Birds that occur in and near the ports of Los Angeles and Long Beach are primarily water-associated species; that is, they are dependent on the marine natural communities for food and other essentials. Over 100 avian species use the various habitats within the Ports seasonally, year-round, or during migration (SAIC 2010). The areas within and near the ports provide very limited areas of trees and/or shrubs for feeding, resting, and/or nesting; most of this small area of vegetation is made up of exotic landscaping. As a result of the high numbers of small fish in the shallow water areas of the ports, substantial numbers of fish-eating birds are found foraging in these areas. The ports provide high-function habitats for many foraging, resting, and breeding birds.

During the 2000-2001 monitoring year, a total of 99 bird species, representing 31 families, were observed within San Pedro Bay (MEC 2002). A total of 96 species representing 30 families were observed within the ports during the 2008 study (SAIC 2010). Of these species from both studies,

69 are considered to be dependent on marine habitats. Gulls comprised 44.5 percent of the birds observed in 2000, with aerial foragers (22.4 percent) and waterfowl (21.4 percent) also common. The remaining 21.7 percent of the birds were small and large shorebirds, wading/marsh birds, raptors, and upland birds. The most abundant birds included several gull species [e.g., Western (*Larus occidentalis*), Heermann's (*L. heermanni*), and California (*L. californicus*)], brown pelican (*Pelecanus occidentalis*), elegant tern (*Thalasseus elegans*), western grebe (*Aechmophorus occidentalis*), Brandt's cormorant (*Phalacrocorax penicillatus*), double-crested cormorant (*Phalacrocorax auritus*), surf scoter (*Melanitta perspicillata*), and rock pigeon (*Columba livia*).

The State and Federal endangered California least tern is a piscivorous (fish eating) sea bird that makes significant breeding use of San Pedro Bay (KBC 2005). The least tern has a long history of nesting on Terminal Island and Pier 400 in the Port of Los Angeles (Figure 4). Pier 400 is near the western portion of the proposed project footprint. This least tern nesting site is typical of those used by the species in highly developed coastal California; the site is a relatively flat, open, barren sandy area near the ocean where the least terns lay and incubate their eggs and chicks fledge. The least tern nesting period extends from April through August; along the California coast least terns typically begin to arrive (from wintering grounds) in the southern most colony breeding sites (e.g., San Diego) in early April and they continue to arrive through the later part of May. During the remainder of the year, the birds are gone from the area.

Least terns nest on sparsely vegetated substrates, including sandy beaches, salt flats, and dredge spoil, in colonies of a few to several hundred nesting pairs. This species relies on sight for foraging and usually requires relatively clear water to locate its preferred baitfish food sources, northern anchovy, topsmelt, and jacksmelt (LSA 2009). Although there is some field evidence to suggest that least terns will forage in turbid waters to which fish are attracted, the majority of foraging occurs in clearer waters (LSA 2009).

The location of the tern nesting site(s) in the ports of Los Angeles and Long Beach previously varied from year to year (KBC 1998) depending largely on development activities in the ports, with most nesting on Pier 400. The Los Angeles Harbor Department manages the Pier 400 nesting site pursuant to a Memorandum of Agreement with the Service, Corps, and California Department of Fish and Wildlife (Department) (LA 2006). A 15.7-acre fenced nesting site is located at the southern tip of Pier. 400, although some nesting by least terns also often occurs outside of this designated area.

Least terns have nested within the ports since the late 1800s and have been observed within the harbor almost every year since annual monitoring studies began in the ports in 1973 (SAIC 2010). Since 1973 the least tern has utilized nesting locations on and around Terminal Island, with nesting at Reeves Field and/or Pier 300 and Pier 400 areas (LAHD 2015). Zero least tern nesting pairs were recorded for the Terminal Island area in 1992 (LAHD 2015). The greatest documented nesting activity for the least tern in the area has occurred since the birds began utilizing the then newly-constructed Pier 400 as a nesting site in 1997. The number of recorded nests at Pier 400 peaked at 1,322 in 2005, then declined to 906 in 2006, and further declined to 710 in 2007 (KBC 2007) and 126 in 2014 (State 2015). The principal foraging areas for least tern in the ports and environs vary somewhat from year to year, but during the chick rearing period, the shallow water areas of the ports are used heavily, probably due to the relatively greater abundances of appropriate prey fish (size and

species) found there (see MEC 1988, 1999). Measures to protect the least tern during channel dredging and landfill construction projects have proven successful (Service 1992). Those measures have included nesting area and predator management, shallow water area conservation/creation, and protection of water quality in the shallow water areas during breeding season.

Least tern nest numbers at Pier 400 increased from approximately 565 during the 2000–2001 to 1,332 in 2005, and then declined to 521 in 2008 (SAIC 2010). The decrease in nest numbers is opined to be related to increases both in upland vegetation and predation at the Pier 400 nesting site (KBC 2008). The majority of least tern observations during 2007–2008 surveys were of individuals foraging or flying in the vicinity of the Pier 400 nesting site; least terns also were observed foraging along the outer breakwater and open-water areas of the Outer Harbor and within Inner Harbor basin and channel areas (SAIC 2010). Least terns foraged most frequently just off the Pier 400 nesting site, off Pier 300, and near Cabrillo Beach (SAIC 2010).

The brown pelican, formerly federally listed as endangered, is found in large numbers in San Pedro Bay (MEC 2002). This bird breeds on the offshore Channel Islands, and forages widely along the southern California coast on small fishes. Brown pelicans make heavy use of the Outer Harbor breakwaters for roosting. The brown pelican is present throughout the year. The peregrine falcon (*Falco peregrinus*), also formerly federally listed as endangered, nests on bridges within the area of the ports (SAIC 2010).

Several piscivorous seabirds began nesting in the adjacent Port of Los Angeles following construction of Pier 400. The royal tern (*Thalasseus maximus*), Caspian tern (*Hydroprogne caspia*), elegant tern, and black skimmer (*Rynchops niger*) had each been recorded nesting on Pier 400 up until 2005 (KBC 2005). No nesting by these species was recorded in 2006 or 2007 (KBC 2007). The landfill area of Pier 400 (constructed in 1996) initially provided a large expanse of suitable bare-dirt nesting habitat for terns adjacent to a well-developed forage base (consisting of small fish) in the Outer Harbor. However, development of Pier 400 is now complete and undeveloped areas in the ports of Los Angeles and Long Beach outside of the Pier 400 nesting site currently contain very little suitable seabird nesting habitats.

No snowy plovers were detected within either the ports of Long Beach or Los Angeles during the 2007–2008 surveys (SAIC 2010). Snowy plovers are occasionally observed during migration at the California least tern nesting site on Pier 400 (SAIC 2010). A few snowy plovers have been observed at nearby Point Fermin and Cabrillo Beach (outside of the breakwater), both south and outside of the Port of Los Angeles (SAIC 2010).

Mammals

Most marine mammals are under the jurisdiction of the National Oceanic and Atmospheric Administration (NOAA Fisheries), including all those potentially occurring in or near the ports. All marine mammals are protected under the Marine Mammal Protection Act of 1972 (16 U.S.C. 1361 *et seq*.) and some are also protected by the ESA. Marine mammals that are known to occur sporadically in waters of the ports include pinnipeds [California sea lion (*Zalophus californianus*) and harbor seal (*Phoca vitulina*)] and cetaceans (SAIC 2010). Cetaceans that have been observed in

outer harbor locations in the ports include the gray whale (*Eschrichtius robustus*), Pacific bottlenose dolphin (*Tursiops truncatus*), short-beaked common dolphin (*Delphinus delphis*), and Pacific white-sided dolphin (*Lagenorhynchus obliquidens*) (SAIC 2010). None of these are species are known to breed in the ports (SAIC 2010).

Riprap-Associated Organisms

A total of 334 species of invertebrates were identified from three tidal zones within the riprap community in the ports (SAIC 2010). Distinct tidal zonation was observed with increasing numbers of species with increasing depth. Mean total abundance was highest in the lower intertidal, lowest in the upper intertidal, and intermediate in the subtidal zone (SAIC 2010). Across all tidal zones, crustaceans were numerically dominant, followed by polychaetes, echinoderms, molluscs, and other phyla. Past studies have noted relatively greater community development in Outer Harbor compared to Inner Harbor areas (MEC 1988, 2002). However, the 2008 study noted general similarities in these communities throughout the two ports (SAIC 2010). Exceptions were for diversity, which was somewhat greater at Outer Harbor breakwater stations compared to Inner Harbor locations, but these differences were mainly associated with the upper intertidal zone (SAIC 2010). Community summary measures did not show distinct trends among Inner and Outer Harbor stations for the lower intertidal and subtidal zones, suggesting some improvement in ecological function at Inner Harbor stations since the 2000 study (SAIC 2010).

Kelp and Macroalgae

Within the ports, the majority of kelp and macroalgae surface canopy is closely associated with the outer breakwaters and with riprap structures in the Outer Harbor and in locations facing the port entrances (SAIC 2010). While algal diversity in the ports is considered relatively low, there is a general pattern of decreasing algal diversity from Outer to Inner Harbor locations (SAIC 2010). During the 2008 study, Macrocystis canopy in the two ports totaled 77.8 acres in spring and decreased to 50.4 acres in the fall (35% decrease) (SAIC 2010). Seasonal declines in kelp canopy cover for both studies are likely due to natural die-offs between winter and fall. Dominant macroalgal communities included the genera *Sargassum*, *Ulva*, *Colpomenia*, *Chondracnathus*, and *Halymenia* (SAIC 2010).

Occurrences of invasive exotic algae within the ports include the brown algae *Sargassum muticum* and *Undaria pinnatifida*. While *Sargassum* has become a commonly observed component of the algal flora in southern California, including the ports, *Undaria* was first reported in the United States in spring 2000 during the previous baseline study of the ports (MEC 2002). Notably, *Undaria* was documented during the present study at all eight Inner Harbor sites studied and at 7 of 12 Outer Harbor locations, indicating an expanded distribution since 2000 (SAIC 2010).

Contaminants

The marine biological environment of the ports of Los Angeles and Long Beach has been periodically studied since the 1950s. Early studies documented severe pollution in several of the basins in the harbors. As recently as the late 1960s, dissolved oxygen (DO) levels at some locations

in Los Angeles Harbor were so low that little or no marine life could survive (SAIC 2010). Since that time, regulations have reduced direct waste discharges into the ports, resulting in improved DO levels throughout the port areas (MEC 2002; SAIC 2010). Comprehensive studies in the 1970s reported a dramatic improvement in marine habitats function/quality relative to the 1950s, although areas of pollution are still evident in Inner Harbor and blind-end slip areas (MEC 2002).

Results from studies in 2000 and 2008 indicate a continued trend of water quality improvement since the 1970s, with most DO concentrations in excess of 5 milligrams/liter (MEC 2002; SAIC 2010). Episodic and localized changes in some parameters, such as low DO concentrations coinciding with low transmissivity, suggested minor effects possibly associated with sediment resuspension events (MEC 2002). Water clarity (transmissivity) decreased with increasing depth and was relatively lower in bottom waters at stations with fine sediments and/or in the vicinity of dredging and/or disposal (MEC 2002). Polluted and "semi-healthy" areas still exist in the ports; however, the spatial extent of these areas of relatively poorer ecological/habitats function is not as widespread today. The most polluted area is the Consolidated Slip of the Port of Los Angeles; "semi-healthy" areas exist in the Cerritos Channel of the Inner Harbor and in confined basins and slips in both ports (MEC 2002).

Water quality conditions measured during July 2008 generally were uniform throughout the environments of the ports, with only minor differences that appeared to be unrelated to natural community (SAIC 2010). Further, water quality conditions also were consistent with values reported previously for the ports (MEC 2002), and indicative of well-mixed and well-oxygenated waters (e.g., DO greater than 5 mg/L) for almost all stations (SAIC 2010). Some localized differences, associated with comparatively warmer surface water temperatures, lower surface water salinities, and lower DO concentrations in near-bottom water, were observed, but the magnitude of the differences were considered small (SAIC 2010).

The waters of ports of Los Angeles and Long Beach (including Inner and Outer Harbor, Main Channel, Consolidated Slip, Southwest Slip, Fish Harbor, Cabrillo Marina, Inner Cabrillo Beach), San Pedro Bay, Dominguez Channel, Dominguez Channel estuary, Torrance Lateral Channel (sometimes referred to as Torrance Carson Channel), and Los Angeles River Estuary are impaired by heavy metals and organic pollutants (CRWQCB 2011). More specifically, each of these water bodies are included on the 303(d) list for one or more of the following pollutants: cadmium, chromium, copper, mercury, lead, zinc, chlordane, dieldrin, toxaphene, DDT, PCBs, and certain PAH compounds (CRWQCB 2011). These impairments may exist in one or more environmental media — water, sediments, or tissue (CRWQCB 2011).

Some site specific data are available that suggest varying levels of contamination in the sediments to be dredged. Additional testing will be required to determine what materials from which areas may be re-used for habitat creation or beach replenishment, disposed of at an ocean dumping site, or disposed of at a confined disposal facility or appropriate upland site. The Service will provide additional input on these determinations as information regarding physical and chemical characteristics of the materials to be dredged becomes available.

San Pedro Bay Landfill Mitigation History

The agency consensus mitigation goal for San Pedro Bay (ports of Los Angeles and Long Beach) landfill impacts to date has been no net loss of habitat value for in-kind resources, as near to the site of loss as feasible, and in advance of, but not later than concurrently with, the fill (Corps and LAHD 1992). For the last several years, the Service, Department, the National Marine Fisheries Service, the City of Los Angeles Harbor Department, and the Port have been designing and executing mitigation plans for development projects in the ports. The process employs a modified habitat evaluation procedure and involves evaluation of the habitat value in the affected port area and compares that to predicted habitat value increases at conceptual mitigation areas.

Following implementation of measures for avoiding and minimizing impacts to fish and wildlife resources, on-site mitigation has been conducted in the adjacent Port of Los Angeles consisting of creation of shallow water from deep areas. In 1985, as a condition of the Harbor Deepening Project in the Port of Los Angeles, the Corps created 190 acres of shallow water (i.e., water less than -20 feet MLLW) as mitigation for the filling of 190 acres of shallow water to make the land area now called Pier 300. The created shallow water area, now called the Pier 300 Shallow Water Habitat, has been the subject of several biological investigations (MEC 1988, 1999) and shown to provide highly productive habitats for fish. It is also an important foraging area for the California least tern (KBC and Aspen Environmental Group 2004).

Potential Impacts of the Proposed Project on Biological Resources

The proposed project would involve deepening of portions of the Port to currently undetermined depths with the disposal of dredge material at currently undetermined locations. The project would involve dredging of only relatively deep (i.e., greater than 20 feet) water areas of San Pedro Bay. These deeper water impacts typically do not involve what is considered significant long-term loss of habitats warranting mitigation.[18] Anticipated potential effects associated with dredging and disposal of dredge materials would depend largely on disposal location; these potentially include: 1) the permanent elimination of fish and wildlife habitats associated with any in-bay landfills; 2) a temporary reduction in available foraging habitat for piscivorous bird species, including the least tern, due to dredging or disposal-associated turbidity generated by the project (depending on locations); 3) the reduction of deep water habitats and creation of shallow water fish habitats with any in-bay subaquatic fill of deeper waters; 4) the reduction of deepwater habitats and creation of island (nesting bird) habitats with any in-bay island fill of deeper waters; and 5) temporary impacts of burying of beach- and nearshore-associated invertebrates and nearshore turbidity associated with disposal of dredge materials through local beach/nearshore replenishment.

The dredging of deeper water areas within the project footprint would impact the invertebrate benthic fauna and demersal fish communities found in these areas. These dredging impacts would be largely temporary, although the resultant areas would then be deeper in the long-term. The replacement benthic fauna that would colonize these dredged areas in the years following project

[18] Historically, mitigation has been required for dredging that deepens shallow water areas, 20 feet deep or less, because the deepening reduces or eliminates the fish nursery and bird foraging values. No such impacts to areas less than 20 feet deep are anticipated with this project.

implementation would likely be different; this fauna would include species combinations adapted to these new deeper areas. The vast majority (if not all) of these areas have been subject to dredging in the past century, with varying levels of recovery since the last dredging event. It is undetermined what areas of the project footprint would be subject to future maintenance dredging.

The dredging and disposal of dredge materials creates temporary turbidity impacts to surrounding waters. When dredge materials are used to create shallow water or island habitats this typically creates long-term benefits due to the typically higher functions and values for fish and wildlife attributable to shallow water and sensitive species nesting areas. The size and duration of the turbidity plume generated by dredging and disposal activities is dependent on grain size of the suspended material and current velocities at the time the activity is conducted (Corps and LAHD 2000). Project dredge material qualities, disposal locations, and associated current velocities are unknown; therefore, turbidity is not readily predictable for the project. The amount of turbidity is generally greater in the immediate vicinity of the filling/disposal operations than at the dredge site because the dredge typically operates with suction, while the filling operation is often by discharge from a pipe (Corps and LAHD 2000). However, based on past dredge disposal operations, the extent of the turbidity plume is not expected to be greater than several hundred feet from the discharge point. Because several hundred acres of high-function shallow water foraging habitat are available for piscivorous bird species within the Port region (e.g., 193-acre Pier 300 Shallow Water Habitat and 326-acre Cabrillo Shallow Water Habitat), the area of disturbance from the project would likely represent a small portion of available foraging habitats for such birds.

Recommendations

The Fish and Wildlife Coordination Act states that "...wildlife conservation shall receive equal consideration and be coordinated with other features of water-resource development projects through the effectual and harmonious planning, development, maintenance, and coordination of wildlife conservation...." (16 U.S.C. 661). Consistent with Fish and Wildlife Coordination Act, should the project be implemented, we suggest incorporation of the following planning aid recommendations in order avoid, minimize, and compensate potential impacts to fish and wildlife resources, and suggest the Corps incorporate the project design elements outlined below that would improve fish and wildlife resources:

1. The Corps should use dredge materials, as contaminant levels in the dredge materials allow, to construct areas of shallow water fish habitats (areas of water less than -20 feet MLLW).

2. Within the center of the area of created shallow water fish habitats noted above, the Corps should create a least tern/snowy plover nesting island with dredge materials. We suggest that the Outer Harbor in areas of low shipping traffic would likely be a functional location for this purpose, particularly areas adjacent to (behind) the existing Middle or Long Beach breakwaters.[19] The middle of this island(s) should be at least several acres in size and relatively flat with the surface constructed of typical least tern nesting soil matrix materials.

[19] We suggest these locations so as to minimize conflict with existing shipping traffic routes in the ports. These Outer Harbor areas would likely provide high ecological function for the fish and wildlife species targeted by these measures.

A portion of the island should have a zone of low gradient shoreline slope down to the water within a protected cove(s), likely adjacent to and facing the existing breakwater within the Port for swell protection. Other features such as subaquatic reefs constructed of rock are also suggested, in part to help prevent erosion of the island cove shoreline surface materials from swells. The configuration and slope surface of the noted cove should be constructed of sand and gravel or other compatible materials for snowy plover chick foraging: the configuration should be such that the cove areas remain open to tide-borne deposition of natural beach wrack[20] and would otherwise support snowy plover chick and adult foraging. The remainder of the island (outside of the cove portion) would likely need to be edged by riprap to avoid erosion of the island by swells. Possibly waste rock from other proposed projects in the area (e.g., partial or full removal of the Long Beach Breakwater) could be used/combined for this purpose. It is preferred that the surface of this island not be utilized for human recreation and be protected from unauthorized entry.

3. The Corps should implement a construction schedule for the project that avoids the least tern breeding season, if feasible.

4. Turbidity from dredge and fill activities in the vicinity of the shallow water habitats should not extend over an area greater than 5 acres of shallow waters (i.e., areas less than 20 feet deep) at any one time during the April-to-September breeding season of the California least tern. Monitoring of project-related turbidity, as provided for in measure 5 below, should be based on visually observed differences between ambient surface water conditions and any visible dredging turbidity plume.

5. The Corps should provide a qualified least tern biologist, acceptable to the Service and Department, and approved by the Corps, to help monitor and manage project activities. This program should be carried out during project activities. The biologist should coordinate with the Service and the Department and:

    a. If the areas associated with project activities (such as staging areas) would occur within upland areas of the Port that are capable of supporting sensitive species, the Corps should provide an education program for construction crews, including the identity of the least tern and their nests, restricted areas and activities, and actions to be taken if least tern nesting sites are found outside the designated least tern nesting sites/within project activity areas.

    b. Visually monitor and report to the dredging contractor or Corps contract manager and Service/Department any turbidity from project dredging which extends over an area greater than 5 acres of shallow waters.

6. If least tern or other protected species nests are found within the project's direct footprint in upland areas during construction, then all work in the immediate area should be halted, and the Corps biologist be notified immediately. An appropriate buffer zone around the nest for

[20] Beach wrack consists of organic material such as kelp and sea grass that is cast up onto the beach by surf, tides, and wind. Beach wrack supports a wide variety and large quantity of beach invertebrates.

exclusion of project-related activities should be specified by the biologist in coordination with the Service and the Department.

If you have any questions you have regarding this letter, please contact Jon Avery, Federal Projects Coordinator, at 760-431-9440, extension 309.

Sincerely,

CAROL ROBERTS
Digitally signed by CAROL ROBERTS
Date: 2016.06.30 15:09:09 -07'00'

Scott A. Sobiech
Deputy Field Supervisor

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FINAL INTEGRATED FEASIBILITY REPORT AND ENVIRONMENTAL IMPACT STATEMENT / ENVIRONMENTAL IMPACT REPORT (EIS/EIR)

APPENDIX J: DISTRIBUTION LIST

PORT OF LONG BEACH
DEEP DRAFT NAVIGATION STUDY
Los Angeles County, California

October 2021

US Army Corps of Engineers ®

Port of LONG BEACH THE PORT OF CHOICE

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Roberto	Uranga	Councilmember	City of Long Beach, District 7		
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Robert	Dowell		City of Long Beach Gas & Oil Department	2400 E Spring St	Long Beach, CA 90806
Elvira	Hallinan		City of Long Beach Marine Dept	205 Marina Dr	Long Beach, CA 90802
Marie	Knight		City of Long Beach Parks & Recreation	2760 Studebaker Rd	Long Beach, CA 90815
Chief Robert	Luna		City of Long Beach Police Department	400 W Broadway	Long Beach, CA 90802
Craig	Beck		City of Long Beach Public Works	411 W. Ocean Blvd.	Long Beach, CA 90802
Eric	Widstrand		City of Long Beach Traffic Engineer	411 W. Ocean Blvd.	Long Beach, CA 90802
Dennis	Santos		City of Long Beach Water Department	1800 E. Wardlow Rd	Long Beach, CA 90807
Mike	Zupanovich		Magnolia Industrial Group, Inc.	537 W. Anaheim	Long Beach, CA 90813

RECIPIENT		TITLE	ORGANIZATION	STREET	CITY, STATE, ZIP
First Name	Last Name				
Kat	Janowicz		3COTECH	224 West 8th Street	San Pedro, CA 90731
Elaine	Silvestro		ACET (Alameda Corridor Engineering Team)	3760 Kilroy Airport Way, Ste 200	Long Beach, CA 90806
John	Doherty		ACTA	3760 Kilroy Airport Way, Ste 200	Long Beach, CA 90806
Harold W	Coon		ADL Transport/AB Mobile Welding	1342 W 11th St	Long Beach, CA 90813
Jim	Glick		Air Products	700 N. Henry Ford Ave.	Wilmington, CA 90744
Daniel and Lisa	Charleston		AJC Sandblasting	932 Schley Ave	Wilmington, CA 90744
George	Wall		Al Larson Boat Shop	1046 Seaside Ave	Terminal Island, CA 90731
			All Ports Logistics	1789 Pier B Street	Long Beach, CA 90813
Lisa	Olsen		Allied Packing & Rubber, Inc.	1335 W. 11th Street	Long Beach, CA 90813
Environmental	Manager		Andeavor Wilmington Calciner	2450 Pier B St.	Long Beach, CA 90813
Chung	Liu		AQMD	21865 Copley Dr	Diamond Bar, CA 91765-4178
		Building Manager	Arco Center Building	200 Oceangate	Long Beach, CA 90802
Allen	Reyno		ATSI	1941 W. 9th Street	Long Beach, CA 90802
Robert M.	Orr		Attorney at Law	6700 E. Pacific Coast Highway, Suite 285	Long Beach, CA 90803
Harrison	Pollak		Attorney General's office, California Department of Justice	1515 Clay Street, 20th Floor	Oakland, CA 94612-0550
			Attorney General's office, California Department of Justice	600 W. Broadway St., Ste. 1800	San Diego, CA 92101-3702
Mitch E.	Bright		Baker Commodities Inc	4020 Bandini Blvd	Los Angeles, CA 90058
Julie	Tumamait-Stenslie	Chair	Barbareno/Ventura Band of Mission Indians	365 North Poli Avenue	Ojai, CA 93023
Dan	Berns		Berns Company	1250 W 17th St	Long Beach, CA 90813

RECIPIENT					
First Name	Last Name	TITLE	ORGANIZATION	STREET	CITY, STATE, ZIP
Steven	Fukuto		Berth 55 Landing of Long Beach, Inc (DBA Long Beach Sportfishing)	555 Pico Ave	Long Beach, CA 90802
Steven G.	Martin		Best Best & Krieger Attorneys At Law	655 West Broadway, 15th Floor	San Diego, CA 92101
Rick	Armstrong		BETA Offshore	111 W Ocean Blvd Ste 1240	Long Beach, CA 90802
Bruce	Harrison		Biltmore Metal Fabricators	1348 W. 11th St	Long Beach, CA 90813
Gilbert and Hilda	Urrutia		Border Valley Trading	604 Mead Rd	Brawley, CA 92227
Rob	Streed		BP Pipelines North America	4 Centerpointe Drive	La Palma, CA 90623
Kimberly	Kesler		BRAC PMO/NAVFAC SW	33000 Nixie Way, Bldg 50, Ste 207	San Diego, CA 92147
Kara	Karibian		Breathe California	5858 Wilshire Blvd, Ste 300	Los Angeles, CA 90036
Walt	Smith		Burlington Northern Santa Fe	740 E Carnegie Dr	San Bernardino, CA 92408
Chuck	Taylor		Butterfield Communication, Inc.	1410 Brett Pl #131	San Pedro, CA 90732
Don	Holland		Cabrillo Boat Shop	1500 Pier C Street	Long Beach, CA 90813
Chris	Marrs		Cacao D/Amour, LLC	1667 W. 9th Street	Long Beach, CA 90813-2609
Frank	Komin		California Resources Company	111 W Ocean Blvd Ste 800	Long Beach, CA 90802
George	Lang		California United Terminals	2525 Navy Way	Terminal Island, CA 90731
Christian	Bushong		CalTrans HQ	1120 N. St., MS-32	Sacramento, CA 95814
Wilkin	Mes		Carnival Cruises	231 Windsor Way	Long Beach, CA 90802
Greg	Bombard		Catalina Express	Berth 95	San Pedro, CA 90733
			Catalina Water Company	1500 Pier C Street	Long Beach, CA 90813-4043
Bill	Bayes		Cemex	16888 North E Street	Victorville, CA 92394-2900
			Cemex	601 Pier D St	Long Beach, CA 90802

RECIPIENT		TITLE	ORGANIZATION	STREET	CITY, STATE, ZIP
First Name	Last Name				
Joann	Goeman		Cerritos Yacht Anchorage	Berth 205C	Wilmington CA 90744
Michelle N.	Black		Chatten-Brown & Carstens, LLP	2200 Pacific Coast Highway, Ste. 318	Hermosa Beach, CA 90254
Vince	Godfrey		Chemoil Marine Terminal	2365 E. Sepulveda Blvd	Long Beach, CA 90810-1944
Craig	Smith		Chemoil Marine Terminal	1004 Pier F Ave	Long Beach, CA 90802
Subir	Bector		Chevron Usa Inc	324 El Segundo	El Segundo, CA 90245
Steven	Lohr		Chief of Land Use Planning, CSU Chancellor's office	401 Golden Shore	Long Beach, CA 90802-4210
Elia	Rocha		Children Today	2591 Long Beach Blvd.	Long Beach, CA 90806-3157
		Director of Planning	City of Bell	6330 Pine Ave	Bell, CA 90201
Planning	Manager		City of Carson	701 E Carson St	Carson, CA 90745
Gina	Nila		City of Commerce	2535 Commerce Way	Commerce, CA 90040
		Planning & Zoning Dept	City of Compton	205 S Willowbrook	Compton, CA 90220
		Director of Planning	City of Cudahy	5220 Santa Ana St	Cudahy, CA 90201-6024
		Planning Department	City of El Segundo	350 Main St	El Segundo, CA 90245
		Planning Department	City of Hawthorne	4455 W 126th St	Hawthorne, CA 90250
		Director of Public Works	City of Huntington Park	Civic Center, 6550 Miles Ave	Huntington Park, CA 90255
Mindy	Wilcox		City of Inglewood	One West Manchester Blvd, 4th Fl	Inglewood, CA 90301
		Planning Department	City of Lawndale	14717 Burin Ave	Lawndale, CA 90260
		Director of Planning	City of Maywood	4319 E Slauson Ave	Maywood, CA 90270
		Director of Comm Development	City of Paramount	16400 Colorado Ave	Paramount, CA 90723
Sebastian	Hernandez		City of Pasadena	221 E. Walnut St., Ste. 199	Pasadena, CA 91101

RECIPIENT		TITLE	ORGANIZATION	STREET	CITY, STATE, ZIP
First Name	Last Name				
		Harbor Director	City of Redondo Beach	415 Diamond Ave	Redondo Beach, CA 90277
Gregory	Priamos		City of Riverside, Office of the City Attorney	3900 Main Street	Riverside, CA 92522
		Community Development Department	City of South Gate	8650 California Ave	South Gate, CA 90280
		Community Development Department	City of Torrance	3031 Torrance Blvd	Torrance, CA 90503
		Director of Community Services	City of Vernon	4305 Santa Fe Ave	Vernon, CA 90058
Victor	Hovsepian		City Paper and Metal	1452 W. 11th St.	Long Beach, CA 90813-2717
Greg	Roche		Clean Energy	4675 Macarthur Ct., Ste 800	Newport Beach, CA 92660
Patricia	Castellanos		Coalition For A Clean & Safe Ports	464 Lucas Ave, Ste 202	Los Angeles CA 90017
Jesse	Marquez		Coalition For A Safe Environment	1601 N. Wilmington Blvd. Suite B	Wilmington, CA 90744
Nidia	Erceg		Coalition For Clean Air	660 South Figueroa, Ste. 1140	Los Angeles, CA 90017
Bill	Magavern		Coalition For Clean Air	1107 9th St, Ste 440	Sacramento, CA
Mariza	Suillivan	Chair	Coastal Band of Chumash Nation	P.O. Box 4464	Santa Barbara, CA 93140
Loara	Cadavona		Community Hospital Foundation	1720 Termino Ave	Long Beach, CA 90804
David	Scott		Connolly Pacific Co	1925 Pier D St	Long Beach, CA 90802
			Cooper T Smith Stevedoring	Berth 207 - Pier F	Long Beach, CA 90802-6242
			County of Los Angeles	500 W. Temple St.	Los Angeles, CA 90012-2713
Steven	Chew		Curtin Maritime	1500 Pier C Street, Berth 57	Long Beach, CA 90813
Jim	Crane		Crane Marketing	11712 Leland Ave	Whittier, CA 90605

RECIPIENT		TITLE	ORGANIZATION	STREET	CITY, STATE, ZIP
First Name	Last Name				
Joshua	Ellis		Crowley Marine Services	300 South Harbor Blvd	San Pedro, CA 90731
Bill	Terry		Eagle Rock Aggregates, Inc	700 Wright Ave	Richmond, CA 94804
Taylor	Thomas		East Yard Communities For Environmental Justice	2448 Santa Fe Ave.	Long Beach, CA 90810
Tony	Rivera		Easy Roll-off Services	2145 W. 16th St.	Long Beach, CA 90813
Eddie	Umana		Eddie's Auto	1411 W. 11th St	Long Beach, CA 90813
Hung	Nguyen		Energia Logistics, Ltd	2700 Nimitz Rd	Long Beach, CA 90802-1047
Jim	Doty		Engineering Services Program, Environmental Mng G	1149 S Broadway, Suite 600 MS-939	Los Angeles, CA 90015
Planning Team	Leader		Federal Highway Administration - CA Division	650 Capitol Mall, Suite 4-100	Sacramento, CA 95814-4708
Ed	McCain		Foss Maritime Company	Pier D Berth D-35 & D49	Long Beach, CA 90801
Bill	McCord		Friction Materials Co.	1600 W. Anaheim St	Long Beach, CA 90813
			Friends of The La River	570 W Avenue, 26 Ste 250	Los Angeles, CA 90065-1011
Elizabeth	Warren		Future Ports	P.O. Box 768	San Pedro CA 90733-0768
Andrew	Salas		Gabrieleno Band of Mission Indians - Kizh Nation	P.O. Box 393	Covina CA 91723
Anthony	Morales		Gabrieleno/Tongva San Gabriel Band of Mission Indians	P.O. Box 693	San Gabriel, CA 91778
Charles	Alvarez		Gabrielino Tongva Tribe	23454 Vanowen Street	West Hills, CA 91307
			Gabrielino - Tongva Tribe	1999 Avenue of the Stars, Ste. 1100	Los Angeles, CA 90067-4618
Robert	Dorame		Gabrielino Tongva Indians of CA Tribal Council	P.O. Box 490	Bellflower, CA 90707
Joseph	Ontiveros		Soboba Band of Luiseno Indians	Po Box 487	San Jacinto, CA 92581

RECIPIENT					
First Name	Last Name	TITLE	ORGANIZATION	STREET	CITY, STATE, ZIP
Goad	Sandonne		Gabrielino/Tongva Nation	106 1/2Judge John Aiso St., #231	Los Angeles, CA 90012
Sam	Dunlap		Gabrielino Tongva Nation	Po Box 86908	Los Angeles, CA 90086
Robert	Stein		Gambol Industries, Inc	1825 W. Pier D St	Long Beach, CA 90802
Nancy	Pfeffer		Gateway Cities COG	16401 Paramount Blvd	Paramount, CA 90723
			Georgia-Pacific Gypsum, LLC	1401 Pier D St	Long Beach, CA 90802
Gilbert and Hilda	Haddad		Gil's Long Beach Plating	3772 Hackett Ave.	Long Beach, CA 90808-4216
Sotiria	Contos		Golden Star Restaurant No. 1	1560 West Pacific Coast Highway	Long Beach, CA 90810
Patrick	Kennedy		Greater LB Interfaith Community Organization	5600 Linden Avenue	Long Beach, CA 90805
John	Whitcombe		Greenberg, Whitcombe, Takeuchi, Gibson & Grayver, LLP	21515 Hawthorne Blvd, Suite 450	Torrance, CA 90503-6531
Henry	Rogers		Harbor Association of Industry & Commerce	6216 E. Pacific Coast Highway #407	Long Beach, CA 90803
Manny	Elefante		Harbor Cogeneration Company	P.O. Box 550	Wilmington CA 90748
			Harbor Cogeneration Company	505 Pier B St.	Wilmington, CA 90744
Tamara	Kim		Harbor Community Clinic	593 W 6th Street	San Pedro, CA 90731
Kirsten	James		Heal The Bay	1444 9th Street	Santa Monica, CA 90401
Manny	Aschemeyer		Intl Seafarers Center of LB	120 S Pico Ave	Long Beach, CA 90802-6247
Michael	Fogarty		Intl Transportation Service	1281 Pier G Way	Long Beach, CA 90802
Whitney	Bagge		Island Express Helicopters Inc	1175 Queens Hwy	Long Beach, CA 90802
Peter	Ruiz		Island Express Helicopters Inc	900 Queensway Drive	Long Beach, CA 90802

RECIPIENT		TITLE	ORGANIZATION	STREET	CITY, STATE, ZIP
First Name	Last Name				
Bob	Rollins Sr		Island Yacht Anchorage	1500 Anchorage Rd #205D	Wilmington, CA 90744
Tom	Jacobsen		Jacobsen Pilot Services Inc	1259 Pier F Ave	Long Beach, CA 90802
Jon	Farguson		Jon's Body Shop	1556 W. 11th St.	Long Beach, CA 90813
Peter	Wu		Kair Trucking	1129 Canal Ave	Long Beach, CA 90813
Scott	Lebbin		Koch Carbon Inc	1020 Pier F Ave Berth F211	Long Beach, CA 90802-6275
Kathy	Bowes		L.G. Everist, Inc.	350 S. Main Ave., Ste 400	Sioux Falls, SD 57104
Gloria	Cuevas		LA City Native American Indian Comm	3175 W. 6th Street, Rm 403	Los Angeles, CA 90020
Richard	Bruckner		LA Co Regional Planning	320 W Temple St, 13th Floor	Los Angeles, CA 90012
Sheheryar	Kaoosji		Laane	464 Lucas Ave, Ste 202	Los Angeles, CA 90017
John	Donaldson		Lan Logistics, Inc.	1520 W. 11th St.	Long Beach, CA 90813-2618
Theral	Golden		LB Assoc.	3549 Fashion Avenue	Long Beach, CA 90810
Ricardo	Vilchis		LB Transport	1532 1/2 W. Anaheim St.	Long Beach, CA 90813
Hank	Bruzza		Lengner & Sons Express	1916 W Anaheim St	Long Beach, CA 90813-1106
Barbara R.	Gleason		Lighthouse Yacht Landing	1300 Anchorage Rd, Berth 205-B	Wilmington, CA 90744
Chris	Luckey		Lineage Logistics	1710 Pier B St	Long Beach, CA 90813
Sylvia	Betancourt		Long Beach Alliance For Children With Asthma	2651 Elm Ave., Ste. 100	Long Beach, CA 90806
Gary	Shelton		Long Beach Area Coalition For The Homeless	P.O. Box 92365	Long Beach, CA 90809-2365
Rev. C. Kit	Wilke		Long Beach Area Homeless Coalition	3737 Atlantic Ave., Apt 1001	Long Beach, CA 90807-6447
Arthur J	Merrick		Long Beach Container Terminal	1171 Pier F Ave, Berth F10	Long Beach, CA 90802
		Environmental Manager	Long Beach Generation, LLC	2665 W Seaside Ave	Long Beach, CA 90813

RECIPIENT		TITLE	ORGANIZATION	STREET	CITY, STATE, ZIP
First Name	Last Name				
Patricia	Benoit		Long Beach Homeless Coalition	4433 E. Barker Way	Long Beach, CA 90814-3018
			Long Beach Multi-Service Center	1301 W. 12th St.	Long Beach, CA 90813-2720
Ryan	Zummaller		Long Beach Post	444 W Ocean Blvd, Ste 150	Long Beach, CA 90802
			Long Beach Shoreline Marina	450 E Shoreline Dr	Long Beach, CA 90802
Alan	Reising		Long Beach Unified School District	2425 Webster Avenue	Long Beach, CA 90810
Paul	Shadmani		Los Angeles County Dept of Public Works	900 S Fremont Ave 10th Floor	Alhambra, CA 91803-1331
Lindy	Lee		Los Angeles County Metropolitan Transportation Authority	1 Gateway Plaza, Mail Stop 99-25-1	Los Angeles, CA 90012
		Manager of Environmental Planning	Los Angeles Dept of Water & Power	111 Hope St	Los Angeles, CA 90012
Evi	Boncato		Los Angeles Dept. of Water & Power	931 N Avalon Blvd	Wilmington, CA 90744
Jennifer	Pinkerton		Los Angeles Dept. of Water & Power	111 N Hope St, Rm 1044	Los Angeles, CA 90012
Cris B.	Liban		Los Angeles Metropolitan Transportation Authority	One Gateway Plaza, Ms 99-17-2	Los Angeles, CA 90012
Marc	Stearns		Manson Construction Co.	340 Golden Shore, Ste 310	Long Beach, CA 90802-4229
Kip	Louttit		Marine Exchange	3601 S Gaffey St, Bldg 803	San Pedro, CA 90731
			Marine Express, Inc.	1500 Pier C Avenue	Long Beach, CA 90802
Raymond	Crispino		Marine Spill Response Corp	3300 East Spring Street	Long Beach, CA 90806
Louis	Tilley		Marine Support International	Po Box 514	Summerland, CA 93067
Ken	Pope		Marine Terminals Corp Lb Shop	2001 John S Gibson Blvd	San Pedro CA 90731
Vincent	Passanisi		Marisa Foods	1401 Santa Fe Ave	Long Beach, CA 90813
Michael	Carter		Maritime Administration	Mar-410, W25-302 1200 New Jersey Ave	Washington, DC 20590

RECIPIENT		TITLE	ORGANIZATION	STREET	CITY, STATE, ZIP
First Name	Last Name				
Dr Mark	Perez		Memorial Maritime Clinic	9017 Suva Street	Downey, CA 90240-3421
Rob	Waterman		Metropolitan Stevedore Co.	3806 Worsham Ave.	Long Beach, CA 90808
			Metropolitan Stevedore Co.	1045 Pier G Avenue	Long Beach, CA 90802
Eric	Jen		Mitsubishi Cement Corp	1150 Pier F Ave	Long Beach, CA 90802
Michael	Jasberg		Mitsubishi Cement Corporation	151 Cassia Way	Henderson, NV 89104-6616
Kyle	Gredvig		Morton Salt	1050 Pier F St	Long Beach, CA 90801
Eddie	Zepeda		MTA	One Gateway Plz	Los Angeles, CA 90012-2952
David	Pettit		National Resources Defense Council (NRDC)	1314 Second Street	Santa Monica, CA 90401
Steve	Rogers		New NGC Inc	1850 Pier B St	Long Beach, CA 90802
Don	Beaumont		Nielsen Beaumont Marine	2420 Shelter Island Dr	San Diego, CA 92106
Fred	Collins	Tribal Spokesperson	Northern Chumash Tribal Counsel	P.O. Box 6533	Los Osos, CA 93412
Mona	Olivas Tucker	Chairwoman	yak tityu tityu yak tithini – Northern Chumash Tribe	660 Camindo Del Rey	Orroyo Grande, CA 93420
Todd	Roloff		NRC Environmental Services	3777 Long Beach Blvd Ste 100	Long Beach, CA 90807-3336
Paul	Morcos		NRC Environmental Services	Pier D Street, Berth 47	Long Beach, CA 90802
		Environmental Manager	NRG Services Corp	301 Vista Del Mar Blvd	El Segundo, CA 90245
Yutaka	Nagashima		NYK Line	300 Lighting Way	Secaucus, NJ 07094
		HCC Holdings LLC	Oceanwide Ship Repair/APR Engineering	1812 W 9th St	Long Beach, CA 90813-2614
Digran	Khalili		Oxbow Carbon & Minerals, LLC	330 Golden Shore Ste 210	Long Beach, CA 90802
Nauman	Charania		Oxy	111 West Ocean Blvd, Ste 800	Long Beach, CA 90802
Jesse	Urquidi		P2S Engineering (Future Ports)	5000 Spring, 8th Floor	Long Beach, CA 90815
Otis	Cliatt II		Pacific Harbor Line	705 N Henry Ford Ave	Wilmington, CA 90744

RECIPIENT		TITLE	ORGANIZATION	STREET	CITY, STATE, ZIP
First Name	Last Name				
Marc	La Maestra		Pacific Maritime Administration	555 Market St	San Francisco, CA 94105-2800
			Pacific Merchant Shipping Association	70 Washington Street, Suite 305	Oakland, CA 94607
Ray	Jackson		Pacific Pipeline System LLC	5900 Cherry Ave	Long Beach, CA 90805
		LA/LB Division Manager	Pacific Tugboat Service	1512 W Pier C Street	Long Beach, CA 90813
			Patriot Environmental Services	P.O. Box 1091	Long Beach, CA 90801-1091
Steven	Ascenio		PCMC	250 W. Wardlow Rd	Long Beach, CA 90807
Robert	Puertas		PCMC	19 Willowbrook	Irvine, CA 92604-3616
Pat	Kennedy		Petro Diamond	1920 Lugger Way	Long Beach, CA 90813
Eric	Conard		Petro Diamond Inc	1100 Main Fl 2	Irvine, CA 92614
Greg	Phillips		Phillips Steel Co	1368 W Anaheim St	Long Beach, CA 90813-2730
Ngiabi	Gicuhi		Plains West Coast Terminals, LLC	5900 Cherry Ave	Long Beach, CA 90805
Thomas	Jelenić		PMSA	One World Trade Center, Ste 1700	Long Beach, CA 90831
			Polar Tankers Inc	600 N. Dairy Ashford/Mo2026	Houston, TX 77079
Steven	Debaun		RCTC Legal Counsel Best Best & Krieger LLP	P.O. Box 1028	Riverside, CA 92502-2208
Shannon	Walker		Residence Inn	600 Queensway Drive	Long Beach, CA 90802
John	Dougherty		Ribost terminal	1405 Pier C Street	Long Beach, CA 90813
John	Standiford		Riverside County Transportation Commission	4080 Lemon St, 3rd Floor	Riverside, CA 92502-2208
			Robertson's Cement	1602 W. Pier D St	Long Beach, CA 90802
Moises	Figueroa		SA Recycling	482 Pier T Berth 118	Long Beach, CA 90802
Mark	Tabbert		SA Recycling	901 New Dock St	Terminal Island, CA 90731
Gary	Pierce	Contemporary Council Lead and Public Law Lead	Salinan Tribe of Monterey and San	7070 Morro Road, Suite A	Atascadero, CA 93422

RECIPIENT		TITLE	ORGANIZATION	STREET	CITY, STATE, ZIP
First Name	Last Name				
			Luis Obispo Counties		
Richard	Averett		San Bernardino County Transportation Authority	1170 W. 3Rd St., 2Nd Floor	San Bernardino, CA 92410-1715
Christina S.	Casgar		San Diego Association of Governments (SANDAG)	401 B Street, Suite 800	San Diego, CA 92101-4231
Katheen	Woodfield		San Pedro Peninsula Home Owners Coalition	505 South Bandini Street	San Pedro, CA 90731
Clay	Sandidge		Sandidge Consulting/Muni-Fed Energy	192 Marina Drive	Long Beach, CA 90803
			Santa Fe Importers	1401 Santa Fe Ave	Long Beach, CA 90813
Kenneth	Kahn	Chairman	Santa Ynez Band of Chumash	P.O. Box 517	Santa Ynez, CA 93460
Teresa	Romero	Environmental Director	Santa Ynez Band of Chumash		
			Sause Bros.	1607 W. Pier D St	Long Beach, CA 90802
			Save The Queen	1126 Queensway Dr	Long Beach, CA 90802
			SERRF	118 Pier S Avenue	Long Beach, CA 90802
Don	Herman		Shell	20945 S Wilmington Ave	Carson, CA 90810
			Sherwin Williams	1168 Harbor Ave	Long Beach, CA, 90813
Patty	Allen		Shippers Transport	1150 E. Sepulveda Blvd	Carson, CA 90745
John	Hinz		Sierra Club of Long Beach	Po Box 91301	Long Beach, CA 90809
			Spun Products Inc-MLZ INC	1800 W 9th St	Long Beach, CA 90813
Rebecca	Maehara		SRM Corporation	555 Pico Ave	Long Beach, CA 90802
Tony	Liberatore		SSA Crescent Terminals Inc	50 W Pier D St	Long Beach, CA 90802
Janaya	Nichols		SSA LB Terminal	700 Pier A Ave	Long Beach, CA 90813
Don	Kee		SSA Marine	1160 Pier F Ave	Long Beach, CA 90802
Ryan	Baird		Pacific Container Terminal	1521 Pier J Avenue	Long Beach, CA 90802

