PORT OF LONG BEACH
DEEP DRAFT NAVIGATION FEASIBILITY STUDY

Los Angeles County, California

Draft Integrated Feasibility Report and Environmental Impact Statement / Environmental Impact Report (EIS/EIR)

October 2019







US Army Corps of Engineers ®

Port of LONG BEACH
The Green Port

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

This Integrated Feasibility Report and Environmental Impact Statement/Environmental Impact Report (Integrated Report) presents a summary of the ongoing planning process for the Port of Long Beach Deep Draft Navigation Feasibility Study. The purpose of this study is to identify and evaluate alternatives 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 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 local lead agency responsible for implementing the California Environmental Quality Act (CEQA) is the Port of Long Beach (POLB).

The tentatively selected plan, which will be undertaken jointly by the USACE and the POLB, 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 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 will 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 needed in order to fully realize the benefits of the project, and will be undertaken solely by POLB. The tentatively selected plan is comprised of feasible dredging and disposal measures in accordance with Federal and state guidelines, including the Port of Long Beach's environmental protection guidelines.

Impacts associated with the alternatives have been evaluated for all resource topics and were determined to be less than significant for all resources except air quality. Mitigation is proposed for the impacts identified under each alternative and the severity of these impacts is directly relative to the size of the alternative and associated number of days for construction.

All comments must be received by the contact person below on or before the following date: December 9, 2019.

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PORT OF LONG BEACH DEEP DRAFT NAVIGATION PROJECT
INTEGRATED FEASBILITY STUDY
AND
ENVIRONMENTAL IMPACT STATEMENT/
ENVIRONMENTAL IMPACT REPORT

Note: The Feasibility Report and joint Environmental Impact Statement/Environmental Impact Report (EIS/EIR) for this study/project have been integrated into one document (Integrated Report) to comprehensively meet USACE planning requirements as well as Federal and State environmental requirements.

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EXECUTIVE SUMMARY

S.1 Introduction

This Integrated Feasibility Report and Environmental Impact Statement/Environmental Impact Report (Integrated Report) presents a summary of the ongoing planning process for the Port of Long Beach (POLB) Deep Draft Navigation Feasibility Study (Study). This Integrated Report is prepared 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 Project is part of a continued effort to improve navigational efficiency and vessel safety throughout the POLB.

This report describes baseline conditions, the formulation and evaluation of alternative plans, and the identification of a tentatively selected plan. The lead Federal agency for this study is the USACE, in coordination with the non-Federal study Sponsor, the POLB. Multiple agencies have and continue to contribute to this study effort.

S.2 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. 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 vicinity map and **Figure ES- 2** for the study location**.**) The dotted line in Figure 1-2 denotes the existing Port of Long Beach boundary.

S.3 Purpose and Need

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 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 need for the proposed action is 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.

The concerns of Port of Long Beach authorities were used as the basis to develop problem statements and study goals and objectives. These were established as objectives for the proposed action.

[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.

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.

PLANNING OBJECTIVES

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.

2. Improve conditions, during the period of analysis, for vessel operation and safety, including reducing constraints of harbor pilot operating practices.



Figure ES- 1 Vicinity Map



Figure ES- 2 Study Location

S.4 Plan Formulation

General Navigation Features

A full array of structural and non-structural measures were 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

- **EPA Deep Ocean Placement sites at LA-2 and LA-3**
- **North Energy Island Borrow Pit**
- **Orange County Surfside-Sunset Borrow Sites**
- **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)**
- **EPA Deep Ocean Placement sites at LA-2 and LA-3**
- **Orange County Surfside-Sunset Borrow Sites**
- **POLB slip fill sites (will be considered in the future if there is an opportunity to utilize a slip fill site)**

Four action alternatives were carried forward to meet the Project's needs and 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 ft MLLW, which involves widening portions of the Main Channel. Sediment disposal options considered the two Ocean Dredged Material Disposal Sites (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 ft MLLW; Approach Channel deepened to -78 ft MLLW.
Alternative 3: container terminal channels deepened to -55 ft MLLW; Approach Channel deepened to -80 ft MLLW.
Alternative 4: container terminal channels deepened to -57 ft MLLW; Approach Channel deepened to -83 ft MLLW.
Alternative 5: container terminal channels deepened to -55 ft MLLW; Approach Channel deepened to -80 ft MLLW, and construction of Standby Area adjacent to the Main Channel dredged to -67 ft MLLW, with a 300-foot diameter center anchor placement evaluated to a depth of -73 ft MLLW.

Local Service Facilities

Local Service Facilities (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 ft MLLW, depending on the action alternative, plus 2 ft 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 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 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 of 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 plans that are fully analyzed for environmental impacts under NEPA and CEQA, and included in this report. Final Array Alternative 5 was added, which is the same as Alternative 3, but also includes a -67 ft 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 feature later in the study based upon further evaluations and concurrent review of this report.

Table ES--1 Final Array of Alternatives (1OCT18 Price Level)

	Dredge Volume (cy)	Total Project Cost	Total Annual Cost	Average Annual Benefits	Average Net Annual Benefits	Incremental Net Benefits[2]	B/C
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

S.5 Summary of Potential Environment Effects and Proposed Mitigation

Affected Environment/Existing Condition

This Integrated Report provides a description of the existing environmental conditions in the project areas 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 project 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					

Cumulative Impacts

NEPA requires that cumulative impacts of the proposed action be analyzed and disclosed. Cumulative impacts are impacts on the environment that would result from the incremental effect of the proposed action when combined with other past, present, and reasonably foreseeable planned and proposed actions. Cumulative impacts can result from individually minor, but collectively significant, actions taking place over a period of time. The geographic scope of this analysis is the Port of Long Beach and the nearshore placement areas.

California guidelines for implementing the California Environmental Quality Act (CEQA) require a discussion of significant impacts resulting from incremental effects considered significant when viewed in combination with the effects of "past, present, and probable future projects