RECIPIENT					
First Name	Last Name	TITLE	ORGANIZATION	STREET	CITY, STATE, ZIP
			SSA Matson Terminal	1521 Pier C St	Long Beach, CA 90813
Paul	Gagnon		SSA Terminals	700 Pier A Plz	Long Beach, CA 90802
			St. Mary Medical Center	1050 Linden Ave	Long Beach, CA 90813
			Stapleton Technologies	1350 W. 12th St	Long Beach, CA 90813
Wayne	Wilms		Sundown Fox & Co/LB Boat Movers, Jones G&H Trust	1769 W 9th St	Long Beach, CA 90813-2611
Stan	Janocha		Superior Electrical Advertising	1700 W Anaheim St	Long Beach, CA 90813-1102
Eric	Tate		Teamsters Local Union No. 848	731 East Arrow Highway	Glendora, CA 91740
Donna	Dirocco		Tesoro	1300 Pier B St	Long Beach, CA 90813
Scott	Gooden		Tesoro	820 Carrack Ave.	Long Beach, CA 90813
Yung	Chung		Tesoro Calciner Barns	1301 Pier G Ave	Long Beach, CA 90802
Chris	Maudlin		Tesoro Socal Pipeline Company, LLC	6 Centerpointe Drive, Suite 500	La Palma, CA 90623
Elisa	Nicholas		The Children's Clinic	455 E Columbia St	Long Beach, CA 90806
Kristi	Allen		The Hotel Maya	700 Queensway Dr	Long Beach, CA 90802
Robert	Rodine		The Polaris Group	14649 Tustin Street	Sherman Oaks, CA 91403
Trent	Rosenlieb		The Reef Restaurant	880 S Harbor Scenic Dr	Long Beach, CA 90802
			The Termo Company	3275 Cherry Ave	Long Beach, CA 90807
Frank	Komin		Thums Long Beach Company	111 W Ocean Blvd, Ste 800	Long Beach, CA 90802
Cindi	Alvitre		Ti'at Society	3094 Mace Ave, Apt B	Costa Mesa, CA 92626
Michael	Mirelez		Torres Martinez Desert Cahuilla Indians	Po Box 1160	Thermal, CA 92274
Gerry	Tintle		Tosco Refining Company	3900 Kilroy Airport Way, Ste 210	Long Beach, CA 90806-6817
Phillip T.	Wright		Total Terminals International	301 Mediterranean Way	Long Beach, CA 90802

RECIPIENT		TITLE	ORGANIZATION	STREET	CITY, STATE, ZIP
First Name	**Last Name**				
Audie	Freeman		Toyota Logistics Services	785 Edison Ave	Long Beach, CA 90813
		Safety & Environmental Mgr	Toyota Motor Sales USA	19001 S Western Ave	Torrance, CA 90509-2991
			Tran Harbor Inc.	222 E. G St.	Wilmington, CA 90744
Dj Auto Body			Trans Harbor Inc.	1130 Santa Fe Ave	Long Beach, CA 90813
Chris	Balden		Trans Harbor Investments, Inc	2501 N. Rosemead Blvd	South El Monte, CA 91733-1531
			Trans Ocean Carrier Inc	1650 Harbor Ave., Ste. B	Long Beach, CA 90813
			Transportation 4 America	1152 15th St. Nw, Ste 450	Washington, DC 20005
Jeff	Asay		Union Pacific Railroad	10031 Foothills Blvd, Rm 200	Roseville, CA 95747
andrea M.	Hricko		USC	2001 Soto St. (SSB) 225R MC9237	Los Angeles, CA 90033
Mark	Phair		Valero Wilmington Refinery	2402 E Anaheim St	Wilmington, CA 90744
Mario	DeLaura		Vnamar Inc	1280 W. 12th Street	Long beach, CA 90813
Michael	La Cavera		Vopak	3601 Dock St	San Pedro, CA 90731
Louis	Warschaw		Warland Investments Co	1299 Ocean Ave, Ste 300	Santa Monica, CA 90401
			Waterman Family Trust	Po Box 596	Wilmington, CA 90748
Steve	Dickson		Wayne Electric Company /Horace Sherer Trust	1560 W. Anaheim St	Long Beach, CA 90813-2644
			Wayne Electric Company /Horace Sherer Trust	421 Daroca Ave	Long Beach, CA 90803-2104
Frank	Murphy		Weighmaster Murphy	1601 W. 12th St	Long Beach, CA 90812
Paul	Collins		Westside Project Area Council	1415 Cota Ave.	Long Beach, CA 90813
Wayne	Driggers		Westway Trading Group	2701 Taleyrand Ave	Jacksonville, FL 32206
Don	Peters		Weyerhauser Company	800 Pier T Ave	Long Beach, CA 90802
			Wilmington Chamber of Commerce	P.O. Box 90	Wilmington, CA 90744

RECIPIENT		TITLE	ORGANIZATION	STREET	CITY, STATE, ZIP
First Name	**Last Name**				
Valerie	Contreras		Wilmington Neighborhood Council	544 N. Avalon Blvd, Suite 103	Wilmington, CA 90744
Nayomi	De Silva		World Oil Corporation	9302 Garfield Ave	South Gate, CA 90280
Legacy Partners			World Trade Center	One World Trade Center, Ste 198	Long Beach, CA 90801
Donna	Haro	Tribal Headwoman	Xolon-Salinan Tribe	P.O. Box 7045	Spreckles, CA 93962
Karen	R. White	Council Chair/Tribal Roll Administrator	Xolon Salinan Tribe	P.O. Box 7046	Spreckles, CA 93962
Linda	Frame		Yusen Terminals Inc	701 New Dock St	Terminal Island, CA 90731
Lawrence	Maehara		Berth 55 Seafood	555 Pico Ave	Long Beach, CA 90802
Taylor	Thomas		East Yard Communities For Environmental Justice	2448 Santa Fe Ave.	Long Beach, CA 90810
Jan Victor	Andasan		East Yard Communities For Environmental Justice	2448 Santa Fe Ave.	Long Beach, CA 90810
Devin	Hanson		International Bird Rescue	3601 S. Gaffey St., Box 3	San Pedro, CA 90731
Julie	Skogland		International Bird Rescue	3601 S. Gaffey St., Box 3	San Pedro, CA 90731
Thomas	Jelenić		PMSA	One World Trade Center, Ste 1700	Long Beach, CA 90831
Nathan	Francis		Rio Tinto - US Borax	300 Falcon St.	Wilmington, CA 90744
			Golden Shore RV Resort	101 Golden Shore	Long Beach, CA 90802
			Annie Nam Southern California Council of Governments	900 Wilshire Blvd., Ste. 1700	Los Angeles, CA 90017
			5000 Spring, LLC c/o Jamison Services	4811 Airport Plaza Drive, Suite #300	Long Beach, CA 90815
			Oryx Energy Company	Four North Park East, P.O. Box 2880	Dallas, TX 75221
			Kinder Morgan Liquids Terminals LLC	200 Dallas Street, Suite 100	Houston, TX 77002

RECIPIENT		TITLE	ORGANIZATION	STREET	CITY, STATE, ZIP
First Name	**Last Name**				
			CEMEX Construction Materials Pacific, LLC	840 Gessner, Suite 1400	Houston, TX 77024
			Air Products and Chemicals, Inc.	12600 Northborough, Suite 196	Houston, TX 77067
			Tesoro Refining & Marketing Company LLC	19100 Ridgewood Parkway	San Antonio, TX 78259
			Garrett Freight Lines, Inc.	12136 West Bayard Ave.	Lakewood, CO 80228
			MCC Terminal, Inc.	151 Cassia Way	Henderson, NV 89014
			Eller Media, Inc.	1550 West Washington Blvd	Los Angeles, CA 90007
			Patrick Media Group, Inc.	1550 West Washington Blvd	Los Angeles, CA 90007
			California State Department of Public Works	120 South Spring Street	Los Angeles, CA 90012
			City of Los Angeles	200 North Spring Street, Room 395	Los Angeles, CA 90012
			General Exploration Company of California	417 South Hill Street	Los Angeles, CA 90013
			MacMillan Ring-Free Oil Co., Inc.	911 Wilshire Blvd, Suite 1680	Los Angeles, CA 90017
			Western Union Telegraph	745 South Flower Street	Los Angeles, CA 90017
			Bruck, William W.	1200 Santa Fe Avenue	Los Angeles, CA 90021
			Signal Trucking Service Ltd.	3770 East 26th Street	Vernon, CA 90023
			Atlantic Richfield Company	P.O. Box 2679	Los Angeles, CA 90051
			Los Angeles County Internal Services Department	1100 North Eastern Avenue	Los Angeles, CA 90063
			MacLeod Metals Company	731 West 182nd Street	Gardena, CA 90248
			Industrial Steel Treating Company	3370 Benedict Way	Huntington Park, CA 90255
			Quality Wood Products, Inc.	6203 Maywood Avenue	Huntington Park, CA 90255
			Dayton Foundry Company	P.O. Box 2008	South Gate, CA 90280

RECIPIENT		TITLE	ORGANIZATION	STREET	CITY, STATE, ZIP
First Name	Last Name				
			Ruchti Bros. Inc.	10600 Ruchti Road	South Gate, CA 90280
			County Sanitation District No. 3 of Los Angeles County	1955 Workman Mill Road	Whittier, CA 90607
			Fremont Forest Group Corporation	P.O. Box 4129	Whittier, CA 90607
			Gulf Oil Corporation	P.O. Box 2109	Santa Fe Springs, CA 90670
			Torrance Basin Pipeline Company	12851 East 166th Street	Cerritos, CA 90703
			Water Replenishment District of Southern California	4040 Paramount Blvd.	Lakewood, CA 90712
			Consolidated Fabricators Corporation	7815 East Compton Boulevard	Paramount, CA 90723
			Pacific Finishing Company	16200 Illinois	Paramount, CA 90723
			Paramount Perlite Company	16236 South Illinois St.	Paramount, CA 90723
			Paramount Petroleum Corporation	14700 Downey Avenue	Paramount, CA 90723
			John S. Meek Company, Inc.	1931 North Gaffey Street, Suite C	San Pedro, CA 90732
			National Metal & Steel Corp.	P.O. Box 3406	Terminal Island, CA 90731
			Murat Mischel, Susan & Mary Murat	1748 El Rey Road	San Pedro, CA 90732
			Rollins, Robert W. Jr, Robert W. Sr & Donald, GP	1313 Mt. Rainier	San Pedro, CA 90732
			Equilon Enterprises, LLC	2101 E. Pacific Coast Highway	Wilmington, CA 90744
			Marcus Trucking Company	1017 North Foote Avenue	Wilmington, CA 90744
			O'Donnell Oil, LLC	246 N. Fries Avenue	Wilmington, CA 90744
			Stevedoring Services of America, Inc.	1001 New Dock Street	Wilmington, CA 90744

RECIPIENT		TITLE	ORGANIZATION	STREET	CITY, STATE, ZIP
First Name	Last Name				
			Ultramar Inc., dba Valero Wilmington Refinery	2402 East Anaheim Street	Wilmington, CA 90744
			Ultramar, Inc.	2402 East Anaheim Street	Wilmington, CA 90744
			Alameda Corridor Transportation Authority (ACTA)	One Civic Plaza, Suite 650	Carson, CA 90745
			California Sulphur Company	P.O. Box 176	Wilmington, CA 90748
			Oil Operators Incorporated	2852 Gundry Ave	Signal Hill, CA 90755
			CSA Equipment Company, LLC	P.O. Box 229	Long Beach, CA 90801
			International City Theatre	P.O. Box 1690	Long Beach, CA 90801
			Long Beach Community TV & Media	P.O. Box 1468	Long Beach, CA 90801
			City of Long Beach	333 W. Ocean Blvd	Long Beach, CA 90802
			Crescent Terminals, Inc.	1160 Pier F Ave	Long Beach, CA 90802
			Crescent Warehouse Company, Ltd.	Berth D50, Pier D Street	Long Beach, CA 90802
			GENERAL TELEPHONE COMPANY OF CALIFORNIA	200 W. Ocean Blvd.	Long Beach, CA 90802
			LBCT LLC	1171 Pier F Ave	Long Beach, CA 90802
			Maehara, Samuel and Rebecca	555 N. Pico Ave	Long Beach, CA 90802
			Mixton Transport Corp.	1409 E. 4th Street, #G	Long Beach, CA 90802
			OOCL LLC	1171 Pier F Ave	Long Beach, CA 90802
			Pacific Maritime Services, LLC/Pacific Container Terminal	1521 Pier J Ave	Long Beach, CA 90802
			PierPass Inc.	444 W. Ocean Blvd, Suite 700	Long Beach, CA 90802
			Port of Long Beach	415 W. Ocean Blvd	Long Beach, CA 90802
			Queensbay Hotel, LLC	700 Queensway Drive	Long Beach, CA 90802
			S7 Sea Launch Limited	2700 Nimitz Road	Long Beach, CA 90802

RECIPIENT		TITLE	ORGANIZATION	STREET	CITY, STATE, ZIP
First Name	Last Name				
			San Pedro Bay Pipeline Company	111 W. Ocean Blvd, Suite 1240	Long Beach, CA 90802
			Southeast Resource Recovery Facility	120 Pier S Ave	Long Beach, CA 90802
			State Lands Commission	245 West Broadway, Suite 425	Long Beach, CA 90802
			United States of America - Department of the Navy	3500 Nimitz Road	Long Beach, CA 90802
			Desiderata Homes, Ltd.	4700 Long Beach Blvd.	Long Beach, CA 90805
			Lorenz, Ed and Glo	6046 Orange Avenue, Apt 1	Long Beach, CA 90805
			Cardinal Pipeline, L.P.	2459 Redondo Avenue	Long Beach, CA 90806
			Long Beach Acquisition Corp/Charter Communications	2931 Redondo Avenue	Long Beach, CA 90806
			Long Beach Gas & Oil	2400 E. Spring Street	Long Beach, CA 90806
			Phillips 66 Pipeline LLC	3900 Kilroy Airport Way, Suite 210	Long Beach, CA 90806
			Xtra Energy Corporation	717 Walton Street	Long Beach, CA 90807
			Chief Oil Company, Inc.	4235 Country Club Drive	Long Beach, CA 90808
			Bowers, William A.	3846 Gondar Ave	Long Beach, CA 90810
			Evanculla, Isidro	2033 Arlington Street	Long Beach, CA 90810
			Martin Magdaleno	1955 W. Cameron St.	Long Beach, CA 90810
			Ojedo, Melesio	2011 West Lincoln St.	Long Beach, CA 90810
			Songcayauon, Vincent	2301 W. Arlington Street	Long Beach, CA 90810
			Villarael, Silverio	2000 West Cameron Street	Long Beach, CA 90810
			ARCO Terminal Services Corporation	1300 Pier B Street	Long Beach, CA 90813
			Pacific Maritime Services, L.L.C.	700 Pier A Plaza	Long Beach, CA 90813
			Wilms, Wayne	4290 E. Patero Way	Long Beach, CA 90815

RECIPIENT		TITLE	ORGANIZATION	STREET	CITY, STATE, ZIP
First Name	Last Name				
			Legacy Partners II LB World Trade, LLC	One World Trade Center, Suite 198	Long Beach, CA 90831
			Sun Oil Company	23928 Lyons Avenue	Newhall, CA 91321
			United Ready Mixed Concrete Company, Inc.	13131 Los Angeles Street	Irwindale, CA 91706
			Insight Cablevision of Los Angeles	212 South Indian Hill Blvd.	Claremont, CA 91711
			Southern California Gas Company	488 8th Ave, HQ06N1	San Diego, CA 92101
			MCM Construction, Inc.	19010 Slover Ave	Bloomington, CA 92316
			Modern Development Company	3152 Redhill Ave, Suite 100	Costa Mesa, CA 92626
			PsomasFMG Long Beach Port Solar I, LLC	7777 Center Avenue, Suite 200	Huntington Beach, CA 92647
			Group W Cable TV of South Gate	2734 Susan	Santa Ana, CA 92704
			XO California, Inc.	1924 East Deere Avenue	Santa Ana, CA 92705
			Western Exterminator Company	P.O. Box C11881	Santa Ana, CA 92711
			Texaco Trading and Transportation, Inc.	P.O. Box 2087	Bakersfield, CA 93303
			Texaco, Inc.	5005 Business Park North, Suite 200	Bakersfield, CA 93309
			Standard Gas Company	9525 Camino Media, E-2037	Bakersfield, CA 93311
			Chemoil Corporation	4 Embarcadero Center, Suite 1800	San Francisco, CA 94111
			California State Division of Highways	P.O. Box 1499	Sacramento, CA 95801
			California Geological Survey - State of California	801 K Street, MS 13-35	Sacramento, CA 95814
			Praxair, Inc.	P.O. Box 44	Tonawanda, NY 14150-7891
			The Sherwin-Williams Company	101 Prospect Avenue NW, 920 M, Store Real Estate Dept.	Cleveland, OH 44225-1075

RECIPIENT		TITLE	ORGANIZATION	STREET	CITY, STATE, ZIP
First Name	Last Name				
			Los Angeles County Hall of Records	500 West Temple Street, 11th Floor	Los Angeles, CA 90012-2770
			Los Angeles County Weights & Measures	222 South Hill Street, 3rd Floor	Los Angeles, CA 90012-3506
			Alfred-Dixon Properties	380 South Beverly Drive, Suite 411	Beverly Hills, CA 90212-3904
			City of Downey	11111 Brookshire Avenue	Downey, CA 90241-3898
			Pacific Bell Telephone Company	100 West Alondra Boulevard, Room A207	Gardena, CA 90248-2702
			Dynamic Machine, Inc.	3470 Randolph Street	Huntington Park, CA 90255-3259
			WC Auto Body of South Gate, Inc.	8648 Atlantic Avenue	South Gate, CA 90280-3502
			W. A. Woods Industries, Inc.	10120 West Frontage Road	South Gate, CA 90280-5433
			ConocoPhillips Company	9645 Santa Fe Springs Road	Santa Fe Springs, CA 90670-2900
			Harbor Land Company, LLC	c/o Martin Container, Inc., 1402 East Lomita Blvd	Wilmington, CA 90744-1611
			Texaco Refining and Marketing, Inc.	2101 East Pacific Coast Highway	Wilmington, CA 90744-2914
			Union Pacific Resources Company	420 Henry Ford Avenue, P.O. Box 1317	Wilmington, CA 90748-1317
			Crimson California Pipeline, L.P.	2459 Redondo Avenue	Long Beach, CA 90755-4020
			Lomita Gasoline Company, Inc.	P.O. Box 851	Long Beach, CA 90801-0851
			Pacific Towboat & Salvage Company	P.O. Box 1940	Long Beach, CA 90801-1940
		Commanding Officer	Eleventh Coast Guard District	Bldg. 50-2, C.G. Island	Alameda, CA 94501-5100

RECIPIENT					
First Name	Last Name	TITLE	ORGANIZATION	STREET	CITY, STATE, ZIP
			ATTN: Waterways Management Branch		
		Commanding Officer	Coast Guard Sector LA/LB	1001 South Seaside Avenue ATTN: Waterways Management Division	San Pedro, CA 90731
		Commanding Officer	Coast Guard Sector San Diego	2710 N. Harbor Dr. ATTN: Waterways Management Division	San Diego, CA 92101
			Tidelands Oil Production Company	301 East Ocean Boulevard, Suite 300	Long Beach, CA 90802-4830
			R.M.S. Foundation, Inc.	1126 Queens Highway	Long Beach, CA 90802-6390
			The Dow Chemical Company	6754 North Paramount Boulevard	Long Beach, CA 90805-1902
			American Transportation Services, Inc.	P.O. Box 9993	Long Beach, CA 90810-0993
			Verizon California, Inc.	6220 East Spring Street	Long Beach, CA 90815-1422
			Livingston-Graham, Inc.	13550 Live Oak Lane	Baldwin Park, CA 91706-1318
			SBC California	100 North Stoneman Avenue, Room 265	Alhambra, CA 91801-3521
			Los Angeles County Flood Control District	P.O. Box 1460	Alhambra, CA 91801-1460
			BNSF Railway Company	740 East Carnegie Drive	San Bernardino, CA 92408-3571
			Pleasantville 27, LLC	1306 Sandcastle Drive	Corona Del Mar, CA 92625-1217

RECIPIENT					
First Name	Last Name	TITLE	ORGANIZATION	STREET	CITY, STATE, ZIP
			Anthem Telecom, LLC	436 Prospect Street	Newport Beach, CA 92663-1918
			Production Operators, Inc.	P.O. Box 40262	Houston, TX 97240-0262
			HCC Holdings LLC	PO Box 9100	Long Beach, CA 90810-0100
			MLZ Inc.	1800 W 9th St	Long Beach, CA 90813-2614
			Berns Bros Inc.	1250 W 17th St	Long Beach, CA 90813-1310
			Harrison Pacific LLC	1326 W. 12th St	Long Beach, CA 90813-2721
			Legend Thirteen 26 LLC	1140 Highland Ave, #112	Manhattan Beach, CA 90266
			Allied Packing and Rubber Inc	1335 W 11th St	Long Beach, CA 90813-2714
			Bernal Holding Company	29723 Knoll View Dr	Rancho Palos Verdes, CA 90275-6435
			1556 W 11th Street LLC	2600 Michelson Dr, #850	Irvine, CA 92612-6504
			KASCO	1458 El Monte Dr	Thousand Oaks, CA 91362-2124
			TRANS Harbor Inc	2501 Rosemead Blvd	South El Monte, CA 91733-1531
			BUEHLER ET AL TR/ BLACKWEILER ET AL TR	420 W. 42nd St, Apt 38E	New York, NY 10036-6866
			Church of the Good Shepherd	400 W Duarte Rd	Arcadia, CA 91007-6819
			1220 9th Street LLC	18303 Gridley Rd	Cerritos, CA 90703-5401
			Deep Pacific	250 W Wardlow Rd	Long Beach, CA 90807-4429

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FINAL INTEGRATED FEASIBILITY REPORT AND ENVIRONMENTAL IMPACT STATEMENT / ENVIRONMENTAL IMPACT REPORT (EIS/EIR)

APPENDIX K: EJSCREEN REPORTS

PORT OF LONG BEACH
DEEP DRAFT NAVIGATION STUDY
Los Angeles County, California

October 2021

US Army Corps of Engineers®

Port of LONG BEACH
THE PORT OF CHOICE

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USACE utilizes the online tool EJSCREEN to evaluate potential environmental justice issues. EJSCREEN is an environmental justice mapping and screening tool developed by the USEPA that provides a nationally consistent dataset and approach for combining environmental and demographic indicators. EJSCREEN users choose a geographic area; the tool then provides demographic and environmental information for that area. All of the EJSCREEN indicators are publicly available data. EJSCREEN simply provides a way to display this information and includes a method for combining environmental and demographic indicators into EJ indices.

The tool helps USACE identify areas with minority and/or low-income populations for purposes of evaluating whether there could be disproportionately high and adverse human health or environmental impacts on minority populations and/or low-income populations for purposes of evaluating compliance with Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations.

Further information on the tool can be found online at: https://www.epa.gov/ejscreen.

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EJSCREEN Report (Version 2018)

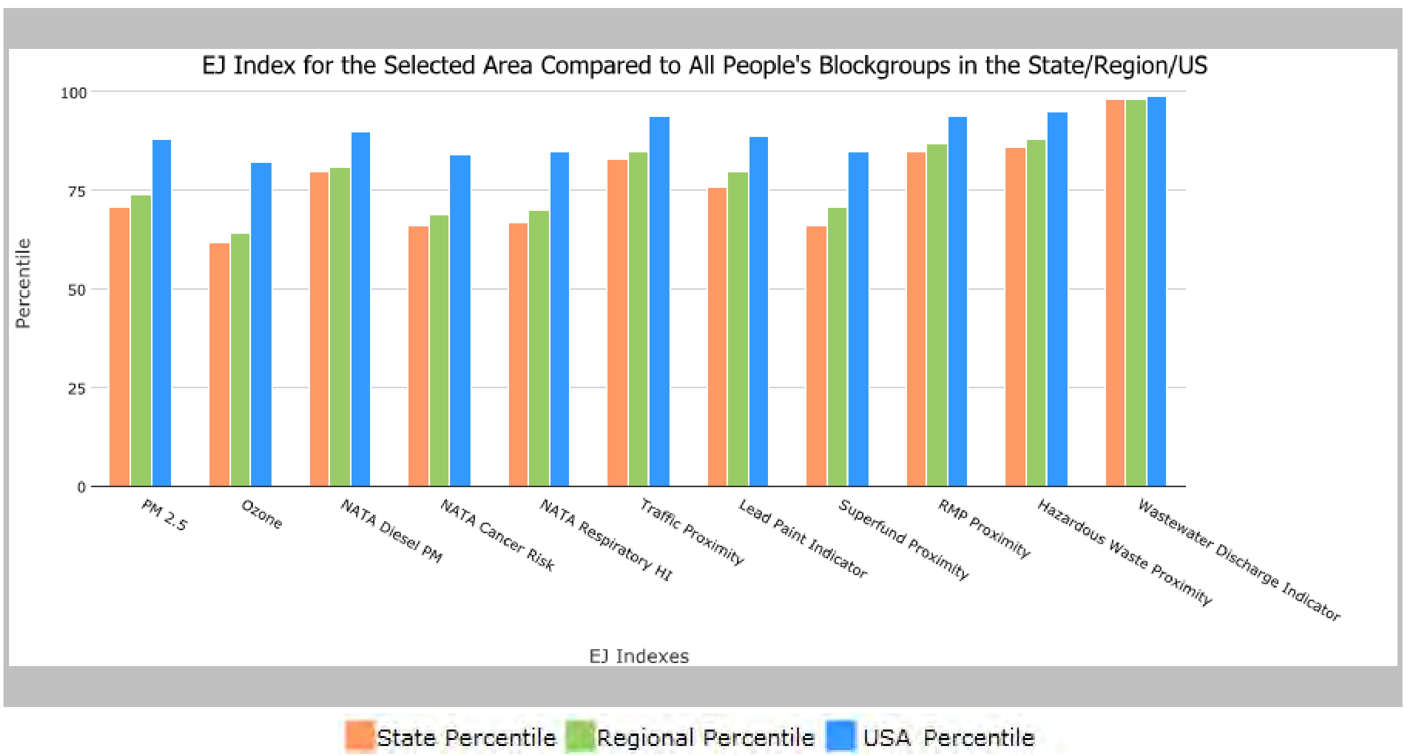
City: Long Beach, CALIFORNIA, EPA Region 9

Approximate Population: 469,743

Input Area (sq. miles): 51.44

(The study area contains 6 blockgroup(s) with zero population.)

Selected Variables	State Percentile	EPA Region Percentile	USA Percentile
EJ Indexes			
EJ Index for PM2.5	71	74	88
EJ Index for Ozone	62	64	82
EJ Index for NATA* Diesel PM	80	81	90
EJ Index for NATA* Air Toxics Cancer Risk	66	69	84
EJ Index for NATA* Respiratory Hazard Index	67	70	85
EJ Index for Traffic Proximity and Volume	83	85	94
EJ Index for Lead Paint Indicator	76	80	89
EJ Index for Superfund Proximity	66	71	85
EJ Index for RMP Proximity	85	87	94
EJ Index for Hazardous Waste Proximity	86	88	95
EJ Index for Wastewater Discharge Indicator	98	98	99



This report shows the values for environmental and demographic indicators and EJSCREEN indexes. It shows environmental and demographic raw data (e.g., the estimated concentration of ozone in the air), and also shows what percentile each raw data value represents. These percentiles provide perspective on how the selected block group or buffer area compares to the entire state, EPA region, or nation. For example, if a given location is at the 95th percentile nationwide, this means that only 5 percent of the US population has a higher block group value than the average person in the location being analyzed. The years for which the data are available, and the methods used, vary across these indicators. Important caveats and uncertainties apply to this screening-level information, so it is essential to understand the limitations on appropriate interpretations and applications of these indicators. Please see EJSCREEN documentation for discussion of these issues before using reports.

EJSCREEN Report (Version 2018)

City: Long Beach, CALIFORNIA, EPA Region 9

Approximate Population: 469,743

Input Area (sq. miles): 51.44

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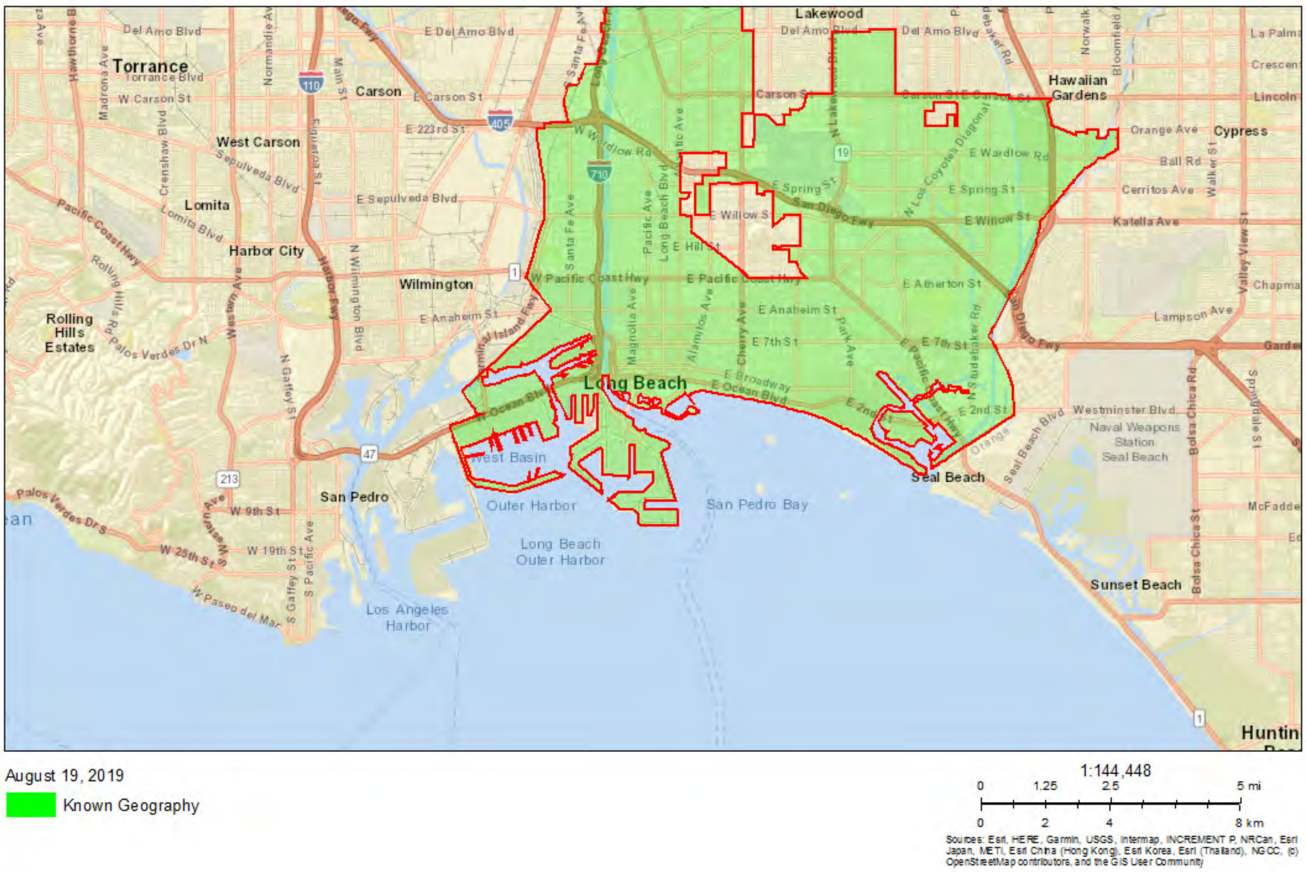


Sites reporting to EPA	
Superfund NPL	0
Hazardous Waste Treatment, Storage, and Disposal Facilities (TSDF)	26

EJSCREEN Report (Version 2018)

City: Long Beach, CALIFORNIA, EPA Region 9

Approximate Population: 469,743

Input Area (sq. miles): 51.44

(The study area contains 6 blockgroup(s) with zero population.)

Selected Variables	Value	State Avg.	%ile in State	EPA Region Avg.	%ile in EPA Region	USA Avg.	%ile in USA
Environmental Indicators							
Particulate Matter (PM 2.5 in µg/m^3)	13.4	10.7	82	10.1	86	9.53	97
Ozone (ppb)	40.3	47.4	26	48.3	20	42.5	30
NATA* Diesel PM (µg/m^3)	1.64	0.972	87	0.978	80-90th	0.938	80-90th
NATA* Cancer Risk (lifetime risk per million)	45	44	56	43	50-60th	40	60-70th
NATA* Respiratory Hazard Index	2.2	2.1	57	2	60-70th	1.8	70-80th
Traffic Proximity and Volume (daily traffic count/distance to road)	1900	1200	82	1100	83	600	93
Lead Paint Indicator (% Pre-1960 Housing)	0.56	0.29	78	0.24	82	0.29	80
Superfund Proximity (site count/km distance)	0.075	0.17	52	0.14	58	0.12	63
RMP Proximity (facility count/km distance)	2.1	1.1	84	0.97	87	0.72	91
Hazardous Waste Proximity (facility count/km distance)	6.1	3.3	82	2.8	85	4.3	92
Wastewater Discharge Indicator (toxicity-weighted concentration/m distance)	21	16	97	12	97	30	98
Demographic Indicators							
Demographic Index	57%	48%	63	47%	65	36%	79
Minority Population	72%	62%	57	59%	61	38%	80
Low Income Population	42%	35%	64	35%	64	34%	67
Linguistically Isolated Population	8%	9%	55	8%	59	4%	80
Population With Less Than High School Education	21%	18%	63	17%	66	13%	78
Population Under 5 years of age	7%	6%	59	6%	60	6%	63
Population over 64 years of age	10%	13%	46	13%	45	14%	35

* The National-Scale Air Toxics Assessment (NATA) is EPA's ongoing, comprehensive evaluation of air toxics in the United States. EPA developed the NATA to prioritize air toxics, emission sources, and locations of interest for further study. It is important to remember that NATA provides broad estimates of health risks over geographic areas of the country, not definitive risks to specific individuals or locations. More information on the NATA analysis can be found at: https://www.epa.gov/national-air-toxics-assessment.

For additional information, see: www.epa.gov/environmentaljustice

EJSCREEN Report (Version 2018)

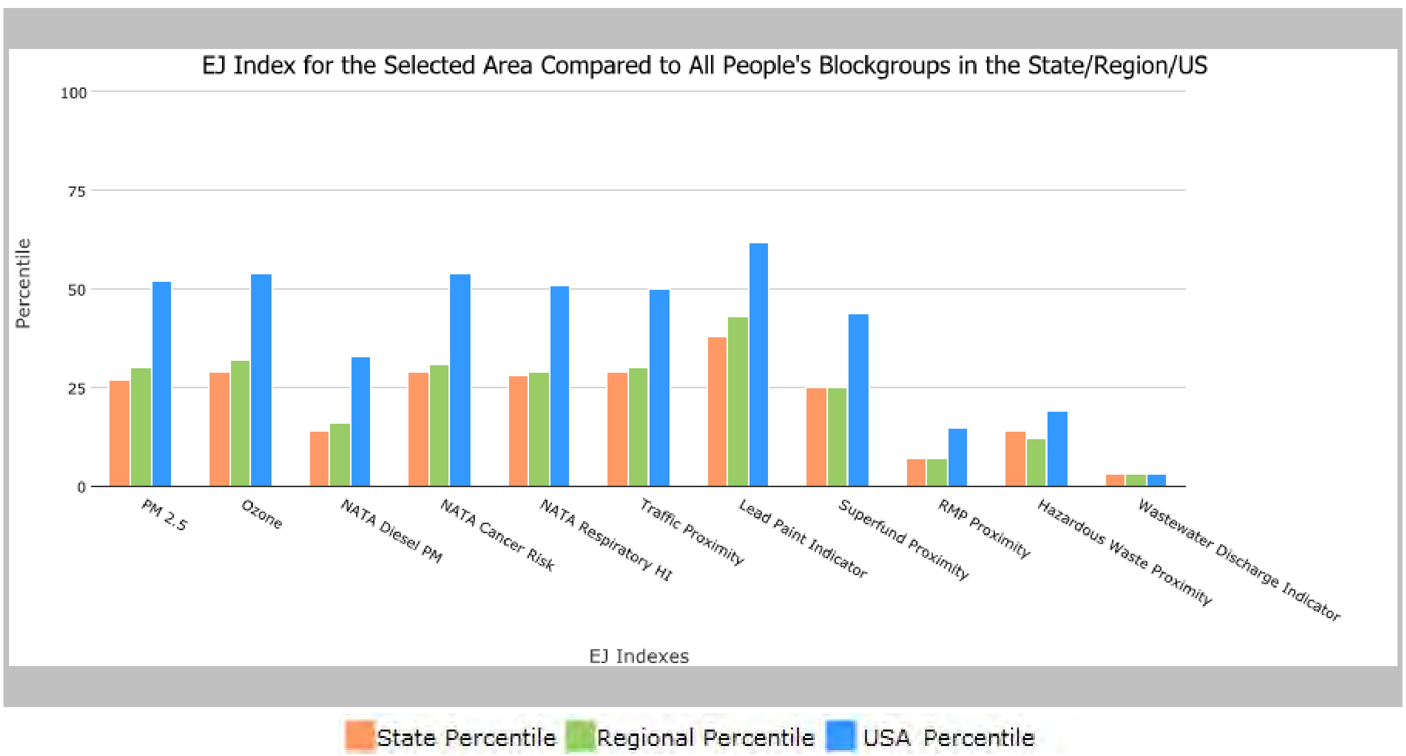
1 mile Ring around the Area, CALIFORNIA, EPA Region 9

Approximate Population: 3

Input Area (sq. miles): 15.79

(The study area contains 3 blockgroup(s) with zero population.)

Selected Variables	State Percentile	EPA Region Percentile	USA Percentile
EJ Indexes			
EJ Index for PM2.5	27	30	52
EJ Index for Ozone	29	32	54
EJ Index for NATA* Diesel PM	14	16	33
EJ Index for NATA* Air Toxics Cancer Risk	29	31	54
EJ Index for NATA* Respiratory Hazard Index	28	29	51
EJ Index for Traffic Proximity and Volume	29	30	50
EJ Index for Lead Paint Indicator	38	43	62
EJ Index for Superfund Proximity	25	25	44
EJ Index for RMP Proximity	7	7	15
EJ Index for Hazardous Waste Proximity	14	12	19
EJ Index for Wastewater Discharge Indicator	3	3	3



This report shows the values for environmental and demographic indicators and EJSCREEN indexes. It shows environmental and demographic raw data (e.g., the estimated concentration of ozone in the air), and also shows what percentile each raw data value represents. These percentiles provide perspective on how the selected block group or buffer area compares to the entire state, EPA region, or nation. For example, if a given location is at the 95th percentile nationwide, this means that only 5 percent of the US population has a higher block group value than the average person in the location being analyzed. The years for which the data are available, and the methods used, vary across these indicators. Important caveats and uncertainties apply to this screening-level information, so it is essential to understand the limitations on appropriate interpretations and applications of these indicators. Please see EJSCREEN documentation for discussion of these issues before using reports.

EJSCREEN Report (Version 2018)

1 mile Ring around the Area, CALIFORNIA, EPA Region 9

Approximate Population: 3

Input Area (sq. miles): 15.79

(The study area contains 3 blockgroup(s) with zero population.)

Sites reporting to EPA	
Superfund NPL	0
Hazardous Waste Treatment, Storage, and Disposal Facilities (TSDF)	4

EJSCREEN Report (Version 2018)

1 mile Ring around the Area, CALIFORNIA, EPA Region 9

Approximate Population: 3

Input Area (sq. miles): 15.79

(The study area contains 3 blockgroup(s) with zero population.)

Selected Variables	Value	State Avg.	%ile in State	EPA Region Avg.	%ile in EPA Region	USA Avg.	%ile in USA
Environmental Indicators							
Particulate Matter (PM 2.5 in µg/m^3)	12.2	10.7	67	10.1	73	9.53	93
Ozone (ppb)	38.3	47.4	19	48.3	15	42.5	21
NATA* Diesel PM (µg/m^3)	2.44	0.972	97	0.978	95-100th	0.938	95-100th
NATA* Cancer Risk (lifetime risk per million)	34	44	17	43	<50th	40	<50th
NATA* Respiratory Hazard Index	1.9	2.1	43	2	<50th	1.8	60-70th
Traffic Proximity and Volume (daily traffic count/distance to road)	17	1200	13	1100	17	600	24
Lead Paint Indicator (% Pre-1960 Housing)	0	0.29	10	0.24	16	0.29	10
Superfund Proximity (site count/km distance)	0.074	0.17	51	0.14	58	0.12	63
RMP Proximity (facility count/km distance)	2.8	1.1	90	0.97	91	0.72	95
Hazardous Waste Proximity (facility count/km distance)	3.3	3.3	66	2.8	72	4.3	85
Wastewater Discharge Indicator (toxicity-weighted concentration/m distance)	0.99	16	90	12	90	30	95
Demographic Indicators							
Demographic Index	32%	48%	26	47%	28	36%	52
Minority Population	63%	62%	49	59%	52	38%	75
Low Income Population	0%	35%	0	35%	0	34%	0
Linguistically Isolated Population	0%	9%	16	8%	19	4%	44
Population With Less Than High School Education	12%	18%	47	17%	49	13%	59
Population Under 5 years of age	2%	6%	8	6%	8	6%	9
Population over 64 years of age	9%	13%	37	13%	36	14%	28

* The National-Scale Air Toxics Assessment (NATA) is EPA's ongoing, comprehensive evaluation of air toxics in the United States. EPA developed the NATA to prioritize air toxics, emission sources, and locations of interest for further study. It is important to remember that NATA provides broad estimates of health risks over geographic areas of the country, not definitive risks to specific individuals or locations. More information on the NATA analysis can be found at: https://www.epa.gov/national-air-toxics-assessment.

For additional information, see: www.epa.gov/environmentaljustice

FINAL INTEGRATED FEASIBILITY REPORT AND ENVIRONMENTAL IMPACT STATEMENT / ENVIRONMENTAL IMPACT REPORT (EIS/EIR)

APPENDIX L: APPLICATION SUMMARY REPORT

PORT OF LONG BEACH
DEEP DRAFT NAVIGATION STUDY
Los Angeles County, California

October 2021

US Army Corps of Engineers®

Port of LONG BEACH
THE PORT OF CHOICE

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APPLICATION SUMMARY REPORT

1.1 Introduction

The California Coastal Act of 1976 (CCA or Coastal Act) requires the Port of Long Beach (Port or POLB) to prepare and adopt master plans for land and water areas within its boundaries that are located within the coastal zone. The Port's most recent plan to be comprehensively updated and certified was the 1990 Port Master Plan (PMP). The Port adopted Guidelines for Implementation of the Port of Long Beach Certified Port Master Plan in July 1996 (Guidelines). Adopted as Ordinance HD-1701, the purpose of the Guidelines is to provide the Board of Harbor Commissioners (BHC or Board) with the necessary procedures, objectives, and criteria for the implementation of City Charter Section 1215 and the PMP in accordance with provisions of the CCA. Section 3 of the Guidelines, states that the Board shall not approve or grant an application for a permit unless a determination has been made by the Board that either the project conforms with the Certified Port Master Plan, or the project is exempt from the provisions of the Coastal Act and a permit is not required. POLB is currently updating its PMP and expects certification of the update next year (the 2021 PMP update).

Section 6.5 of the Guidelines requires the preparation of a summary report of each application filed. The Application Summary Report (ASR) requires presentation of a description of the significant features of the proposed project, applicable policies of the Port Master Plan and Coastal Act, as well as summaries of environmental impact reports and other environmental and geotechnical evaluations. This ASR, in conjunction with the environmental impact report (EIR), is prepared in accordance with the Port PMP, as amended, and the CCA.

The proposed Deep Draft Navigation and Channel Deepening Project (proposed Project), which would be undertaken jointly by the U.S. Army Corps of Engineers and the POLB, would deepen the approach channel to -80 feet (ft) mean lower low water (MLLW), bend-easing sections of the main channel to a depth of -76 ft MLLW, construct an approach channel to Pier J to an authorized depth of -55 ft MLLW, and deepen the West Basin to -55 ft MLLW. The proposed Project comprises feasible dredging and disposal measures, in accordance with federal and state guidelines, including the POLB's environmental protection guidelines. In addition to the activities listed above, the POLB would also deepen additional locations within the harbor to an authorized depth of -55 MLLW: the Pier J slip, including berths J266–J270. Structural improvements would also be performed on the Pier J breakwaters at the entrance to the Pier J slip to accommodate deepening of the slip and approach channel to -55 ft MLLW. These activities would be undertaken solely by the POLB.

As discussed below, the proposed Project is in conformance with the stated policies of the PMP and the CCA. The ASR and proposed staff recommendations have been prepared to evaluate the proposed Project for consistency with both the certified 1990 PMP, as amended, as well as the 2021 PMP update. In the consistency analysis discussed below, the proposed Project is demonstrated to be in conformance with the stated policies of both PMPs and the CCA. In addition, this document will be circulated for public review and will become effective upon certification by the Board of Harbor Commissioners. Section 6.3 contains the special conditions that would be imposed upon the proposed Project or any of the build alternatives.

1.2 Consistency with the California Coastal Act

Relevant sections of the CCA are listed below, with a brief discussion of each.

1.2.1 Chapter 3 (Coastal Resources Planning and Management Policies)

As discussed below, Section 30715 of Chapter 8 of the CCA may result in an interpretation by the California Coastal Commission (CCC) that the proposed Project represents an appealable development. The policies of Chapter 3 constitute the standards by which the adequacy of local coastal programs and the permissibility of proposed developments subject to the provisions are determined. These policies relate to:

- Public Access (Article 2: Sections 30210 – 30214)
- Recreation (Article 3: Sections 30220 – 30224)
- Marine Environment (Article 4: Sections 30230 – 30236)
- Land Resources (Article 5: Sections 30240 – 30244)
- Development (Article 6: Sections 30250 – 30255)
- Industrial Development (Article 7: Section 30260 – 30265.5)

The proposed Project would not restrict public access or recreational opportunities. No new development or activities would occur that would affect access or recreation within the harbor. Marine resources, such as biological and water quality would be temporarily impacted during dredging. However, there are no environmentally sensitive habitat areas that would be impacted, and nominal impacts have been determined to be less than significant in the EIR. Improvements to the Pier J breakwaters would occur to reinforce the structure as a result of deeper dredging, and not result in new or expansion of uses or alteration of the natural shoreline. Commercial fishing and boating would not be affected as a result of the proposed Project. No agricultural or timberland areas are located within the project area that would be affected. No scenic resources are located within the vicinity of the project area, and existing visual conditions would be maintained without significantly impacting the project area. The proposed Project would not increase risks to life, property, or structural integrity, or otherwise result in adverse impacts other than air quality, which have been analyzed in the EIR. Mitigation in the form of an electric clam shell dredge will be incorporated to reduce air emissions. The proposed project does not propose any new industrial development. Therefore, for the reasons discussed above, the proposed Project would be consistent with Chapter 3 of the CCA.

1.2.2 Chapter 8 (Ports)

In accordance with the CCA, the coastal zone includes all areas within 3 miles seaward and approximately 1,000 yards inland, depending on the level of existing inland development. Chapter 8 of the CCA recognizes California ports, including the POLB, as primary economic and coastal resources that are essential elements of the national maritime industry (Section 30701[a]). Relevant Chapter 8 sections of the CCA are listed below, and their relationship to the proposed Project is discussed.

1.2.2.1 Section 30705

(a) *Water areas may be diked, filled, or dredged when consistent with a certified Port master plan only for the following:*

1. *Such construction, deepening, widening, lengthening, or maintenance of ship channel approaches, ship channels, turning basins, berthing areas, and facilities that are required for the safety and the accommodation of commerce and vessels to be served by port facilities.*

The Port currently experiences navigational challenges, including existing channel depths that do not meet the draft requirements of the current and future fleet of larger container and liquid bulk vessels. Tide restrictions, light loading, lightering, and other operational inefficiencies result in economic inefficiencies that translate into increased costs for the national economy. Container movements along the secondary channels serving Pier J and Pier T/West Basin, as well as liquid bulk vessel movements along the main channel, have been identified as constrained by current conditions. The proposed Project would increase transportation efficiencies for container and liquid bulk vessels operating in the POLB for both the current and future fleet and improve conditions for vessel operations and safety by dredging several areas of the harbor and the approach channel. This change would continue efforts to improve navigational efficiency and vessel safety throughout the POLB.

Dredging would be planned, scheduled, and carried out to minimize disruptions to fish and bird breeding and migration, marine habitats, and water circulation. Bottom sediments or sediment elutriate would be analyzed for toxicants prior to dredging; where water quality standards are met, dredged spoils may be deposited in open coastal water sites designated to minimize potential adverse impacts on marine organisms or in confined coastal waters designated as fill sites, in accordance with regulatory permits and the master plan, where the spoil can be isolated and contained or in fill basins on upland sites. Dredged material would not be transported from coastal waters into estuarine or freshwater areas for disposal. Excavated materials would be hauled by barge and disposed of at permitted ocean disposal facilities or nearby borrow pits.

1.2.2.2 Section 30708

All port-related developments shall be located, designed, and constructed so as to:

(a) Minimize substantial adverse environmental impacts.

The proposed Project would reduce wait times within the harbor and reduce loading and unloading delays for deeper-drafting liquid bulk vessels. The proposed Project would incorporate several minimization measures to avoid or reduce impacts on water quality and biological resources. The proposed Project would result in significant impacts on air quality from emissions associated with dredging activities. Although several mitigation measures have been identified and incorporated that would reduce impacts, including the use of an electric dredge, impacts would remain significant and unavoidable.

(c) Give highest priority to the use of existing land space within harbors for Port purposes.

The proposed Project would not involve the use of existing land space. The proposed Project would improve existing navigation channels within the Port complex and would not require zone changes or changes to existing land uses. The dredging and deepening of harbor waters would allow the terminals to continue to operate efficiently for Port purposes related to national and regional goods movement, thereby promoting maritime commerce. Container movements along the secondary channels serving Pier J and Pier T/West Basin and liquid bulk vessel movements along the main channel would be improved, thereby reducing transportation costs and vessel congestion and increasing the Port's competitiveness. Removing channel and berth restrictions so as to increase the vessels' maximum practicable loading capacity, would result in fewer vessel trips to transport the forecast cargo, and the proposed Project would contribute to the efficient functioning of the Port. While the proposed Project could accommodate larger ships, larger ships alone do not drive growth for the harbor. Many factors may influence the growth of a particular harbor, and harbor depth is just one of many involved in determining growth and market share for a particular port. The economic analysis for the proposed Project was conducted with the historical cargo share at the POLB remaining the same in both the future without-project and future with-project conditions. Cargo may vary in the future as investments are made in port facilities and supporting infrastructure, and long-term leases are renewed or changed at individual terminals; however, the POLB's share of cargo is expected to remain relatively consistent with growth in the future being attributed to GDP growth for the U.S. West Coast and associated hinterland based on the information provided in the commodity forecast conducted for the IFR study (Mercator 2016). Based on that evaluation, the analysis assumes that the POLB will receive a relatively similar share of regional cargo volumes with or without navigation improvements. Thus, since the proposed Project would not accommodate an increase in throughput, the efficiencies gained by the proposed Project would result in fewer, but larger, vessels within the harbor.

1.2.2.3 Section 30715

Section 30715 identifies the California Coastal Commission's permit authority and the process for appealable approvals, as follows:

(a) Until such time as a port master plan or any portion thereof has been certified, the commission shall permit developments within ports as provided for in Chapter 7 (commencing with Section 30600). After a port master plan or any portion thereof has been certified, the permit authority of the commission provided in Chapter 7 (commencing with Section 30600) shall no longer be exercised by the commission over any new development contained in the certified plan or any portion thereof and shall at that time be delegated to the appropriate port governing body, except that approvals of any of the following categories of development by the port governing body may be appealed to the commission:

(1) Developments for the storage, transmission, and processing of liquefied natural gas and crude oil in such quantities as would have a significant impact upon the oil and gas supply of the state or nation or both the state and nation. A development which has a significant impact shall be defined in the master plans.

(2) Waste water treatment facilities, except for those facilities which process waste water discharged incidental to normal port activities or by vessels.

(3) Roads or highways which are not principally for internal circulation within the port boundaries.

(4) Office and residential buildings not principally devoted to the administration of activities within the port; hotels, motels, and shopping facilities not principally devoted to the sale of commercial goods utilized for water-oriented purposes; commercial fishing facilities; and recreational small craft marina related facilities.

(5) Oil refineries.

(6) Petrochemical production plants.

(b) If maintenance dredging is part of, or is associated with, any category of development specified in paragraphs (1) to (6), inclusive, of subdivision (a), the commission shall not consider that maintenance dredging in its review and approval of those categories.

The proposed Project involves dredging to improve the navigation by liquid bulk vessels, which transport crude oil. The CCC may interpret Section (a)(1) to apply to the proposed project, in which case the project may be characterized as an appealable project under the CCA.

1.2.2.4 Section 30233

Any offshore disposal of dredged materials that is to occur outside of the Port would be subject to the standard of review for dredged material disposal in Section 30233 of the CCA. The relevant sections are presented below.

(a) The diking, filling, or dredging of open coastal waters, wetlands, estuaries, and lakes shall be permitted in accordance with other applicable provisions of this division, where there is no feasible less environmentally damaging alternative, and where feasible mitigation measures have been provided to minimize adverse environmental effects, and shall be limited to the following:

(1) Maintaining existing, or restoring previously dredged, depths in existing navigational channels, turning basins, vessel berthing and mooring areas, and boat launching ramps.

(2) Restoration purposes.

(3) Nature study, aquaculture, or similar resource dependent activities.

(b) Dredging and spoils disposal shall be planned and carried out to avoid significant disruption to marine and wildlife habitats and water circulation. Dredged spoils suitable for beach replenishment should be transported for these purposes to appropriate beaches or into suitable longshore current systems.

The proposed Project comprises feasible dredging and placement/disposal measures, in accordance with federal and state guidelines, including POLB environmental protection guidelines. Dredged material would be disposed of at a nearshore placement site (Surfside Borrow Site), an ocean-dredged material disposal site (LA-2 and/or LA-3), or a combination of the two. The nearshore placement site (Surfside Borrow Area) can accommodate about 2.5 million cubic yards (mcy) of dredged material. LA-2 and LA-3 have annual disposal volumes of 1.0 and 2.5 mcy, respectively, from all sources. It is assumed that 0.9 mcy for LA-2 and 2.2 mcy for LA-3 is available for use by the proposed Project annually. It is assumed that dredging would be performed using a hopper dredge as well as a clamshell dredge. To minimize transit time, the disposal of material from the hopper dredge would maximize use of the nearshore site, while a clamshell dredge would be evaluated for disposal at an ocean-dredged material disposal site. All disposal options have been previously analyzed and permitted.

1.3 Consistency with the Port Master Plans

As discussed above, this ASR has been prepared to evaluate the proposed Project for consistency with both the certified 1990 PMP, as amended, as well as the 2021 PMP update. Both are described below.

1.3.1 1990 PMP

Under the 1990 PMP, the proposed Project site is within Harbor Planning District 4 (Terminal Island Planning District), District 5 (Middle Harbor Planning District), District 6 (Southwest Harbor Planning

District), District 7 (Navigation Planning District), District 8 (Southeast Harbor Planning District), and District 10 (Outer Harbor Planning District). The proposed Project is consistent with (a) permitted Port-related industrial and navigation uses associated with the harbor planning districts and (b) overall goals stipulated in the PMP and the long-range planning goals for the Terminal Island, Middle Harbor, and Southwest Harbor Planning Districts to increase primary Port use, as well as the navigation goal, and the Outer Harbor Planning District's goal to help navigation.

1.3.1.1 1990 PMP Goals and Objectives

The 1990 PMP identifies six long-range planning goals and objectives for developing Port policies involving future Port development and expansion. Among the goals for Port development in Chapter IV of the PMP, the proposed Project would support the relevant goals summarized below.

Goal 2: Encourage maximum use of facilities.

The proposed Project would allow more efficient use of navigational channels and existing terminals within the Port. However, the proposed Project would not result in increased use or throughput of the terminal facilities because of existing backland constraints. Objectives under Goal 2 would be met by the proposed Project.

Goal 4: Provide for the safe cargo handling and movement of vessels within the Port.

The objectives of Goal 4 are to deepen channels and basins to accommodate supertanker and post-panamax vessels, and separation of ocean-going vessels and recreational small craft. The need for the project is to address transportation inefficiencies at the POLB, which occur when channels and maneuvering areas do not fully accommodate the vessels using them. Existing channel depths, and in some areas, channel widths, do not meet the draft requirements of the current and future fleet of larger container and liquid bulk vessels that call on POLB. Tide restrictions, light loading, lightering, and other operational inefficiencies result in vessel congestion, increased wait times, and delays in loading and unloading. The increased channel depths would allow for shippers to replace smaller, less efficient vessels with larger, more efficient vessels that are not subject to these restrictions. Thus, the proposed Project would reduce vessel congestion, and the number of vessels calling at the Port, thereby improving safety and allowing for better separation between ocean-going vessels and recreational small craft. The proposed Project would be consistent with Goal 4 by improving the movement of vessels within the Port.

Goal 5: Develop land for primary Port facilities and Port-related uses.

Although the proposed Project would not involve land development, the dredging and deepening of harbor waters would allow the terminals to continue to operate efficiently for Port purposes related to national and regional goods movement, thereby promoting maritime commerce. Container movements along the secondary channels serving Pier J and Pier T/West Basin and liquid bulk vessel movements along the main channel would be improved, thereby reducing transportation costs and vessel congestion and increasing the Port's competitiveness. By recognizing the importance of removing channel and berth restrictions so as to increase the vessels' maximum practicable loading capacity, accommodating larger vessels, and resulting in fewer vessel trips to transport the forecast cargo, the proposed Project would contribute to the efficient functioning of the Port and would use the site in accordance with its highest priority. Objectives under Goal 5 would be met by the proposed Project.

1.3.1.2 1990 PMP Elements

In addition to the long-range planning goals addressed above, the 1990 PMP also identifies plan elements that focus on specific areas where a Port-wide review is pertinent compared to individual district plans. Plan elements identified in the PMP are listed below.

A. Public Access, Visual Quality, and Recreation/Tourism
B. Navigation
C. Environmental
D. Vehicular Transportation/Circulation
E. Intermodal Rail Facilities
F. Oil Production and Operations

For each of these plan elements, the PMP identifies planning goals, issues or areas of controversy, and recommendations for implementation, including a course of action for correcting, alleviating, and/or necessitating further study of the issue (POLB 1990). Of these, Elements B and C are applicable to the proposed Project, as discussed below.

1.3.1.2.1 Element B: Navigation Element

In addition to the general planning goals identified in the PMP, the Navigation Element details the need for developing and supporting a world fleet, including liquid bulk, dry bulk, and post-Panamax container vessels; maintaining navigational capabilities within the harbor district; and minimizing vessel congestion. The proposed Project would support the following Navigation Element goals:

Goal 1: Remain current to the changing needs of the maritime industry with respect to deep water access to commercial berths and anchorage areas by deepening channels to accommodate the existing and future tanker, dry bulk, and general cargo fleet.
Goal 3: Continue to facilitate access to anchorage areas within and adjacent to the harbor.
Goal 4: Minimize vessel congestion possibilities by properly coordinating and arranging ancillary Port uses (i.e., sport fishing; marine contracting, etc.) to complement primary Port activities.

The proposed Project would help the Port attain these goals by allowing for a more efficient future fleet mix, reducing vessel congestion, increasing the reliability of the channel depth to encourage more efficient vessels, and removing channel restrictions to increase the vessels' maximum practicable loading capacity to transport forecast cargo. The proposed Project would help the Port attain these goals by improving the existing navigation channels within the POLB, which, in turn, would allow greater efficiency of current and future container and liquid bulk vessel operations. The proposed Project would be implemented in accordance with the Navigation Element and consistent with the PMP.

1.3.1.2.2 Element C: Environmental Element

The Environmental Element details the Port's environmental objective to protect, maintain, enhance, and restore the overall quality of both the human-made and the natural coastal environment. The Environmental Element encompasses the need for careful planning for Port development and implementation of environmental regulatory compliance. The issues of concern for this element are as follows: air quality, habitat preservation/marine mitigation, hazardous waste, and permit processing.

Of the five goals identified in the Environmental Element, the proposed Project would support the following:

Goal 1: Minimize pollutant levels from existing and future sources.

The proposed Project would minimize pollutant levels by mitigating air emissions from dredging activities. In addition, a reduction in vessel congestion through the channel would help minimize pollutant levels from existing and future resources. With implementation of the proposed Project's features and improvements, existing channel congestion would be reduced along with its associated pollutants.

Goal 2: Minimize habitat loss within Port boundaries.

Although the proposed Project could result in some impacts on benthic habitat in regard to turbidity and water quality, impacts would be localized and temporary. Water quality monitoring would be performed in accordance with regulatory permits during dredging activities. Therefore, the proposed Project would be implemented in accordance with the Environmental Element and consistent with the PMP.

1.3.1.3 1990 PMP District Goals

The proposed Project area is large and covers several planning districts within the Port. The proposed improvements at Pier T/West Basin would occur primarily in District 4, Terminal Island Planning District, which is designated for primary Port facilities, Port-related industries and facilities, ancillary Port facilities, federal uses, utilities, hazardous cargo facilities, navigation, and oil and gas production. The proposed main channel bend-easing improvements would occur within District 5, Middle Harbor Planning District, which is designated for primary Port facilities, Port-related, oil production, and ancillary Port facilities, and District 7, Navigation Planning District, which is designated for navigation uses. Deepening of the channel to Pier J would occur in District 8, Southeast Harbor Planning District. The proposed improvements at the Pier J approach would be located in District 10, Outer Harbor Planning District, which is designated for navigation and maneuvering.

The proposed Project's consistency with each of these planning districts from the 1990 PMP is described below.

1.3.1.3.1 District 4 – Terminal Island Planning District

Goal 1: Acquire excess Navy property as it becomes available.
Goal 2: Redevelop excess Navy property for development of Port facilities.

1.3.1.3.1.1 Permitted Uses

Permitted uses for the Terminal Island Planning District include the following: primary Port facilities, Port-related industries and facilities, ancillary Port facilities, hazardous cargo facilities, navigation, and oil and gas production.

The proposed Project would improve the Port's ability to support Port-related uses and therefore would be consistent with the permitted uses within the Terminal Island Planning District.

1.3.1.3.2 District 5 – Middle Harbor

Goal 1: Expand primary Port facilities.
Goal 2: Consolidate and abandon oil wells whenever possible.

1.3.1.3.2.1 Permitted Uses

This district's permitted uses are primary Port facilities, Port-related, oil production, and ancillary Port facilities. The proposed channel bend easing would benefit the primary and ancillary Port uses within District 5.

1.3.1.3.3 District 7 – Navigation Area

Goal 1: Maintain and improve access for vessels entering and leaving the Port.

1.3.1.3.3.1 Permitted Uses

The permitted use for the Navigation Planning District is navigation.

The proposed Project would provide deepening and bend-easing improvements to the main channel, which would be consistent with the permitted uses within the Navigation Planning District.

1.3.1.3.4 District 8 – Southeast Harbor Planning District

The PMP identifies one goal for this district:

Goal 1: Modernize and maximize use of existing and future facilities.

The proposed Project would be consistent with the goals of District 8 because the primary components of the proposed Project would dredge Port facilities to accommodate deep-draft berthing, support a more efficient future fleet mix, and reduce vessel congestion.

1.3.1.3.4.1 Permitted Uses

The permitted uses for the Southeast Harbor Planning District include the following: primary Port facilities, Port-related operations, oil production, and ancillary Port facilities.

The proposed Project would be consistent with the designated uses of this district because would support primary Port facilities and include improvements to Port-related operations by bend-easing the channel.

1.3.1.3.5 District 10 – Outer Harbor

The PMP identifies one goal for this district:

Goal 1: Maintain and improve vessel access and manageability.

The proposed Project would be consistent with Goal 1 of District 10 because it would modernize Port facilities to maximize uses and cargo support.

1.3.1.3.5.1 Permitted Uses

The permitted uses for the Southeast Harbor Planning District include the following: navigation and maneuvering.

The proposed Project would be consistent with the designated uses of District 10 because it would provide improvements to the Pier J approach channel, which would be consistent with navigation and maneuvering uses.

1.3.2 2021 PMP Update

Under the PMP update (certification anticipated 2021), the proposed Project site is within Harbor Planning District 4 (West Basin) and District 5 (Southeast).

The proposed Project would be consistent with (a) permitted primary Port facilities use, maritime support facilities use, navigable corridor use, and maneuvering and berthing use associated with these harbor planning districts and (b) overall goals stipulated in the 2021 PMP update.

1.3.2.1 2021 PMP Goals and Objectives

The 2021 PMP update identifies four long-range planning goals and corresponding objectives for Port development that are designed to maintain flexibility, respond to Port tenant needs, and allow the Port to respond effectively to requirements dictated by national and international economic trends. Among the proposed goals for Port development in the 2021 PMP update, the proposed Project would support the following:

Goal 1: Accommodate Forecasted Demand for Diverse Cargoes

The proposed Project would reduce vessel congestion, increase the opportunity for a more efficient fleet mix, and reduce loading and unloading delays for deeper drafting liquid bulk vessels, providing more efficient operations on existing terminals to accommodate existing and forecasted demand. Objectives under Goal 1 would be met by the proposed Project.

Goal 2: Develop Modern Terminal Facilities with Efficient Operations

The proposed Project would not directly develop terminal facilities but would be designed to support ongoing and future operations within the harbor and at terminal facilities for current and future container vessels and deeper drafting liquid bulk vessels. Objectives under Goal 2 would be met by the proposed Project.

Goal 3: Integrate Green Port Policy and Land Use Planning

The proposed Project would help the Port attain Goal 3 by increasing the reliability of the channel depth, which would encourage shippers to replace smaller, less efficient vessels with larger, more efficient vessels, which would reduce the number of smaller ships in the channel and result in fewer environmental impacts on the channel. Existing channel depths, and in some areas, channel widths, do not meet the draft requirements of the current and future fleet of larger container and liquid bulk vessels that call on POLB.

Tide restrictions, light loading, lightering, and other operational inefficiencies result in vessel congestion, increased wait times, and delays in loading and unloading. The increased channel depths would allow for shippers to replace smaller, less efficient vessels with larger, more efficient vessels that are not subject to these restrictions. In addition, the proposed Project would minimize pollutant levels by mitigating air emissions from dredging activities through the use of electric dredging equipment. Therefore, the proposed Project would be implemented in accordance with Goal 3 and consistent with the PMP.

1.3.2.2 2021 PMP Update District Elements

In addition to the long-range planning goals addressed above, the 2021 PMP update also includes Plan elements, which provide the policy framework for future POLB development and Port-wide guidance on major operational/functional areas and policy areas. The PMP update includes eight plan elements:

1. Public Access and Recreation
2. Environment and Sustainability
3. Climate Change Adaptation
4. Transportation and Circulation
5. Navigation
6. Terminal Operations
7. Intermodal Rail
8. Oil Operations

Each of these plan elements consists of planning goals and issues and recommended actions. Of these elements, Element 2, Environment and Sustainability; Element 5, Navigation; and Element 6, Terminal Operations, are relevant to the proposed Project, as discussed below.

1.3.2.2.1 Element 2: Environment and Sustainability Element

The Environment and Sustainability Element embodies the Port's ongoing efforts to preserve and enhance the environment through innovative goods movement, natural resources stewardship, and sustainable Port operations and policy. The Environment and Sustainability Element is complementary to the Green Port Policy, which was adopted by the Board of Harbor Commissioners in January 2005.

Of the six goals identified for the Environment and Sustainability Element, the proposed Project would support the following planning goal:

Goal 1: Reduce environmental and health impacts from Port operations.

The proposed Project would help the Port attain this element goal by increasing the reliability of the channel depth, which would encourage shippers to replace smaller, less efficient vessels with larger, more efficient vessels, which would reduce the number of smaller ships in the channel and result in fewer environmental impacts on the channel. In addition, the proposed Project would minimize pollutant levels by mitigating air emissions from dredging activities through the use of electric dredging equipment.

1.3.2.2.2 Element 5: Navigation Element

The Navigation Element details the need for accommodation of diverse fleets, including liquid bulk, dry bulk, and post-Panamax container vessels within the harbor district. The Navigation Element also includes the need for proper sediment management and navigational safety within the harbor district.

The proposed Project would support the following planning goals under the Navigation Element:

Goal 1: Provide deep-water access to commercial berths and anchorage areas to accommodate existing and future vessels.
Goal 2: Enhance navigation capabilities for vessel safety while transiting or maneuvering within the harbor.
Goal 3: Improve access to anchorage areas within and adjacent to the harbor's main channel.

The proposed Project would help the Port attain these goals by allowing for a more efficient future fleet mix, reducing vessel congestion, increasing the reliability of channel depths to encourage more efficient vessels, and improving the existing navigation channels within the POLB, which, in turn, would allow greater efficiency of current and future container and liquid bulk vessel operations.

1.3.2.2.3 Element 6: Terminal Operations Element

The Terminal Operations Element is a new plan element that details the Port's need to accommodate forecast demand for containerized and non-containerized cargo as well as updates to terminal operational elements to accommodate changes in vessel sizes, increases in terminal capacities, the intermodal supply chain, and advances in technology. The proposed Project would support the following planning goals under the Terminal Operations Element:

Goal 1: Enhance the capacities of container terminals to accommodate future demand.
Goal 2: Promote cargo diversity.
Goal 3: Streamline the movement of cargo within the Port complex.
Goal 4: Modernize container terminals to improve operational efficiency.
Goal 5: Transition to cleaner operations consistent with the Clean Air Action Plan.

Although the proposed Project would not directly develop terminal facilities, it would help the Port attain these goals with the proposed Project's improvements at Pier T/West Basin, improving conditions and transportation efficiencies for container and liquid bulk vessels, and removing channel restrictions to increase vessels' maximum loading capacity for transporting the forecast cargo of the present and future.

The proposed Project would be implemented in accordance with all plan elements and consistent with the PMP, as summarized above.

1.3.2.3 2021 PMP Update District Goals

The proposed Project is within Districts 4 (West Basin), 5 (Southeast), and 6 (Anchorage and Open Water). The 2021 PMP update identifies goals and permitted uses for each planning district. The goals and permitted uses relevant to the proposed Project are described below.

1.3.2.3.1 District 4 – West Basin

Goal 1: Accommodate container cargo forecast associated with international container market demands.
Goal 5: Provide safe navigation for bigger liquid bulk vessels to Pier T.

The proposed Project would be consistent with Goals 1 and 5. The project would deepen channels, maneuvering areas, and berths to accommodate the current and future fleet of larger container and liquid bulk vessels that call on POLB. The project would also alleviate restrictions on vessel calls and maneuvers that are currently constrained by tidal fluctuations, light loading, lightering, and other operational inefficiencies result in vessel congestion, increased wait times, and delays in loading and unloading. Furthermore, the project includes bend-easing portions of the Main Channel (bend easing) to a depth of -76 ft MLLW to improve navigation of larger liquid build vessels calling at Pier T. These improvements would be consistent with Goals 1 and 5 in District 4.

1.3.2.3.1.1 Permitted Land and Water Uses

The permitted uses for the West Basin Planning District include the following: primary Port facilities and Port-related facilities, hazardous cargo facilities, maritime support facilities, institutional facilities, oil and gas production, renewable energy resources, environmental protection, utilities, navigable corridor, maneuvering and berthing, and sediment management areas.

The proposed Project would improve maneuvering and berthing in the channels and support primary Port facilities. The proposed Project would therefore be consistent with permitted land and water uses for the West Basin Planning District.

1.3.2.3.2 District 5 – Southeast

Goal 1: Accommodate container cargo forecast associated with international container market demands.
Goal 5: Provide safe navigation for larger ships in the Main Channel, turning basins, and berths and while maneuvering.

The project would deepen channels, maneuvering areas, and berths to accommodate the current and future fleet of larger container and liquid bulk vessels that call on POLB. The project would also alleviate restrictions on vessel calls and maneuvers that are currently constrained by tidal fluctuations, light loading, lightering, and other operational inefficiencies result in vessel congestion, increased wait times, and delays in loading and unloading. Furthermore, the project includes bend-easing portions of the Main Channel (bend easing) to a depth of -76 ft MLLW to improve navigation of larger liquid build vessels calling at Pier T. These improvements would be consistent with Goals 1 and 5 in District 5.

1.3.2.3.2.1 Permitted Land and Water Uses

The permitted uses for the Southeast Planning District include the following: primary Port facilities and Port-related facilities, maritime support facilities, oil and gas production, hazardous cargo facilities, institutional facilities, environmental protection, navigable corridor, maneuvering and berthing, and sediment management areas.

The proposed Project would improve the navigable corridor and maneuvering and berthing in the channels and support primary Port facilities. The proposed Project would therefore be consistent with permitted land and water uses for District 5.

1.4 Special Conditions

In some instances where the proposed Project presents no significant impact and no mitigation is required, there may be additional "Special Conditions" imposed on the Project by the Port that would further lessen a "no significant impact" finding to a level below a significance threshold or potentially eliminate an impact. These Special Conditions would be implemented as required in the Harbor Development Permit, proposed Project specifications, or other applicable documents governing site use and or facility operations. Special Conditions are consistent with the Green Port Policy, Clean Air Action Plan, and the Water Resources Action Plan.

The following describes the Special Conditions that would be incorporated as part of the proposed Project. The various means used to implement the Special Conditions, as well as their timing, are also provided.

1.4.1 Water Resource Protection

Special Condition: The Permittee shall complete the provided stormwater BMP checklist for small construction projects (under 1 acre in total disturbed area) and implement those best management practices (BMPs) as identified in the checklist. A copy of the completed stormwater BMP checklist shall be submitted to the Director of Environmental Planning fourteen (14) days prior to the start of construction activities for approval. Upon approval of the stormwater BMP checklist, the Permittee shall be responsible for installing, constructing and implementing all control measure requirements described in the stormwater BMP checklist and other stormwater BMPs that may be appropriate during construction. The Permittee shall perform visual observations to verify that all control measures are implemented and performing properly. If control measures being implemented by the Permittee are inadequate to control water pollution effectively, the Port may require the Permittee to revise the operations and amend the stormwater BMP checklist. The Port's review and approval of the Permittee's stormwater BMP checklist shall not waive any contractual requirements and shall not relieve the Permittee from achieving and maintaining compliance with all Federal, State, and local laws, ordinances, statutes, rules and regulations. All records shall remain on site and readily accessible for review by the Port and any responsible agencies. In the event that the proposed project scope changes and the landside disturbed area is greater than 1 acre, the Permittee shall work with the Port to obtain coverage under the Los Angeles Regional Water Quality Control Board's General Permit for Storm Water Discharges Associated with Construction and Land Disturbing Activities (CAS000002). A copy of the Notice of Intent (NOI) and Storm Water Pollution Prevention Plan (SWPPP) shall be provided to the Director of Environmental Planning prior to the start of construction.

1.4.2 Transportation

Special Condition. Transportation Management Plan (TMP). The Permittee shall coordinate with the POLB Traffic Engineering Bureau during the development of the Project to determine if a TMP is warranted, and if yes, what it needs to address. Permittee shall coordinate with adjacent construction projects at the time, if any, to ensure proper traffic circulation in the area is maintained. If a TMP is warranted during any phase of the project, the Permittee shall submit a Transportation Management Plan to POLB Traffic Engineering for review and approval.

1.4.3 Cultural Resources

Special Condition. Discovery of Archaeological Materials or Human Remains. In the unlikely event that any archaeological material is discovered during construction, construction activities are to be halted, archeological experts are to be notified, and the USACE/Port will complete an evaluation of the significance of those resources and will determine the appropriate resolution of any potential adverse effects.

Permittee shall immediately notify the Director of Environmental Planning of any discoveries.

1.4.4 Air Quality

Special Condition. Community Grants Program (CGP). In 2016, the Port adopted a Community Grants Program (CGP) following a public hearing process. The CGP contains mitigation measures for environmental impacts as policies and requirements within the program. As applied to projects within the Harbor District, projects must mitigate environmental impacts to the extent feasible, and when impacts remain, compliance with the CGP can be a condition of project approval such that the project must provide funding to future projects that apply to the CGP for such grant awards. The Port will participate and fund the CGP, as determined by the methodology described below. The timing of the payment will be made by the later of the following two dates: (a) the date that the Port issues a Notice to Proceed (NTP) or otherwise authorizes commencement of construction; or (b) the date that the Final EIS/EIR is conclusively determined to be valid, either by operation of PRC Section 21167.2 or by final judgment or final adjudication.

Contribution to the CGP was considered for pollutants that would exceed the SCAQMD peak day significance thresholds, following mitigation. Emissions greater than the threshold were multiplied by the cost per ton of emissions, per SCAQMD Rule 301, July 1, 2019. Table III. The CGP funding contribution for the proposed Project is expected to be $146,753. The plan is, in short, a firm commitment to future mitigation of significant impacts. The Port ensures compliance with the CGP.

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FINAL INTEGRATED FEASIBILITY REPORT AND ENVIRONMENTAL IMPACT STATEMENT / ENVIRONMENTAL IMPACT REPORT (EIS/EIR)

APPENDIX M: TRAFFIC

PORT OF LONG BEACH
DEEP DRAFT NAVIGATION STUDY
Los Angeles County, California

October 2021

US Army Corps of Engineers®

Port of LONG BEACH
THE PORT OF CHOICE

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FEHR PEERS

Traffic Technical Memorandum

Date: September 25, 2019

To: Chad Beckstrom, ICF

From: Ribeka Toda and Netai Basu, Fehr & Peers

Subject: Traffic Impact Analysis for Deep Draft Navigation Study and Deepening Project

LA19-3125

Fehr & Peers conducted a traffic impact analysis for the proposed Deep Draft Navigation Feasibility Study and Deepening project. The study presents estimates of trip generation over the course of the entire project and available data on existing and future intersection operations along key access routes to the various sites where construction would occur. Based on the analysis, this memo summarizes conclusions regarding the significance of the temporary project-related traffic impacts.

Project Description

The Port of Long Beach (POLB, the applicant) proposes to widen and deepen existing navigation channels to better accommodate container and liquid bulk vessels. The project is comprised of several components that would be conducted over a period of approximately five years from 2024 to 2029.

- Dredging would occur at five locations throughout the harbor as shown in Figure 1, including in the West Basin, the Pier J Turning Basin and approach; a new Standby Area adjacent to the Main Channel; along the Main Channel; and along the Approach Channel through Queen's Gate. Up to approximately 8.3 million cubic yards of material would be dredged and transported by barge to an approved offshore location.
- To power the dredging equipment, the POLB proposes to build an electric substation in the southeast area of Pier J.
- Underwater bulkheads would be constructed, and other structural modifications made to portions of the existing wharves on Pier J and Pier T to improve their strength near areas proposed for dredging.

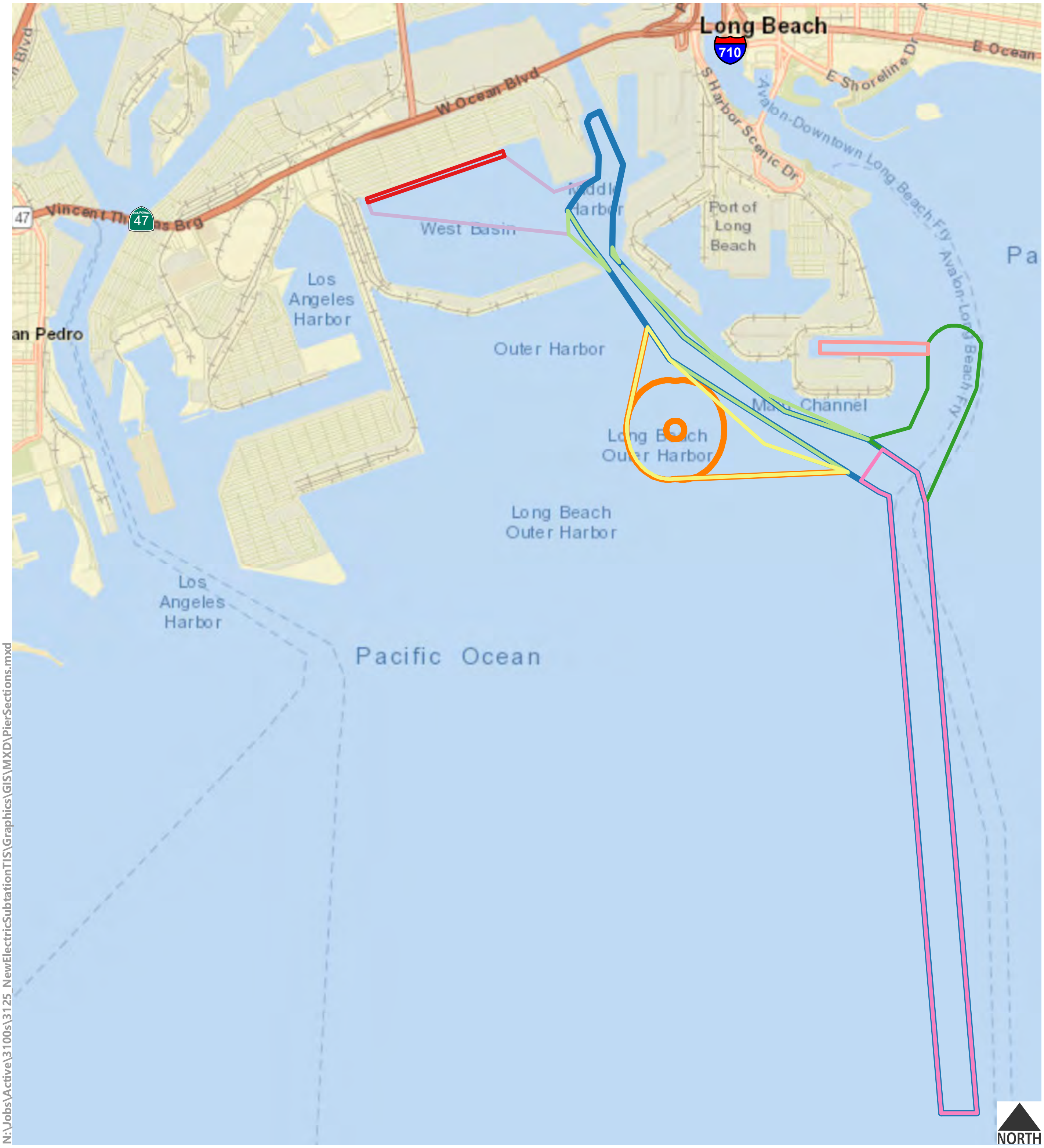
The following phases or activities are required for the proposed project:

1. Landside Work: Construction of new electric substation (10/1/24 to 12/31/24)
2. Landside Work: Construction of finger dike at Pier J (1/1/24 to 3/2/24)
3. Landside Work: Upgrade of Pier J Wharf (1/1/24 to 6/24/24)
4. Landside Work: Upgrade of Pier T Wharf (1/1/24 to 11/16/24)
5. In-Water Work: Dredging of approach channel (1/1/25 to 2/4/26)
6. In-Water Work: Dredging of main channel for deepening and widening (1/1/26 to 6/28/26)
7. In-Water Work: Dredging of West Basin, part one (6/29/26 to 12/9/26)
8. In-Water Work: Dredging of West Basin, part two (1/1/27 to 3/28/27)
9. In-Water Work: Dredging of Pier T berths (3/29/27 to 4/5/27)
10. In-Water Work: Dredging of Pier J Basin (4/6/27 to 6/13/27)
11. In-Water Work: Dredging of Pier J approach, part one, (6/14/27 to 12/9/27)
12. In-Water Work: Dredging of Pier J approach, part two, (1/1/28 to 12/6/28)
13. In-Water Work: Dredging of Pier J approach, part three (1/1/29 to 2/20/29)

Trip Generation Estimates

Information on the project schedule, number of workers, equipment, and number of truck trips required for different activities during construction of the project was obtained from ICF and Port staff. Maximum daily project trips were estimated for each activity or phase and then put into a table to identify the changes in daily trip-making over the course of the project. The following assumptions were considered in the estimation of total daily and peak hour project trips:

- Number of daily workers during different phases of the project were estimated by the applicant. To be conservative, the peak number of daily workers within each month is assumed for every day of that month.
- Work on the landside construction at Pier T and Pier J will be done in one 8-hour to 10-hour shift, which may include Saturdays. Access routes were identified for each location.



Approach Channel
Main Channel
Main Channel Widening
Pier J Approach Channel
Pier J Basin
Pier T Berths
Standby Area
Turning Basin
West Basin

Figure 1

Areas within the Port Under Study

- There are three potential launch sites for the workers on barges for the dredging activity: Pier S, Pier T, and a site near Pier D Street & Pico Avenue. Dredging activity will be a 24-hour operation, including weekends, with three 8-hour to 10-hour shifts. Access routes were identified for each option.

- Vehicular trip generation closely relates to the number of employee trips to and from the project site. Because the project site is not served by public transit, all employees were assumed to travel by private automobile. Consistent with Port practices and to provide a conservative analysis, it was assumed that no carpooling would occur. All workers were assumed to arrive at the project site during weekday morning peak hour and depart the project site during the afternoon peak hour. Trips by dredging workers at the beginning and end of their shifts were assumed to potentially occur during any of the three analyzed peak hours.

- One quarter of the workers on the land-side elements of the project were assumed to travel off-site during a lunch break.

- Trucks delivering material for the construction of the electric substation were assumed to make up to 4 round trips a day, with one trip occurring in the morning peak hour, one occurring in the midday peak hour, one trip occurring in the afternoon peak hour, and one trip during an off-peak period.

- A passenger car equivalent (PCE) factor of 2.0 is assumed for heavy duty trucks.

- Estimated daily trips are rounded to nearest even number.

Table 1 shows the estimated number of workers needed each month by activity/phase and the periods when simultaneous construction activities would occur. Truck trips are also included in the resulting total daily trips by activity/phase. The month representing peak traffic activity associated with the construction and demolition phase was selected for detailed traffic impact analysis. As shown in Table 1, the total daily trips range from a low of 54 to a high of 240. The highest number of daily trips is expected to occur in February 2024 (162 daily trips) and the first two months of year 2026 (240 daily trips).

The morning, midday, and afternoon peak hours, for traffic impact analysis purposes, are defined as occurring between 7:00 and 8:00 AM, 2:00 PM and 3:00 PM, and 4:00 and 5:00 PM, respectively. As shown in Table 1, the project would generate a maximum of approximately 240 daily trips during the first and second month of 2026, during which there is planned dredging over three shifts at the approach channel with the hopper dredger and the main channel widening with the clam shell dredge. Because it is not known when shift changes would occur, these estimates assume that they could coincide with the peak hours of traffic within the Port. Of the 240 daily trips, 80 trips would occur in the AM peak hour, 80 trips would occur in the midday peak hour, and 80 trips would occur in the PM peak hour. The 80 trips during each peak hour includes 40 inbound trips and 40 outbound trips. The peak hour trips are estimated based on assumptions set forth above.

Project Site Access

The substation construction and wharf improvements will be located on Pier J and Pier T. For dredging activity, workers will travel by water taxi from one of three potential launch sites: Pier T, and Pier S or a location near Pier D Street & Pico Avenue. Primary access routes connecting the regional freeway system with each landside work site and each launch site under consideration were identified and are shown in Figures 2A through 2E. The main access routes are via Ocean Boulevard, the Long Beach Freeway (I-710), the Harbor Freeway (I-110), and the Terminal Island Freeway (SR-47/SR-103). These access routes would be for both truck access and for workers commuting to the project site.

Table 1: Schedule of Daily Workers and Trips

Activity	Location	2024											
		1	2	3	4	5	6	7	8	9	10	11	12
1. Electrical Substation Construction at Pier J	Pier J										15	15	15
2. Finger Dike Construction	Pier J	25	25	7									
3. Pier J Wharf Upgrade	Pier J	15	25	25	25	25	25						
4. Pier T Wharf Upgrade	Pier T	15	15	25	25	25	25	25	25	25	25	25	
5. Approach Channel (hopper dredge 5,447,000 CY)	In water												
6. Main Channel Widening (clam shell dredge 1,065,000 CY)	In water												
7. West Basin (clam shell dredge 975,000 CY)	In water												
Total Workers		**55**	**65**	**57**	**50**	**50**	**50**	**25**	**25**	**25**	**40**	**40**	**15**
Total Trips		**138**	**162**	**142**	**126**	**126**	**126**	**62**	**62**	**62**	**116**	**116**	**54**

Activity	Location	2025											
		1	2	3	4	5	6	7	8	9	10	11	12
1. Electrical Substation Construction at Pier J	Pier J												
2. Finger Dike Construction	Pier J												
3. Pier J Wharf Upgrade	Pier J												
4. Pier T Wharf Upgrade	Pier T												
5. Approach Channel (hopper dredge 5,447,000 CY)	In water	66	66	66	66	66	66	66	66	66	66	66	66
6. Main Channel Widening (clam shell dredge 1,065,000 CY)	In water												
7. West Basin (clam shell dredge 975,000 CY)	In water												
Total Workers		**66**	**66**	**66**	**66**	**66**	**66**	**66**	**66**	**66**	**66**	**66**	**66**
Total Trips		**132**	**132**	**132**	**132**	**132**	**132**	**132**	**132**	**132**	**132**	**132**	**132**

Activity	Location	2026											
		1	2	3	4	5	6	7	8	9	10	11	12
1. Electrical Substation Construction at Pier J	Pier J												
2. Finger Dike Construction	Pier J												
3. Pier J Wharf Upgrade	Pier J												
4. Pier T Wharf Upgrade	Pier T												
5. Approach Channel (hopper dredge 5,447,000 CY)	In water	66	66										
6. Main Channel Widening (clam shell dredge 1,065,000 CY)	In water	54	54	54	54	54	54						
7. West Basin (clam shell dredge 975,000 CY)	In water							54	54	54	54	54	54
Total Workers		**120**	**120**	**54**	**54**	**54**	**54**	**54**	**54**	**54**	**54**	**54**	**54**
Total Trips		**240***	**240***	**108**	**108**	**108**	**108**	**108**	**108**	**108**	**108**	**108**	**108**

Activity	Location	2027											
		1	2	3	4	5	6	7	8	9	10	11	12
8. West Basin (Clam shell dredge 513,000 CY)	In water	54	54	54									
9. Pier T Berths (clam shell dredge Berths T132 to T140, 44,000 CY)	In water				54								
10. Pier J Basin (clam shell dredge 408,000 CY)	In water					54	54						
11. Pier J Approach (clam shell dredge 1,066,00 CY)	In water							54	54	54	54	54	54
12. Pier J Approach (clam shell dredge 2,040,000 CY)	In water												
13. Pier J Approach (clam shell dredge 297,000 CY)	In water												
Total Workers		**54**	**54**	**54**	**54**	**54**	**54**	**54**	**54**	**54**	**54**	**54**	**54**
Total Trips		**108**	**108**	**108**	**108**	**108**	**108**	**108**	**108**	**108**	**108**	**108**	**108**

Activity	Location	2028												2029	
		1	2	3	4	5	6	7	8	9	10	11	12	1	2
8. West Basin (Clam shell dredge 513,000 CY)	In water														
9. Pier T Berths (clam shell dredge Berths T132 to T140, 44,000 CY)	In water														
10. Pier J Basin (clam shell dredge 408,000 CY)	In water														
11. Pier J Approach (clam shell dredge 1,066,00 CY)	In water														
12. Pier J Approach (clam shell dredge 2,040,000 CY)	In water	54	54	54	54	54	54	54	54	54	54	54	54		
13. Pier J Approach (clam shell dredge 297,000 CY)	In water													54	54
Total Workers		**54**	**54**	**54**	**54**	**54**	**54**	**54**	**54**	**54**	**54**	**54**	**54**	**54**	**54**
Total Trips		**108**	**108**	**108**	**108**	**108**	**108**	**108**	**108**	**108**	**108**	**108**	**108**	**108**	**108**

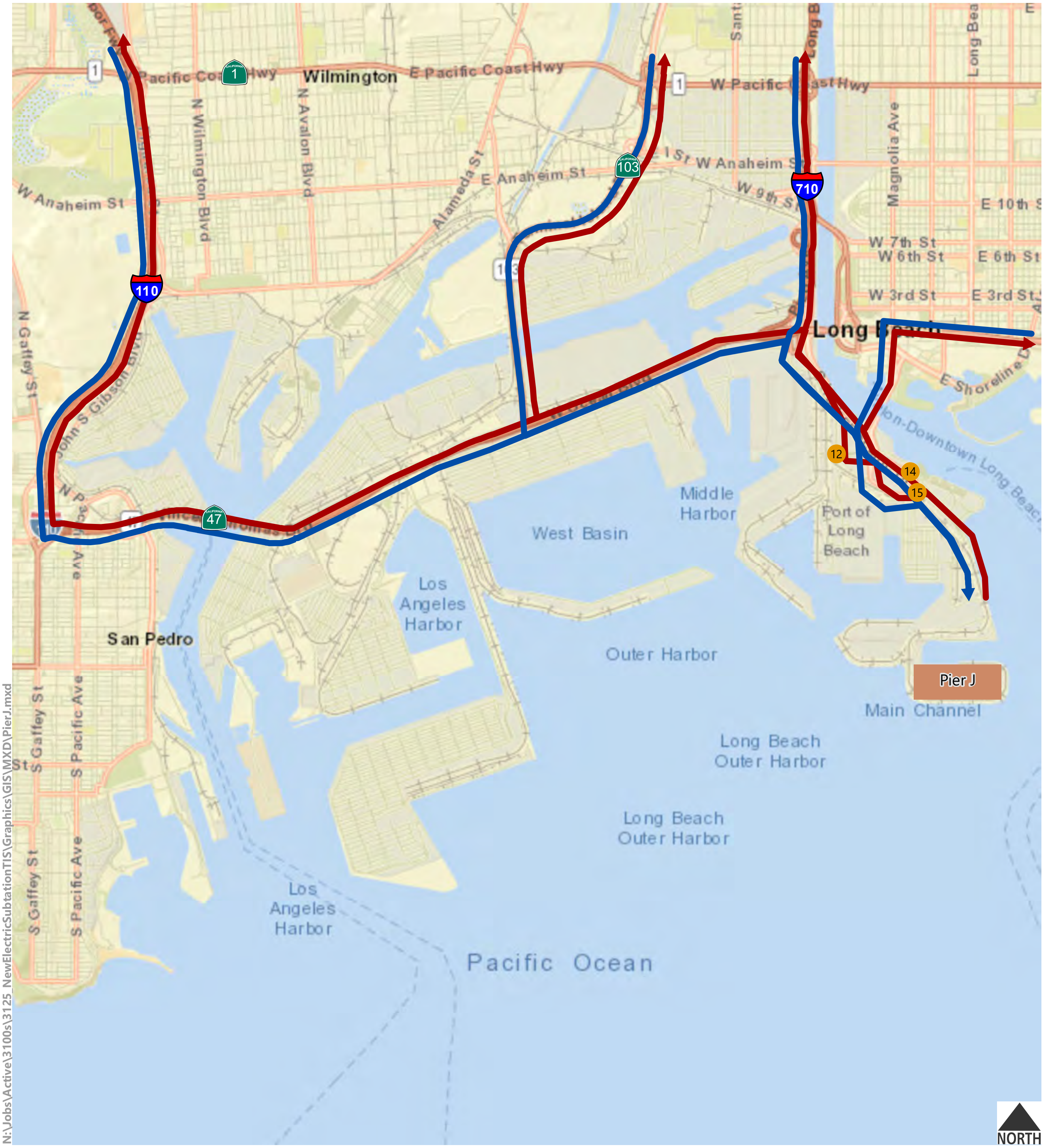
Notes:

The total trips for the electrical substation construction phase includes the trips associated with one truck making 4 round trips a day, with a passenger car equivalent (PCE) of 2.

The dredging work is consecutive and the activities do not overlap, other than in early 2026. The schedule calendar has been simplified to show this.

For example, the dredging of the Pier T Berths is projected to end on April 5th and is projected to to start at the Pier J Basin on April 6th. The calendar has been simplified to show that only one activity - Pier T Berths - occurs in April 2027, to avoid double-counting activities that are consecutive, and not overlapping.

*The maximum number of daily trips, 240, was used for the analysis.

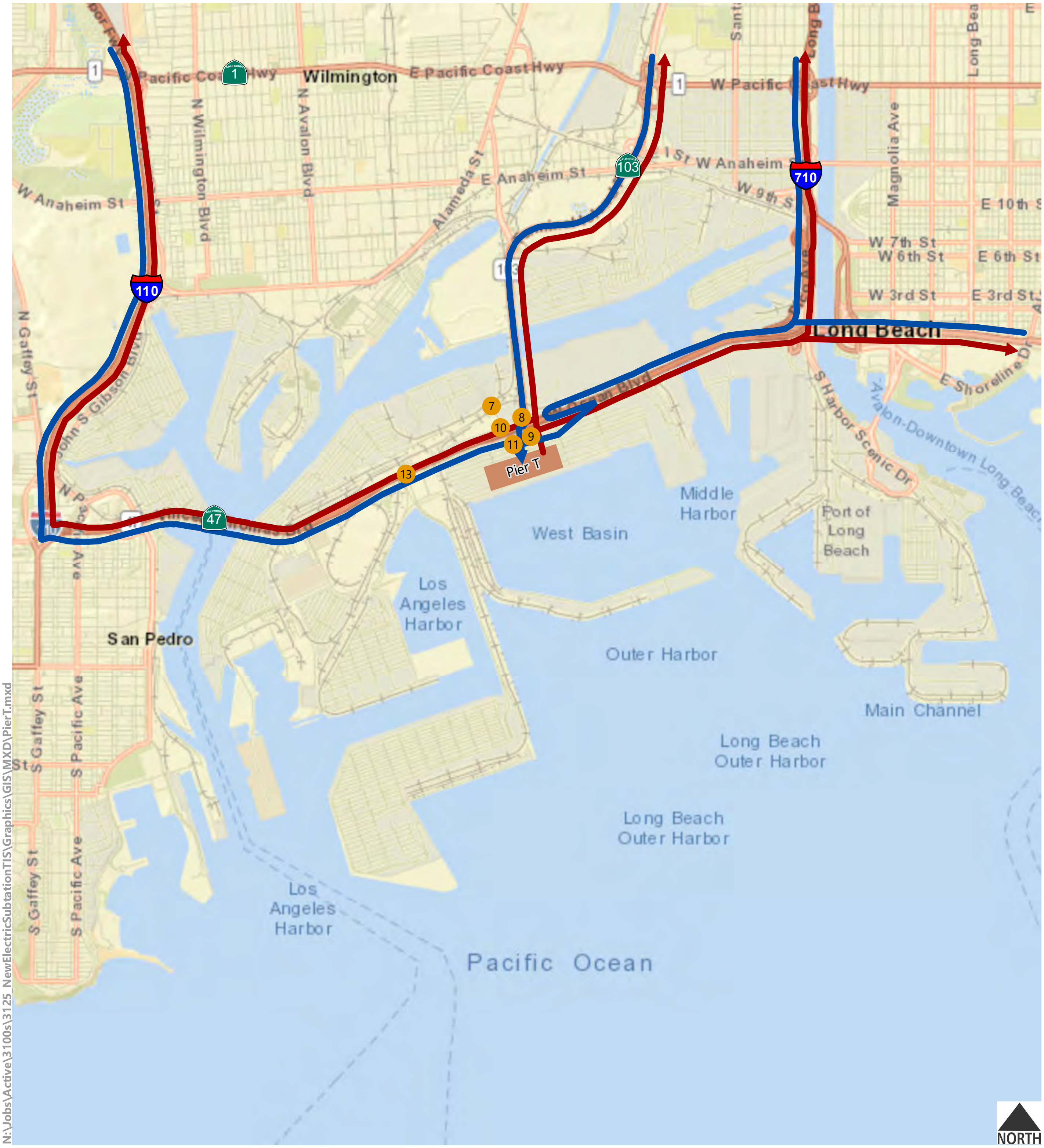


Access Routes
- Inbound
- Outbound
- Study Intersections

Peak Hour Trips	AM	MD	PM	Total
Inbound	50	13	0	63
Outbound	0	13	50	63

Figure 2A

Access Routes to Pier J Landside Work Site



Access Routes

Inbound

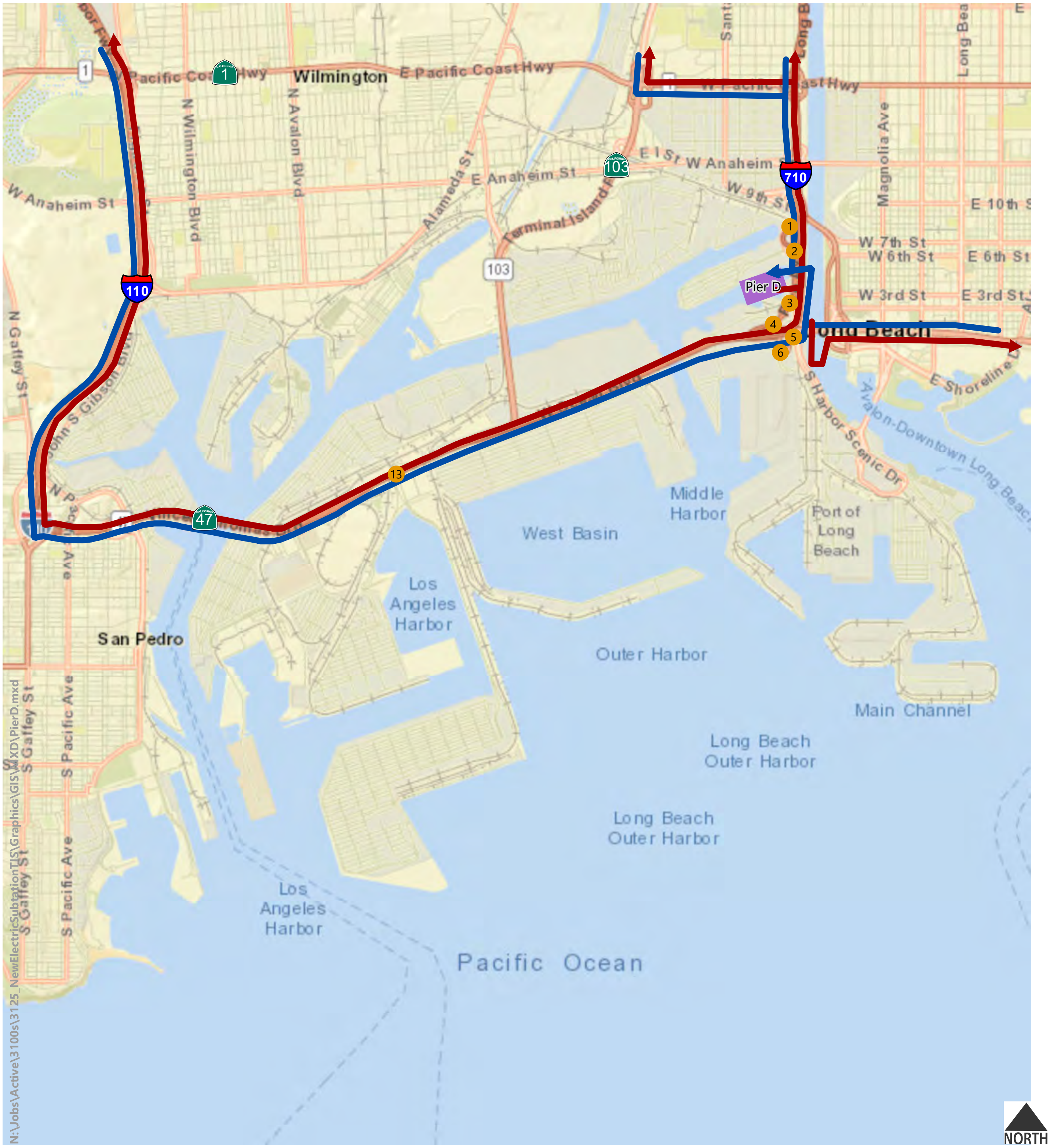
Outbound

Study Intersections

Peak Hour Trips	AM	MD	PM	Total
Inbound	25	6	0	31
Outbound	0	6	25	31

Figure 2B

Access Routes to Pier T Landside Work Site

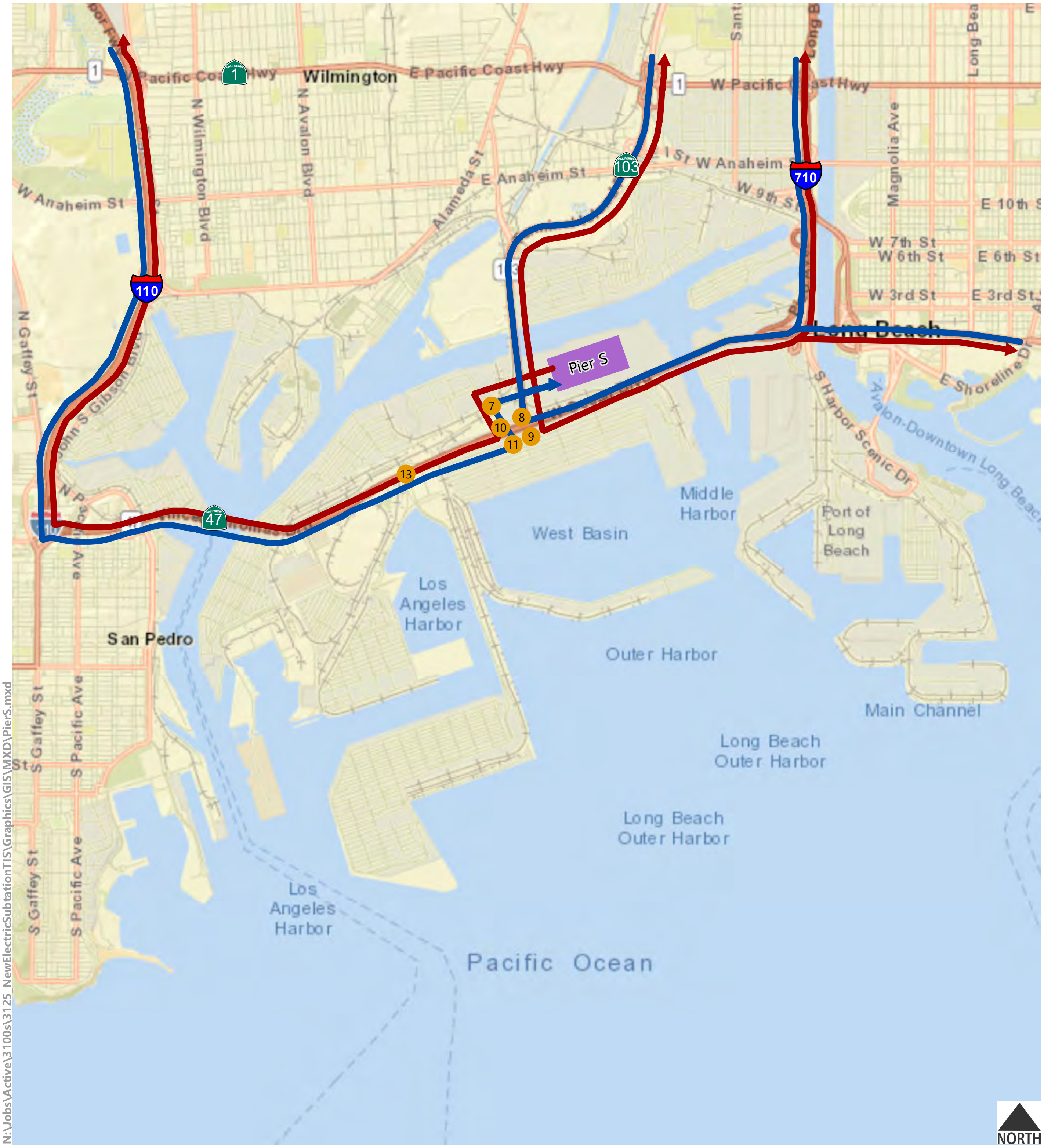


Access Routes
Inbound
Outbound
Study Intersections

Peak Hour Trips	AM	MD	PM	Total
Inbound	40	40	40	120
Outbound	40	40	40	120

Figure 2C

Access Routes to Potential Launch Site for In-Water Work on Pier D



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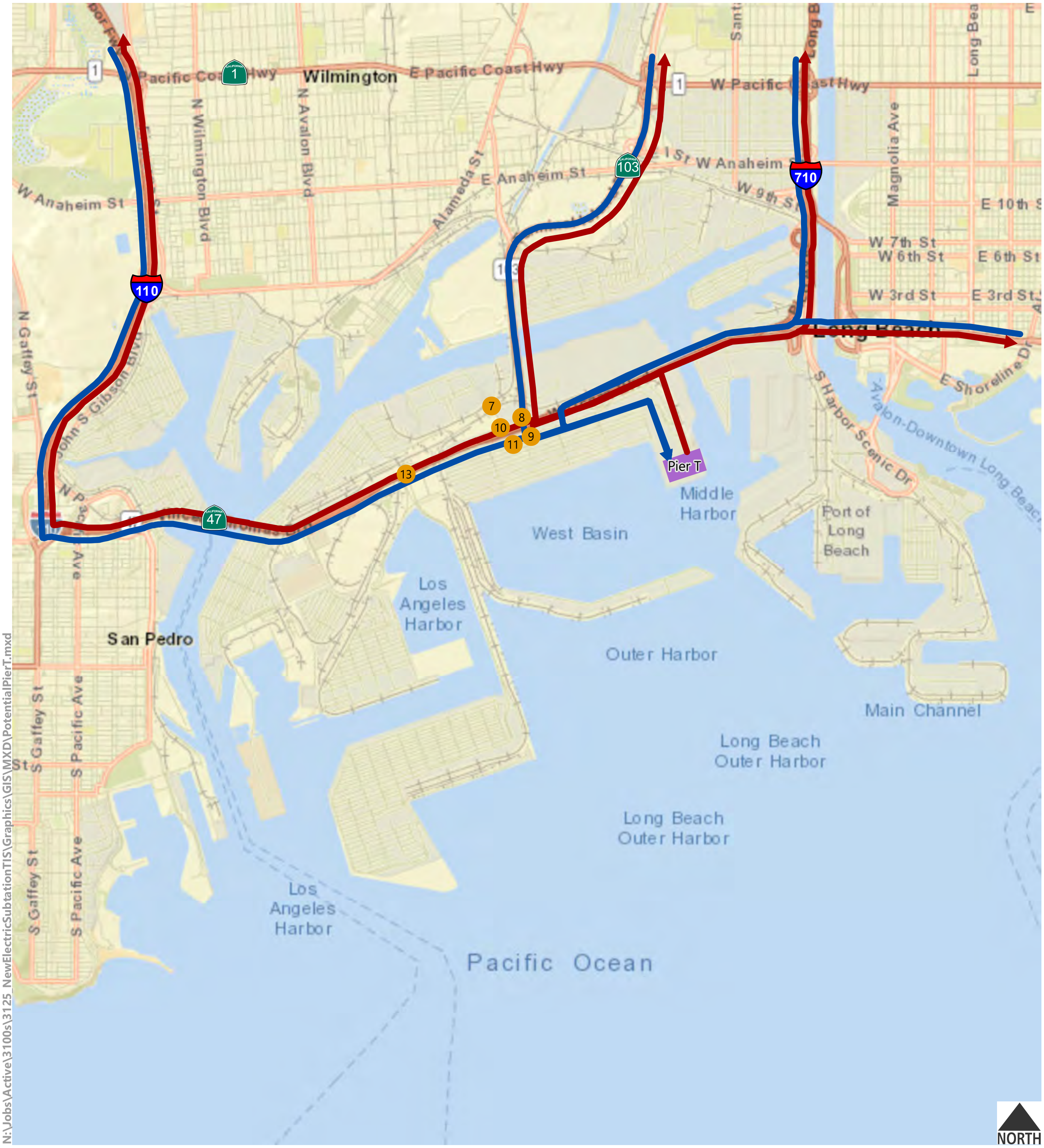
Access Routes

- Inbound
- Outbound
- Study Intersections

Peak Hour Trips	AM	MD	PM	Total
Inbound	40	40	40	120
Outbound	40	40	40	120

Figure 2D

Access Routes to Potential Launch Site for In-Water Work on Pier S



Peak Hour Trips	AM	MD	PM	Total
Inbound	40	40	40	120
Outbound	40	40	40	120

Figure 2E

Access Routes to Potential Launch Site for In-Water Work on Pier T

Existing Traffic Conditions

Available information on current and future (2040) traffic operations at 15 intersections in the vicinity of the proposed land-side work sites and potential launch sites was taken from a recent study published by the Port (Port Master Plan Update Draft Program Environmental Impact Report [PMP EIR], August 2019). The intersections are shown on Figure 3. The analysis presents information on Existing Baseline conditions rather than simply Existing (2018) conditions, to account for the completion of the Gerald Desmond Bridge Replacement and Middle Harbor Terminal Redevelopment projects. The traffic counts were collected in 2018 when there were detour routes in place for the construction of these two major projects. The Existing Baseline conditions reflect the post-construction conditions in which the vehicles that were using the detour routes during construction would use the new Gerald Desmond Bridge. The PMP EIR projected 105,110 daily trips under the proposed master plan, of which 62,305 were trucks and 42,805 were autos associated with the Port of Long Beach. These locations are shown in Figures 2A through 2E and listed Table 2. As shown, good levels of service (LOS D or better) are shown under existing baseline and future conditions for the three analyzed weekday peak hours. Construction of the proposed project would occur between 2024 and 2029, ending approximately midway between the two horizon years for which LOS data is available.

Impact Analysis

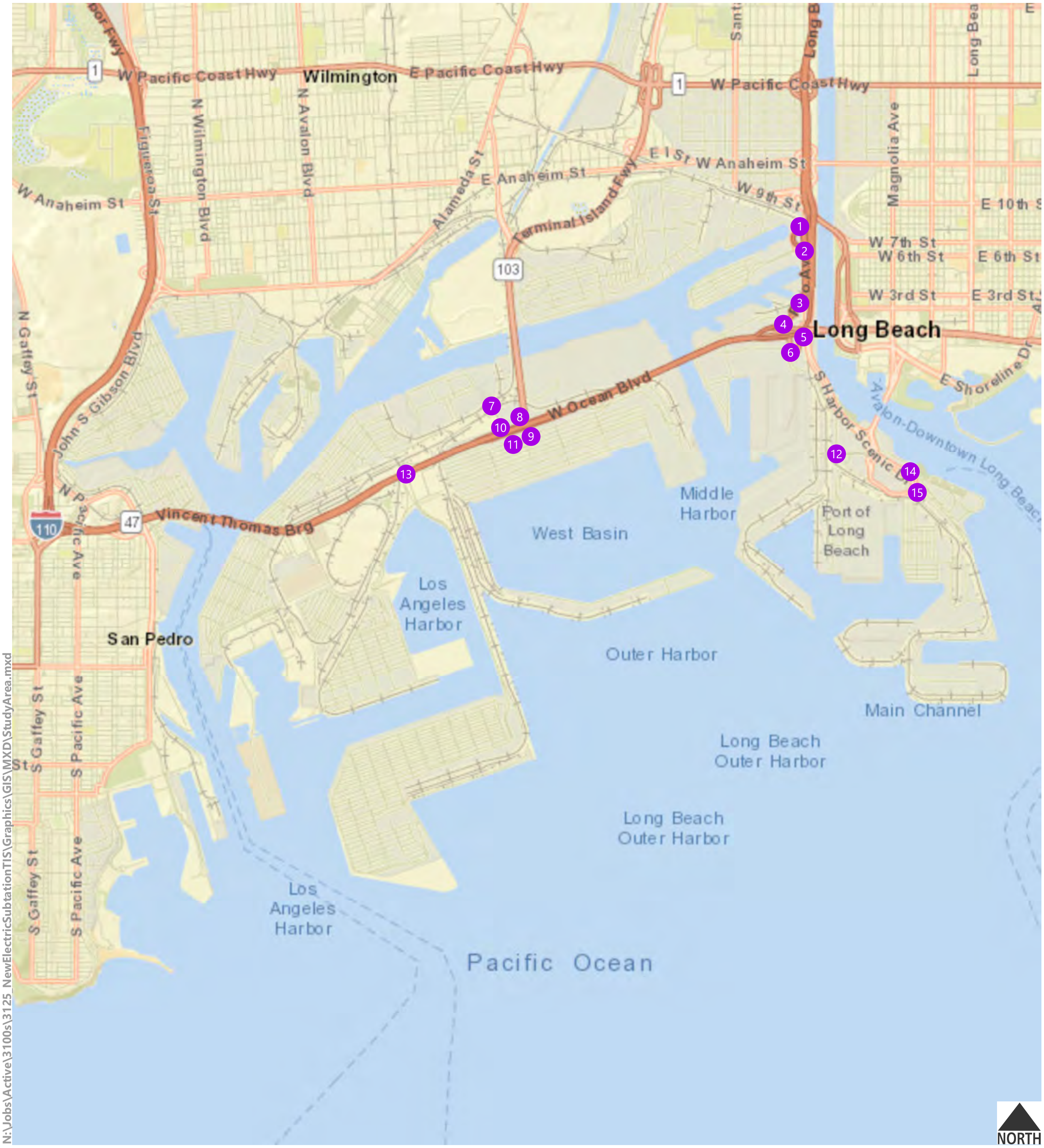
Significant Impact Thresholds

The City of Long Beach considers LOS D as the upper limit of satisfactory operations for intersections. A significant impact is identified where project traffic causes the intersection to deteriorate from LOS D to LOS E or F and increases the V/C ratio by 0.02 or more, or if the project traffic causes an increase in V/C ratio of 0.02 or greater when the intersection is operating at LOS E or F in the baseline condition.

As shown in Table 2, acceptable levels of service (LOS D or better) are shown under existing baseline and future conditions for the three analyzed weekday peak hours. Construction of the proposed project would occur between 2024 and 2029, ending approximately midway between the two horizon years for which LOS data is available. Because workers would travel between their homes and the different project work sites over various access routes, the project trips would be broadly distributed. During the peak of construction activity, estimated to occur over a period of two months, up to 80 trips would occur in any one-hour period (40 inbound and 40 outbound). Given the moderate peak hour trip generation, the various access sites, and the different sites that the workers would be travelling to and from, the trips would be distributed broadly across the study area, it can be concluded that the additional project traffic would result in less than significant impacts according to the City's criteria.

While other project alternatives are studied under NEPA, the construction impact analysis for each alternative was not analyzed because this analysis is conducted for the peak day and the peak day is the same for all alternatives.

Upon completion of construction, there would be no traffic-related operational impacts as a result of this project. The purpose of this project is to increase safety and efficiency for in-water facilities and would not increase throughput capacity of the terminals. There would a nominal increase in vehicle trips per year for routine maintenance of the electrical substation, which would not be anticipated to impact traffic conditions.



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● **Study Intersections**

Figure 3

Study Intersections

Table 2: Intersection Level of Service Summary

	Intersection	Peak Hour	Existing Baseline V/C	Existing Baseline LOS	Future (2040) V/C	Future (2040) LOS
1	PICO AVE &	AM	0.327	A	0.479	A
	PIER B ST	MID	0.390	A	0.546	A
		PM	0.417	A	0.493	A
2	PICO AVE &	AM	0.178	A	0.544	A
	PIER C ST	MID	0.295	A	0.576	A
		PM	0.287	A	0.6	A
3	PICO AVE &	AM	0.235	A	0.443	A
	PIER D ST	MID	0.363	A	0.519	A
		PM	0.241	A	0.486	A
4	PICO AVE &	AM	0.272	A	0.44	A
	WESTBOUND OCEAN BLVD ON-RAMP	MID	0.492	A	0.697	B
		PM	0.308	A	0.443	A
5	PICO AVE &	AM	0.172	A	0.525	A
	WESTBOUND OCEAN BLVD OFF-RAMP	MID	0.206	A	0.594	A
		PM	0.207	A	0.494	A
6	PICO AVE &	AM	0.378	A	0.616	B
	PIER E ST/EASTBOUND OCEAN BLVD RAMP	MID	0.340	A	0.672	B
		PM	0.314	A	0.55	A
7	PIER S AVE &	AM	0.339	A	0.622	B
	NEW DOCK ST	MID	0.328	A	0.664	B
		PM	0.328	A	0.569	A
8	TERMINAL ISLAND FWY &	AM	0.420	A	0.709	C
	SR-47 WESTBOUND	MID	0.469	A	0.757	C
		PM	0.469	A	0.703	C
9	TERMINAL ISLAND FWY &	AM	0.362	A	0.714	C
	SR-47 EASTBOUND	MID	0.387	A	0.805	D
		PM	0.434	A	0.757	C
10	PIER S AVE &	AM	0.346	A	0.819	D
	SR-47 WESTBOUND	MID	0.336	A	0.691	B
		PM	0.361	A	0.578	A
11	PIER S AVE &	AM	0.340	A	0.505	A
	SR-47 EASTBOUND	MID	0.369	A	0.622	B
		PM	0.300	A	0.484	A
12	PICO AVE/PIER G AVE &	AM	0.519	A	0.881	D
	HARBOR PLAZA	MID	0.592	A	0.819	D
		PM	0.592	A	0.812	D
13	NAVY WAY &	AM	0.436	A		
	SEASIDE AVE	MID	0.340	A	Not an intersection in the future*	
		PM	0.554	A		
14	HARBOR PLAZA &	AM	0.275	A	0.609	B
	QUEENSWAY DR	MID	0.387	A	0.863	D
		PM	0.390	A	0.701	C
15	HARBOR PLAZA &	AM	0.449	A	0.723	C
	HARBOR SCENIC DR	MID	0.442	A	0.897	D
		PM	0.434	A	0.585	A

* The intersection of Navy Way & Seaside Avenue, in Los Angeles, is planned for full grade separation in the future.

VMT Analysis

The following discussion is only relevant to CEQA. Since this is also a NEPA document the VMT discussion has no bearing on NEPA.

On September 27,2013, Governor Brown signed SB 743, which mandated a change in the way that transportation impacts of projects are evaluated under CEQA. The legislation requires the OPR to amend the CEQA guidelines to use VMT as a criterion for determining significant transportation impacts rather than LOS. Instead of promoting mitigation that involves increasing capacity (i.e., the width of a roadway or size of an intersection), which may increase auto use and emissions, and discourage alternative forms of transportation, the new VMT criterion would support reduction of GHG emissions, creation of multimodal networks, and promotion of a mix of land uses. Section 15064.3 in the current (2018) CEQA Guidelines states: "For the purposes of this section, 'vehicle miles traveled' refers to the amount and distance of automobile travel attributable to the project."

OPR published a preliminary evaluation of possible metrics to replace LOS in transportation analyses in December 2013 and, following substantial public input, released the final guidelines in December 2018. While the new analysis rules are now in effect, local agencies have until July 1, 2020, to develop and adopt new analytical procedures and threshold criteria.

The estimation of project-related daily vehicles miles of travel (VMT) is based on the trip generation estimates presented earlier over the course of the project. Average VMT per day and average VMT per year for automobile commute trips, excluding truck trips, were estimated based on information from POLB.

POLB estimates that the commute trip lengths to the construction site could be up to 50 miles. This analysis assumes that one-way commute trips to and from the construction site would average 25 miles.

Based on the estimate 240 daily one-way trips, the highest project-related daily VMT is estimated to be approximately 6,000 miles. The 240 daily one-way trips estimated for the first two months of 2026 do not include truck trips nor midday lunch trips since the activities are in-water dredging work that do not involve trucks and workers are on the barge for the whole shift.

To estimate the VMT per year, the total number of round trips per year was multiplied by the assumed average round-trip length of 50 miles. Table 3 shows the VMT estimates for each year of construction. Of the five full years of construction, Year 2 (2025) has the highest annual average

VMT with an estimated 1,204,500 miles. During this year, there is planned dredging every day for the approach channel.

The City of Long Beach has not yet adopted thresholds for VMT impacts. As such, this VMT analysis is for informational purposes only and no conclusions regarding project-generated VMT impact can be made at this point.

Conclusions

Based on the quantitative and qualitative analysis presented in this memorandum, it is concluded that the temporary traffic impacts related to the construction of the proposed Deep Draft Navigation project would result in less than significant traffic impacts on the surrounding street network.

Table 3: VMT Analysis

Activity	Year 1 (2024)			Year 2 (2025)			Year 3 (2026)			Year 4 (2027)			Year 5 (2028)			Year 6 (2029)		
	Days	Daily Round Trips	VMT	Days	Daily Round Trips	VMT	Days	Daily Round Trips	VMT	Days	Daily Round Trips	VMT	Days	Daily Round Trips	VMT	Days	Daily Round Trips	VMT
1. Electric Substation				***5. Approach Channel***			***5. Approach Channel***			***8. West Basin, Part 2***			***12. Pier J Approach, Part 2***			***13. Pier J Approach, Part 3***		
Subtask 1	5	4	1,000	365	66	1,204,500	34	66	112,200	86	54	232,200	340	54	918,000	50	54	135,000
Subtask 2	15	4	3,000															
Subtask 3	5	2	500															
Subtask 4	20	15	15,000															
Subtask 5	26	8	10,400															
Subtask 6	2	8	800															
Subtotal			30,700															
2. Pier J Finger Dike							***6. Main Channel***			***9. Pier T Berths***								
Subtask 1	3	8	1,200				178	54	480,600	7	54	18,900						
Subtask 2	2	11	1,100															
Subtask 3	45	21	47,250															
Subtask 4	40	4	8,000															
Subtask 5	2	7	700															
Subtotal			58,250															
3. Pier J Wharf Improvements							***7. West Basin, Part 1***			***10. Pier J Basin***								
Subtask 1	5	8	2,000				163	54	440,100	68	54	183,600						
Subtask 2	10	8	4,000															
Subtask 3	20	15	15,000															
Subtask 4	135	21	141,750															
Subtask 5	130	4	26,000															
Subtask 6	5	3	750															
Subtotal			189,500															
4. Pier T Wharf Improvements										***11. Pier J Approach, Part 1***								
Subtask 1	5	8	2,000							178	54	480,600						
Subtask 2	20	8	8,000															
Subtask 3	35	15	26,250															
Subtask 4	250	21	262,500															
Subtask 5	245	4	49,000															
Subtask 6	10	3	1,500															
Subtotal			349,250															
Total Annual VMT			**627,700**			**1,204,500**			**1,032,900**			**434,700**			**918,000**			**135,000**

Year 1 Activities and Subtasks:

1. Electric substation activities: 1) Demolish asphalt, 2) Cut trench for ducts and foundation for substation, 3) Removal of demlished material to disposal site, 4) Construct manholes, ducts, foundations, 5) New asphalt and paving, 6) Install transformer and heavy electrical equipment
2. Pier J Finger Pier Activities: 1) Mobilize/demobilize, 2) Clearing of seabed of any obstruction prior to pile driving, 3) Driving of bulkhead wall, 4) Installation of anti-scour rock in front of new bulkhead wall, 5) Survey of installed bulkhead wall
3. Pier J Wharf Improvements Activities: 1) Mobilize/demobilize, 2) Sheet pile delivery, 3) Clearing of seabed of any obstruction prior to pile driving, 4) Driving of bulkhead wall, 5) Installation of anti-scour rock in front of new bulkhead wall, 6) Survey of installed bulkhead wall
4. Pier T Wharf Improvements Activities: 1) Mobilize/demobilize, 2) Sheet pile delivery, 3) Clearing of seabed of any obstruction prior to pile driving, 4) Driving of bulkhead wall, 5) Installation of anti-scour rock in front of new bulkhead wall, 6) Survey of installed bulkhead wall

FINAL INTEGRATED FEASIBILITY REPORT AND ENVIRONMENTAL IMPACT STATEMENT / ENVIRONMENTAL IMPACT REPORT (EIS/EIR)

APPENDIX N: CULTURAL RESOURCES COORDINATION

PORT OF LONG BEACH
DEEP DRAFT NAVIGATION STUDY
Los Angeles County, California

October 2021

US Army Corps of Engineers

Port of LONG BEACH
THE PORT OF CHOICE

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Attachments

1 SHPO Coordination
2 Tribal Coordination

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Attachment 1

SHPO Coordination

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DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS
LOS ANGELES DISTRICT
915 WILSHIRE BOULEVARD, SUITE 930
LOS ANGELES, CALIFORNIA 90017-3489

November 12, 2020

Julianne Polanco
State Historic Preservation Officer
Office of Historic Preservation
1725 23rd Street, Suite 100
Sacramento, California 95816-7100

Dear Ms. Polanco:

The U.S. Army Corps of Engineers, Los Angeles District (Corps), and the Port of Long Beach (POLB) are proposing a navigation project to increase transportation efficiencies for container and liquid bulk vessels operating in the POLB to accommodate deep draft vessels to call at the POLB fully loaded. To meet obligations under the National Historic Preservation Act (NHPA), 36 CFR 800, as amended, the Corps is hereby consulting with you regarding any cultural resource concerns your tribe may have regarding the undertaking.

The project, undertaken jointly by the Corps and the Port of Long Beach (POLB), would deepen the entrance to the Main Channel (the Approach Channel through Queens Gate) to a depth of -80 feet mean lower low water (MLLW), widen portions of the Main Channel to ease the bend to a depth of -76' MLLW, construct an approach channel and turning basin to Pier J South to a depth of -55' MLLW, and deepen portions of the West Basin and West Basin Approach to a depth of -55' MLLW. Project areas behind the breakwater (Main Channel and West basin) will be deepened using an electric clamshell dredge. The Approach Channel through Queens Gate and the approach Channel and turning basin to Pier J South will be deepened using a hopper dredge.

The Area of Potential Effects (APE), depicted on the enclosed Figure 1, is defined as areas previously dredged and proposed for deepening, and includes the area near Pier J not previously dredged.

To take into account the potential for shipwrecks that could be affected by proposed deepening and expansion, the Corps reviewed comprehensive survey data. In 2000, at the request of the Port of Los Angeles, the Port of Long Beach, and the pilots who maneuver increasingly large oil tankers and cargo ships through the area's crowded shipping lanes, NOAA deployed the *Fairweather* to investigate potential hazards and anomalies in San Pedro Bay. NOAA used remote sensing survey to update nautical charts 18749 and 18751, which provide depth measurements and aids to navigation that mariners rely on for safe transit. The project encompassed 114 square nautical miles. The survey areas included San Pedro Bay and its approaches, stretching south to the waters off Huntington Beach and Newport Beach. Altogether, remote sensing bathymetric surveys conducted from 1970 to 2015 and side-scan surveys conducted in the 2000s show no submerged vessels or objects in the APE (Figure 2). The nearest wreck (Wreck #2) is located 0.5 miles from the Pier J approach channel, just inside the breakwater and is well outside the APE (Figures 3 and 4).

These surveys recorded anomalies within a 2-meter horizontal resolution and were sufficient to have detected any large submerged objects. Bathymetry data near Pier J obtained for the years, 1970, 1989, 2004, and 2015 confirm this area of seafloor stable and not subject to high sedimentation rates. There has in fact, been little need to perform maintenance dredging in these areas, nor has there been significant sedimentation to bury wrecks beyond the range of remote sensing. We are therefore confident to state no historic vessels or remnants would be encountered during the deepening actions.

The Corps also considered the potential for Paleolandscapes to exist within the APE. A 1994 investigation by Statistical Research Inc. of the Queens Gate Channel prior to dredging provided relevant data for the current proposed project. Surveyed areas extended from the Queens Gate entrance southward across the San Pedro Bay portion of the outer continental shelf to a water depth of 78', encompassing all of the APE proposed for dredging. The report, *Technical Synthesis Report, Underwater Remote Sensing Survey of Proposed Dredging Area, Queensgate Channel, Long Beach Harbor, California, February 1994*, observed that, prior to warming of the ice sheets and rising sea levels 18,000 years ago, human habitation may have occurred on the exposed continental shelf. However, because the high energy wave environment of the San Pedro shelf likely washed away any intact deposits, submerged archaeological sites would likely only exist in protected areas of heavy alluvium or in highly unconsolidated sediments. Because proposed dredging areas are unprotected and have been found to have sparse deposition, there is little probability intact sites remain on the seafloor in the APE. In addition, the findings stated there have been no discoveries of isolated artifacts in the Port of Long Beach, due to high energy wave activity and low levels of alluvium.

A more recent study, *Inventory and Analysis of Coastal and Submerged Archaeological Site Occurrence on the Pacific Outer Continental Shelf* (U.S. Department of the Interior, Bureau of Ocean Energy Management, Pacific OCS Region, November 2013) also investigated the possibility of such sites existing on the Pacific Ocean Continental Shelf (POCS). Research found that very few prehistoric sites are known to exist on the POCS. Consistent with the 1994 remote sensing survey, the 2013 study posits that submerged archaeological sites or isolates could only remain in low wave or protected areas or in unconsolidated sediments. Because the seafloor in the APE is highly stable and has shown very little secondary sedimentation, this portion of the POCS proposed for deepening is not likely to contain unconsolidated deposits and would therefore have little to no potential to contain submerged archaeological sites.

Deepening will produce 7.4 million cubic yards of dredge material, to be placed at the nearshore Surfside Borrow Site, used since 1964 for San Gabriel River to Newport Bay nourishment, as well as at two EPA-designated offshore disposal sites at the edge of the San Pedro Shelf. The latter, Newport Beach, CA (LA-3) and Los Angeles/Long Beach, CA (LA-2) locations, were designated in 1991 and 2005, respectively. All disposal sites are shown in Figure 5. No historic properties have been identified at these sites; therefore, the current disposal actions will also have no potential to affect historic properties.

To summarize, due to the high energy environment of San Pedro Bay and limited sedimentary deposition, remote sensing survey data showing no historic era wrecks or objects, and low potential for paleo-era sites to exist, the Corps finds no historic properties will be affected by the undertaking.

At this time, the Corps invites your comment on the proposed action. The Corps has also notified the following tribes about the project and will forward any comments or concerns received: Barbareno-Ventureno Band of Mission Indians; Coastal Band of the Chumash Nation; Northern Chumash Tribal Council; Salinan Tribe of Monterey; Santa Ynez Band of Chumash; Xolon-Salinan Tribe; and the Yak tityu tityu-Northern Chumash.

If you have any questions, please contact Ms. Lauren McCroskey, at (253) 279-3316 or via email at lauren.l.mccroskey@usace.army.mil.

Sincerely,

DEMESA.EDUARD [redacted]

Eduardo T. De Mesa
Chief, Planning Division

Enclosure(s)

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State of California • Natural Resources Agency

Gavin Newsom, *Governor*

DEPARTMENT OF PARKS AND RECREATION
OFFICE OF HISTORIC PRESERVATION

Armando Quintero, *Director*

Julianne Polanco, State Historic Preservation Officer

1725 23rd Street, Suite 100, Sacramento, CA 95816-7100
Telephone: (916) 445-7000 FAX: (916) 445-7053
calshpo.ohp@parks.ca.gov www.ohp.parks.ca.gov

December 09, 2020

In reply refer to: COE_2020_1113_001

VIA ELECTRONIC MAIL

Eduardo T. DeMesa
Chief
Planning Division
U.S. Army Corps of Engineers, Los Angeles District
915 Wilshire Blvd., Suite 930
Los Angeles, CA 90017-3489

RE: Section 106 consultation for the Port of Long Beach Deepening and Turning Bay Expansion, Los Angeles County

Dear Eduardo DeMesa:

The U.S. Army Corps of Engineers (COE) is initiating consultation with the State Historic Preservation Officer (SHPO) to comply with Section 106 of the National Historic Preservation Act of 1966 (as amended) and its implementing regulation at 36 CFR Part 800. By letter received on November 12, 2020, the COE is seeking comments on their determination of eligibility and finding of effect for the above-referenced undertaking. The COE submitted the following document to support their finding of effect:

- *Port of Long Beach Channel Deepening and Turning Basin Expansion; Figures 1-5* (USACE 2020)

The COE is issuing a permit supporting a navigation project to increase transportation efficiencies operating in the Port of Long Beach (POLB) located in San Pedro Bay in Los Angeles County. Project activities include deepening and widening portions of the Main Channel, the construction of an approach channel and turning basin to Pier J South, and deepening portions of the West Basin and West Basin Approach. The Area of Potential Effects (APE) is defined as areas proposed for dredging and deepening. Efforts to identify historic properties include a records search, review of underwater surveys, and Native American outreach.

The COE contacted Native American as groups having cultural ties to the project area. The COE received a response from the Barbareno-Ventureno Band of Mission Indians; Coastal

Band of the Chumash Nation; Northern Chumash Tribal Council; Salinan Tribe of Monterey; Santa Ynex Band of Chumash; Xolon-Salinan Tribe; and the Yak tityu tityu-Northern Chumash. The COE received no responses.

Efforts to identify historic properties resulted in no possible historic properties in the APE.

The COE has concluded that issuing a permit would have no effect on historic properties and has requested my review and comment on their finding of effect for the proposed undertaking. After reviewing your letter and supporting documentation, **I do not object** to a finding of *no historic properties affected* for this undertaking pursuant to 36 CFR 800.4(d)(1).

Be advised that under certain circumstances, such as unanticipated discovery or a change in project description, the COE may have additional future responsibilities for this undertaking under 36 CFR Part 800. If you require further information, contact Elizabeth Hodges of my staff at (916) 445-7017 or Elizabeth.Hodges@parks.ca.gov.

Sincerely,

Julianne Polanco
State Historic Preservation Officer

Attachment 2

Tribal Coordination

(No tribal response letters received.)

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DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS
LOS ANGELES DISTRICT
915 WILSHIRE BOULEVARD, SUITE 930
LOS ANGELES, CALIFORNIA 90017-3489

November 12, 2020

Ms. Julie Tumamait-Stenslie
Chair
Barbareno/Ventura Band of Mission Indians
365 North Poli Avenue
Ojai, California 93023
jtumamait@hotmail.com

Dear Ms. Tumamait-Stenslie:

The U.S. Army Corps of Engineers, Los Angeles District (Corps), and the Port of Long Beach (POLB) are proposing a navigation project to increase transportation efficiencies for container and liquid bulk vessels operating in the POLB to accommodate deep draft vessels to call at the POLB fully loaded. To meet obligations under the National Historic Preservation Act (NHPA), 36 CFR 800, as amended, the Corps is hereby consulting with you regarding any cultural resource concerns your tribe may have regarding the undertaking.

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Sincerely,

DEMESA.EDUARD [redacted]

Eduardo T. De Mesa
Chief, Planning Division

Enclosure(s)

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DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS
LOS ANGELES DISTRICT
915 WILSHIRE BOULEVARD, SUITE 930
LOS ANGELES, CALIFORNIA 90017-3489

November 12, 2020

Mr. Fred Collins
Tribal Spokesperson
Northern Chumash Tribal Council
P.O. Box 6533
Los Osos, California 93412
fcollins@northernchumash.org

Dear Mr. Collins:

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Sincerely,

DEMESA.EDUARD [redacted]

Eduardo T. De Mesa
Chief, Planning Division

Enclosure(s)

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DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS
LOS ANGELES DISTRICT
915 WILSHIRE BOULEVARD, SUITE 930
LOS ANGELES, CALIFORNIA 90017-3489

November 12, 2020

Ms. Mariza Sullivan
Chair
Coastal Band of the Chumash Nation
P.O. Box 4464
Santa Barbara, California 93140
cbcntribalchair@gmail.com

Dear Ms. Sullivan:

The U.S. Army Corps of Engineers, Los Angeles District (Corps), and the Port of Long Beach (POLB) are proposing a navigation project to increase transportation efficiencies for container and liquid build vessels operating in the POLB to accommodate dep draft vessels to call at the POLB fully loaded. To meet obligations under the National Historic Preservation Act (NHPA), 36 CFR 800, as amended, the Corps is hereby consulting with you regarding any cultural resource concerns your tribe may have regarding the undertaking.

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Sincerely,

DEMESA.EDUARD [redacted]

Eduardo T. De Mesa
Chief, Planning Division

Enclosure(s)

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DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS
LOS ANGELES DISTRICT
915 WILSHIRE BOULEVARD, SUITE 930
LOS ANGELES, CALIFORNIA 90017-3489

November 12, 2020

Ms. Mona Olivas Tucker
Chairwoman
yak tityu tityu yak tithini - Northern Chumash Tribe
660 Camino Del Rey
Orroyo Grande, California 93420
olivas.mona@gmail.com

Dear Ms. Tucker:

The U.S. Army Corps of Engineers, Los Angeles District (Corps), and the Port of Long Beach (POLB) are proposing a navigation project to increase transportation efficiencies for container and liquid bulk vessels operating in the POLB to accommodate deep draft vessels to call at the POLB fully loaded. To meet obligations under the National Historic Preservation Act (NHPA), 36 CFR 800, as amended, the Corps is hereby consulting with you regarding any cultural resource concerns your tribe may have regarding the undertaking.

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Sincerely,

DEMESA.EDUARD[redacted]

Eduardo T. De Mesa
Chief, Planning Division

Enclosure(s)

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DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS
LOS ANGELES DISTRICT
915 WILSHIRE BOULEVARD, SUITE 930
LOS ANGELES, CALIFORNIA 90017-3489

November 12, 2020

Mr. Kenneth Kahn
Chairman
Santa Ynez Band of Chumash
P.O. Box 517
Santa Ynez, California 93460
kkahn@santaynezchumash.org

Dear Mr. Kahn:

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DEMESA.EDUARD [redacted]

Eduardo T. De Mesa
Chief, Planning Division

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U.S. ARMY CORPS OF ENGINEERS
LOS ANGELES DISTRICT
915 WILSHIRE BOULEVARD, SUITE 930
LOS ANGELES, CALIFORNIA 90017-3489

November 12, 2020

Mr. Freddie Romero
Santa Ynez Band of Chumash
Cultural Resources Coordinator
Santa Ynez Tribal Elders Council
fromero@santaynezchumash.org

Dear Mr. Romero:

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Sincerely,

DEMESA.EDUARD [redacted]

Eduardo T. De Mesa
Chief, Planning Division

Enclosure(s)

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DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS
LOS ANGELES DISTRICT
915 WILSHIRE BOULEVARD, SUITE 930
LOS ANGELES, CALIFORNIA 90017-3489

November 12, 2020

Mr. Gary Pierce
Contemporary Council Lead and Public Law Lead
Salinan Tribe of Monterey and San Luis Obispo Counties
7070 Morro Road, Suite A
Atascadero, California 93422
Morrorock40@gmail.com

Dear Mr. Pierce:

The U.S. Army Corps of Engineers, Los Angeles District (Corps), and the Port of Long Beach (POLB) are proposing a navigation project to increase transportation efficiencies for container and liquid bulk vessels operating in the POLB to accommodate deep draft vessels to call at the POLB fully loaded. To meet obligations under the National Historic Preservation Act (NHPA), 36 CFR 800, as amended, the Corps is hereby consulting with you regarding any cultural resource concerns your tribe may have regarding the undertaking.

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Sincerely,

DEMESA.EDUARD [redacted]

Eduardo T. De Mesa
Chief, Planning Division

Enclosure(s)

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DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS
LOS ANGELES DISTRICT
915 WILSHIRE BOULEVARD, SUITE 930
LOS ANGELES, CALIFORNIA 90017-3489

November 12, 2020

Ms. Donna Haro
Tribal Headwoman
Xolon-Salinan Tribe
P.O. Box 7045
Spreckels, California 93962
dhxolonaakletse@gmail.com

Dear Ms. Haro:

The U.S. Army Corps of Engineers, Los Angeles District (Corps), and the Port of Long Beach (POLB) are proposing a navigation project to increase transportation efficiencies for container and liquid bulk vessels operating in the POLB to accommodate deep draft vessels to call at the POLB fully loaded. To meet obligations under the National Historic Preservation Act (NHPA), 36 CFR 800, as amended, the Corps is hereby consulting with you regarding any cultural resource concerns your tribe may have regarding the undertaking.

The project, undertaken jointly by the Corps and the Port of Long Beach (POLB), would deepen the entrance to the Main Channel (the Approach Channel through Queens Gate) to a depth of -80 feet mean lower low water (MLLW), widen portions of the Main Channel to ease the bend to a depth of -76' MLLW, construct an approach channel and turning basin to Pier J South to a depth of -55' MLLW, and deepen portions of the West Basin and West Basin Approach to a depth of -55' MLLW. Project areas behind the breakwater (Main Channel and West basin) will be deepened using an electric clamshell dredge. The Approach Channel through Queens Gate and the approach Channel and turning basin to Pier J South will be deepened using a hopper dredge.

The Area of Potential Effects (APE), depicted on the enclosed Figure 1, is defined as areas previously dredged and proposed for deepening, and includes the area near Pier J not previously dredged.

To take into account the potential for shipwrecks that could be affected by proposed deepening and expansion, the Corps reviewed comprehensive survey data. In 2000, at the request of the Port of Los Angeles, the Port of Long Beach, and the pilots who maneuver increasingly large oil tankers and cargo ships through the area's crowded shipping lanes, NOAA deployed the *Fairweather* to investigate potential hazards and anomalies in San Pedro Bay. NOAA used remote sensing survey to update nautical charts 18749 and 18751, which provide depth measurements and aids to navigation that mariners rely on for safe transit. The project encompassed 114 square nautical miles. The survey areas included San Pedro Bay and its approaches, stretching south to the waters off Huntington Beach and Newport Beach. Altogether, remote sensing bathymetric surveys conducted from 1970 to 2015 and side-scan surveys conducted in the 2000s show no submerged vessels or objects in the APE (Figure 2). The nearest wreck (Wreck #2) is located 0.5 miles from the Pier J approach channel, just inside the breakwater and is well outside the APE (Figures 3 and 4).

These surveys recorded anomalies within a 2-meter horizontal resolution and were sufficient to have detected any large submerged objects. Bathymetry data near Pier J obtained for the years, 1970, 1989, 2004, and 2015 confirm this area of seafloor stable and not subject to high sedimentation rates. There has in fact, been little need to perform maintenance dredging in these areas, nor has there been significant sedimentation to bury wrecks beyond the range of remote sensing. We are therefore confident to state no historic vessels or remnants would be encountered during the deepening actions.

The Corps also considered the potential for Paleolandscapes to exist within the APE. A 1994 investigation by Statistical Research Inc. of the Queens Gate Channel prior to dredging provided relevant data for the current proposed project. Surveyed areas extended from the Queens Gate entrance southward across the San Pedro Bay portion of the outer continental shelf to a water depth of 78', encompassing all of the APE proposed for dredging. The report, *Technical Synthesis Report, Underwater Remote Sensing Survey of Proposed Dredging Area, Queensgate Channel, Long Beach Harbor, California, February 1994*, observed that, prior to warming of the ice sheets and rising sea levels 18,000 years ago, human habitation may have occurred on the exposed continental shelf. However, because the high energy wave environment of the San Pedro shelf likely washed away any intact deposits, submerged archaeological sites would likely only exist in protected areas of heavy alluvium or in highly unconsolidated sediments. Because proposed dredging areas are unprotected and have been found to have sparse deposition, there is little probability intact sites remain on the seafloor in the APE. In addition, the findings stated there have been no discoveries of isolated artifacts in the Port of Long Beach, due to high energy wave activity and low levels of alluvium.

A more recent study, *Inventory and Analysis of Coastal and Submerged Archaeological Site Occurrence on the Pacific Outer Continental Shelf* (U.S. Department of the Interior, Bureau of Ocean Energy Management, Pacific OCS Region, November 2013) also investigated the possibility of such sites existing on the Pacific Ocean Continental Shelf (POCS). Research found that very few prehistoric sites are known to exist on the POCS. Consistent with the 1994 remote sensing survey, the 2013 study posits that submerged archaeological sites or isolates could only remain in low wave or protected areas or in unconsolidated sediments. Because the seafloor in the APE is highly stable and has shown very little secondary sedimentation, this portion of the POCS proposed for deepening is not likely to contain unconsolidated deposits and would therefore have little to no potential to contain submerged archaeological sites.

Deepening will produce 7.4 million cubic yards of dredge material, to be placed at the nearshore Surfside Borrow Site, used since 1964 for San Gabriel River to Newport Bay nourishment, as well as at two EPA-designated offshore disposal sites at the edge of the San Pedro Shelf. The latter, Newport Beach, CA (LA-3) and Los Angeles/Long Beach, CA (LA-2) locations, were designated in 1991 and 2005, respectively. All disposal sites are shown in Figure 5. No historic properties have been identified at these sites; therefore, the current disposal actions will also have no potential to affect historic properties.

To summarize, due to the high energy environment of San Pedro Bay and limited sedimentary deposition, remote sensing survey data showing no historic era wrecks or objects, and low potential for paleo-era sites to exist, the Corps finds no historic properties will be affected by the undertaking.

At this time, the Corps invites your comment on the proposed action. If you have any questions, please contact Ms. Lauren McCroskey, at (253) 279-3316 or via email at lauren.l.mccroskey@usace.army.mil.

Sincerely,

DEMESA.EDUARDO [redacted]

Eduardo T. De Mesa
Chief, Planning Division

Enclosure(s)

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FINAL INTEGRATED FEASIBILITY REPORT AND ENVIRONMENTAL IMPACT STATEMENT / ENVIRONMENTAL IMPACT REPORT (EIS/EIR)

APPENDIX O: COMMENTS AND RESPONSES TO COMMENTS

PORT OF LONG BEACH
DEEP DRAFT NAVIGATION STUDY
Los Angeles County, California

October 2021

US Army Corps of Engineers®

Port of LONG BEACH
THE PORT OF CHOICE

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The U.S. Army Corps of Engineers (USACE) and the Port of Long Beach (POLB) thank the public for their comments on the Draft Integrated Feasibility Report and Environmental Impact Statement / Environmental Impact Report (IFR) during the October – December 2019 comment period. Our agencies have considered all comments in the preparation of the Final IFR. This appendix provides responses to all comments received by mail or email during the public comment period, as well as to verbal comments provided during the November 13, 2019, public hearings held at the POLB Administration Building in the City of Long Beach, California.

The following tables are organized to display USACE and POLB responses as follows:

- First Column – numbers corresponding to comments highlighted in the comment letters, as shown in Attachment 2 of this appendix
- Second Column – USACE and POLB responses (Attachment 1)
- Third Column – Location in the Final IFR to find revisions/updates made in response to each comment, as applicable

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Attachment 1

Responses to Comments

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General Comments and Responses		
Response Number	**General Theme**	**Response**
1	Growth Inducement and Scope of the Project	Growth inducement is discussed in Section 12.8 of the Draft IFR. Growth inducement is defined by ways in which a project could foster economic or population growth, either directly or indirectly, in the surrounding environment. Included in this are projects which would remove obstacles to growth. The proposed activities associated with the proposed Project are not considered to be growth inducing. The main purpose of the proposed Project is to increase operational efficiencies and improve conditions for existing and future vessel operations and safety. Transportation inefficiencies occur when channels and maneuvering areas do not fully accommodate the vessels using them. Existing channel depths, and in some areas, channel widths, do not meet the draft requirements of the current and predicted future fleet of larger container and liquid bulk vessels that call on the Port of Long Beach (POLB). Tide restrictions, light loading, lightering, and other operational inefficiencies result in increased transportation costs for the shipment of commodities at the POLB. Light loading is the process of not loading a vessel to its maximum capacity at the initial port to reduce the draft, and lightering is the process of moving cargo from one vessel to another, often to reduce the draft of a larger vessel. By improving these inefficiencies through deep draft dredging, the POLB would be able to handle fully loaded larger vessels that call at the POLB. While the proposed Project would not result in larger vessels calling at the POLB beyond current forecasts, the efficiencies afforded by accommodating these larger vessels fully loaded with no operational restrictions would in turn reduce the total number of vessels calling at the POLB over time. The Draft IFR analysis does not evaluate the number, types, or distribution of vessels generated by the proposed Project as this would be extremely complex and speculative. The objective of the proposed Project is to improve conditions for vessel operations and safety, and to accommodate larger vessels with fewer restrictions. The primary factor related to throughput is the backland storage and liquid bulk storage areas of the POLB, which are well developed, constrained, and at capacity. The proposed

General Comments and Responses		
Response Number	**General Theme**	**Response**
		Project will not, in and of itself, increase throughput because of POLB terminal backlands and storage constraints (among other factors). Throughput dynamics are addressed in the POLB's Integrated Land Use Tool (ILUT), which provides data to show that most POLB container terminals are backland constrained and that larger vessels do not themselves induce growth (they actually inhibit throughput). The ILUT was developed to analyze the capacity and operating impacts of the marine terminals at the POLB, specifically, container terminals, auto terminals, dry-bulk terminals, break bulk terminals, and liquid bulk terminals. The ILUT models the POLB terminals and transportation components considering all relevant aspects of POLB operations, including ship and cargo profiles for each terminal, dwell times, work shifts, operating hours, on-dock/off-dock activity, as well as transportation and navigational networks. The model produces key performance indicators associated with various POLB terminal designs, including terminal throughput capacity, inland transport modal splits, ship and train traffic, emissions, revenue, jobs, and “big ship” capability (WSP 2017). In addition, POLB terminals would need to be updated and modernized to accommodate any increases in throughput. This would require project-specific environmental review, during which time the potential environmental impacts associated with increases in throughput would be evaluated accordingly. The primary decision criteria for identifying the National Economic Development (NED) Plan for the proposed Project includes reasonably maximizing net benefits while remaining consistent with the federal objective of protecting the Nation’s environment. For the proposed Project, benefits were derived mainly from transportation cost savings (e.g., increased loads for existing vessels, switching to larger vessels, enhanced maneuverability, and delay reduction), or higher net income to commodity users or producers (as a result of lower transportation costs) during the economic period of analysis.
2	Beneficial Reuse	The USACE and the POLB are committed to beneficially reusing dredge material to the maximum extent practicable. The possibility of using sediments from the proposed Project for the East San Pedro Bay Ecosystem Restoration Project, if authorized, and funded, would be evaluated during PED and a

General Comments and Responses		
Response Number	**General Theme**	**Response**
		decision made based on sediment quality and the timing of construction for both projects. Another possibility is in-harbor fill associated with future POLB developments. Maximum use of such an in-harbor fill would be to the benefit of the POLB and the USACE and would be considered, if available. No specific projects have been identified that match construction timing. If beneficial use sites become available, the USACE would be required to conduct additional analysis under NEPA and the POLB would be required to perform additional analysis under CEQA.
3	POLB-wide Programs	The POLB is committed to its zero-emissions goals and policies. In 2006, the POLB and Port of Los Angeles adopted the Clean Air Action Plan (CAAP), a plan aimed at significantly reducing the health risks posed by air pollution from port-related mobile sources, specifically ships, trains, trucks, terminal equipment, and harbor craft, such as tugboats. The CAAP describes the relationship between air emissions and health impacts. The 2017 CAAP Update includes targets and baselines for emissions reduction and proposes strategies to reach those targets. The POLB's Strategic Plan, as approved by the Board of Harbor Commissioners (BHC), reflects the POLB's commitment to the CAAP goals and policies. As a component under the CAAP, the POLB and Port of Los Angeles fund the development and demonstration of promising emission-reduction technologies under the guidance of the Technology Advancement Program (TAP). The CAAP TAP webpage includes annual reports that document the demonstration and performance of 45 zero-emissions and clean technology projects dating back to 2007 (http://www.cleanairactionplan.org/technology-advancement-program/). In 2018, the POLB and Port of Los Angeles developed a conceptual scope to demonstrate a Large-Scale Zero-Emissions Pilot Truck Deployment, which will pave the way for the deployment of 50 to 100 zero-emissions drayage trucks in the near future. In addition, the POLB is using grant funding from the California Energy Commission and the California Air Resources Board to demonstrate zero emissions equipment and advanced energy systems in POLB operations, such as zero-emissions terminal

General Comments and Responses		
Response Number	General Theme	Response
		equipment, zero-emission cargo handling equipment, clean container ships, electric trucks, electrical charging infrastructure to support battery-electric cargo handling, among others. Information on these programs can be found at: https://www.polb.com/environment/our-zero-emissions-future#program-details. The POLB and Port of Los Angeles also support a number of other technology development efforts that are outside of the TAP. These projects include direct POLB and Port of Los Angeles investment, as well as grants from partner agencies such as the South Coast Air Quality Management District (SCAQMD) to support demonstration projects implemented by POLB tenants and technology manufacturers. The 2017 CAAP Update webpage includes quarterly progress reports on these efforts (http://www.cleanairactionplan.org/2017-clean-air-action-plan-update/). In total, the Port of Long Beach and Port of Los Angeles are actively pursuing efforts to achieve the goals in the 2017 CAAP Update. However, some of the challenges discussed in the CAAP remain. For example, commercially available zero-emissions technology related to the operation of all cargo handling equipment and drayage trucks at the POLB and Port of Los Angeles is currently at the demonstration stage rather than the implementation stage. While some emerging technologies have been “acknowledged” by regulatory agencies or “validated” by (unspecified) third parties as implementable, this does not necessarily ensure that such technologies will be feasible, which means “capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, legal, social, and technological factors” (CEQA Guidelines Section 15364). In addition, the POLB’s Energy Initiative Roadmap outlines the energy initiative priorities to implement the POLB's Energy Policy adopted in 2013 and provides the link between CAAP strategies to lower air emissions and the engineering and infrastructure necessary to ensure these strategies are successful.

1. State Water Resources Control Board		
Commenter: Dmitriy Ginzburg, Hollywood District Engineer		
Comment Number	**Response**	**Location in IFR**
1-1	Comment noted. Contractor will comply as needed.	NA

2. California Coastal Commission		
Commenter: Dani Ziff, Coastal Program Analyst		
Comment Number	**Response**	**Location in IFR**
2-1	POLB and California Coastal Commission (CCC) staff agreed that the proposed Project would be included and analyzed in the 2020 Port Master Plan Update (PMPU), thus giving the CCC approval oversight. However, the proposed Project is listed as a non-appealable project in the PMPU. The POLB carefully reviewed the Draft IFR and Section 30715(a)(1) of the California Coastal Act and determined that the proposed Project is not an appealable project because it is not a development for the storage, transmission, or processing of liquefied natural gas and crude oil in such quantities as would have a significant impact upon the oil and gas supply of the state or nation or both. The POLB defines a development with a significant impact as a development that would (1) substantially increase or decrease the oil and gas supply of the nation, or both; or (2) substantially increase or decrease the value of the oil and gas facilities of the state or nation, or both. The proposed Project is not a significant development under this standard. The proposed Project will facilitate the safe and efficient transportation of all types of cargo into and out of the POLB because larger vessels are calling at the POLB that need deeper and wider channels to safely operate. Currently, these vessels must engage in lightering, where some of the petroleum material is transferred to a second ship offshore so both ships need less depth when they enter the POLB, or light loading, where larger ships are not fully loaded to ensure they can safely navigate, which resulting in more trips (and significantly higher transportation costs) to transport the same amount of product. The quantity of oil and gas deliveries will not	Section 12 Environmental Impact Report (CEQA)-12.2.9 Land Use/Planning, Impact LU-1: Impact Determination, p267

2. California Coastal Commission

Commenter: Dani Ziff, Coastal Program Analyst

Comment Number	Response	Location in IFR
	materially change due to this project; it will simply be handled in a safer and more cost-effective manner. This dynamic is fully explained in the Draft IFR, wherein the USACE identifies the proposed Project as having national significance because it will improve transportation efficiencies, decrease costs, and improve conditions for vessel operations and safety, not because it will significantly increase the oil and gas supply of California or the nation (Draft IFR, p. 3, Section 1.4 Purpose and Need.) As such, this proposed Project would have little to no impact on the oil and gas supply of the state or nation and is not an appealable project under Section 30715(a)(1).	

3. State of California Department of Transportation District 7

Commenter: Mya Edmonson, IGR/CEQA Branch Chief

Comment Number	Response	Location in IFR
3-1	The work would be done primarily by sea. Construction-related truck traffic is not anticipated to require any detours or street closures requiring the preparation of a Traffic Management Plan.	NA
3-2	Comment noted. This type of truck traffic is not expected to be generated by the proposed Project.	NA
3-2	Comment noted. The work will involve dredging by marine equipment. Significant earthmoving is not expected during the proposed Project.	NA

4. US Environmental Protection Agency, Region IX

Commenter: Bridget Coyle, Deputy Director, Tribal, Intergovernmental and Policy Division

Comment Number	Response	Location in IFR
4-1	Should the sediment testing program identify sediments that are unsuitable either for nearshore placement or ocean disposal, alternative disposal options would have to be identified. It is not possible to identify specific alternative disposal at this time as none of them would be in-harbor fill associated with future POLB developments, which are not currently planned. Maximum use of such an in-harbor fill would be to the benefit of the POLB and the USACE and would be	Section 10.1.1, Clean Water Act and Section 103 of the Marine Protection, Research and Sanctuaries Act

4. US Environmental Protection Agency, Region IX		
Commenter: Bridget Coyle, Deputy Director, Tribal, Intergovernmental and Policy Division		
Comment Number	**Response**	**Location in IFR**
	considered, if available. It is also not feasible at this point to discuss placement/disposal alternatives lacking the necessary volumes of sediments requiring alternative sites. A supplemental NEPA document would be required to address potential impacts.	
4-2	See General Response #1. The proposed Project, in and of itself is not growth inducing nor would it affect the volume or capacity of POLB operations because of terminal and backlands storage constraints, among other factors. While an objective of the proposed Project is to create efficiencies by allowing larger vessels to call at the POLB and thereby reducing the number of calls made by smaller vessels, the Draft IFR only evaluates the potential environmental impacts associated with construction activities and dredging of the various areas within the geographic scope of the project. It would be extremely complex and speculative to analyze the potential operation of the number, types, or distribution of vessels and other types of equipment and vehicles potentially generated by proposed Project. Any terminal improvements that will accommodate increases in throughput would require and undergo project-specific environmental analyses in accordance with CEQA and/or NEPA. Though not specific to the proposed Project, as committed to in the San Pedro Bay Ports Clean Air Action Plan (CAAP), the POLB conducts activity-based annual inventories of air emissions from port-related operational sources (i.e., vessels, harbor craft, heavy-duty trucks, trains, and cargo-handling equipment) to track the POLB's progress towards emission reduction goals identified in the CAAP. The annual air emissions inventories have been prepared for each calendar year since 2005 and are available on the POLB's website at: http://www.polb.com/environment/air#emissions-inventory (accessed March 30, 2020).	NA
4-3	See response above to comment 4-1. In addition, measures to be implemented during dredging would be identified based on sediment test results to ensure that contaminated sediments are properly handled and transported. Additional text has been added to the Final IFR to address this issue.	Same as Comment 4-1
4-4	Additional information on the Surfside Borrow Site Nearshore Placement Area, including its historical use, current bathymetry, and proposed bathymetry after placement will be	Sections 4.4; 5.1.3; 5.1.4; and 5.1.6

4. US Environmental Protection Agency, Region IX		
Commenter: Bridget Coyle, Deputy Director, Tribal, Intergovernmental and Policy Division		
Comment Number	**Response**	**Location in IFR**
	added to the Final IFR. There are no other known projects planning to use the site for sediment placement, including the Seal Beach Naval Weapons Station Redevelopment Project. A portion of the site would be used as a borrow source for Surfside-Sunset Beach Nourishment Project, Stage 13 prior to construction of the proposed Project in the POLB.	
4-5	Other beneficial reuse sites are not currently available. The USACE would maximize beneficial reuse if future sites are identified. The possibility of using sediments from the proposed Project for the East San Pedro Bay Ecosystem Restoration Project, if authorized, would be evaluated during PED and a decision made based on sediment quality and the timing of construction for both projects. It is in the USACE's interest to maximize beneficial reuse and it is a policy of the Los Angeles District to do so as part of the Southern California Dredged Materials Management Team (SC-DMMT). Shallow water habitat (SWH) placement sites were also evaluated to beneficially use dredge material and create additional mitigation credits. A SWH was developed as part of the Port of Los Angeles (POLA) channel deepening project. The POLA SWH is located at the west end of the breakwater on the inner harbor site. It has successfully enhanced marine mammal, fish, and bird habitat development. Potential development sites in the POLB include along the Navy Mole and along the Pier 400 Transportation Corridor adjacent to the existing shallow water habitat site. Depths at these sites are -25 to -30 ft, and as such a mitigation site would convert subtidal habitat to shallow water habitat, and this would at best provide acreage credit. The SWH can also be designed to accommodate chemically impacted material. Other options can include developing underwater material storage sites at strategic locations in the POLB to store dredge material for beneficial use at a later date. Development of a Confined Aquatic Disposal (CAD) Site would require considerable additional studies to demonstrate that such sites would be stable and provide physical isolation to any contaminated sediments placed within them. Development of	NA

4. US Environmental Protection Agency, Region IX		
Commenter: Bridget Coyle, Deputy Director, Tribal, Intergovernmental and Policy Division		
Comment Number	**Response**	**Location in IFR**
	a CAD site would only be beneficial if sediments unsuitable for ocean disposal were identified during PED.	
4-6	Prior deepening of the Approach Channel identified the formation material as fine sand. The preliminary determination that this material is suitable for nearshore placement is based on that information. This would be confirmed during PED by the performance of a Sediment Sampling and Analysis Program. Final design for placement would be done during PED using bathymetric surveys of the placement area with the goal of filling in the current borrow site, confirmed by pre- and post-construction surveys.	Clarifying text has been added in Section 10.1.1.
4-7	The only known large dredging project with ocean disposal is located in Lower Newport Bay with disposal at the LA-3 ODMDS. That project is expected to be completed prior to construction of the proposed Project and would not interfere or interact cumulatively with the proposed Project.	NA
4-8	The Final IFR has been revised to clarify that ocean disposal would require written concurrence from the USEPA.	Clarifying text has been added in Section 10.1.1.
4-9	The USACE will be coordinating a disposal plan with the USEPA for ocean disposal when requesting formal concurrence with any suitability determination made by the USACE for ocean disposal. The USACE would ensure disposal events comply with site conditions provided by the USEPA for the two ocean disposal sites to be used (LA-2 and LA-3) with reports provided to USEPA. No surveys of the disposal sites would be conducted as part of the proposed Project. Surveys are conducted by the USEPA as part of their site monitoring program for the two sites.	NA
4-10	A discussion of the MPRSA has been added to the Final IFR as recommended.	Section 10.1.1
4-11	A reference to the USEPA Southern California Disposal Site Management and Monitoring Plan is included in Appendix B	Appendix B, Section 3.7.2
4-12	See General Response #1. The proposed Project would not trigger any expansion projects at Pier J and Pier T, nor would it lead to any additional berth-deepening and terminal expansion projects at the POLB. Any terminal expansion projects at the POLB would require and undergo the appropriate level of	NA

4. US Environmental Protection Agency, Region IX		
Commenter: Bridget Coyle, Deputy Director, Tribal, Intergovernmental and Policy Division		
Comment Number	**Response**	**Location in IFR**
	project-specific environmental review under CEQA and/or NEPA.	
4-13	The proposed Project includes maximized use of electric dredges. The areas planned for dredging by hopper dredges are not suitable, or accessible, for dredging by electric dredge.	NA
4-14	All air quality measures identified in the Draft IFR will be carried into the Final IFR and would be implemented in full during construction.	NA
4-15	The South Coast Air Quality Management District (SCAQMD) did not comment on the Draft IFR or its air quality section. Revisions will be made in response to public comments. The Port of Long Beach and USACE worked with the SCAQMD to find offsets for emissions within the SCAQMD emissions budget that supports the USACE's conformity determination. The final conformity determination is included in the Final IFR.	Section 10.1.1 Clean Air Act
4-16	The proposed Project is not growth inducing and would not affect the operation of highway vehicles such as drayage trucks at POLB terminals. Therefore, no additional action or mitigation on the part of the proposed Project is necessary. See General Responses #1 and #3.	NA
4-17	The proposed Project is not growth inducing and would not affect the operation of marine vessels associated with POLB activities. Therefore, no additional action or mitigation on the part of the proposed Project is necessary. See General Responses #1 and #3.	NA
4-18	The proposed Project is not growth inducing and would not affect the operation of line-haul or switcher locomotives associated with POLB activities. Therefore, no additional action or mitigation on the part of the proposed Project is necessary. See General Responses #1 and #3.	NA
4-19	The proposed Project is not growth inducing and would not affect the operation of cargo handling equipment associated with POLB activities. Therefore, no additional action or mitigation on the part of the proposed Project is necessary. See General Response #1 and #3.	NA
4-20	Comment noted, revision has been made.	Section 10.1.1 MPRSA
4-21	The proposed Project is not growth inducing and would not affect the volume or capacity of POLB operations due to terminal and backlands storage constraints. See General	NA

4. US Environmental Protection Agency, Region IX		
Commenter: Bridget Coyle, Deputy Director, Tribal, Intergovernmental and Policy Division		
Comment Number	**Response**	**Location in IFR**
	Response #1. A cumulative analysis was included in Section 6 of the Draft IFR, wherein related projects in San Pedro Bay as the Region of Influence (ROI) are considered. Related projects include projects that are proposed (i.e., with pending applications), recently approved, under construction, or reasonably foreseeable that could produce a cumulative impact on the local environment when considered in combination with the proposed Project. Table 6-1 includes a listing of those projects considered to be reasonably foreseeable during the construction period. As such, the analysis includes future growth related to accelerating development with the construction period of 2025-2027. The Draft IFR evaluated the proposed Project's contribution to cumulative impacts on air quality; and has included all feasible environmental control measures to reduce the proposed Project's contribution. The USACE and POLB acknowledge that the proposed Project would result in a cumulatively considerable contribution to air quality and GHG emissions, and have included measures to that will help to reduce air quality impacts within the vicinity of the POLB and reduce GHG emissions that contribute to global climate change. No additional analysis or updates to the impact determination are warranted.	
4-22	For purposes of the EJ analysis, the affected area is a one-mile radius around the project area, and the city of Long Beach is the community of comparison. The one-mile radius is the standard for assessing environmental justice impacts for the project area. It focused on areas of impact from an air quality perspective, which is the primary impact to residents due to the isolated nature of project activities. Maps showing the affected communities in the project area are included in Appendix K.	NA
4-23	Comment noted. Changes recommended would be made to the Final IFR, if needed. Such changes are not currently expected. Also refer to General Response #1.	NA
4-24	California Assembly Bill (AB) 617 was signed into state law in 2017, and the California Air Resources Board (CARB) Community Air Protection Project which implements AB 617,	NA

4. US Environmental Protection Agency, Region IX		
Commenter: Bridget Coyle, Deputy Director, Tribal, Intergovernmental and Policy Division		
Comment Number	**Response**	**Location in IFR**
	the South Coast AQMD has developed a Community Emissions Reduction Plan (CERP) for Wilmington, Carson, and West Long Beach aims to reduce air pollution in these communities through actions that include measurements and observations; enforcement of existing rules and regulations; development of new rules and regulations; incentives for cleaner equipment; collaboration with agencies, organizations, businesses, and stakeholders; awareness programs and air filtration at schools; and educational outreach programs for equipment operators. POLB staff regularly attend SCAQMD’s community meetings and participated in South Coast AQMD’s development of the CERP. The CERP incorporates CAAP initiatives such as incentives for cleaner ships and harbor craft, and implementation of at-berth regulations for ocean-going vessels. While the CERP would be implemented by the Community Steering Committee, SCAQMD, and CARB, the exact timing of implementation and details of the CERP actions are currently unknown. The POLB continues to monitor the efforts of the CERP, and in the meantime, will continue to implement its own initiatives and measures under the CAAP. Further, the POLB provided formal comment on the Assembly Bill (AB) 617 Community Air Protection Program Draft Blueprint on July 23, 2018, expressing support for the strategies outlined in the document and future collaboration to reduce emissions from POLB-related operations. While the CERP would be implemented by the Community Steering Committee, SCAQMD, and California Air Resources Board, the exact timing of implementation and details of the CERP actions are currently unknown. The POLB continues to monitor the efforts of the CERP, and in the meantime, will continue to implement its own initiatives and measures under the CAAP. The Draft IFR proposes all feasible measures to mitigate potentially significant air quality impacts from construction of the project and its alternatives. In addition, the POLB has established its Community Grants Program to fund programs in community health, facility improvements, and community infrastructure to alleviate or reduce impacts from POLB-related activities. As discussed in Section 12.4.3 of the Draft IFR, the	

4. US Environmental Protection Agency, Region IX		
Commenter: Bridget Coyle, Deputy Director, Tribal, Intergovernmental and Policy Division		
Comment Number	**Response**	**Location in IFR**
	proposed Project's contribution to the Community Grants Program was considered for pollutants that would exceed the South Coast AQMD peak day significance thresholds, after the implementation of mitigation measures. The proposed project is expected to contribute $146,753 to the POLB's Community Grants Program.	

5. California State Clearinghouse		
Commenter: Scott Morgan, Director		
Comment Number	**Response**	**Location in IFR**
5-1	Comment noted. Thank you for acknowledging compliance with the State Clearinghouse review requirements for draft environmental documents pursuant to CEQA.	NA

6. National Marine Fisheries Service, West Coast Region		
Commenter: Chris Yates, Assistant Regional Administrator for Protected Resources		
Comment Number	**Response**	**Location in IFR**
6-1	See General Response #2.	NA
6-2	The U.S. Navy's Ammunition Pier and Turning Basin project at Naval Weapons Station Seal Beach is not planning to use the Surfside Borrow Site Nearshore Placement Area for sediment disposal. Permits issued for the project by USACE's Regulatory Division does not currently authorize use of the Surfside Borrow Site Nearshore Placement Area for sediment disposal. Any change would require a permit modification.	NA
6-3	The Surfside Borrow Site Nearshore Placement Area is a non-dispersive site, which is why the borrow site has not naturally filled. Placement at the Surfside Borrow Site Nearshore Placement Area is not expected to have any impacts downcoast to the Bolsa Chica inlet.	NA
6-4	Comment noted. Pre-construction surveys of the Surfside Borrow Site Nearshore Placement Area deleted from the commitments in the Final IFR.	S.5; Section 5.4.3; Section 10.2, Item 13; and Section 12.2.4

6. National Marine Fisheries Service, West Coast Region		
Commenter: Chris Yates, Assistant Regional Administrator for Protected Resources		
Comment Number	**Response**	**Location in IFR**
6-5	Concur, Local Service Facilities will require separate permitting by the Regulatory Division of the USACE. NMFS will be re-consulted on EFH prior to issuing any permit to the POLB pursuant to section 404 of the Clean Water Act and section 10 of the Rivers and Harbors Act related to Local Service Facilities, including structural improvements to the Pier J breakwater.	NA
6-6	See General Response #2.	NA
6-7	Refer to responses to comments 6-2 and 6-3.	NA
6-8	Local Service Facilities will require separate permitting by the Regulatory Division of the USACE. NMFS will be re-consulted on EFH prior to issuing any permit to the POLB pursuant to section 404 of the Clean Water Act and section 10 of the Rivers and Harbors Act related to Local Service Facilities, including structural improvements to the Pier J breakwater. Three concepts were reviewed for improving/stabilizing the Pier J rock slopes to allow dredging to take place. The concepts encompassed the following: -Rock dike installed on the dredged slope -Steel sheet pile bulkhead wall -Ground improvement such as jet grouting. Of the three concepts the bulkhead wall was the most cost effective. During final design it may be determined that another concept or a combination of one or all three concepts would be the most practical alternative. Temporary impacts to EFH may occur during construction, however Permanent EFH loss is not anticipated, therefore, mitigation is not anticipated.	NA
6-9	Permanent EFH loss is not anticipated. Options studied allow for conversion of habitat from soft bottom to rock by use of rock dike or rock toe protection to structures.	NA
6-10	Comment noted. The USACE is aware of its obligations to re-consult, if needed. The USACE will be reinitiating EFH consultation with NMFS for the structural improvements to the Pier J breakwater. See response to comment 6-5.	NA

6. National Marine Fisheries Service, West Coast Region		
Commenter: Chris Yates, Assistant Regional Administrator for Protected Resources		
Comment Number	**Response**	**Location in IFR**
6-11	With the implementation of avoidance and minimization measures listed in Section 5.4 of the IFR, the USACE determined the project may affect not likely to adversely affect green sea turtles. The USACE initiated informal consultation with the NMFS on August 9, 2021. On August 30, 2021, NMFS concurred with USACE determination.	Section 3.4; 5.4; 10.2; and Executive Summary
6-12	Due to the nature, location, and duration of construction, impacts to marine mammals are not expected, as discussed in the Draft IFR. Additional text has been added to Section 5.4 to address marine mammals under the MPRSA, text that was inadvertently left out of the Draft IFR.	Section 5.4
6-13	The USACE has revised Section 10 as recommended.	Section 10.1.1, FWCA

7. FuturePorts		
Commenter: Marnie O. Primmer, Executive Director		
Comment Number	**Response**	**Location in IFR**
7-1	Comment noted, the support is greatly appreciated.	NA

8. Andrea Hricko		
Commenter: Andrea Hricko		
Comment Number	**Response**	**Location in IFR**
8-1	Emissions associated with dredging activities were analyzed. The proposed Project is not growth inducing and would not result in an increase in POLB throughput, trucks, marine vessels, rail or cargo handling activities. See General Response #1. Please also see response to comments 4-2, 4-16, 4-17, 4-18, and 4-19.	NA
8-2	Tugboats: The Draft IFR includes mitigation measure AQ-2 which requires construction-related harbor craft with Category 1 or 2 marine engines shall meet USEPA Tier 3 emission standards for marine engines. All air quality measures identified in the Draft IFR will be carried into the Final IFR and would be implemented in full during construction. The commenter asserts that the EIR must require that the POLB purchase the needed Tier 3 tugboats for the proposed Project. While quantities are limited, Tier 3	NA

8. Andrea Hricko		
Commenter: Andrea Hricko		
Comment Number	Response	Location in IFR
	tugboats used in construction activities are available. Neither the USACE nor the POLB operate, own, control, or purchase construction equipment for specific projects (i.e. equipment is owned and operated by private companies). The Corps and POLB enter into contracts with qualified construction contractors through a process that follows regulations for public works construction projects, including detailed bid specifications that outline all the requirements for a project, including equipment specifications and requirements. The bid specification will include the mitigation measure and requirement for the use of an electric clamshell dredge for the proposed Project, where applicable. In addition, all construction-related mitigation measures will be included in the Harbor Development Permit issued for the proposed Project. Electric Dredge: The commenter asserts that the Draft IFR must require that the POLB buy an electric clamshell dredge or dredges. Clamshell dredges are available from contractors in configurations that can be electrified and have been used on previous POLB projects. As indicated previously, neither the USACE nor the POLB operate, own, control, or purchase construction equipment for specific projects (i.e., equipment is owned and operated by private companies). The USACE and POLB enter into contracts with qualified construction contractors through a process that follows regulations for public works construction projects, including detailed bid specifications that outline all the requirements for a project, including equipment specifications and requirements. The bid specification will include the mitigation measure and requirement for the use of an electric clamshell dredge for the proposed Project, where applicable. In addition, all construction-related mitigation measures will be included in the Harbor Development Permit issued for the proposed Project. The proposed Project proposes to construct an electrical substation specifically to accommodate the use of an electric clamshell dredge by the construction contractor. Hopper Dredge: Hopper dredgers are powered by self-propelled Category 2 marine engines and as such differ from	

8. Andrea Hricko		
Commenter: Andrea Hricko		
Comment Number	Response	Location in IFR
	clamshell dredge engines, which are considered off-road engines. Electric hopper dredges are not available, and it would be speculative to assume otherwise.	
8-3	A detailed Sediment Sampling and Analysis Program (SAP) would be conducted during PED to test all sediments proposed for dredging in accordance with current regulations. This SAP would be coordinated with the SC-DMMT, as discussed in the IFR. The results would also be coordinated with the SC-DMMT and written concurrence for ocean disposal sought from the USEPA.	NA

9. Consortium Comments Submitted by EarthJustice		
Commenter: Refer to Letter		
Comment Number	Response	Location in IFR
9-1	42 U.S.C. 4332(2)(C) Section 102 of NEPA requires Federal agencies to prepare a detailed statement on the environmental impact of the proposed action; avoidance measures for any adverse effects that cannot be addressed; alternatives to the proposed action; and any irreversible and irretrievable commitments of resources that would be involved in the proposed action. CEQA's statutory framework sets forth a series of analytical steps intended to promote the fundamental goals and purposes of environmental review – information, participation, mitigation, and accountability. The purpose of an EIR is to provide public agencies and the public in general with detailed information about the effect which a project is likely to have on the physical environment, to list ways in which any significant adverse effects might be minimized, and to indicate alternatives that reduce any identified adverse impacts (Public Resources Code Section 21061). Consistent with CEQ Regulations and CEQA Guidelines Section 15124(b), the Draft IFR includes a discussion of the project purpose and need and objectives that are used to explain the underlying reasons why the USACE and the POLB are proposing the Project. As stated in Draft IFR Sections 1.3 and 1.4, the overall purpose of the proposed Project is to	NA

9. Consortium Comments Submitted by EarthJustice		
Commenter: Refer to Letter		
Comment Number	**Response**	**Location in IFR**
	identify and evaluate alternatives to increase transportation efficiencies for container and liquid bulk vessels operating in the POLB, for both the current and future fleet, and to improve conditions for vessel operations and safety in the event of vessel malfunction or weather-related events. In addition, all potentially significant impacts have been analyzed using widely accepted methodologies and have been thoroughly discussed and documented in the Draft IFR. Moreover, for all potentially significant impacts, all feasible mitigation measures and alternatives that would avoid or substantially lessen significant environmental impacts have been imposed on the Project to reduce the significant effects to the extent possible, while attaining most of the objectives of the proposed Project. This approach fully satisfies the requirements of CEQA and NEPA.	
9-2	The purpose of the proposed Project is complete and accurately stated in a manner compliant with applicable federal and state regulations. Compliance with the Clean Water Act is a matter of a legal duty and is not considered to be a project objective as it applies to all USACE projects.	NA
9-3	The project description is complete, detailed, and meets all requirements of NEPA and its implementing regulations. Some details would be worked out in PED, but this is not considered to be non-compliant. Per CEQA Guidelines Section 15124, Project Description, the description of the project shall contain the information on the location of the proposed Project, the project objectives, description of the project’s technical, economic, and environmental characteristics and the intended uses of the EIR but should not provide extensive detail beyond that needed for evaluation and review of the environmental impact. Therefore, the project description in the Draft IFR describes the proposed Project to the appropriate level of detail required by CEQA. See General Response #1 for additional information regarding the growth inducing effects.	NA
9-4	The range of alternatives considered was broad and diverse and complies with NEPA and its implementing regulations.	NA

9. Consortium Comments Submitted by EarthJustice		
Commenter: Refer to Letter		
Comment Number	**Response**	**Location in IFR**
	Mitigation measures have been incorporated for all significant impacts in an attempt to reduce them to a level of insignificance.	
9-5	The comment states that the EIR fails to provide a range of alternatives that account for "meaningful" discussion and allow for informed decision making suggesting that the alternatives are similar. As discussed, Section 12.5 Alternative Analysis of the Draft IFR, CEQA Guidelines Section 15126.6 requires that: *An EIR shall describe a range of reasonable alternatives to the project, or to the location of the project, which would feasibly attain most of the basic objectives of the project but would avoid or substantially lessen any of the significant effects of the project, and evaluate the comparative merits of the alternatives.* The EIR need not account for every conceivable alternative to the proposed Project including alternatives that do not meet the primary or secondary objectives of the proposed Project. This CEQA evaluation presents a reasonable range of alternatives that are consistent with the POLB's legal mandates under the California Coastal Act of 1976, which identifies the POLB and its facilities as a primary economic/coastal resource of the state and an essential element of the national maritime industry for promotion of commerce, navigation, fisheries, environmental preservation, and public recreation. To comply with CEQA requirements, all alternatives considered in the EIR have been evaluated in accordance with the following: - Does the alternative accomplish all or most of the basic objectives of the proposed Project? - Is the alternative potentially feasible (from economic, environmental, legal, social, and technological standpoints)? - Does the alternative avoid or substantially lessen any significant effects of the proposed Project, including consideration of whether the alternative itself could create	NA

9. Consortium Comments Submitted by EarthJustice		
Commenter: Refer to Letter		
Comment Number	**Response**	**Location in IFR**
	significant effects greater than those of the proposed Project? Three action alternatives, in addition to the proposed Project, were carried forward to meet the Project's needs and objectives. Numerous scenarios were explored to determine the most prudent and practicable designs, which are described in more detail in Section 4. Section 5 provides a detailed co-equal analysis of the alternatives. For the purposes of CEQA, a qualitative comparison of the impacts associated with each alternative are compared to the respective impacts associated with the proposed Project. As noted in Section 12, both the No Project Alternative and Alternative 2 were found to reduce impacts associated with the proposed Project. All four action alternatives include widening the Main Channel, deepening the added width to the authorized depth of -76 feet MLLW, and constructing reinforcement of the Pier J breakwaters. These activities are needed to fully implement the General Navigation Features discussed and to allow the POLB to fully realize all the economic benefits of the project and contribute to the national economic development (NED) while protecting the environment. Additionally, only impacts related to air quality and health risk were found to be significant, even with the incorporation of feasible mitigation measures. No additional alternatives that would meet the project objectives would be able to reduce air quality and health risk impacts below significance levels. As discussed in Section 4 and Section 12.5 of the Draft IFR, these represent a range of reasonable alternatives to the project, which would feasibly attain most of the basic objectives of the project and are consistent with the POLB's legal mandates under the CCA.	
9-6	The range of alternatives considered was broad and diverse and complies with NEPA and its implementing regulations, and the CEQA Guidelines. No specific alternatives are suggested that would help to achieve the project objectives.	NA

9. Consortium Comments Submitted by EarthJustice		
Commenter: Refer to Letter		
Comment Number	**Response**	**Location in IFR**
9-7	The purpose of the Study is to identify and evaluate alternatives to increase transportation efficiencies for the current and future fleet of container and liquid bulk vessels operating in the POLB, and to improve overall conditions for vessel operations and safety in the event of vessel malfunction or weather-related events. It is beyond the scope of this Draft IFR to evaluate or establish a mechanism for the vessels to operate at certain speeds on approach or transit in the Santa Barbara Channel, nor are there specific objectives or purpose and need related to the reduction of marine mammal deaths. The commenter provides no substantial evidence of marine mammal deaths. The proposed Project would not introduce any uses or activities that are incompatible with existing POLB operations. Dredging activities are common within POLB environments for channel deepening and maintenance of existing channels. The Draft IFR did not find any significant impacts related to the increase in marine mammal deaths. Thus, an alternative to address such effects is not warranted. Furthermore, vessel operations are not part of the scope of analysis as there will be no increase in vessel capacity or increase throughput for cargo or liquid bulk as a result of project implementation. See General Response #1.	NA
9-8	See General Response #1.	NA
9-9	The proposed Project would accommodate larger vessels forecasted to call at the POLB; the efficiencies afforded by accommodating these larger vessels would in turn reduce the total number of vessels calling at the POLB over time. While these larger vessels could accommodate larger cargo and liquid bulk loads, the overall throughput at the POLB would not be affected by the proposed Project. Furthermore, the fleet and commodity forecast in the POLB Master Plan Update does not consider the completion of the proposed Project. Therefore, as documented in the Draft IFR the efficiencies would not increase throughput for cargo or liquid bulk with project implementation.	NA
9-10	The commenter states that the analysis does not address direct impacts and reasonably foreseeable indirect impacts	NA

9. Consortium Comments Submitted by EarthJustice		
Commenter: Refer to Letter		
Comment Number	**Response**	**Location in IFR**
	and cumulative impacts from the proposed Project. Section 6, Section 12.4 and Section 12.8 includes a cumulative analysis of potential impacts and growth inducing impacts of the proposed Project. Table 6-1 includes a listing of those projects considered to be reasonably foreseeable during the construction period. See General Response #1 for additional information regarding growth inducement.	
9-11	The commenter states that the Draft report unlawfully overlooked the significant environmental effects of the proposed Project on air quality, marine ecosystems, cultural resources and environmental justice communities. Section 3.8 provides an overview of the cultural resources that may be present within the area of potential effect (APE). Sections 5.8 Cultural Resources and 12.2.5 Historic and Tribal Cultural Resources of the Draft IFR discuss the NEPA and CEQA impacts respectively. Additionally, a search of the Native American Heritage Commission (NAHC) Sacred Lands File indicated there are no known sacred resources within the project area. Due to the nature, location, and duration of construction, impacts to marine ecosystems are not expected, as discussed in the Draft IFR. The proposed Project would not introduce any uses or activities that are incompatible with existing POLB operations. Dredging activities are common within POLB environments for channel deepening and maintenance of existing channels. The Draft IFR did not find any significant impacts related to marine ecosystems. Air quality impacts and mitigation measures associated with dredging and construction activities are addressed in Section 12.2.3. The proposed Project is not growth inducing and would not impact POLB operations. See General Response #1. For environmental justice impacts, the project area does constitute an EJ community and a health risk assessment conducted by the POLB concluded that there would be no increase in health risks to disadvantaged communities as a result of the proposed Project. Therefore, there would not be disproportionately high and adverse human health or environmental impacts on minority populations because of the proposed Project.	NA

9. Consortium Comments Submitted by EarthJustice		
Commenter: Refer to Letter		
Comment Number	Response	Location in IFR
	Please refer to previous responses and General Response #1 regarding impacts from growth inducement.	
9-12	The proposed Project is not growth inducing and as such would not increase throughput. See General Response #1.	NA
9-13	The proposed Project is not growth inducing and as such would not lead to an increase in freight transport or health impacts associated with freight transport. See General Response #1.	NA
9-14	The proposed Project is not growth inducing and as such would not lead to air quality impacts associated with operational activities. See General Response #1.	NA
9-15	The proposed Project is not growth inducing and as such would not lead to an increase in cargo transport. See General Response #1.	NA
9-16	Of all criteria pollutants, ozone (O_3) is unique because it would not be directly emitted from proposed Project-related sources. Rather, O_3 is a secondary pollutant, formed from precursor pollutants volatile organic compounds (VOC) and nitrogen oxides (NOx) which react to form O_3 in the presence of sunlight, through a complex series of photochemical reactions. As a result, unlike inert pollutants, O_3 levels usually peak several hours after the precursors are emitted and many miles downwind of the source. In addition, ozone formation is non-linear (i.e., in that one pound of VOC does not necessarily produce one pound of ozone) and is reversible (i.e., ozone tends to convert back to VOC and NOx during the night). Because of the complexity and uncertainty in predicting photochemical pollutant concentrations, it is industry practice and SCAQMD guidance to assess O_3 impacts indirectly by comparing proposed Project-generated emissions of VOC and NOx to daily emission thresholds set by SCAQMD. Similarly, USEPA's general conformity guidance also assesses O_3 impacts by comparing annual Project emissions of VOC and NOx to annual de minimis levels. General conformity is discussed in Section 5.5 of the document. An exceedance of an emission threshold means the proposed Project would make a significant contribution to regional air pollutant emissions in the SCAB. However, an	NA

9. Consortium Comments Submitted by EarthJustice

Commenter: Refer to Letter

Comment Number	Response	Location in IFR
	emission threshold exceedance does not necessarily mean that the proposed Project would contribute to a violation of the state ambient air quality standards. Regional dispersion modeling would be necessary to determine the downwind ambient concentrations of O_3 in the atmosphere where the general population would be exposed. However, regional modeling tools are designed to be used at the national, state, regional, and/or city levels. The SCAQMD holds that currently available regional modeling tools are not well suited to analyze relatively small changes in pollutant concentrations associated with individual projects. Please refer to Section 5.5 and Section 12 of the Draft IFR for a discussion of VOC and NOx emissions and associated impacts. Please refer to Appendix H3 of the Draft IFR for a detailed discussion of regional modeling and SCAQMD's position. In addition, the proposed Project is a dredging and construction project that would not induce growth inducement or increase throughput. Therefore, all impacts would be transient and temporary. In regard to the 2015 ozone NAAQS, the SCAQMD is working on addressing the 2015 ozone standard as part of the 2022 AQMP. The USEPA had not made a designation at the time of the 2016 AQMP and designated the area as Extreme Nonattainment in 2018. The 2016 AQMP does provide a preliminary evaluation of the 2015 ozone 8-hour standard (SCAQMD 2016). The 2016 AQMP also identifies feasible measures toward achievement of CAAQS; this strategy and underlying technical analyses are integrated into the AQMP. Finally, attainment of ambient air standards depends on performance of the region as a whole and a significant increase in an individual project's emissions does not necessarily translate into a delay in reaching attainment, especially given that the proposed Project's emissions are temporary.	
9-17	See General Response #1. See response to comment 4-2.	NA
9-18	See General Response #1; No mitigation measures are needed because there will be no operational impacts due to the project.	NA

9. Consortium Comments Submitted by EarthJustice		
Commenter: Refer to Letter		
Comment Number	**Response**	**Location in IFR**
9-19	The proposed Project is not growth inducing and would not affect cargo throughput or the operation of trucks, marine vessels or cargo handling equipment associated with POLB activities. Therefore, no additional action on the part of the proposed Project is necessary. See General Response #1.	NA
9-20	The proposed Project is not growth inducing and would not affect cargo throughput or the operation of trucks, marine vessels, rail or cargo handling equipment associated with POLB activities. Therefore, no additional action on the part of the proposed Project is necessary. See General Response #1.	NA
9-21	The proposed Project is not growth inducing and would not affect cargo throughput or the operation of trucks, marine vessels, rail or cargo handling equipment associated with POLB activities. Therefore, no additional action on the part of the proposed Project is necessary. See General Response #1.	NA
9-22	The proposed Project is not growth inducing and would not affect cargo throughput or the operation of trucks, marine vessels, rail or cargo handling equipment associated with POLB activities. Therefore, no additional action on the part of the proposed Project is necessary. See General Response #1.	NA
9-23	The proposed Project is not growth inducing and would not facilitate an increase in oil production of refinement. See General Response #1.	NA
9-24	See General Response #1. Assumptions regarding vessel traffic are based on the throughput limitations imposed by terminal backland storage and liquid bulk storage areas, which are constrained and at capacity and based on experience with commercial port operations.	NA
9-25	Channel restrictions limit a vessels capacity by limiting its draft. Deepening the channel reduces this constraint and the vessel's maximum practicable capacity increases towards its design capacity. This increase in vessel capacity results in fewer vessel trips required to transport the forecasted cargo. Increasing the water depth encourages the deployment of larger vessels to the POLB. Furthermore, the increase in larger Post-Panamax vessels displaces the less economically efficient smaller Post-Panamax vessels and Panamax class vessels. This would decrease the number of vessel trips, overall, at the POLB.	NA

9. Consortium Comments Submitted by EarthJustice		
Commenter: Refer to Letter		
Comment Number	Response	Location in IFR
	The proposed Project would facilitate the safe and efficient transportation of all types of cargo into and out of the POLB because larger vessels are calling at the POLB that need deeper and wider channels in order to safely operate. That said, the Draft IFR analysis does not evaluate the number, types, or distribution of vessels generated by the proposed Project as this would be extremely complex and speculative. The objective of the proposed Project is to increase vessel efficiencies/safety and accommodate larger vessels with fewer calls. The proposed Project in and of itself will not increase throughput because of POLB terminal backlands and storage constraints (among other factors). In addition, in order to optimize overall operational efficiencies, the POLB terminals would need to be updated and modernized to accommodate any increases in throughput. Future berths would need to be designed to accommodate larger ships. This would require project-specific environmental review, during which time the potential environmental impacts associated with vessels would be evaluated—including air, noise, and impacts to marine mammals. See also General Response #1.	
9-26	The USACE has adequately characterized the noise impacts from construction using the best available information.	NA
9-27	See response to comment 9-7.	NA
9-28	The USACE has extensive experience dredging sediments in southern California, including the navigation channels in the POLB. Monitoring during those events supports the conclusions reached in the Daft IFR concerning potential water quality impacts from dredging, including the potential for hazardous materials in the sediments. Potential impacts are conservatively estimated in the Draft IFR based on those prior events.	NA
9-29	The commenters assert that the proposed Project does not analyze the heightened risks of oil spills as a result of the proposed Project. The scope of the environmental analysis of the proposed project evaluates the construction activity associated with dredging to increase channel depths to facilitate the safe and efficient transportation of all types of cargo into and out of the POLB because larger vessels are	NA

9. Consortium Comments Submitted by EarthJustice		
Commenter: Refer to Letter		
Comment Number	**Response**	**Location in IFR**
	calling at the POLB that need deeper and wider channels in order to safely operate, among other objectives. Currently, liquid bulk vessels must engage in lightering, where some of the petroleum material is transferred to a second ship offshore so both ships need less depth when they enter the POLB. Reducing the number of lightering events, inherently, will reduce the risk of oil spills from the transfer of liquid bulk cargo from one vessel to another. As discussed in General Response #1, while larger vessels could accommodate larger liquid bulk loads, the overall volumes of liquid bulk would not be affected by the proposed Project. The Draft IFR only evaluates the potential environmental impacts associated with construction activities and dredging of the various areas within the scope of the proposed Project. The Draft IFR does not evaluate the number, types, and distribution of vessels or types of cargo potentially generated by the proposed Project, as this would be complex and speculative. Because of constraints on liquid bulk storage areas, amongst other factors, improvements to facilities that handle liquid bulk would require project-specific environmental review, during which time, the potential for any heightened risk of oil spills would be evaluated accordingly. Furthermore, marine oil terminals in California are required to comply with Marine Oil Terminal Engineering Maintenance Standards (MOTEMS) that apply to all marine oil terminals in California. MOTEMS establish minimum engineering, inspection, maintenance criteria for marine oil terminals to protect public health, safety and the environmental, and govern the upgrade and design of terminals to ensure better resistance to earthquakes and reduce the potential of oil spills.	
9-30	The USACE consulted with the SHPO regarding the potential for historic properties to exist within the APE. On December 9, 2020, the USACE received comment from the SHPO agreeing there would be no historic properties affected. Documentation of consultation is included in Appendix N. Because no effects are anticipated as a result of Alternative 2, impacts would be less than significant.	Sections 5.8; 10.1.7; 13.1.3 NA

9. Consortium Comments Submitted by EarthJustice		
Commenter: Refer to Letter		
Comment Number	Response	Location in IFR
	For environmental justice the project area does constitute an EJ community. However, dredging activities are common within POLB environments for channel deepening and maintenance of existing channels. Construction impacts are located in the outer harbor and two terminals both of which are located remotely from any potential environmental justice communities. Negligible new construction jobs would be created as the Project would mainly draw from construction workers who already reside in the larger region, there would not be a large influx of construction workers to the area. The proposed Project would not induce a substantial decrease in area employment. Project impacts would be restricted to temporary construction impacts. The minority population would not be directly affected by the proposed Project. Furthermore, a health risk assessment conducted by the POLB concluded that there would be no increase in health risks to disadvantaged communities as a result of the proposed Project. Therefore, there would not be disproportionately high and adverse human health or environmental impacts on minority populations due to the proposed Project.	
9-31	See response to comment 9-9.	NA
9-32	The Area of Potential Effect (APE) for the proposed Project has been determined, in consultation with the SHPO, and is described in the Draft IFR. Areas, such as the Santa Barbara Channel, are well outside the APE and would not be affected by the proposed Project.	NA
9-33	The Port of Los Angeles currently has no plans to widen or deepen its navigation channels. The remaining ports listed are all well outside any area of influence from the proposed Project.	NA
9-34	POLB Operations are outside the scope of this proposed Project. See General Response #1.	NA
9-35	The USACE has determined that the proposed Project would not affect any listed species or their designated critical habitat. That determination was provided to the USFWS and NMFS for their review and comment. Nothing in that coordination has resulted in any change to the initial no effect determinations. Consultation, therefore, is not required under section 7 of the Endangered Species Act.	NA

9. Consortium Comments Submitted by EarthJustice		
Commenter: Refer to Letter		
Comment Number	**Response**	**Location in IFR**
9-36	The USACE has determined that the proposed Project would not affect marine mammals. That determination was provided to NMFS staff for their review and comment. Nothing in that coordination has resulted in any change to the initial no effect determinations. A marine mammal take authorization under the Marine Mammal Protection Act, therefore, is not required.	NA
9-37	The project does not affect shipping in a meaningful way; therefore, the impacts from shipping in general are not addressed in this analysis. See General Response #1.	NA
9-38	See General Response #1.	NA

10. USC Keck School of Medicine		
Commenters: Andrea Hricko, Verbal Comments at Public Meeting		
Comment Number	**Response**	**Location in IFR**
Transcript p 36, lines 20-25	The proposed Project is not growth inducing and would not affect cargo throughput. The proposed Project would create efficiencies by allowing larger vessels to call at the POLB, thereby reducing the number of smaller vessels. See General Response #1. Emissions associated with larger vessels are expected to be offset by this reduction in the number of smaller vessels. Please see response to Comment 4-2.	NA
Transcript p 37, lines 1-8	See response to Comment 8-1.	NA
Transcript p 37, lines 15-25	See response to Comment 8-2.	NA
Transcript p 38, lines 2-10	The proposed Project includes maximized use of electric dredges. The areas planned for dredging by hopper dredges are not suitable, or accessible, for dredging by electric dredge.	NA
Transcript p 38, lines 11-23	A detailed Sediment Sampling and Analysis Program (SAP) would be conducted during PED to test all sediments proposed for dredging in accordance with current regulations. This SAP would be coordinated with the SC-DMMT, as discussed in the Draft IFR. The results would also	NA

10. USC Keck School of Medicine		
Commenters: Andrea Hricko, Verbal Comments at Public Meeting		
Comment Number	**Response**	**Location in IFR**
	be coordinated with the SC-DMMT and written concurrence for ocean disposal sought from the USEPA.	

11. Natural Resources Defense Council		
Commenter: Heather Kryczka, Verbal Comments at Public Meeting		
Comment Number	**Response**	**Location in IFR**
Transcript p 34, lines 9-15	See General Response #1.	NA
Transcript p 35, lines 4-9	See General Response #1.	NA
Transcript p 35, lines 10-15	See General Response #1.	NA
Transcript p 35, lines 16-23	The proposed Project is not growth inducing and would not affect cargo throughput. The proposed Project would create efficiencies by allowing larger vessels to call at the POLB, thereby reducing the number of smaller vessels. See General Response #1. Emissions associated with larger vessels are expected to be offset by this reduction in the number of smaller vessels. Please see response to Comment 4-2.	NA
Transcript p 35-36, lines 24-9	See General Response #1.	NA

12. William Johns		
Commenter: Utility Coordinating, Inc., Written Comments at Public Meeting		
Comment Number	**Response**	**Location in IFR**
12-1	This issue was addressed in the section on Public Utilities: "There are no public utilities, including pipelines, electrical lines, or telecommunications lines, in the project area . . .".	3.15
12-2	Comment noted. However, as noted in comment response 12-1, there are no public utilities, including pipelines, electrical lines, or telecommunications lines, in the project area.	NA

13. William Johns		
Commenter: Verbal Comments at Public Meeting		
Comment Number	**Response**	**Location in IFR**
Transcript p 40, lines 2-15	The issue of underground utilities was addressed in the section on Public Utilities: "There are no public utilities, including pipelines, electrical lines, or telecommunications lines, in the project area . . .".	NA

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Attachment 2

Annotated Comment Letters

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Comment Letter 1

CALIFORNIA
Water Boards

Gavin Newsom
Governor

Jared Blumenfeld
Secretary for
Environmental Protection

State Water Resources Control Board

Division of Drinking Water

November 25, 2019

VIA E-MAIL AND USPS MAIL

Ms. Allyson Teramoto
Environmental Planning Manager
Port of Long Beach
415 West Ocean Boulevard
Long Beach, CA 90802

Dear Ms. Teramoto:

SCH# 2016111014: PORT OF LONG BEACH DEEP DRAFT NAVIGATION FEASIBILITY STUDY AND CHANNEL DEEPENING PROJECT

Thank you for the opportunity to review and comment on the Draft Environmental Impact Report/Draft Environmental Impact Study (EIR/EIS) prepared for the subject project. The State Water Resources Control Board, Division of Drinking Water (DDW) is providing the following comments:

1. Whenever and wherever potable water will be used before, during, and after implementation of the subject project, project proponents shall comply with the State Safe Drinking Water Act and its implementing regulations and requirements. Examples of potential use of potable water supply are the potential staging areas within Port boundaries as stated in the EIR/EIS document. Please contact the City of Long Beach Water Department (LBWD) for statutory and regulatory requirements that may apply. 1-1

2. Subject project shall properly install and use the appropriate backflow prevention devices wherever applicable.

3. Subject project shall comply with the cross-connection requirements whenever

and wherever applicable. Please contact the LBWD for any applicable cross-connection requirements.

If you have any questions, please contact Mr. Ric M. Roda, P.E., at (818) 551-2009 or me at (818) 551-2022.

Sincerely,

Dmitriy Ginzburg, P.E.
Hollywood District Engineer
Division of Drinking Water

cc: Mr. Tai Tseng
Assistant General Manager, Operations
Long Beach Water Department
1800 E. Wardlow Rd.
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Yan Zhang, Ph.D., P.E.
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Mr. Scott Morgan
State Clearinghouse
1400 Tenth Street, Room 121
Sacramento, CA 95814

Mr. Dan Bacani
Cross-Connection and Water Pollution Control Program
County of Los Angeles Department of Public Health
5050 Commerce Drive
Baldwin Park, CA 91706

STATE OF CALIFORNIA - NATURAL RESOURCES AGENCY GAVIN NEWSOM, *Governor*

CALIFORNIA COASTAL COMMISSION
South Coast Area Office
301 E Ocean Blvd, Suite 300
Long Beach, CA 90802
(562) 590-5071

December 9, 2019

U.S. Army Corps of Engineers
Attn: Mr. Larry Smith
915 Wilshire Boulevard, Suite 930
Los Angeles, California 90017-3849

RE: Port of Long Beach Deep Draft Navigation Study, Draft Integrated Feasibility Report Coastal Commission Staff Comments on Notice of Availability

Mr. Larry Smith:

Thank you for the invitation to comment on the Notice of Availability of the Draft Integrated Feasibility Report (Integrated Feasibility Study/Environmental Impact Statement/Environmental Impact Report; CEQA SCH# 2016111014) for the Port of Long Beach Deep Draft Navigation Feasibility Study. The Draft Integrated Feasibility Study identifies the Channel Deepening Project as a non-appealable project under Section 30715 of the Coastal Act. However, as stated in comments provided by Commission staff to Port of Long Beach staff on the Amended NOP Feasibility Study and Channel Deepening Project (March 1, 2019), as well as guidance provided by phone on September 26, 2019, and by email on October 3, 2019, the proposed development is appealable to the Coastal Commission under Section 30715 because it provides for the transmission, which the Commission has interpreted to include transportation by boat, of increased capacities of liquefied natural gas and crude oil. 2-1

Feel free to contact me at (562) 590-5071 with any questions.

Sincerely,

Dani Ziff
Coastal Program Analyst

cc: Baron Barrera, Port of Long Beach

Comment Letter 3

DEPARTMENT OF TRANSPORTATION
DISTRICT 7 – Office of Regional Planning
100 S. MAIN STREET, MS 16
LOS ANGELES, CA 90012
PHONE (213) 897-9140
FAX (213) 897-1337
TTY 711
www.dot.ca.gov

Making Conservation a California Way of Life.

December 9, 2019

Mr. Larry Smith
Environmental Coordinator
915 Wilshire Blvd., Suite 930
Los Angeles, CA 90017-3401

RE: Port of Long Beach Deep Draft Navigation Feasibility Study – Draft Environmental Impact Report (DEIR)
SCH# 2016111014
GTS # 07-LA-2016-02885
Vic. LA-710/PM: 3.565

Dear Mr. Larry Smith:

Thank you for including the California Department of Transportation (Caltrans) in the environmental review process for the above referenced project's Draft Environmental Impact Report (DEIR). The Port of Long Beach Deep Draft Navigation Feasibility Study and Channel Deepening Project will evaluate dredging to deepen several channels, basins, and standby areas within the Port to improve waterborne transportation efficiencies and navigational safety for current and future container and liquid bulk vessel operations. Project areas include the approach channel extending seaward from the Queen's Gate opening of the Long Beach Breakwater; the approach channel to Pier J, the Pier J Breakwaters and berths J266-J270; and the Pier T/West Basin and berth T140. A new electrical substation will be constructed landside, on Pier J, to provide electricity to the dredge equipment.

After reviewing the DEIR, Caltrans has the following comments:

1. The proposed project's DEIR traffic study indicates that peak project trip volumes are projected to be potentially higher during some months as opposed to others (e.g. January & February 2026). When larger truck traffic volumes are anticipated Caltrans suggests implementing a Traffic Management Plan (TMP) to alleviate some congestion. 3-1

2. Whenever possible Caltrans recommends truck trips be limited to off-peak commute periods. Additionally, any transportation of heavy construction equipment and/or materials which requires use of oversized-transport vehicles on State highways will need a Caltrans transportation permit. 3-2

3. If significant earth-moving activities will take place during construction Caltrans recommends vehicles are covered when hauling dirt/sediment. Please be cautious of lost 3-3

sediment spilling onto roads and state facilities during this process as this can adversely impact state facilitates.

If you have any questions regarding these comments, please contact project coordinator Reece Allen, at reece.allen@dot.ca.gov and refer to GTS# 07-LA-2016-02885.

Sincerely,

MIYA EDMONSON
IGR/CEQA Branch Chief
cc: Scott Morgan, State Clearinghouse

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105-3901

December 9, 2019

Eduardo T. De Mesa
Chief, Planning Division
U.S. Army Corps of Engineers, Los Angeles District
ATTN: Mr. Larry Smith, CESPL-PDR-Q
915 Wilshire Boulevard, Suite 930
Los Angeles, California 90017-3849

Subject: EPA Comments on the Draft Environmental Impact Statement for the Port of Long Beach Deep Draft Navigation Feasibility Study, Los Angeles County, California (EIS #20190260)

Dear Mr. De Mesa:

The U.S. Environmental Protection Agency has reviewed the above-referenced document. Our review is pursuant to the National Environmental Policy Act, Council on Environmental Quality regulations (40 CFR Parts 1500-1508), and our NEPA review authority under Section 309 of the Clean Air Act. We submitted comments on this project's Notice of Intent on February 25, 2016.

The U.S. Army Corps of Engineers is proposing to deepen the federal navigation channels at the Port of Long Beach in order to enable larger container and liquid bulk vessels to more efficiently enter the Port. The project would entail deepening the Approach Channel to -80 feet mean lower low water, deepening the West Basin to -55 ft MLLW, constructing an approach channel to Pier J South at -55 ft MLLW, and creating a turning basin near Pier J South. The POLB would also deepen the Pier J Basin (berths J266-J270) and Pier T (berth T140).

The project would generate roughly 7.4 million cubic yards of dredged sediment during construction. The USACE intends to place 2.5 mcy of sediment at a nearshore placement site and dispose of the remaining 4.9 mcy at the LA-2 and LA-3 Ocean Disposal Sites. The EPA appreciates the USACE identifying a nearshore placement site that could potentially accommodate a portion of the project's dredged material. We have some concerns, however, regarding the assumptions that were made about 4-1
dredged sediment characteristics and the available capacities at both the nearshore placement and ocean disposal sites. We recommend that the USACE identify placement options for any contaminated sediment encountered during construction and more thoroughly assess placement and disposal site available capacities. We also recommend that the USACE commit to maximizing beneficial reuse of dredged material to the fullest extent feasible.

The USACE anticipates that the project would generate transportation efficiencies by enabling larger 4-2
ships to transport the same quantity of goods in fewer trips. According to the Draft EIS, the proposed project would not affect the volume or capacity of port operations. Given the poor air quality in the

project area, and the presence of vulnerable populations near the project area, we recommend that the USACE more rigorously evaluate the project's potential to affect port operations and associated air quality impacts. These comments and others are discussed in the enclosed detailed comments.

Please note that effective October 22, 2018, the EPA no longer includes ratings in our comment letters. Information about this change and the EPA's continued roles and responsibilities in the review of federal actions can be found on our website at: https://www.epa.gov/nepa/epa-review-process-under-section-309-clean-air-act

We appreciate the opportunity to provide feedback on the Draft EIS. Please send a copy of the Final EIS when it becomes available to the address above (mail code TIP-2). If you have any questions, please contact me at 415-947-4286, or Morgan Capilla, the lead reviewer for this project, at 415-972-3504 or capilla.morgan@epa.gov.

Sincerely,

Bridget Coyle, Deputy Director
Tribal, Intergovernmental and Policy Division

Enclosures: EPA Detailed Comments

cc: Mr. Stanley Armstrong, California Air Resources Board
Ms. Lijin Sun, South Coast Air Quality Management District
Mr. Bryant Chesney, National Marine Fisheries Service
Mr. Jon Avery, U.S. Fish and Wildlife Service
Ms. Heather Tomley, Port of Long Beach

EPA DETAILED COMMENTS ON THE DRAFT ENVIRONMENTAL IMPACT STATEMENT FOR THE PORT OF LONG BEACH DEEP DRAFT NAVIGATION FEASIBILITY STUDY, LOS ANGELES COUNTY, CALIFORNIA--DECEMBER 9, 2019

Dredged Material Management

Contaminated Sediment

The Draft Environmental Impact Statement assumes that all dredged material from the project would be clean and suitable for either nearshore placement or ocean disposal. Since the project is located in an active port, it should be assumed that some contaminated material will be encountered. In particular, the document states Pier J has not been dredged since construction. It is, therefore, likely that, at minimum, the surface sediment in Pier J may have some contaminants present.

> ***Recommendations for the Final EIS:*** Identify potential placement sites for any contaminated material dredged during construction. Describe the best management practices that the U.S. Army Corps of Engineers would implement to ensure that contaminated sediment is properly handled and transported to a suitable placement location. 4-3

Beneficial Reuse

The U.S. Environmental Protection Agency supports the USACE's commitment to contribute a portion of the project's dredged sediment to the Surfside Borrow Site Nearshore Placement Area. We note, however, that the Draft EIS only generally describes this proposed nearshore placement site and does not provide an assessment of the volume the site can accept. The Draft EIS appears to assume that the site would be able to accommodate up to 2.5 million cubic yards of dredged sediment generated by the project. The EPA is aware that the Navy Ammunition Pier Project is also proposing nearshore placement in this area. It is unclear whether the Navy plans to use the same site that is proposed for the Port of Long Beach deepening project.

It is also unclear whether other potential beneficial reuse opportunities were considered. The East San Pedro Bay Ecosystem Restoration Feasibility Study, for example, is investigating nearby restoration sites, some of which may need clean sediment.

In addition, highly consolidated formation materials may be physically unsuitable for placement in the nearshore environment. Nearshore placement of large quantities of cobble or larger size material would likely alter the seabed of the littoral zone and deeper areas. These impacts would need to be analyzed if highly consolidated material is proposed for nearshore placement.

Recommendations for the Final EIS:

- Provide additional information on the Surfside Borrow Site Nearshore Placement Area, including its historical use, current bathymetry, and proposed bathymetry after placement. Discuss cumulative impacts to the nearshore placement site, including what other projects have used, or are proposing to use, this site. If other projects plan to use the site, discuss the total volume capacity for the site and the portion of that capacity that may be available for the proposed deepening project. 4-4
- Discuss other potential beneficial reuse opportunities for this project, including whether any nearby restoration sites, such as the East San Pedro Bay Ecosystem Restoration Project, may be available to accept sediment from the project. Include a commitment to beneficially reusing sediment from this project to the maximum extent practicable. 4-5
- Evaluate whether consolidated formation material is physically suitable for nearshore placement. This evaluation should include an assessment of potential alterations of the seabed of the littoral zone or deeper areas with concurrence by the Federal and State 4-6

resources agencies. Placement operations may need to be modified to avoid any significant mounding in the shallow littoral zone or deeper areas. Pre- and post multi-beam surveys may also be required to assess potential impacts to the seabed.

Ocean Disposal

The Draft EIS assumes the project would be able to place up to 900,000 cy of sediment at the LA-2 ocean disposal site and up to 2.2 mcy at the LA-3 disposal site over multiple years. This may be feasible if there are no other large dredging projects in LA or Orange Counties that would overlap with the proposed project. The document, however, does not discuss other planned use of the disposal sites during the project's construction period. It is therefore not possible to determine whether the disposal proposed in the Draft EIS is likely to result in exceedance of the annual disposal limits at LA-2 (1 mcy) or LA-3 (2.5 mcy).

Please note that highly consolidated (cobble or larger size) sediment would not be physically compatible with a predominantly fine-grained muddy seabed at these deep ocean disposal sites. Placement of physically incompatible sediment may significantly alter the seafloor habitat over large areas or cause mounding. The EPA would need to work with the USACE on the disposal plan to ensure that there are no adverse impacts at the ocean disposal sites. Depending on the volume of consolidated material disposed of at the sites, the EPA may require a modified surface disposal zone as well as pre- and post-project multi-beam echo sounder surveys of the ocean disposal sites to establish baseline conditions, and then assess any changes to the seafloor environment after completion of the project.

Recommendations for the Final EIS:

- Identify other large projects from the POLB, Port of LA, Newport Harbor, and other areas with in LA and Orange Counties that may coincide with the proposed deepening project. Discuss whether the cumulative disposal from the identified projects would likely exceed the capacity of any disposal sites. If capacities would potentially be exceeded, describe measures to reduce impacts. These measures could include identifying other disposal locations, conducting additional monitoring at the ocean disposal sites, or extending the project timeline, among others. If the USACE determines that it would be necessary to extend the project's timeline, update the impact assessment in the Final EIS to reflect the prolonged construction period. 4-7
- Clarify that the EPA must provide written concurrence for use of the ocean disposal sites before any sediment can be placed at these sites. As part of our evaluation, we will assess the need for ocean disposal, including whether there are alternative disposal sites. Please note that clean sand would likely not be appropriate for ocean disposal and should, instead, be considered for beneficial reuse. 4-8
- Confirm that the USACE would need to coordinate with the EPA on a disposal plan to ensure that no adverse impacts result from any potential placement of consolidated materials at the ocean disposal sites. Disclose the potential need for multi-beam echo sounder monitoring surveys. 4-9

Discussion of the Marine Protection, Research, and Sanctuaries Act

While the Draft EIS includes information pertaining to the MPRSA, such as a brief description of coordination that has taken place with the Southern California Dredged Material Management Team (p. 323) and references to the EPA's Final EIS for the Designation of the LA-3 Ocean Dredged Material Disposal Site, it does not explicitly mention the MPRSA or the requirements for ocean disposal of dredged material.

Recommendations for the Final EIS:

- Discuss the MPRSA in the Environmental Compliance and Commitments Section (Section 10.1.1), including MPRSA requirements for ocean disposal. 4-10
- Include a reference to the EPA Southern California Disposal Site Management and Monitoring Plan.[1] 4-11

Induced Growth

Section 12.8 of the Draft EIS includes a brief analysis to determine whether enabling larger vessels to enter the POLB would increase the port's throughput and operations. Under "Direct Growth-Inducing Impacts," the documents states that, although larger ships associated with the project would be able to more fully load, the project would not affect throughput because "the primary factor related to throughput is the backland storage areas, which are constrained and at capacity" (p. 319). The analysis does not appear to consider whether the project could result in any indirect growth-related impacts by facilitating capacity expansion projects at port storage facilities and terminals.

Recommendations for the Final EIS: Include a more detailed growth-inducement analysis. Discuss whether the proposed project would trigger any expansion projects at Pier J and Pier T and whether the project would lead to any additional berth-deepening and terminal expansion projects at the POLB. Identify mitigation measures for any adverse impacts. Confirm that an appropriate level of environmental review will be undertaken for each potential project identified. 4-12

Air Quality

The project area is located within the South Coast Air Basin, which faces some of the worst air quality in the country. The SCAB is designated as a federal nonattainment area for ozone (extreme) and $PM_{2.5}$ (serious). It is also a maintenance area for PM_{10} and carbon monoxide. The Draft EIS includes general conformity applicability analyses both with and without mitigation measures (Tables 5-19 and 5-8, respectively). Without mitigation measures, the project is anticipated to exceed *de minimis* thresholds for NOx, NO_2, CO, and VOC in 2025, and NOx in 2026 and 2027. We appreciate that the USACE has incorporated robust mitigation for the project's construction phase, including the use of an electric dredge for a large portion of the proposed dredging; however, even with mitigation measures applied, the project would exceed *de minimis* levels for NOx and NO_2 in 2025, and NOx in 2026 and 2027. The largest NOx exceedance would occur in 2025, when the project would produce 145.5 tons per year, compared to the 10 tpy threshold.

Recommendations for the Final EIS:

- Maximize the use of the electric dredge to the fullest extent feasible. 4-13
- Commit to implementing all air quality mitigation measures. 4-14
- Include a Draft General Conformity Determination. If this document is not included in the Final EIS, the USACE will need to make arrangements to fulfill the public notice requirements for conformity determinations at 40 CFR 93.156. Please note that the applicability analysis should incorporate only the mitigation measures that the USACE is committing to fully implement. 4-15

Operational Emissions

We understand that the project may have the ability to generate air quality benefits by using more fully-laden ships; however, if increased transportation efficiencies associated with the project result in an

[1] Available at: https://www.epa.gov/sites/production/files/2015-10/documents/r9_la_235_smmp_01-11.pdf

increase in Port operations, the area could experience additional adverse impacts. We encourage the USACE to work with the POLB to examine operational mitigation measures for the terminals that would benefit from the project.

Recommendations for the Final EIS:
Consider incorporating the following mitigation measures at Pier J, Pier T, and other relevant POLB terminals:

- *On-Highway Vehicles:* Incentivize the deployment of near-zero and zero-emissions trucks. 4-16
- *Marine Vessels*: Require marine vessels to meet, or exceed, the latest EPA exhaust emissions standards for marine compression-ignition engines (i.e., Tier 4 for Category 1 & 2 vessels, and Tier 3 for Category 3 vessels).[1] 4-17
- *Locomotives*: Require locomotives to meet, or exceed, EPA Tier 4 exhaust emissions standards for line-haul and switcher locomotive engines.[2] 4-18
- *Cargo-Handling Equipment:* Require all cargo-handling equipment to be zero-emissions, subject to equipment availability, by 2030, as described in the 2017 Clean Air Action Plan Update. 4-19

Disclosure of Attainment Status
Section 5.5 of the Draft EIS states that the project area is in moderate nonattainment for $PM_{2.5}$, and that the corresponding *de minimis* threshold is 100 tpy. The South Coast Air Basin, however, is in serious nonattainment for the 2006 $PM_{2.5}$ NAAQS. The *de minimis* threshold for serious nonattainment areas for $PM_{2.5}$ is 70 tpy.

Recommendation for the Final EIS:

- Revise Section 5.5 to reflect the SCAB's serious nonattainment status for the $PM_{2.5}$ NAAQS. Update the corresponding *de minimis* threshold to 70 tpy. 4-20

Cumulative Impacts
A brief cumulative impact analysis is included in Section 6 of the Draft EIS. The geographic scope of analysis is defined as "the Inner Harbor Channels of the Ports of Los Angeles and Long Beach in the north to the outer breakwater in the south" (p. 177), and the temporal scope is defined as the project's construction phase (2025-2027). Table 6-1 lists six projects that were determined to fall within the scope of analysis.

Recommendations for the Final EIS: Given the magnitude of Port operations, ongoing development at and near the Port, and the poor air quality in the project area, we recommend that the USACE expand the geographic and temporal scope of analysis for the cumulative air quality impact analysis to capture the effects of all relevant past, present, and reasonably foreseeable projects.[3] Update the impact determination based on the revised scope of analysis. 4-21

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[1] See EPA's Exhaust Emission Standards for Federal Marine Compression-Ignition (CI) Engines. Available at: https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=P100OA0B.pdf
[2] See EPA's Exhaust Emission Standards for Locomotives. Available at: https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=P100OA09.pdf
[3] In its 2017 Draft EIS, the Everport Container Terminal Expansion Project, Port of Los Angeles, determined that 70 projects were relevant for its cumulative effects analysis. This document may serve as a resource in identifying other relevant projects. Available at: https://cdxnodengn.epa.gov/cdx-enepa-II/public/action/eis/details/downloadEisDocuments?eisId=231026

Environmental Justice

A brief Environmental Justice analysis is included in Section 10.1.1 of the Draft EIS. The affected population is defined as those living within a one-mile radius of dredging activities, and the reference population is defined as the City of Long Beach. According to the analysis, 63% of the affected community is considered minority, and 0% of the affected community is considered low-income. It concludes that, while a minority population is present, no EJ impacts would result from the project due to the project's remote location. EJScreen reports included in Appendix K indicate that the approximate population of the affected community is 3.

Recommendations for the Final EIS:

- In Section 10.1.1, include maps that illustrate the presence of low-income and minority communities near the project area. Ensure that the boundary for the affected population effectively captures the proposed project's impacts on any low-income and minority communities near the project area and explain the rationale for the selected boundary. Provide a more detailed summary of the affected and reference communities, including estimated population sizes. 4-22
- If any revisions are made to the Final EIS that would affect the project's environmental justice assessment (e.g., air quality, water quality, induced growth), we recommend that USACE update the environmental justice analysis accordingly and identify appropriate mitigation measures for any adverse impacts. If the project is determined to have the potential to increase operations at the Port, we recommend that the boundaries for the affected population be expanded accordingly. 4-23

California Assembly Bill 617

The project area is located near the communities of Wilmington, West Long Beach, and Carson. These communities face a high cumulative exposure burden to criteria pollutants and toxic air contaminants, and were selected by the California Air Resources Board to participate in the first year of the state's Community Air Protection Program under California Assembly Bill 617.[2] SCAQMD is working closely with these communities to devise and implement air quality monitoring and emissions reductions programs to address disproportionate air pollution impacts.

Recommendations for the Final EIS: Include a discussion of AB 617. Describe any outreach that has been undertaken in AB 617 communities, including whether any project mitigation measures were informed by community input. 4-24

[2] See http://www.aqmd.gov/nav/about/initiatives/community-efforts/environmental-justice/ab617-134/wilm

STATE OF CALIFORNIA
Governor's Office of Planning and Research
State Clearinghouse and Planning Unit

Gavin Newsom
Governor

Kate Gordon
Director

December 10, 2019

Baron Barrera
Long Beach, Port of
415 West Ocean Boulevard
Long Beach, CA 90802

Subject: Port of Long Beach Deep Draft Navigation Feasibility Study and Channel Deepening Project
SCH#: 2016111014

Dear Baron Barrera:

The State Clearinghouse submitted the above named EIR to selected state agencies for review. The review period closed on 12/9/2019, and the comments from the responding agency (ies) is (are) available on the CEQA database for your retrieval and use. If this comment package is not in order, please notify the State Clearinghouse immediately. Please refer to the project's ten-digit State Clearinghouse number in future correspondence so that we may respond promptly.

Please note that Section 21104(c) of the California Public Resources Code states that:

> "A responsible or other public agency shall only make substantive comments regarding those activities involved in a project which are within an area of expertise of the agency or which are required to be carried out or approved by the agency. Those comments shall be supported by specific documentation."

Check the CEQA database for submitted comments for use in preparing your final environmental document: https://ceqanet.opr.ca.gov/2016111014/3 . Should you need more information or clarification of the comments, **we recommend that you contact the commenting agency directly**.

This letter acknowledges that you have complied with the State Clearinghouse review requirements for draft environmental documents, pursuant to the California Environmental Quality Act. Please contact the State Clearinghouse at (916) 445-0613 if you have any questions regarding the environmental review process. 5-1

Sincerely,

Scott Morgan
Director, State Clearinghouse

cc: Resources Agency

Comment Letter 6

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
West Coast Region
501 West Ocean Boulevard, Suite 4200
Long Beach, California 90802-4213

December 23, 2019

Mr. Eduardo T. De Mesa
Chief, Planning Division
U.S. Army Corps of Engineers
Los Angeles District
ATTN: Mr. Larry Smith, CESPL-PDR-Q
915 Wilshire Boulevard, Suite 930
Los Angeles, California 90017-3849

Dear Mr. De Mesa:

NOAA's National Marine Fisheries Service (NMFS) has reviewed the U.S. Army Corps of Engineers' (USACE) Port of Long Beach (POLB) Deep Draft Navigation Study Integrated Feasibility Report (IFR) and Environmental Impact Statement / Environmental Impact Report. NMFS offers the following comments pursuant to our responsibilities under the Magnuson-Stevens Fishery Conservation and Management Act (MSA), Fish and Wildlife Coordination Act (FWCA), Endangered Species Act (ESA), and Marine Mammal Protection Act (MMPA).

Consultation Background

The USACE requested an ESA species list request on July 31, 2014, and NMFS responded on August 29, 2014 that a number of listed species may occur in the project area. NMFS staff received your transmittal letter on October 21, 2019, regarding the public release of the Deep Draft Study with requested comment response by December 9, 2019. NMFS received notice of the release of the Draft Integrated Feasibility Report, including an Environmental Impact Statement/Environmental Impact Report for the East San Pedro Bay Ecosystem Restoration Study (Restoration Study) on November 27, 2019, which contained new information that affected the basis of our essential fish habitat (EFH) review. Therefore, on December 4, 2019, we requested the use of the expanded EFH consultation timeline (60 days) for our response to the Deep Draft Study. Also, we requested clarification of the dredging area and proposed changes in seafloor depth. The USACE accepted the revised timeline and addressed our information request on December 10, 2019, via electronic mail.

Proposed Project

The proposed project would deepen the entrance to the Main Channel (the Approach Channel through Queens Gate) to a depth of -80 feet (ft) mean lower low water (MLLW), widen portions of the Main Channel (bend easing) to a depth of -76 ft MLLW, construct a new approach channel and turning basin to Pier J South to a depth of -55ft MLLW, and deepen portions of the West Basin and West Basin Approach to a depth of -55 ft MLLW. The POLB would also deepen two additional locations within the harbor to a depth of -55 ft MLLW: the Pier J Slip, including berths J266-270, and berth T140 on Pier T. Structural improvements would also be implemented on the Pier J breakwaters at the entrance of the Pier J Slip to accommodate deepening of the Pier J Slip and Approach Channel to -55 ft MLLW. The total proposed dredging volume is approximately 7.4 million cubic yards (mcy) and total dredge area is approximately 880 acres. The project would expand the size of existing navigation channels and turning basin areas by approximately 345 acres.

According to the IFR, sediment in the proposed Pier J approach channel has not previously been dredged. This area was naturally deep enough to accommodate container vessels going to Pier J without dredging. Dredging in this area would be through sediments that have not historically been dredged, and are expected to be suitable for open ocean disposal. Based upon clarifying information provided by USACE, this new area of dredging would be approximately 241 acres.

Dredged material will be disposed of in a nearshore placement site (Surfside Borrow Site) and ocean-dredged material disposal sites (ODMDS) (LA-2 and LA-3). The nearshore placement site, approximately 5 miles from the project, can accommodate about 2.5 mcy of dredged material. LA-2 and LA-3, approximately 9 miles and 22 miles, respectively, from the project site, have an annual disposal volume limit of 1.0 and 2.5 mcy, respectively, from all sources. It is assumed that 0.9 mcy for LA-2 and 2.2 mcy for LA-3 is available for use by this project each year.

The IFR assumes that dredging will be performed using a hopper dredge as well as an electric clamshell dredge. In order to minimize transit time, disposal of material from the hopper dredge will maximize use of the nearshore site, while a clamshell dredge will be evaluated for disposal at ODMDS. Project construction is expected to last two and a half years. The Approach Channel will be completed in year one, utilizing the nearshore placement site and LA-2. The rest of the project areas, completed by the clamshell dredge, will take the full 2.5 years. One limiting factor on production is the disposal sites LA-2 and LA-3, due to their yearly disposal capacity. Another is the production rate that the clamshell dredge can achieve.

The IFR indicates that the POLB would implement structural improvements to the Pier J breakwaters to account for the deepened channels and need for increased structural stability. The types of improvements could consist of placing additional rock at the base of the existing structure, placing rock on the dredge slope and stepping it, or in extreme cases using ground improvement methods, or submerged bulkhead walls of steel sheet pile structures. The most likely ground improvement method would be injection grouting of cement grout at the base of the existing structure. However, the IFR does not specify the location, amount, and/or type of fill associated with these improvements.

Magnuson-Stevens Fishery Conservation and Management Act

Essential Fish Habitat Affected by the Project

The proposed project occurs within EFH for various federally managed fish species within the Pacific Coast Groundfish, Coastal Pelagic Species, and Highly Migratory Species Fishery Management Plans (FMP). In addition, the project occurs within the vicinity of estuarine and canopy kelp habitat, which are all considered habitat areas of particular concern (HAPC) for various federally managed fish species within the Pacific Coast Groundfish FMP. HAPC are described in the regulations as subsets of EFH which are rare, particularly susceptible to human-induced degradation, especially ecologically important, or located in an environmentally stressed area. Designated HAPC are not afforded any additional regulatory protection under MSA; however, federally permitted projects with potential adverse impacts to HAPC will be more carefully scrutinized during the consultation process.

The project area primarily consists of relatively deepwater soft bottom habitat. In addition, MBC (2016) observed kelp on the breakwaters protecting the harbors, riprap along the piers and wharves facing the open waters of the Outer Harbor, riprap along some piers and wharves not directly exposed to the Outer Harbor, and submerged rock dikes. Specific to the project area, they found kelp on both faces of the Long Beach and Middle breakwaters, both faces of Pier F and the Navy Mole, and the west-, south-, and east-facing outer faces of Pier J and both faces of the breakwaters protecting the Pier J slip.

Effects of the Action

The USACE indicated that the proposed activities related to deepening of the channel within the area of the proposed action would directly affect the identified FMP species in the following ways: 1) temporary disturbance and displacement of fish species; 2) increased sediment loads and turbidity in the water column; 3) temporary loss of food items to fisheries (vis-a-vis temporary loss of soft bottom habitat and associated benthic invertebrates); 4) limited sediment transport and re-deposition; and 4) temporary degradation of the water quality due to dredging and construction activities. Ultimately, the USACE determined that the project would not have a substantial, adverse impact to EFH.

The Pacific Fishery Management Council (PFMC) (2019, 1998) has identified broad types of potential adverse effects and recommendations to consider when evaluating dredging and disposal projects. In general, the potential adverse effects on EFH from dredging and disposal include: 1) loss and alteration of habitat; 2) altered hydrology and geomorphology; 3) sedimentation, siltation, and turbidity; 4) release of contaminants; 5) direct impact to organisms; and 6) noise. Of particular concern to NMFS are benthic impacts associated with new dredging, cumulative impacts associated with disposal at the Surfside Borrow Site, and potential fill impacts associated with structural repairs.

Many fishery species forage on infaunal and bottom-dwelling organisms, such as polychaete worms, crustacean, and other prey types. Dredging may adversely affect these prey species at the site by directly removing or burying these organisms. Recolonization studies suggest that recovery (generally meaning the later phase of benthic community development after disturbance when species that inhabited the area prior to disturbance begin to re-establish) may not be straightforward, and can be regulated by physical factors including particle size distribution, currents, and compaction/stabilization processes following disturbance. Rates of recovery listed in the literature range from several months to several years for estuarine muds to up to 2 to 3 years for sands and gravels. Recolonization can also take up to 1 to 3 years in areas of strong current but up to 5 to 10 years in areas of low current. Given the large dredging footprint (i.e. 880 acres) and expansion into previously undredged areas (i.e. 241 acres), NMFS believes the adverse effects to benthic foraging habitat are more than temporary and minimal.

As a result of southern California's large population and intense economic and recreational activity, very little coastal space exists that has not been subject to construction, mineral extraction, or other form of habitat alteration. Dredge and fill activities, shoreline armoring, and overwater structures are the primary causes of habitat alteration within southern California coastal habitats. At the Ports of Long Beach and Los Angeles, increasing global economic trade have resulted in the need for larger, deeper draft ships to transport cargo. This has led to a demand for new construction dredging to widen and deepen channels, turning basins, and slips to accommodate these larger vessels. The USACE's Restoration Study specifically identified habitat loss and declines in abundance and biodiversity of marine populations as the primary problems in the study area, which includes the majority of the area comprised by the Deep Draft Study. Consistent with the general recommendations provided by PFMC (2019), NMFS believes 6-1 the USACE should, to the extent feasible, mitigate all adverse effects to EFH from new dredging. Specifically, the dredged material may provide a beneficial re-use opportunity to restore aquatic ecosystem structure and function in East San Pedro Bay. Therefore, NMFS believes the USACE should evaluate the feasibility of re-using the dredged material provided to support various restoration measures (e.g., shallow water habitat, wetlands, sandy island) requiring fill material described in the USACE's Restoration Study.

The disposal of dredged material may adversely affect EFH by 1) impacting or destroying benthic communities; 2) affecting adjacent habitats; 3) creating turbidity plumes and introducing contaminants and/or nutrients. Sediment disposal at the ODMDS sites has previously undergone significant environmental review during their designation as offshore disposal sites. In addition, dredged material proposed for these areas are evaluated through the Southern California Dredged Material Management Team approval process. NMFS believes these environmental review processes adequately address anticipated adverse impacts to EFH for the ODMDS sites.

The IFR indicates that the USACE still needs to investigate the potential to utilize the Surfside- 6-2 Sunset Borrow Sites for sediment disposal, but assumes that 2.5 million cubic yards of sediment may be placed here. Placement of 2.5 mcy at the Surfside Borrow Site would fill in an underwater pit resulting in a flatter, more natural topography. However, the USACE did not consider the cumulative effects of sediment disposal at the Surfside Borrow Site associated with the U.S. Navy's Ammunition Pier and Turning Basin project at Naval Weapons Station Seal Beach. In addition, as the name implies, the Surfside Borrow Site provides source material for future USACE beach nourishment efforts at Surfside/Sunset Beach. Therefore, the benefit of restoring a natural topography in this area may be temporary depending upon future shoreline protection needs.

The Bolsa Chica Lowlands Restoration Project lies to the south of the Surfside Borrow Site and relies upon an open tidal inlet connection with the ocean. The USACE's existing beach nourishment program at Surfside/Sunset Beach may periodically increase sedimentation rates at the tidal inlet. If gross sediment transport increases due to a cumulative increase in sand nourishment at Surfside/Sunset Beach, sedimentation of the tidal inlet at Bolsa Chica may also increase. Increased sedimentation within the tidal inlet may increase tidal muting and/or risk of inlet closure, which may adversely affect the ecological condition of the Bolsa Chica project. In our EFH consultation response to the Navy's Seal Beach project, we recommended that the Navy should collaborate with USACE Civil Works program responsible for periodic beach nourishment at Surfside/Sunset to ensure there is not a net cumulative increase in sedimentation down coast that may impact sedimentation patterns within the tidal inlet channel connecting the Pacific Ocean to the full tidal basin within the Bolsa Chica Lowlands Restoration Project. Similarly, NMFS recommends that the USACE consider the cumulative disposal impacts at the Surfside Borrow Site on the Bolsa Chica project. 6-3

Another potential project concern is the spread of the invasive alga *Caulerpa taxifolia* from project activities. This invasive alga had been introduced to our coastline. Evidence of harm that can ensue as a result of an uncontrolled spread of the alga has already been seen in the Mediterranean Sea where it has destroyed local ecosystems, impacted commercial fishing areas, and affected coastal navigation and recreational opportunities. Although it is not known to be present within the project area, it had been detected in two other locations in Southern California. If the invasive alga is present within the project area, the dredging activities would adversely affect EFH by promoting its spread and increasing its negative ecosystem impacts. The IFR indicates that pre-construction surveys for *Caulerpa taxifolia* would be conducted in the Main Channel, proposed Pier J Channel and Turning Basin, and the Surfside Borrow Site. In addition, construction would not begin should *Caulerpa taxifolia* be identified until cleared to do so by NMFS. The proposed environmental commitment to survey appropriate locations for *Caulerpa taxifolia* adequately addresses our concern. According to the IFR, the Approach Channel is considered to be too deep and too rough for *Caulerpa taxifolia*, however, the Main Channel, proposed Pier J Channel and Turning Basin, and the Surfside Borrow Site are considered to be suitable habitat. NMFS generally agrees with this conclusion, and believes that the Surfside Borrow Site is also unlikely to be suitable habitat for *Caulerpa taxifolia*. 6-4

The IFR does not fully describe or analyze the structural improvements to the Pier J breakwater. It does indicate that the placement of a submerged sheet pile structure with associated rock protection to stabilize the Pier J breakwaters would have localized effects on marine biota, including marine mammals. Sheet pile installation would be by either a hammer or vibratory method, to be determined during design based on sediment characteristics. Likewise, other motile organisms are expected to leave during construction. Rock placement would bury soft bottom habitat, replacing it over time with a rocky reef type of habitat after colonization of the placed stone. As described in MBC Applied Environmental Sciences (2016), riprap supports a unique biological community associated with the rock substrate in the Port Complex. In addition, it supports canopy kelp HAPC and associated biogenic habitat. If present in the areas proposed 6-5 for structural improvements, NMFS believes the use of concrete grouting in such locations would adversely affect canopy kelp HAPC via direct disturbances to the macroalgal and associated biogenic community, and may ultimately reduce habitat complexity, which is important as settlement substrate, foraging, and refuge, for various living marine resources. Given the limited information provided regarding the type, location, and effects of the Pier J structural improvements, NMFS believes additional consultation will be necessary to fully assess the effects of these structural improvements, and identify appropriate conservation recommendations. However, we offer preliminary conservation recommendations on these structural improvements below.

EFH Conservation Recommendations

Based upon the above effects analysis, NMFS has determined that the proposed project would adversely affect EFH for various federally managed fish species under the Coastal Pelagic Species, Pacific Coast Groundfish Species, and Highly Migratory Species FMPs. Therefore, pursuant to section 305(b)(4)(A) of the MSA, NMFS offers the following EFH conservation recommendations to avoid, minimize, mitigate, or otherwise offset the adverse effects to EFH.

1. The USACE should evaluate the feasibility of beneficially re-using suitable dredged material for ecosystem restoration purposes within East San Pedro Bay. Specifically, the USACE should evaluate the feasibility of utilizing dredged material to support restoration measures identified in the USACE's East San Pedro Bay Ecosystem Restoration Feasibility Study. Beneficial re-use for ecosystem restoration purposes would offset adverse effects associated with the extensive dredge footprint and disturbance of new areas not previously dredged within San Pedro Bay. 6-6
2. The USACE should evaluate the cumulative effects of sediment disposal at the Surfside Borrow Site and ensure there is not a net cumulative increase in sedimentation down coast that may impact sedimentation patterns within the tidal inlet channel connecting the Pacific Ocean to the full tidal basin within the Bolsa Chica Lowlands Restoration Project. 6-7
3. If the use of grouting is necessary for Pier J structural improvements to rock slope areas that currently support or have previously supported canopy kelp HAPC, the USACE should conduct pre- and post-construction surveys to document impacts to these communities. In addition, a contingency mitigation plan to offset any potential impacts to canopy kelp HAPC should be developed prior to conducting any repairs to rock slopes. Both the monitoring and mitigation plans should be developed in consultation with NMFS. Compensatory mitigation should be conducted, in consultation with NMFS, for any adverse impacts to canopy kelp HAPC. 6-8
4. Compensatory mitigation should be developed and implemented for any permanent loss of EFH due to fill associated with Pier J structural improvements. Mitigation may be provided at the POLB's existing Bolsa Chica Mitigation Bank and/or other USACE-approved sites. 6-9

Statutory Response Requirement

Please be advised that regulations at section 305(b)(4)(B) of the MSA and 50 CFR 600.920(k) of the MSA require your office to provide a written response to this letter within 30 days of its receipt and at least 10 days prior to final approval of the action. A preliminary response is acceptable if final action cannot be completed within 30 days. Your final response must include a description of measures to be required to avoid, mitigate, or offset the adverse impacts of the activity. If your response is inconsistent with our EFH conservation recommendations, you must provide an explanation of the reasons for not implementing those recommendations. The reasons must include the scientific justification for any disagreements over the anticipated effects of the proposed action and the measures needed to avoid, minimize, mitigate, or offset such effects.

Supplemental Consultation

Pursuant to 50 CFR 600.920(l), the USACE must reinitiate EFH consultation with NMFS if the proposed action is substantially revised in a way that may adversely affect EFH, or if new information becomes available that affects the basis for NMFS' EFH conservation recommendations. As previously stated, NMFS believes additional consultation will be necessary to fully assess the effects of Pier J structural improvements given the lack of information on these project components in the IFR. 6-10

Endangered Species Act Comments

As a federal agency and pursuant to section 7 of the ESA of 1973, as amended (16 U.S.C. § 1531 et. seq.), the USACE shall, in consultation with and with the assistance of NMFS, insure that any action it authorizes, funds, or carries out, does not jeopardize the continued existence of any species listed as threatened or endangered, or result in the destruction or adverse modification of designated critical habitat designated. In our 2014 letter to the USACE identifying the threatened or endangered species that may be found in the project area, we indicated that green sea turtles are known to reside and forage year-round in the Long Beach area, including areas within the vicinity of POLB, through observations of free-swimming and stranded animals, as well as through directed scientific research. In contrast, the USACE determined that federally-listed marine turtles do not occur in the study area, but are occasionally sighted in warm-water areas of estuaries and bays in the regions.

Consistent with our 2014 letter, NMFS believes the federally-listed endangered green sea turtle (*Chelonia mydas*) has the potential to occur within the project area. Various sightings and strandings have been documented in the POLB area (NMFS, unpublished data), and preliminary green sea turtle tagging results also indicate they are present (Bredvik *et al.*, 2019). NMFS recommends that the USACE consider the risks of potential injury, disturbance, and impacts to foraging habitats of green sea turtles in their determination of whether this species may be adversely affected by activities described in the IFR. In particular, NMFS recommends that the USACE consider the risks of injury associated with hopper dredge activities. In 2012, a dead 6-11 green sea turtle was found near Encinitas with injuries consistent with contact from a hydraulic hopper dredge (Harris, 2014). NMFS understands that dredging activities permitted by the USACE were occurring in the vicinity of Encinitas during that time period. Hopper dredge encounters with sea turtles known to occur in the Southeastern U.S. have been formally consulted upon numerous times by Corps and NMFS. NMFS recommends that the USACE engage in consultation with NMFS Protected Resources Division in Long Beach, California, for assistance with ESA compliance. Upon request, NMFS staff may be able to help in the determination of how green sea turtles or any other ESA-listed species may be directly or indirectly affected by the Project. NMFS staff may also be able to assist in the development of protective measures that can help minimize the potential for adverse effects to ESA-listed species.

Marine Mammal Protection Act Comments

Harbor seal (*Phoca vitulina*) and California sea lion (*Zalophus californianus californianus*) are commonly observed within the Port complex. Cetaceans known to occur within the Port complex include bottlenose dolphin (*Tursiops* spp) and common dolphin (*Delphinus* spp). Both pinnipeds and cetaceans utilize the waters of the Port complex primarily to rest and forage (MBC 2016). Marine mammals are protected under the Marine Mammal Protection Act (MMPA; 16 U.S.C. § 1361 et. seq.). Under the MMPA, it is generally illegal to "take" a marine mammal without prior authorization from NMFS. "Take" is defined as harassing, hunting, capturing, or killing, or attempting to harass, hunt, capture, or kill any marine mammal. Except with respect to military readiness activities and certain scientific research conducted by, or on behalf of, the Federal Government, "harassment" is defined as any act of pursuit, torment, or annoyance which has the potential to injure a marine mammal in the wild, or has the potential to disturb a marine mammal in the wild by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering.

NMFS recommends that the USACE assess the potential for harassment or injury to marine 6-12
mammals as a result of any activities that could occur under the proposed project. For example, the IFR indicates that structural improvements to Pier J may have localized effects on marine mammals. If the incidental take of marine mammals may be expected to occur as a result of the project, the USACE should apply for an Incidental Harassment Authorization (IHA) or Letter of Authorization (LOA) from NMFS well in advance of any work. NMFS staff is available to assist with this assessment and compliance with the MMPA, including any IHA or LOA applications, upon request from the USACE. If it becomes apparent to the USACE that impacts to marine mammals in the form of “take” that hasn’t been authorized by NMFS may be occurring as a result of any project activities, the USACE should cease operations and contact NMFS immediately to discuss appropriate steps going forward. In the unlikely event of an injury or mortality of a marine mammal due to project activities, please immediately contact our regional stranding coordinator, Justin Viezbicke, at (562) 980-3230.

Fish and Wildlife Coordination Act

The purpose of the FWCA is to ensure that wildlife conservation receives equal consideration, and is coordinated with other aspects of water resources development (16 U.S.C. 661). The FWCA establishes a consultation requirement for Federal departments and agencies that undertake any action that proposes to modify any stream or other body of water for any purpose, including navigation and drainage (16 U.S.C. 662(a)). Consistent with this consultation requirement, NMFS provides recommendations and comments to Federal action agencies for the purpose of conserving fish and wildlife resources. The FWCA allows the opportunity to offer recommendations for the conservation of species and habitats beyond those currently managed under the ESA and MSA.

In Section 10 of the IFR describing environmental compliance and commitments, the USACE 6-13
describes extensive coordination with NMFS regarding the development of the proposed alternatives, environmental commitments, and potential mitigation measures. However, NMFS has no substantive record of coordination on these issues since the request for an ESA-species list in 2014. Therefore, NMFS recommends that the USACE remove references to extensive FWCA coordination with NMFS in the final IFR.

NMFS has determined that various benthic habitats within San Pedro Bay may be negatively impacted by proposed project activities. In addition, sediment disposal has the potential to negatively affect sedimentation patterns within the tidal inlet channel connecting the Pacific Ocean to the full tidal basin within the Bolsa Chica Lowlands Restoration Project.
As such, EFH Conservation Recommendations provided above also serve as FWCA recommendations to address these negative impacts.

Thank you for considering our comments. Please contact Mr. Bryant Chesney at (562) 980-4037, or via email at Bryant.Chesney@noaa.gov if you have any questions concerning our EFH comments. Please contact Dan Lawson at (206) 526-4740, Dan.Lawson@noaa.gov, if you have any questions pursuant to ESA, and Laura McCue at (562) 980-3232, Laura.McCue@noaa.gov, for MMPA questions.

Sincerely,

Penny Ruvelas for

Chris Yates
Assistant Regional Administrator
for Protected Resources

cc: Administrative File: 150316WCR2019PR00241

References

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Comment Letter 7

FUTUREPORTS

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November 7, 2019

Eduardo De Mesa, Chief of the Planning Division
U.S. Army Corps of Engineers, Los Angeles District
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Los Angeles, CA 90017-3849

Re: Port of Long Beach Deep Draft Harbor Deepening Project

Dear Eduardo,

On behalf of FuturePorts, I write in support of the Port of Long Beach Deep Draft Harbor Deepening Project. FuturePorts has long been a supporter of sustainable growth at the Port, and we remain committed to partnership with regional stakeholders in ensuring the sustainability of our region's supply chain for generations to come. This project is consistent with FuturePorts mission of green growth and sustainability, as deepening the ship channels will allow larger ships to call in the Port. Larger ships are also cleaner as they burn less fuel per ton on cargo delivered. Also the large ships are powered by the newest and cleanest engines. 7-1

This project is significant for development at the Port, which will continue to ensure our region's ability to retain market share, supporting thousands of good paying jobs throughout Southern California. As ships continue to be engineered larger, they will bypass the Port if the shipping channels aren't deepened and widened. Larger ships mean more business, more cargo, more revenue, more tax dollars, and more employment. Widening and deepening the channels provides important improvements which allow ship masters and pilots to safely handle the larger vessels with adequate room to maneuver.

Founded in 2005, FuturePorts is a 501(c)6 nonprofit advocacy coalition dedicated to help coalesce the Southern California supply chain around the need to both grow the ports and to address the environmental, air quality, and quality of life issues that come with that growth. FuturePorts represents a diverse membership that includes industry, energy, labor, and goods movement business entities as well as environmental consultants, attorneys, engineering consultants, and public agencies. Our mission is to support the Ports and industrial users and our comments are aligned with ensuring that growth is done in a sustainable, responsible manner. Based on the review of the EIR, FuturePorts finds the Harbor Deepening Project to be comprehensive, and consistent with our guidelines and policies.

Thank you for your consideration,

Marnie O. Primmer
Executive Director
FuturePorts

Comment Letter 8

Comments to the Port of Long Beach and Army Corps of Engineers
Hearing on the draft EIR/EIS for the Port of Long Beach Harbor Deepening Project
November 13, 2019

Andrea Hricko, Professor Emerita, USC Keck School of Medicine
ahricko@usc.edu

Thank you for the opportunity to present comments on this proposal. I have the same key concern that many others have voiced: namely, lack of an evaluation of air pollution and health effects resulting from bringing in larger oil tankers and container ships in future years. In February, comments from U.S. EPA stated:

> **Analysis and Disclosure of Air Quality Impacts**
> 8-1 The proposed project has the potential to result in increased air pollutants from dredg
> larger cargo vessels, and the rail and truck transport of the increased freight that a dee
> allow. EPA recommends that emissions from all of these sources be analyzed, disclos
> to the extent feasible.

I raise two concerns about the dredging itself:

1. The use of Tier III tug boats and electric dredges as Mitigation Measures, and
2. The cursory and flawed description of the contaminant levels in the sediment – and where dredge materials would be disposed.

8-2 First, the Air Quality Mitigation Measures for tug boats and dredges. The draft EIR says that tug boats should use Tier III engines. In the City of Long Beach Mitigated Negative Declaration for the Long Beach Cruise Terminal Improvement Project, it is clear that small Tier III engine tug boats are not readily available. If the type of tug boats needed for this harbor deepening project are not readily available to dedicate to the project, then the EIR must require that the Port of Long Beach purchase the needed Tier III engine tug boats for this major project. The EIR also describes a clamshell electric dredge. Again, the EIR must require that the Port buy such a dredge or dredges. The Port cannot just assume it will have access to an electric dredge for a Mitigation Measure. Also, is there no way to electrify the hopper dredges?

8-3 Another major concern in the EIR is that there appears to have not yet been chemical contamination testing of the sediment that will be dredged, other than some sampling done in 2018 of the Approach Channel. More robust sampling with results publicly available. This must be done before the dredging begins as part of the EIR (and then on an ongoing basis during the many months of dredging in different areas of the Port). Based on the cruise terminal project Dredging Soils Report, there is likely to be moderate contamination. The EIR states that there is likely to be moderate contamination and states that it likely will be okay for ocean disposal.

BUT we need to see the results of the actual testing for contamination. The phrase "moderate contamination" of POLB harbor sediments has been interpreted in divergent ways.

One of my concerns is that sediment sampling done at the Port of LB in 2009 near the Cruise Terminal showed "moderate contamination" (levels shown below) and the material was deemed unsuitable for ocean disposal. On the other hand, sediment sampling done in 2018 near the Cruise Terminal showed "moderate contamination," yet the City of LB concluded that disposal in the ocean was acceptable. Lead levels in Cruise Terminal sediment in 2018 were actually 4x higher than in 2009! We must be able to evaluate the actual levels of metals and pesticides in the sediment in the final EIR/EIS.

Thank you.

APPENDIX:

This is what MND for the cruise terminal project says:

> The project proposes to deepen the existing berth by dredging approximately 33,250 cubic yards in order to increase navigable and mooring margins. A soil sampling analysis was conducted as part of the Dredging Soils Report to determine whether the dredged sediments could be placed at the LA-2 Ocean Dredge Material Disposal Site (ODMDS). According to the soils sampling and testing results, the dredged sediment showed moderate chemical contamination with some chemical concentrations elevated compared to LA-2 reference samples. However, none of the tested sediments were toxic to *Ampelisca abdita* and *Neanthes arenaceodentata*, which are indicators of sediment toxicity, and there was no observed water column toxicity. Additionally, among others, bioaccumulation testing was conducted to determine whether the dredged materials had an accumulation of chemicals and/or heavy metals in exceedance of permissible concentrations. Based on the analysis, the proposed dredging sediments would not exceed permissible concentrations related to bioaccumulation. Overall, the Dredging Soils Report concluded that the proposed dredging sediments from the Long Beach cruise terminal would be environmentally suitable for placement at the LA-2 ODMDS. As such, impacts concerning the routine transport, use, or disposal of hazardous materials during project construction would be less than significant.

Below is a chart from Appendix E of the MMD, showing levels of some metals found in the sediment testing that were many times higher levels than in the LA-2 reference levels. Also below is a chart showing the lower levels of metals in 2009 sampling.

Table 9. 2018 Long Beach Cruise Terminal Bulk Sediment Chemistry Results.

Valid Analyte Name	Units	Composite Samples		C1-*b*	LA2 Reference	NOAA Screening	
		a	*b*			Salt ERL[1]	Salt ERM[1]
SEDIMENT CONVENTIONALS							
Total Solids	%	51.1	58	55.7	56.5		
Total Ammonia	mg/kg dry	1.4	2.4	1.3	2.5		
Oil and Grease	mg/kg dry	700	560	800	83		
TRPH	mg/kg dry	330	410	590	24		
Dissolved Sulfides	mg/kg	<0.017	<0.017	<0.017	<0.017		
Total Sulfides	mg/kg dry	300	190	220	0.53		
Total Organic Carbon	%	2.2	1.5	1.4	0.36		
Total Volatile Solids	%	3.7	3.4	3.8	1.7		
METALS							
Arsenic	mg/kg dry	9.51	12.1	9.26	2.3	8.2	70
Cadmium	mg/kg dry	1.17	1.15	1.24	0.112J	1.2	9.6
Chromium	mg/kg dry	34.1	38.6	39.3	20.3	81	370
Copper	mg/kg dry	85.4	61.5	57	9.16	34	270
Lead	mg/kg dry	80.4	72.3	75.7	5.16	46.7	218
Mercury	mg/kg dry	0.14	0.168	0.168	0.0159J	0.15	0.71
Nickel	mg/kg dry	23.8	30	25.5	10.6	20.9	51.6
Selenium	mg/kg dry	4.3	2.8	3.06	0.744		
Silver	mg/kg dry	0.561	0.566	0.631	0.0855J	1	3.7
Zinc	mg/kg dry	211	174	189	44.4	150	410

Testing that was done in 2009 at the Long Beach Cruise Terminal site had LOWER levels of contaminants and a decision was made to not dispose of the dredged material in the ocean disposal site. See text and chart below:

2.0 SITE HISTORY AND HISTORICAL DATA REVIEW

This section provides a brief history of dredging activities at the Long Beach Cruise Terminal site.

2.1 January 2009 (Weston, 2009)

Sediments from the Long Beach Cruise Terminal berth area were collected and tested in 2009 by Weston for CH2MHill and Carnival Corporation. This project was associated with the maintenance dredging of the berth to its design depth of -30 ft MLLW, with a total dredging volume of approximately 2,000 cy. Cores were collected from three (3) stations and tested for physical and chemical characteristics. The test results were reported by Weston (2009) and summary results are provided in Appendix A.

The material was found to be predominantly fine-grained sediments consisting of 77-95% silt and clay across the sampling area. Moderate contaminant levels were present in the samples. Four metals (arsenic, copper, lead, and nickel) were found to exceed the NOAA Effects Range Low (ERL) benchmark value for marine sediment but did not exceed the Effects Range Median (ERM) for marine sediment (Long et al., 1995). Total DDTs exceeded the ERM threshold in the site-wide composite sample.

Additional tests of individual cores from the berth proper showed elevated PCBs and chlordane compared with the site-wide composite sample. PCBs and chlordane were found to exceed ERL and ERM values, respectively.

The elevated sediment levels of certain constituents were determined to be significant enough to preclude open-water disposal at the offshore ocean disposal site LA-2. As a result, biological testing was not conducted. Based on available information, the dredged material was temporarily stockpiled at Pier S in POLB (Manson, person. comm.) before being transported to a thermal treatment recycling Class II landfill facility operated by TPST Soil Recyclers of California in Adelanto, CA, for disposal as non-hazardous petroleum contaminated soil (BESI, 2009).

Comment Letter 9

CENTER for BIOLOGICAL DIVERSITY EARTHJUSTICE SIERRA CLUB East Yard Communities For Environmental Justice NRDC

SAN PEDRO PENNISULA HOMEOWNERS' COALITION SPPHC wlba WEST LONG BEACH ASSOCIATION

December 9, 2019

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Re: Comments on Draft Integrated Feasibility Report (Integrated Feasibility Study/Environmental Impact Statement/Environmental Impact Report), Port of Long Beach Deep Draft Navigation Feasibility Study

We submit these comments on behalf of the undersigned organizations and individuals on the United States Army Corps of Engineers ("Corps") and Port of Long Beach's ("Port") Draft Integrated Feasibility Report and Environmental Impact Statement/Environmental Impact Report ("Draft Report"). We request that the agencies address the significant flaws with the Draft Report, including its failure to adequately analyze the proposed project's air pollution, growth promotion, and shipping traffic impacts.

I. The Draft Report Fails to Comply with NEPA and CEQA

Pursuant to the National Environmental Policy Act (NEPA) and California Environmental Quality Act (CEQA), an environmental impact statement or report must contain the necessary analysis to enable the decision makers and the general public to properly consider the 9-1 environmental consequences of the Project.[1] An Environmental Impact Report is the only tool that can "effectively disclose to the public the analytic route the agency traveled from evidence to action."[2] Likewise, under NEPA, the agency must "consider and disclose the actual environmental effects in a manner that will ensure that the overall process . . . brings those effects to bear on decisions to take particular actions that significantly affect the environment."[3]

The Draft Report is limited in its scope and analysis, and does not comport with the requirements of NEPA and CEQA for the reasons provided below.

A. Purpose and Need, Scope and Project Are Too Narrowly Defined

The Draft Report's discussion of the project need fails to comply with NEPA. NEPA's implementing regulations provide that an EIS "shall briefly specify the underlying purpose and need to which the agency is responding in proposing the alternatives including the proposed action."[4] This need inquiry is crucial for a sufficient environmental analysis because "[t]he stated goal of a project necessarily dictates the range of 'reasonable' alternatives."[5] Thus, "an agency cannot define its objectives in unreasonably narrow terms" without violating NEPA.[6] Here, the Draft Report has defined the purpose of the project as "increas[ing] transportation efficiencies for container and liquid bulk vessels operating in the Port of Long Beach." But, this stated purpose completely ignores the Corps' duty under the Clean Water Act to protect water quality. By narrowly defining the purpose and needs, the alternatives and mitigation are too narrowly constrained. 9-2

Furthermore, the Draft Report is misleading in its definition and scope of project. For an environmental document to adequately evaluate the environmental impacts of a project, it must first provide a comprehensive description of the project itself. "An accurate, stable and finite project description is the sine qua non of an informative and legally sufficient EIR."[7] Courts have held that, even if an EIR is adequate in all other respects, the use of a "truncated project concept" violates CEQA.[8] Further, "[a]n accurate project description is necessary for an 9-3

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[1] *See Idaho Conservation League v. Mumma*, 956 F.2d 1508, 1519 (9th Cir. 1992) (an EIS should "contain[] a reasonably thorough discussion of the significant aspects of the probable environmental consequences); *Citizens for a Sustainable Treasure Island v. City & Cty. Of San Francisco*, 227 Cal. App. 4th 1036, 1052 (2014) (finding that an EIR should provide decision makers "with sufficient analysis to intelligently consider the environmental consequences" of a project). *See also Silva v. Lynn*, 482 F.2d 1282, 1285 (1st Cir. 1973) (stating that Congress intended that the EIS provide information to the public of a project's environmental costs); *Sierra Club v. U.S. Army Corps of Eng'rs*, 701 F.2d 1011, 1029 (2d Cir. 1983) ("the EIS must set forth sufficient information for the general public to make an informed evaluation and for the decisionmaker to consider fully the environmental factors involved . . .").

[2] *Citizens of Goleta Valley v. Bd. of Supervisors*, 52 Cal.3d 553, 568-69 (1990) (internal quotation marks omitted).

[3] *Baltimore Gas & Elec. Co. v. Natural Resources Defense Council*, 462 U.S. 87, 96 (1983).

[4] 40 C.F.R. § 1502.13.

[5] *Carmel-by-the-Sea v. U.S. Dep't of Transp.*, 123 F.3d 1142, 1155 (9th Cir. 1997).

[6] *Id.*

[7] *San Joaquin Raptor/Wildlife Rescue Center v. County of Stanislaus*, 27 Cal. App. 4th 713, 730 (1994) (quoting *County of Inyo v. City of Los Angeles*, 71 Cal. App. 3d 185, 193(1977)).

[8] *Id.*

intelligent evaluation of the potential environmental effects of a proposed activity."[9] Thus, an inaccurate or incomplete project description renders the analysis of significant environmental impacts inherently unreliable. In other words, the law mandates that EIRs describe proposed projects with sufficient detail and accuracy to permit informed decisionmaking.[10] NEPA likewise requires that an EIS provide a complete and accurate description of the proposed federal action.[11] Here, the Corps and the Port have limited the project to the dredging activities itself and ignored the important impacts of the operation of the project. The expansion project will not only dredge the channel to deeper depths but it will also enable growth of cargo into the Port of Long Beach, result in larger vessels calling on the Port of Long Beach, and a concomitant increase in the impacts of marine traffic and other environmental effects.

B. The Agencies Failed to Consider a Reasonable Range of Alternatives

The Draft Report must consider a reasonable range of alternatives. NEPA requires that an EIS "rigorously explore and objectively evaluate all reasonable alternatives" to a proposed plan of action that has significant environmental effects.[12] The alternatives analysis "is 'the heart' of an EIS."[13] The purpose of this requirement is to ensure agencies do not undertake projects "without intense consideration of other more ecologically sound courses of action, including shelving the entire project, or of accomplishing the same result by entirely different means."[14] Importantly, this evaluation extends to considering more environmentally protective alternatives and mitigation measures.[15] NEPA regulations require that alternatives "include appropriate mitigations measures."[16] Additionally, the regulations require that the analysis of environmental consequences discuss "means to mitigate adverse environmental impacts."[17] 9-4

Likewise, the alternatives analysis in the Draft Report fails to meet the requirements of CEQA. Alternatives are central to an EIR, and their assessment is a major function of the EIR.[18] The purpose of the requirement to contemplate alternatives is to identify ways to mitigate or avoid the significant effects of a project.[19] "[A]n agency may not approve a proposed project if feasible 9-5

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[9] *Id.*
[10] *See* 14 Cal. Code Regs. § 15124 (requirements of an EIR).
[11] *See Aberdeen & Rockfish R. Co. v. SCRAP*, 422 U.S. 289, 322 (1975) ("In order to decide what kind of an environmental impact statement need be prepared, it is necessary first to describe accurately the 'federal action' being taken").
[12] 40 C.F.R. § 1502.14(a).
[13] *Natural Resources Defense Council v. U.S. Forest Service*, 421 F.3d 797, 813 (9th Cir. 2005).
[14] *Envt'l Defense Fund., Inc. v. U.S. Army Corps of Eng'rs*, 492 F.2d 1123, 1135 (5th Cir. 1974). *See also City of New York v. Dept. of Transp.*, 715 F.2d 732, 743 (2nd Cir. 1983) (NEPA's requirement for consideration of a range of alternatives is intended to prevent the EIS from becoming "a foreordained formality."); *Utahns for Better Transportation v. U.S. Dept. of Transp.*, 305 F.3d 1152 (10th Cir. 2002).
[15] *See, e.g., Kootenai Tribe of Idaho v. Veneman*, 313 F.3d 1094, 1122-1123 (9th Cir. 2002) (and cases cited therein).
[16] 40 C.F.R. § 1502.14(f).
[17] 40 C.F.R. § 1502.16(h).
[18] *Id.*; *Laurel Heights Improvement Ass'n v. Regents of the Univ. of California*, 47 Cal.3d 376, 400 (1988).
[19] Cal. Pub. Res. Code § 21002.1.

alternatives exist that would substantially lessen its significant environmental effects."[20] The alternatives discussion must be "meaningful" and must "contain analysis sufficient to allow informed decision making."[21]

All of the Corps' alternatives are virtually the same, save the no action alternative, because each basically considers a different dredging depth:

Alternative 1; no action alternative.

Alternative 2: container terminal channels deepened to -53 ft MLLW; Approach Channel deepened to 15 -78 ft MLLW.

Alternative 3: container terminal channels deepened to -55 ft MLLW; Approach Channel deepened to 17 -80 ft MLLW.

Alternative 4: container terminal channels deepened to -57 ft MLLW; Approach Channel deepened to 19 -83 ft MLLW.

Alternative 5: container terminal channels deepened to -55 ft MLLW; Approach Channel deepened to 21 -80 ft MLLW, and construction of Standby Area adjacent to the Main Channel dredged to -67 ft MLLW, 22 with a 300-foot diameter center anchor placement evaluated to a depth of -73 ft MLLW.

The document fails to examine other alternatives that could achieve the project objectives. 9-6

Moreover, the agencies should consider an alternative that also addresses inefficiencies resulting in marine mammal deaths. For example, the agencies should examine an alternative that includes requiring marine vessels using the Port of Long Beach to limit ship speeds to 10-knots on their approach to the Port of Long Beach, including during transit in the Santa Barbara Channel. Cooperation between the Corps, the Port of Long Beach and the National Marine Fisheries Service to accomplish this mitigation would reduce air pollution, ship collisions with wildlife, and ship noise. 9-7

C. The Agencies Failed to Properly Analyze Numerous Significant Impacts of the Project

The agencies have failed to look at many direct, indirect, and cumulative impacts of the proposed action to expand the Port of Long Beach shipping channel.

The Corps and the Port are legally required to disclose the impacts that will result from accommodating more growth and larger ships, in order to allow for an honest and informed decisionmaking process.[22] Pursuant to NEPA, an EIS must also evaluate indirect effects that are "caused by the action and are later in time or farther removed in distance, but are still reasonably 9-8

[20] *Save Panoche Valley v. San Benito Cnty.*, 217 Cal. App. 4th 503, 520 (2013) (citations omitted). *See also* Cal. Pub. Res. Code § 21081(a); 14 Cal. Code Regs. § 15091(a)(3); *California Native Plant Soc. v. City of Santa Cruz*, 177 Cal. App. 4th 957, 1002 (2009)

[21] *Laurel Heights*, 47 Cal.3d at 403-4.

[22] *See Citizens of Goleta Valley*, 52 Cal.3d at 564 (finding that the purpose of an EIR is "to inform the public and its responsible officials of the environmental consequences of their decisions *before* they are made"); *Baltimore Gas & Elec. Co. v. NRDC*, 462 U.S. at 96 (NEPA requires agencies "to consider every significant aspect of the environmental impact of a proposed action").

foreseeable."[23] This may include growth inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, commercial growth, and related effects on air and water and other natural systems, including ecosystems. Similarly, under CEQA, agencies are required to consider growth-inducing impacts,[24] and must consider "[a]ll phases of project planning, implementation, and operation."[25] An EIR must "reasonably set[] forth sufficient information to foster informed public participation and to enable the decision makers to consider the environmental factors necessary to make a reasoned decision."[26]

The Draft Report concludes that the project will not directly induce growth in part because "the 9-9
proposed Project would not significantly affect the economy of the region in ways that would generate significant direct growth inducing impacts."[27] According to the agencies, the overall throughput at the Port will not be affected by the harbor deepening, despite the fact that the project's purpose is to accommodate larger vessels. This rationale rests on a faulty premise and contradicts the Port of Long Beach's Draft Port Master Plan Update, which states that harbor deepening among other projects will aid the projected growth of the Port over the next 20 years.[28]

Both the Corps and the Port treat forecasted growth in cargo throughput as a given in its analysis, 9-10
but in reality, this project will directly impact the level of growth that will occur in the future. By deepening the harbor, the Port intends to increase efficiency and capacity, and indeed, will expand its capacity to bring in bigger ships and process more cargo than it currently handles. In failing to analyze the project's role in facilitating larger ships and cargo growth, the agencies have failed to properly address direct impacts from the project, as well as reasonably foreseeable indirect impacts and cumulative impacts.

In failing to account for these impacts, the Draft Report unlawfully overlooks the significant 9-11
environmental effects that the Project will have on air quality, marine ecosystems, cultural resources, and environmental justice communities.

1. The Air Quality Impact Analysis Is Inadequate

In its air quality analysis, the Corps and the Port only assess impacts of construction activities 9-12
because of the underlying assumption that the project will not increase overall throughput.[29] As with the entire Draft Report, this assumption renders the analysis inadequate.

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[23] 40 C.F.R. § 1508.8(b).

[24] The CEQA Guidelines specify that the EIR should "[d]iscuss the ways in which the proposed project could foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment." 14 Cal. Code Regs. § 15126.2(e).

[25] 14 Cal. Code. Regs. § 15063(a)(1).

[26] *Berkeley Keep Jets Over the Bay Comm. v. Bd. of Port Comm'rs*, 91 Cal. App. 4th 1344, 1356 (2001).

[27] Port of Long Beach Deep Draft Navigation Feasibility Study, at 319 [hereinafter DEIS/DEIR].

[28] "The 2016 forecast indicates that combined cargo volumes through the San Pedro Bay Ports are likely to grow at an average annual rate of 3.9 percent and exceed 41.1 million twenty-foot equivalent units (TEUs) by 2040. The Port of Long Beach and Port of Los Angeles had a throughput of 15.3 million TEUs in 2015." Port of Long Beach Draft Port Master Plan Update, 2-12.

[29] "While the action alternatives may accommodate changes in the vessel fleet calling at the Port, they would not increase cargo or liquid bulk throughput." DEIS/DEIR, 115.

According to the Draft Report, the "primary problem" addressed by this project is that existing channel depths and widths "create limitations ... resulting in the inefficient operation of deep draft vessels" in the Port of Long Beach complex.[30] The Draft Report states that the existing conditions have historically impacted 5 to 10 percent of crude oil imports (1-3 million tons per year), or 15 percent of these imports more recently.[31] Future fleet changes are expected to further exacerbate the transportation inefficiencies for container and liquid bulk vessels.[32]

The planning objectives contradict the assumption that the channel deepening will not facilitate the Port's growth. The agencies admit that the channel deepening "would induce changes in the operations and composition of the future fleet mix at the Port of Long Beach." These changes include: (1) an increase in a vessel's maximum practicable loading capacity; (2) an increase in the reliability of water depth, encouraging the deployment of larger vessels to the Port; and (3) an increase in larger vessels, which will displace less economically efficient smaller vessels.[33]

While the Draft Report claims that these operational changes will decrease the overall number of vessel trips at the Port, the agencies do not provide any support for this assertion. In improving operational efficiency, this project will facilitate growth and increased cargo and vessel throughput at the Port. Even if the project does somehow decrease the overall number of vessel trips, the larger ships that will be accommodated by this project carry more cargo and will take longer to unload, spending more time in the harbor. They will also require more cargo handling equipment, rail, and truck visits at any given time to handle the influx of larger cargo loads, resulting in higher localized concentrations of pollution.

The South Coast Air Basin is in extreme nonattainment of all national ozone standards, and in nonattainment for particulate matter. The movement of goods to and from the Port is a significant source of criteria pollutant emissions affecting the region's nonattainment status, and this project will lead to increased freight transportation. This growth promotion will exacerbate the already heightened health risks that communities who live along the freight corridor face every day. Studies show that residents living near the Ports are exposed to greater cancer risk, compared to the regional average.[34] 9-13

Despite the anticipated growth of the Port, the Draft Report fails to consider the operational impacts or provide a quantitative assessment of potential health risks.[35] Instead, the Draft Report states that the Project would not result in substantial elevated cancer risks to exposed persons, since "construction activities in any single location would be transitory and short-term."[36] For one threshold (AQ-1), the Corps considers the emissions from dredging equipment, construction- 9-14

[30] *Id.* at 64.
[31] *Id.*
[32] *Id.*
[33] *Id.* at 65.
[34] South Coast Air Quality Management District, *Multiple Air Toxics Exposure Study in the South Coast Air Basin, MATES IV* (2012), at 4-16, *available at* https://www.aqmd.gov/docs/default-source/air-quality/air-toxic-studies/mates-iv/mates-iv-final-draft-report-4-1-15.pdf?sfvrsn=7.
[35] DEIS/DEIR, 117.
[36] *Id.* at 119, 247.

related harbor craft, off-road construction equipment, on-road construction vehicles, and construction worker vehicles, as well as fugitive dust emissions from land-side construction.[37] Likewise, in its CEQA analysis, the Port examines only the short-term emissions during construction that would result from the use of construction equipment.[38] The Draft Report utterly disregards the potential air quality impacts from future operations at the Port, and is misleading.

The Draft Report also wrongly concludes that the impacts on air quality would be less than significant for Impact AQ-5 ("The proposed Project would not conflict with or obstruct implementation of an applicable AQMP or would not conform to the most recently adopted SIP"). The Port reasons that the impacts will be less than significant because the Port "operates well within the cargo forecasts provided for the AQMP."[39] However, as stated above, the DEIR's assumption that cargo throughput will not be impacted by the Project is inaccurate. 9-15

Furthermore, the analysis fails to examine emissions from the project in accordance with the most recent federal air quality standards. The agencies have a duty to consider whether the proposed action "threatens a violation of Federal . . . law or requirement[] imposed for the protection of the environment."[40] While the Draft Report addresses the 2016 AQMP, it fails to come to terms with the fact that this project and its associated impacts will affect attainment of federal air quality standards, such as the 2015 0.70 ppm 8-hour ozone standard, and the state 8-hour ozone standard. 9-16

The agencies must address the project's impacts on growth at the Port and the effects of increased cargo throughput on Clean Air Act attainment in the South Coast Air Basin. NEPA and CEQA require that the Draft Report account for the levels of growth anticipated at the Port, and consider operational emissions from the current and future fleet in its analysis. 9-17

In addition, the agencies must propose mitigation measures for the operational impacts of the project. In 2016, Port of Long Beach had the highest emissions of PM and NOx per day from ocean-going vessels compared to any other port statewide.[41] Yet, in 2017, the Port had a low utilization rate of shoreside power and the Advanced Maritime Emission Control System (AMECS).[42] 9-18

The agencies should require that future growth be consistent with the Port's commitments to achieve 100% zero emission cargo handling equipment by 2030, and 100% zero emission trucks by 2035, as outlined in the 2017 San Pedro Bay Ports Clean Air Action Plan and directed by the 9-19

[37] *Id.* at 115.
[38] *Id.* at 240.
[39] *Id.* at 248.
[40] 40 C.F.R. § 1508.27(b)(10).
[41] CARB, Updates to At Berth Emissions Inventory for Ocean-Going Vessels (OGV) (2019), at 36, *available at* https://ww3.arb.ca.gov/msei/ordiesel/feb19ogvinv.pdf.
[42] "The at-berth OGV emissions reflect that in 2017, an average of 39 percent of all vessel calls (72 percent of container vessels, 95 percent of cruise vessels, 4 percent of tankers, 100 percent of Ro/Ro off vessels, and 0 percent of all other vessels) used shore power; and 1 percent used the Advanced Maritime Emission Control System (AMECS)." Draft Port Master Plan Update Program Environmental Impact Report at 3.2-9, *available at* http://www.polb.com/civica/filebank/blobdload.asp?BlobID=15228.

Mayors of LA and Long Beach in their 2017 Executive Directive. To achieve this, the Port should mandate usage of shoreside power for all vessels, not only construction-related harbor craft, and consider AMECS and other mitigation measures to reduce emissions at-berth. The Draft Report must also consider readily available zero-emission technologies. In 2018, the Ports of LA and Long Beach published feasibility assessments for zero emission trucks and cargo handling equipment. These studies recognized that several types of zero-emission technologies are available to deploy today.[43] The Port and Army Corps should incorporate zero-emission technologies where applicable in its mitigation measures.

2. The Greenhouse Gas and Global Climate Change Impacts Analysis Is Insufficient

Like the air quality analysis, the global climate change analysis is legally deficient because of its narrow focus on greenhouse gas (GHG) emissions solely from construction activities. 9-20

While the Draft Report acknowledges the effects of global climate change and sea level rise, the analysis conveniently omits any discussion of how this channel deepening may facilitate more GHG emissions. Port operations – ocean-going vessels, tugboats, cargo handling equipment, trucks, and locomotives – constitute major sources of GHG and other air pollutant emissions, approximately 10 percent of the region's pollutants.[44] The primary purpose of the project is to reduce transportation costs and increase deep draft navigation efficiency at the Port. This project would allow larger vessels with greater capacity to operate at the Port, thereby increasing freight transport in the area. Yet, the Draft Report does not account for operational GHG emissions, and thus wrongly concludes that the global climate change impacts will be less than significant and mitigation measures are not required. 9-21

The GHG analysis also fails to consider the impacts of increased crude oil imports and exports of petroleum products. The Draft Report recognizes the benefits that the project will have on crude oil imports. In its discussion of the project purpose and need, the Draft Report states that transportation costs and inefficiencies at the Port have thus far affected up to 15 percent of crude oil imports.[45] It is clear from the Draft Report that the harbor deepening will expand the capacity of the Port and facilitate more cargo throughput.[46] This will in turn lead to more oil production, refinement, coal exports, and freight transportation, and increased emissions of criteria pollutants. The activities facilitated by the Project will accelerate climate change and impede state and local goals for GHG reduction. 9-22

In 2006, Governor Schwarzenegger signed AB 32, a landmark law to control and reduce the emission of global warming gases in California along with the companion statute SB 1368,

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[43] San Pedro Bay Ports, Clean Air Action Plan, 2018 Feasibility Assessment for Cargo-Handling Equipment (Sept. 2019), at 29, *available at* http://www.cleanairactionplan.org/documents/final-cargo-handling-equipment-che-feasibility-assessment.pdf/.
[44] Port of Long Beach, Port Emissions, http://www.polb.com/environment/air/port_emissions.asp (last visited Dec. 2, 2019).
[45] DEIS/DEIR, 64.
[46] According to the DEIS/DEIR, top imports at the Port of Long Beach are crude oil, electronics, plastics, and furniture. Top exports are petroleum products, chemicals, and agriculture. *Id.* at 8.

which prohibits California utilities from making long term investments in coal-based electricity generation. AB 32 requires both reporting of GHG emissions and their reduction on an ambitious timeline, including a reduction of CO_2 emissions to 1990 levels by 2020. Looking beyond 2020, Executive Order S-3-05 sets an emissions reduction target of 80 percent below 1990 levels by 2050. Under Executive Order B-55-18, California's goal is to achieve carbon neutrality by no later than 2045. Executive Order B-32-15, taking into account the state's GHG reduction targets, directed state agencies to establish an action plan and set clear targets to ensure progress towards the sustainable movement of goods.

In 2017, the Port of Long Beach, in conjunction with the Port of Los Angeles, issued the Clean Air Action Plan Update (CAAP), further committing to the zero-emission goals, setting new GHG reduction targets, and reaffirming previous emissions goals:

- Reduce GHGs from port-related sources to 40 percent below 1990 levels by 2030
- Reduce GHGs from port-related sources to 80 percent below 1990 levels by 2050
- By 2014, reduce port-related emissions by 22 percent for NOx, 93 percent for SOx and 72 percent for DPM.
- By 2023, reduce port-related emissions by 59 percent for NOx, 93 percent for SOx and 77 percent for DPM.
- By 2020, reduce residential cancer risk from port-related DPM emissions by 85 percent.[47]

In addition to accommodating greater volumes of petroleum imports and exports, this project would facilitate increased oil production and refinement, and does not align at all with state and local efforts to mitigate the effects of climate change and reduce GHG emissions. The Draft Report is silent on these issues, which means its fails to take the requisite "hard look" required by NEPA. 9-23

3. Significant Threats to Endangered Species from Shipping Remain Undisclosed and Unmitigated

The threats to marine ecosystems from shipping are well-known: oil spills and other water pollution, air pollution, anchor scouring, biological invasions, container loss, chronic noise and collisions with large whales and sea turtles.[48] Deepening Port of Long Beach will worsen these serious, prevalent problems.

The Corps must quantify and evaluate the impacts of the increased volume and intensity of shipping traffic. Port of Long Beach has about 2000 vessel calls per year. Not only is the volume of traffic likely to increase with the project, but also the intensity of traffic will increase because of the larger vessels that the project is designed to accommodate.

In the Draft Report, the Corps assumes that deepening the channel will lead to reduced overall vessel traffic. The Draft Report's assumption is not based on any evidence nor is there a legally 9-24

[47] San Pedro Bay Ports, Clean Air Action Plan 2017, http://www.cleanairactionplan.org/documents/final-2017-clean-air-action-plan-update.pdf/.
[48] T.J. Moore et al, Exploring ship traffic variability off California, 163 Ocean & Coastal Management 515-527 (2018).

binding limit that would restrict the number of vessels. There is a greater likelihood of increased vessel traffic and growth. Any number of factors could lead to an increase in the number of vessels transiting beyond what is forecast and analyzed in the Draft Report, with a concomitant increase in vessel impacts on fish and wildlife species.

Even assuming the overall reduction in vessel traffic holds, the Draft Report nonetheless forecasts an "increase in larger Post-Panamax vessels."[49] The increased presence of these larger vessels—in addition to a potential increase in size or number of accompanying tending vessels—may introduce significantly more noise into the marine environment, particularly if they have larger positioning thrusters and propulsion units.[50] The threat to marine mammals of ship strike also would increase with any increase in large vessel traffic enabled by the proposed dredging project. Effects of ship strike and noise are discussed in more detail below. Vessel traffic and noise caused by the project has the potential to cause serious harm to marine mammals, including the blue whale population. Additionally, the Draft Report fails to consider that the large ships will call on other ports under the no action alternative, which could decrease vessel traffic to the Port of Long Beach. 9-25

a) Vessel Noise from the Project Harms Marine Mammals

The Corps also must conduct a more searching analysis on the effects of project-associated noise on regional wildlife. The noise associated with the dredging project itself must be better analyzed—including behavioral disturbances of fish and marine mammals such as reduced foraging, reduced ability to avoid predators, and increased flight/avoidance behavior, as well as neurological stress and hearing threshold shifts.

Noise associated with the project also will come from the ships utilizing the navigation channel—both while the vessels are transiting the channel and during their approach. The Corps never discusses the noise generated by shipping, and it neglects to adequately analyze how shipping noise associated with use of a deepened channel will affect regional wildlife.

Kaplan and Solomon (2016) estimate that commercial shipping noise could increase by 87-102% by 2030 due to the combined effects of an increase in the volume of goods shipped, an increase in larger and noisier ships, and an increase in distance goods are shipped.[51] Oil tankers noise specifically is projected to increase by 11%.[52] Because much of the increased noise pollution will be concentrated near harbors and shipping lanes including those in and around the Santa Barbara Channel and Port of Long Beach, it is particularly important that this proposed dredging project address the issue of noise pollution from commercial shipping in more depth.

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[49] DEIS/DEIR, 66.

[50] M.B. Kaplan & S. Solomon, A coming boom in commercial shipping? The potential for rapid growth of noise from commercial ships by 2030, 73 Marine Policy 119, 120 (2016).

[51] *Id.*

[52] *Id.*

Anthropogenic noise pollution can mask marine mammal communications at almost all frequencies these mammals use.[53] "Masking" is a "reduction in an animal's ability to detect relevant sounds in the presence of other sounds."[54] Ambient ship noise can cover important frequencies these animals use for more complex communications.[55] Some species, such as the highly endangered right whale, are especially vulnerable to masking.[56] Ship noise can completely and continuously mask right whale sounds at all frequencies.[57] Masking may affect marine mammal survival and reproduction by decreasing these animals' ability to "[a]ttract mates, [d]efend territories or resources, [e]stablish social relationships, [c]oordinate feeding, [i]nteract with parents, or offspring, [and] [a]void predators or threats."[58]

In addition to masking effects, marine mammals have displayed a suite of stress-related responses from increased ambient and localized noise levels. These include "rapid swimming away from [] ship[s] for distances up to 80 km; changes in surfacing, breathing, and diving patterns; changes in group composition; and changes in vocalizations."[59] For example, researchers documented chronic stress in North Atlantic right whales associated with exposure to low frequency noise from ship traffic, which can cause long-term reductions in fertility and decreased reproductive behavior, increased vulnerability to diseases, and permanent cognitive impairment.[60] Some avoidance responses to localized marine sounds may even lead to individual

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[53] *See, e.g.*, John Hildebrand, Impacts of Anthropogenic Sound on Cetaceans, in Marine Mammal Research: Conservation Beyond Crisis (Reynolds, J.E. III et al. eds., 2006); L. S. Weilgart., The Impacts of Anthropogenic Ocean Noise on Cetaceans and Implications for Management, 85 Canadian J. Zoology 1091-1116 (2007).

[54] Ocean Noise and Marine Mammals, Nat'l Res. Council 96 (2003), available at http://www.nap.edu/openbook.php?record_id=10564&page=R1.

[55] *Id.* at 42, 100 ("An even higher level, an understanding threshold" may be necessary for an animal to glean all information from complex signals.")

[56] C.W. Clark et al., Acoustic Masking in Marine Ecosystems: Intuitions, Analysis, and Implication, 395 Marine Ecology Progress Series 201, 218-19 (2009), *available at* http://www.int-res.com/articles/theme/m395p201.pdf; C.W. Clark et al., Acoustic Masking in Marine Ecosystems as a Function of Anthropogenic Sound Sources, at *17, fig. 8, *available at* https://www.academia.edu/5100506/Acoustic_Masking_in_Marine_Ecosystems_as_a_Function_of_Anthropogenic_Sound_Sources (last visited Oct. 29, 2014) [hereinafter Acoustic Masking & Anthropogenic Sound Sources].

[57] *See* Acoustic Masking & Function of Anthropogenic Sound Sources, *supra* note 56 (showing anthropogenic noise masking 100 percent of the frequencies right whales used over the majority of a six-hour study).

[58] Jason Gedamke, Ocean Sound & Ocean Noise: Increasing Knowledge Through Research Partnerships, NOAA 2 (2014), *available at* http://cetsound.noaa.gov/Assets/cetsound/documents/MMC%20Annual%20Meeting%20Intro.pdf; Acoustic Masking & Anthropogenic Sound Sources, *supra* note 56, at *3.

[59] Ocean Noise and Marine Mammals, *supra* note 54, at 94.

[60] R.M. Rolland et al., Evidence that ship noise increases stress in right whales, Proceedings of the Royal Society B (2012); R.M. Rolland et al., The inner whale: hormones, biotoxins and parasites, in The Urban Whale: North Atlantic Right Whales at the Crossroads (Kraus S.D. & R.M. Rolland eds., 2007).

or mass strandings.[61] Louder anthropogenic sounds may also lead to permanent hearing loss in marine mammals.[62]

The greatest source of human-caused marine noise by far is ship propeller cavitation—the sound poorly designed propellers make as they spin through the water.[63] Cavitation accounts for as much as 85 percent of human caused noise in the world's oceans.[64] Cavitation may also increase due to hull designs that create non-homogenous wake fields behind ships.[65] And even well-designed propellers and hulls may begin to cavitate if they are not regularly cleaned and smoothed.[66] Another significant source of anthropogenic marine noise is on-board machinery, especially diesel engines.[67] Other onboard machines may also cause vibrations that migrate underwater.[68] Finally, ship noise increases at higher speeds, as this increases the degree and volume of cavitation and onboard machine sounds.[69]

The Corps has underestimated the impacts of the project's noise from construction, and it has completely failed to analyze the impacts from both the larger ships and the likely increase in vessel traffic that will result from the project. 9-26

b) Increased ship size and traffic will increase the risk of ship strikes.

The Corps entirely failed to analyze the threat that shipping traffic associated with this navigation channel poses to marine mammals. Ship strikes serve as a primary cause of mortality for large whales. Large vessels (i.e., those ≥ 80 m, which includes Panamax, Aframax, and Suezmax) are responsible for most of the collisions leading to whale death or severe injury.[70] For

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[61] Ocean Noise and Marine Mammals, *supra* note 54, at 132; Brandon L. Southall et al., Final Report of the Independent Scientific Review Panel Investigating Potential Contributing Factors to a 2008 Mass Stranding of Melon-Headed Whales 3 (Peponocephala electra) in Antsohihy, Madagascar, Int'l Whaling Comm'n 4 (2013), *available at* https://iwc.int/private/downloads/SLvy5e15tG6X7IECFfK0aQ/Madagascar%20ISRP%20FINAL%20REPORT.pdf.
[62] D. Kastak et al., Noise-Induced Permanent Threshold Shift in a Harbor Seal, 123 J. Acoustical Soc'y of Am. 2986 (2008); S.G. Kujawa & M.C. Liberman, Adding Insult to Injury: Cochlear Nerve Degeneration After "Temporary" Noise-Induced Hearing Loss, 29 J. Neuroscience 14077.
[63] Joseph J. Cox, Evolving Noise Reduction Requirements in the Marine Environment, Marine Mammal Comm'n: Congressional Briefing on Ocean Noise at 12 (2014), *available at* https://www.mmc.gov/wp-content/uploads/cox_capitalhill_briefing_0914.pdf; International Maritime Organization, Guidelines for the reduction of underwater noise from commercial shipping to address adverse impacts on marine life (2014), http://www.imo.org/en/MediaCentre/HotTopics/Documents/833%20Guidance%20on%20reducing%20underwater%20noise%20from%20commercial%20shipping%2C.pdf [hereinafter IMO Underwater Noise Reduction Guidelines].
[64] Cox, *supra* note 63.
[65] IMO Underwater Noise Reduction Guidelines, *supra* note 63.
[66] *Id.* at 5.
[67] *Id. at 4.*
[68] *Id.*
[69] *Id.at 5.*
[70] Caitlin M. Jensen et al., Spatial and Temporal Variability in Shipping Traffic Off San Francisco, California, 43 Coastal Mgmt. 575 (2015).

imperiled populations, "death from vessel collisions may be a significant impediment to population growth and recovery."[71]

The Santa Barbara channel hosts the world's largest aggregation of blue whales that are put in peril as a result of the proposed project. There are fewer than 2,000 blue whales in the population, and a recent report cites that ship strikes are a reason that blue whales have not recovered.[72] Blue whales have a limited ability to avoid collisions with ships.[73] The blue whale recovery plan recommends actions to reduce the threat of ship strikes and it concludes that "implementation of appropriate measures designed to reduce or eliminate such problems are essential to recovery" and that such actions "must be taken to prevent a significant decline in population numbers."[74] In its most recent stock assessment reports for marine mammals in the Pacific, National Marine Fisheries Service has also documented numerous vessel-related mortalities and serious injuries for humpback whales, fin whales, killer whales, and other species on the West Coast, including some off of Oregon and Washington.[75] In 2016, NOAA determined that humpback whales off California consist of two separate distinct populations – Central America and Mexico. The Central America humpback population consists of fewer than 800 individuals. The combined serious injury and mortality from vessel collisions and other anthropogenic threats is already in excess of potential biological removal for blue and humpback whales.

Ship strikes are known to be a huge problem in the Santa Barbara Channel and voluntary efforts to reduce the risk have be ineffective. The primary initiative to cut air pollution and protect endangered whales in the Santa Barbara Channel region is a voluntary and incentive-based vessel speed reduction program, known as Protecting Blue Whales and Blue Skies.[76] Because the program is not mandatory, only a small fraction of vessels participate (125 transits participated in 2017 compared to 2,500 container ships that travel through Santa Barbara Channel each year).[77]

Vessel collisions are a severe threat to the conservation and recovery of large whales.[78] Between 1986 and 2018, the National Marine Fisheries Service documented 143 vessel collisions with

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[71] R.C. Rockwood, J. Calambokidis,& J. Jahncke, High mortality of blue, humpback and fin whales from modeling of vessel collisions on the U.S. West Coast suggests population impacts and insufficient protection, 12 PLoS ONE e0183052 (2017).

[72] Virginia Morrell, Blue whales being struck by ships, Science Magazine, Jul. 23, 2014, *available at* http://www.sciencemag.org/news/2014/07/blue-whales-being-struck-ships.

[73] M.F. McKenna et al., Simultaneous tracking of blue whales and large ships demonstrates limited behavioral responses for avoiding collision, 27 Endangered Species Research 219-232 (2015)

[74] National Marine Fisheries Service, Recovery Plan for the Blue Whale (1998); National Marine Fisheries Service, Draft Recovery Plan for the Blue Whale (Balaenoptera musculus) Revision (2018).

[75] J.V. Caretta et al., U.S. Pacific Marine Mammal Stock Assessments: 2018 (2019), *available at* https://repository.library.noaa.gov/view/noaa/20266.

[76] *Twelve global shipping companies slowed transits in 2018 program off California coast to protect blue whales and blue skies*, March 14, 2019, https://www.ourair.org/wp-content/uploads/031419-VSR.pdf.

[77] Jesse Ryan, Whales are facing a big, deadly threat along West Coast: Massive ships, Washington Post, Mar. 18, 2019, *available at* https://www.washingtonpost.com/national/health-science/whales-are-facing-a-big-deadly-threat-along-west-coast-massive-container-ships/2019/03/15/cebee6e8-3eb0-11e9-a0d3-1210e58a94cf_story.html (last visited Apr. 1, 2019).

[78] Caretta et al., *supra* note 74.

large whales off the California Coast.[79] Most of them resulted in mortality. California had at least ten whale deaths attributed to ship strikes in 2018; this is the highest on record since tracking began in 1982.[80]

Figure 1. Ship Strikes Off the California Coast. National Marine Fisheries Service Large Whale Ship Strike Data 1986-2018

Scientists estimate that 80 whales each year die from ship strikes off the West Coast.[81] Rockwood et al. 2017 reports a best conservative estimate of 18 blue and 22 humpback whale deaths from ship strikes per 6-month season.[82] Based on these predictions and the average annual strike reports from 2006-2016 (1.0 for blue and 1.4 for humpback whale), they calculated that 95 percent of blue whale and 94 percent of humpback whale strike deaths go undocumented.[83] Given the uncertainty in accounting for whale collision avoidance, they also calculated strike mortality in the case of no avoidance, producing estimates of 40 blue and 48 humpback whale deaths.[84]

Higher traffic volumes of larger ships calling on the Port of Long Beach will increase the risk of collisions with large whales and sea turtles. Larger vessels account for a disproportionate number of ship strikes—especially fatal ship strikes.[85] Partly due to their greater weight and partly

[79] National Marine Fisheries Service, Large Whale Ship Strike Data 1986-2018.
[80] Ryan, *supra* note 77.
[81] Rockwood et al., *supra* note 71.
[82] *Id.*
[83] *Id.*
[84] *Id.*
[85] Laist et al., Collisions Between Ships and Whales, 17 Marine Mammal Sci. 35, 54 (2001); Silber et al., Hydrodynamics of a Ship/Whale Collision, 391 J. Experimental Marine Biology & Ecology 11, 18-19 (2010) (ship size correlated to risk and severity of ship strike).

because of their decreased maneuverability, "most, if not all, lethal collisions are caused by large ships rather than small vessels."[86] Most ship strikes to large whales result in death.[87]

Figure 2 below shows the impacts of shipping on protected species off the West Coast. (Maxwell et al. 2013.) The map shows that despite the proximity of national marine sanctuaries and other protections, the impact of shipping on southern California ecosystems is high.

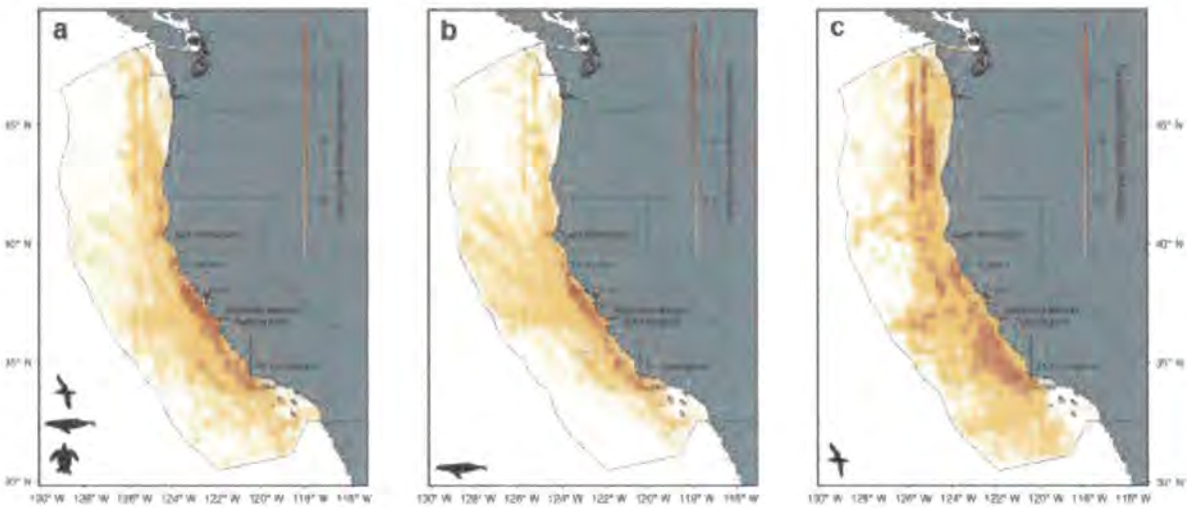

Figure 2. Shipping cumulative utilization and impact for (a) all species combined, (b) marine mammals and (c) seabirds. Solid outer line represents U.S. EEZ, solid inner lines represent National Marine Sanctuaries and dashed lines represent 200 m isobaths. (Source: Maxwell et al. 2013 Supp. fig. S4.)

Requiring ships to limit their speed to 10-knots would reduce threats from ships traveling to the Port of Long Beach. Scientific research has shown that there is a direct correlation between vessel speed and ship strikes resulting in whale mortality.[88] Ship speed affects the likelihood of whale mortality in two ways. First, slower ship speeds provide whales with a greater opportunity to detect the approaching ship and avoid being hit by it. Second, whales that are hit by slower moving ships are less likely to suffer serious injury or death. Finally, scientists recommend reducing ship speeds to 10-knots to mitigate the harmful impacts of ship noise.[89] The Corps should evaluate a 10-knot speed limit for vessels as an alternative, or mitigation. 9-27

4. The Report Underestimates the Impacts of Dredging

[86] *Id.*

[87] A.S. Jansen & G.K. Silber, Large Whale Ship Strike Database, NOAA Technical Memorandum, NMFS-OPR-25 9, fig. 4 (2004).

[88] Silber et al., *supra* note 85.

[89] R.L. Putland et al., Vessel noise cuts down communication space for vocalizing fish and marine mammals, 24(4) Global change biology 1708-21 (2018).

While the Draft Report addresses some of the water quality impacts of the project, it must conduct a more comprehensive evaluation of the water quality impacts of dredging, dumping and transit of dredged material.

The analysis in the Draft Report minimizes the water quality impacts of the project. The Corps anticipates 4.9 to 11.9 million cubic yards of dredged material. Dredging resuspends sediment and associated organic material, including any contamination within the sediments. This can lead to temporary increases in turbidity and nutrients, reductions in dissolved oxygen, and/or changes in temperature and pH. These water quality impacts can harm fish, benthic animals, and marine mammal foraging. The transit of dredged material can have spills and the disposal can also resuspend dredged materials. Additionally, resuspension of contaminated sediments accompanying the proposed dredging project poses a substantial risk to marine life in the project vicinity.

Notably, the Corps underestimates the plume that the dredging, transport and dumping of dredged material will create. In a similar harbor expansion for Port of Miami, the Army Corps severely underestimated impacts and area of damage from dredging that killed a half-million corals. The Army Corps settled litigation over the issue with coral mitigation and other restoration. Multiple studies from the Miami Harbor dredging project, such as Ross 2019,[90] show conclusively that sediment from dredging travels further than 1,000 feet from the site of dredging – and caused permanent impacts at distances more than 10 times that far. The Corps has also failed to consider how runoff from the Los Angeles River during rain events will impact the travel of sediment from dredging.

Additionally, the Corps has underestimated the hazardous materials that may affect water quality and marine wildlife due to dredging the contaminated Port of Long Beach channel. Because the Draft Report has underestimated the resuspension and impact zone of the dredged material, it has also underestimated the significance of the impacts from hazardous materials that contaminate the approach channel for the Port of Long Beach. 9-28

5. The Analysis of the Risk of Spills Is Inadequate

The proposed project threatens to increase the risk, severity and the magnitude of oil spills. There is a steady stream of oil tanker traffic. The Draft Report states that in 2016, there were 17 million tons of oil calling on the Port of Long Beach, and that this is predicted to remain steady. The Draft Report fails to analyze the heightened risk of larger oil spills as a result of the proposed project. 9-29

6. The Report Fails to Consider Important Cultural Resources and Environmental Justice Impacts

The Draft Report's conclusion that there are no significant impacts for cultural resources, socioeconomic and environmental justice is arbitrary. In failing to properly analyze the numerous environmental impacts of this Project, the Draft Report also inadequately considers the 9-30

[90] R. Cunning et al., Extensive coral mortality and critical habitat loss following dredging and their association with remotely-sensed sediment plumes, Marine Pollution Bulletin (2019).

impacts on the environmental justice communities that live within the study area, and on cultural resources important to Native American tribes of California.

Contrary to the assumptions underlying this Report, the proposed project is directly linked to future growth at the Port. The Port of Long Beach's Draft Port Master Plan Update acknowledges that certain planned actions will aid the Port's projected growth target of more than doubling cargo throughput over the next 20 years.[91] The Port's own master planning document identifies channel deepening as necessary "to accommodate larger ships and crucial cargo."[92] In fact, part of this Project includes channel deepening to allow larger ships at Pier T, which includes "the only very large crude carriers berth on the West Coast."[93] The Port Master Plan update concedes "liquid bulk vessel movements along the main channel are constrained by current conditions."[94] Projects that encourage this growth in liquid bulk and containers, including this channel deepening, will have adverse consequences on the daily lives of residents living near the Ports, railyards, warehouses, the I-710 corridor, and the inland port communities in the Inland Valley. 9-31

In its 2016 letter to the Corps, the United States Environmental Protection Agency recommended that the Draft Environmental Impact Statement identify communities with potential environmental justice concerns that could be affected by the proposed project and assess potential health impacts and impact avoidance measures:

> "The increased volume of freight traffic that will likely occur in conjunction with the navigation improvements may result in additional conventional truck traffic along the freight corridor, which would contribute to increases in roadway-related MSAT and criteria pollutant emissions impacting already heavily burdened, low income and minority communities along the I-710 Corridor and other freight corridors."[95]

It is evident that the permanent expansion of the Port achieved through this project and others will facilitate increased cargo and liquid bulk growth in the future. However, this Draft Report only considers construction impacts, while completely ignoring the significant air pollution that will result from increased throughput of containers and liquid bulk. The harbor deepening will allow the Port to accommodate additional cargo, and lead to greater truck, rail, and vessel traffic. This increase in goods movement will affect freight-impacted environmental justice communities, who continue to suffer from increased health risks associated with the goods movement.

Additionally, the larger vessels calling on the Port of Long Beach have a potential to affect cultural resources beyond the dredging area, such as in the Santa Barbara Channel. For example, the Corps should consult with the Chumash because the Santa Barbara Channel contains a number of underwater Chumash cultural and historic resources and traditional fishing grounds. 9-32

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[91] Port of Long Beach, Draft Port Master Plan Update, 2-12.
[92] *Id.*, at 5-13.
[93] *Id.*, at 6-28.
[94] *Id.*, at 6-29.
[95] DEIS/DEIR, Appendix A, Attachment 2.

Under CEQA, agencies must, when feasible, avoid damaging tribal cultural resources, which include sites, features, places, cultural landscapes, sacred places, and objects with cultural value to California's Native American tribes.[96] Among other cultural resources impacts, the proposal may threaten sacred waters and wildlife that sustain Chumash culture, religious practices, and lifeways.

D. The Agencies Failed to Evaluate the Cumulative Effects and Connected Actions

The cumulative effects and connected actions[97] of several related efforts to widen and deepen shipping channels must be evaluated – for this project (as cumulative impacts), as well as in a programmatic environmental review. The agencies' evaluation and approval of widening and deepening ports throughout the coastal U.S. are connected actions that should be evaluated in a programmatic environmental review. Cumulative environmental effects can be defined as effects on the environment which are caused by the combined results of past, current and future activities.[98] There are numerous feasibility studies occurring at ports and harbors throughout the United States to widen and deepen navigation channels to allow larger vessels. These actions are all related and foreseeable. Additionally, many will have impacts in multiple locations for species that migrate. Specifically, with more of these larger vessels being able to go into numerous ports, this will increase vessel traffic in the ocean that will be louder and more likely to collide with marine mammals.

Along the West Coast, in addition to the Port of Long Beach, there are several proposals pending 9-33
to deepen and widen navigation channels to accommodate larger ships, including at the Port of Seattle, Port of San Francisco, Port of Los Angeles, Port of Tacoma, Coos Bay, and probably others. These projects are within the same region, impacting the same waterbody, the Pacific Ocean, along the migratory path of blue whales, humpback whales, killer whales and other protected species. Many of the marine species affected by the Port of Long Beach project will therefore be affected by the vessel traffic and other navigation channel deepening and widening projects along the entire west coast because of the migratory nature of these animals.

E. The Draft Report's Conclusion on Significant Effects and Failure to Mitigate Them Is Flawed

The Draft Report concludes that there will be no significant effects on geology and topography, oceanographic and coastal processes, water and sediment quality, greenhouse gases, aesthetics, cultural resources, noise, socioeconomics, transportation, land use, recreation, public safety, and public utilities. It only found air quality significant effects from toxic emissions from construction equipment needing mitigation.

As discussed above, there are several shortcomings and remaining concerns about the impacts of 9-34
the proposed project. A meaningful evaluation would demonstrate that there are significant

[96] Cal. Pub. Res. Code § 21084.3.
[97] *See* 40 C.F.R. § 1508.25 (defining connected actions as those that are "closely related and therefore should be discussed in the same impact statement").
[98] 40 C.F.R. §1508.7; 14 Cal. Code Regs. § 15355.

impacts needing mitigation, such as reducing ship speeds to address ship strikes, noise, and air pollution. Additional mitigation is also needed to address the impacts of cargo growth on freight-impacted communities, such as ensuring goods are handled and transported using zero emission technologies.

2) The Corps must complete consultation under section 7 of the ESA because its action may affect listed species, and it must obtain a permit under the MMPA.

Section 7(a)(2) of the ESA requires federal agencies to "insure that any action authorized, funded, or carried out by such agency . . . is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the adverse modification of habitat of such species . . .determined . . . to be critical . . . ."[99] To accomplish this goal, agencies must consult with the delegated agency of the Secretary of Commerce or Interior whenever their actions "may affect" a listed species.[100]

The ESA's consultation requirement applies to Federal agencies taking *any action*.[101] "Action means all activities or programs of any kind authorized, funded, or carried out, in whole or in part, by Federal agencies in the United States or upon the high seas" including "the granting of licenses, contracts, leases, easements, rights-of-way, permits, or grants-in-aid."[102] The Supreme Court noted that ESA's section 7 command to Federal agencies "admits of no exception."[103] Moreover, the use of the word "shall" in a statute indicates Congress' intent to impose a mandatory duty.[104]

The project may affect listed species such as blue whales, humpback whales, and several species of imperiled salmon, among other listed species, and therefore the Corps must engage in consultation with the National Marine Fisheries Service and Fish and Wildlife Service. Moreover, the Corps should undertake programmatic consultation on the impacts of the numerous channel deepening and widening projects that are occurring throughout the US. 9-35

Additionally, the Corps needs an authorization under the Marine Mammal Protection Act (MMPA). The MMPA prohibits the taking of marine mammals, unless the take falls within certain statutory exceptions.[105] The statute defines "take" is as "to harass, hunt, capture, collect, or kill, or attempt to harass, hunt, capture, collect or kill, any marine mammal."[106] Here, the project will harass and harm marine mammals and such authorization is required before the project can proceed. 9-36

II. Conclusion

[99] 16 U.S.C. § 1536(a)(2); 50 C.F.R. § 402.14(a).
[100] *Id.*
[101] 16 U.S.C. § 1536(a)(2).
[102] 50 C.F.R. § 402.02 (emphasis added).
[103] *Tenn. Valley Auth. v. Hill*, 437 U.S. 153, 173 (1978). *See also Pacific Rivers Council v. Thomas*, 30 F.3d 1050, 1054-55 (9th Cir. 1994) (recognizing that Congress intended "agency action" to be interpreted broadly, admitting of no limitations.)
[104] *Bennett v. Spear*, 520 U.S. 154, 172 (1997) (use of "shall" creates a "categorical requirement").
[105] 16 U.S.C. § 1371(a)(3).
[106] 50 C.F.R. § 216.3; 16 U.S.C. § 1362(13).

Because the Draft Report for the Project fails to consider the impacts of shipping on marine ecosystems, it does not comply with either CEQA or NEPA. The Corps and the Port must revise the Draft Report to include missing scientific studies, specific management actions that address the needs of the listed species and develop alternatives that provide a meaningful assessment. 9-37

The Draft Report must also be revised to fully address and disclose the significant environmental effects of the project, including the operational impacts of the channel deepening. The agencies must fulfill their duties under CEQA and NEPA to provide a meaningful environmental impact analysis that informs the public, especially communities most impacted by the project, of the associated impacts. 9-38

Thank you for your consideration of these comments, and please do not hesitate to reach out if you have any questions.

Sincerely,

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INDEX OF ATTACHMENTS IN SUPPORT OF COMMENTS

Attachments viewable at https://earthjustice.sharefile.com/d-sfc35156b12e41978.

A – San Pedro Bay Ports Documents

A1 – Port of Long Beach, Draft Port Master Plan Update 2020 (Jul. 2019), available at http://www.polb.com/civica/filebank/blobdload.asp?BlobID=15173

A2 – Port of Long Beach, Port Master Plan Update Draft Program Environmental Impact Report (Aug. 2019), available at http://www.polb.com/civica/filebank/blobdload.asp?BlobID=15228

A3 – San Pedro Bay Ports, Clean Air Action Plan 2017, available at http://www.cleanairactionplan.org/documents/final-2017-clean-air-action-plan-update.pdf/

A4 – San Pedro Bay Ports, Clean Air Action Plan, 2018 Feasibility Assessment for Cargo-Handling Equipment (Sept. 2019), available at http://www.cleanairactionplan.org/documents/final-cargo-handling-equipment-che-feasibility-assessment.pdf/

B – State, Federal, and Intergovernmental Documents

B1 – South Coast Air Quality Management District, *Multiple Air Toxics Exposure Study in the South Coast Air Basin, MATES IV* (2012), at 4-16, *available at* https://www.aqmd.gov/docs/default-source/air-quality/air-toxic-studies/mates-iv/mates-iv-final-draft-report-4-1-15.pdf?sfvrsn=7

B2 – CARB, Updates to At Berth Emissions Inventory for Ocean-Going Vessels (OGV) (2019), at 36, available at https://ww3.arb.ca.gov/msei/ordiesel/feb19ogvinv.pdf

B3 – Jason Gedamke, Ocean Sound & Ocean Noise: Increasing Knowledge Through Research Partnerships, NOAA 2 (2014), available at http://cetsound.noaa.gov/Assets/cetsound/documents/MMC%20Annual%20Meeting%20Intro.pdf

B4 – International Maritime Organization, Guidelines for the reduction of underwater noise from commercial shipping to address adverse impacts on marine life (2014), http://www.imo.org/en/MediaCentre/HotTopics/Documents/833%20Guidance%20on%20reducing%20underwater%20noise%20from%20commercial%20shipping%2C.pdf

B5 – National Marine Fisheries Service, Recovery Plan for the Blue Whale (1998)

B6 – National Marine Fisheries Service, Draft Recovery Plan for the Blue Whale (Balaenoptera musculus) Revision (2018)

B7 – J.V. Caretta et al, U.S. Pacific Marine Mammal Stock Assessments: 2018 (2019), available at https://repository.library.noaa.gov/view/noaa/20266

B8 – National Marine Fisheries Service, Large Whale Ship Strike Data 1986-2018

B9 – A.S. Jansen & G.K. Silber, Large Whale Ship Strike Database, NOAA Technical Memorandum, NMFS-OPR-25 (2004).

C – Academic and other independent studies

C1 – T.J. Moore et al, Exploring ship traffic variability off California, 163 Ocean & Coastal Management 515-527 (2018)

C2 – M.B. Kaplan & S. Solomon, A coming boom in commercial shipping? The potential for rapid growth of noise from commercial ships by 2030, 73 Marine Policy 119, 120 (2016)

C3 – John Hildebrand, Impacts of Anthropogenic Sound on Cetaceans, in Marine Mammal Research: Conservation Beyond Crisis (Reynolds, J.E. III et al. eds., 2006)

C4 – L. S. Weilgart, The Impacts of Anthropogenic Ocean Noise on Cetaceans and Implications for Management, 85 Canadian J. Zoology 1091-1116 (2007)

C5 – Ocean Noise and Marine Mammals, Nat'l Res. Council 96 (2003), available at http://www.nap.edu/openbook.php?record_id=10564&page=R1

C6 – C.W. Clark et al., Acoustic Masking in Marine Ecosystems: Intuitions, Analysis, and Implication, 395 Marine Ecology Progress Series 201 (2009), available at http://www.int-res.com/articles/theme/m395p201.pdf

C7 – C.W. Clark et al., Acoustic Masking in Marine Ecosystems as a Function of Anthropogenic Sound Sources, available at https://www.academia.edu/5100506/Acoustic_Masking_in_Marine_Ecosystems_as_a_Function_of_Anthropogenic_Sound_Sources

C8 – Brandon L. Southall et al., Final Report of the Independent Scientific Review Panel Investigating Potential Contributing Factors to a 2008 Mass Stranding of Melon-Headed Whales 3 (Peponocephala electra) in Antsohihy, Madagascar, Int'l Whaling Comm'n 4 (2013), available at https://iwc.int/private/downloads/SLvy5e15tG6X7IECFfK0aQ/Madagascar%20ISRP%20FINAL%20REPORT.pdf

C9 – D. Kastak et al., Noise-Induced Permanent Threshold Shift in a Harbor Seal, 123 J. Acoustical Soc'y of Am. 2986 (2008)

C10 – S.G. Kujawa & M.C. Liberman. Adding Insult to Injury: Cochlear Nerve Degeneration After "Temporary" Noise-Induced Hearing Loss, 29 J. Neuroscience 14077

C11 – Joseph J. Cox, Evolving Noise Reduction Requirements in the Marine Environment, Marine Mammal Comm'n: Congressional Briefing on Ocean Noise at 12 (2014), available at https://www.mmc.gov/wp-content/uploads/cox_capitalhill_briefing_0914.pdf

C12 – Caitlin M. Jensen et al., Spatial and Temporal Variability in Shipping Traffic Off San Francisco, California, 43 Coastal Mgmt. 575 (2015)

C13 – R.C. Rockwood, J. Calambokidis,& J. Jahncke, High mortality of blue, humpback and fin whales from modeling of vessel collisions on the U.S. West Coast suggests population impacts and insufficient protection, 12 PLoS ONE e0183052 (2017)

C14 – Virginia Morrell, Blue whales being struck by ships, Science Magazine, Jul. 23, 2014, available at
http://www.sciencemag.org/news/2014/07/blue-whales-being-struck-ships

C15 – M.F. McKenna et al., Simultaneous tracking of blue whales and large ships demonstrates limited behavioral responses for avoiding collision, 27 Endangered Species Research 219-232 (2015)

C16 – *Twelve global shipping companies slowed transits in 2018 program off California coast to protect blue whales and blue skies*, March 14, 2019, https://www.ourair.org/wp-content/uploads/031419-VSR.pdf

C17 – Jesse Ryan, Whales are facing a big, deadly threat along West Coast: Massive ships, Washington Post, Mar. 18, 2019, available at https://www.washingtonpost.com/national/health-science/whales-are-facing-a-big-deadly-threat-along-west-coast-massive-container-ships/2019/03/15/cebee6e8-3eb0-11e9-a0d3-1210e58a94cf_story.html

C18 – Laist et al., Collisions Between Ships and Whales, 17 Marine Mammal Sci. 35, 54 (2001)

C19 – Silber et al., Hydrodynamics of a Ship/Whale Collision, 391 J. Experimental Marine Biology & Ecology 11, 18-19 (2010)

C20 – R.L. Putland et al., Vessel noise cuts down communication space for vocalizing fish and marine mammals, 24(4) Global change biology 1708-21 (2018)

C21 – R. Cunning et al., Extensive coral mortality and critical habitat loss following dredging and their association with remotely-sensed sediment plumes, Marine Pollution Bulletin (2019)

But growth is not a force of nature. Actions taken by the Port and the Army Corps impact the level of growth that will occur in the future. This deepening project is one of the actions that will majorly influence the Port's future capacity. The agencies are legally required to disclose the impacts that will result from accommodating more growth and larger ships in order to allow for an honest and informed decision-making process on this issue.

Thank you.

COL. BARTA: Thank you for your comments. For the future speakers, there is a light next to the speaker, and it's set for three minutes. When 30 seconds remains, it will turn yellow and turn red after three minutes.

MR. De MESA: We have Ms. Andrea Hricko.

MS. HRICKO: Hi. My name is Andrea Hricko, and I'm a professor emeritus from the USC Keck School of Medicine. Thank you for the opportunity to present comments on this proposal. I have the same key concerns that many others have raised in comment letters; namely, lack of an evaluation of air pollution and health effects resulting from brining in larger oil tankers and containerships in future years.

In February comments from USEPA stated that the proposed project has the potential to result in increased air pollutants from dredging, from larger cargo vessels and the rail and truck-transported increased freight that a deepening allows. EPA recommends that emissions from all of these sources be analyzed, disclosed and mitigated to the extent feasible.

I have two other concerns about the dredging itself. One is the use of Tier III tugboats and electric dredges as mitigation measures. And the second is the cursory and, I believe, flawed description of the contaminant levels in the sediment and where dredging materials would be disposed.

First the air quality mitigation measures call for tugboats and dredges. The draft EIR says tugboats should use Tier III engines. The City of Long Beach mitigated negative declaration for the Long Beach cruise terminal improvement project, and it is clear that small Tier III engine tugboats are not readily available in southern California. If the type of tugboats that are needed for this harbor deepening are actually not readily available, then the EIR must require that the Port of Long Beach purchase the needed Tier III engine tugboats for this major project.

The EIR also describes a clamshell electric dredge. Again, the EIR must require that the Port buy such a dredge or dredges. The Port cannot assume it will have access to an electric dredge. I have a question about whether there is any way to electrify the hopper dredges that will be dredging sediment material to the nearshore disposal site. And if there is a way to electrify them, then they should be required to be electrified.

Another major concern in the EIR is there appears to have not yet been any chemical contamination testing of the sediment that will be dredged other than some sampling done in 2018 of the Approach Channel. Obviously, more robust sampling with results must be made publicly available, and it must be done as part of this EIR.

Based on the cruise terminal project dredging soils report, there is likely to be moderate contamination. The EIR, however, states there is likely to be moderate contamination, and it states that will be okay for ocean disposal with no data backing that up. We need to see the actual results.

And the phrase "moderate contamination" of Port of Long Beach Harbor sediments had been

COL. BARTA: Do you mind stepping to the microphone?

MS. KRYCZKA: I'm Heather Kryczka. I'm an attorney with the National Resources Defense Council. So thanks so much to the staff for the presentation today, and I'd also like to thank the Long Beach Environmental staff for giving us some information about this project and meeting with us about this.

The draft CEQA and NEPA documents here take the position that the dredging project will not facilitate future growth at the Port. This position is flawed and the documents are inadequate because they fail to disclose or mitigate the impacts of growth that will be accommodated by the dredging project.

The stated purpose of the project gives away the fact that this project is inextricably linked to the Port's growth. The draft EIR and EIS states that the project is needed to reduce current inefficiencies in ship unloading and to expand the Port's capacity to bring in the larger ships of the future. Increasing the harbor's efficiency and capacity means that the Port will be able to bring in bigger ships carrying more cargo than it currently brings in. And indeed, deepening the harbor to accommodate mega ships that the Port expects to see in future years is an important component of its plan to grow and maintain its market share.

CEQA and NEPA require the Port and the Army Corps to analyze and mitigate the foreseeable environmental impacts of the project including the growth-inducing effects of the project. The agencies must analyze how the project will impact the Port's capacity for increasing its cargo throughput.

The agencies must also analyze how increased cargo throughput will result in overall higher levels of emissions, health impacts, truck traffic, noise, greenhouse gas emissions and other impacts on the community. Mitigation measures must be proposed for those operational impacts.

The EIR and EIS also failed to look at the direct impacts of bringing larger vessels into the harbor. Ultra large ships carry more cargo and will take longer to unload spending more time in the harbor. They also require more cargo handling equipment, rail and truck visits at any given time to handle the influx of the larger cargo loads resulting in higher concentrations of pollution.

The agencies treat forecasted growth and cargo throughput as a given in this draft EIR/EIS.

But growth is not a force of nature. Actions taken by the Port and the Army Corps impact the level of growth that will occur in the future. This deepening project is one of the actions that will majorly influence the Port's future capacity. The agencies are legally required to disclose the impacts that will result from accommodating more growth and larger ships in order to allow for an honest and informed decision-making process on this issue.

Thank you.

COL. BARTA: Thank you for your comments. For the future speakers, there is a light next to the speaker, and it's set for three minutes. When 30 seconds remains, it will turn yellow and turn red after three minutes.

MR. De MESA: We have Ms. Andrea Hricko.

MS. HRICKO: Hi. My name is Andrea Hricko, and I'm a professor emeritus from the USC Keck School of Medicine. Thank you for the opportunity to present comments on this proposal. I have the same key concerns that many others have raised in comment letters; namely, lack of an evaluation of air pollution and health effects resulting from brining in larger oil tankers and containerships in future years.

Comment Letter 10

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US Army Corps of Engineers
Los Angeles District

PORT OF LONG BEACH DEEP DRAFT NAVIGATION STUDY
PUBLIC MEETING COMMENT CARD
13 NOVEMBER 2019

Port of LONG BEACH

SPEAKER NAME *(please print)*: Andrea HRICKO

ORGANIZATION *(if applicable)*:

WOULD YOU LIKE TO PROVIDE VERBAL COMMENTS AT THIS MEETING? ☑ YES ☐ NO

WOULD YOU LIKE TO BE ADDED TO OUR MAILING LIST? ☑ YES ☐ NO

ADDRESS:

EMAIL: ahricko@usc.edu

Regardless of whether you provide verbal comments today, if you would like to provide written comments on this study, you may respond on the back of the card and submit this card to a Corps representative or write the Corps by December 9, 2019 at:

Mr. Larry Smith, CESPL-PDR-Q
U.S. Army Corps of Engineers
Project Environmental Coordinator
915 Wilshire Boulevard, Suite 930
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Comment Letter 11

1

US Army Corps of Engineers
Los Angeles District

PORT OF LONG BEACH DEEP DRAFT NAVIGATION STUDY
PUBLIC MEETING COMMENT CARD
13 NOVEMBER 2019

Port of LONG BEACH

SPEAKER NAME *(please print)*: Heather Kryczka   Natural Resources Defense Council

ORGANIZATION *(if applicable)*: NRDC (National Resource Defense Council)

WOULD YOU LIKE TO PROVIDE VERBAL COMMENTS AT THIS MEETING? ☑ YES ☐ NO

WOULD YOU LIKE TO BE ADDED TO OUR MAILING LIST? ☐ YES ☐ NO

ADDRESS: [redacted]

EMAIL: hkryczka@nrdc.org

Regardless of whether you provide verbal comments today, if you would like to provide written comments on this study, you may respond on the back of the card and submit this card to a Corps representative or write the Corps by December 9, 2019 at:

Mr. Larry Smith, CESPL-PDR-Q
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Comment Letter 12

US Army Corps
of Engineers
Los Angeles District

PORT OF LONG BEACH DEEP DRAFT NAVIGATION STUDY
PUBLIC MEETING COMMENT CARD
13 NOVEMBER 2019

Port of LONG BEACH

SPEAKER NAME *(please print)*: WILLIAM JOHNS

ORGANIZATION *(if applicable)*: UTILITY COORDINATING, INC.

WOULD YOU LIKE TO PROVIDE VERBAL COMMENTS AT THIS MEETING? ☒ YES ☐ NO

WOULD YOU LIKE TO BE ADDED TO OUR MAILING LIST? ☒ YES ☐ NO

ADDRESS: [redacted]

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Regardless of whether you provide verbal comments today, if you would like to provide written comments on this study, you may respond on the back of the card and submit this card to a Corps representative or write the Corps by December 9, 2019 at:

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Project Environmental Coordinator
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presentation.

I did have one question on how far into the main channel the depth -- I think it was 57 feet. If it goes 70 feet all the way to that Berth 121, which is the deep water oil facility -- but my comment is for the planning, taking care of, including permitting and then footprint for impacted utilities.

So if you find underground former dredge HDDs, things like that, that allows for in the permitting process -- it could take a mile away on each side of the project to impact a large petroleum line and crossing. So taking that into account is the permitting development and also the footprint for temporary construction easements and things like that.

On my statement -- I didn't write it down. I'm just winging it up here. So thank you.

COL. BARTA: Thank you. Those are all the registered comments. There's opportunity for anybody who had oral comments. No.

So with that, we will go ahead and end the formal portion. All the project management teams for Corps of Engineers and the Port will stick around to answer informal questions that you have to get more input and feedback from the public. So thank you for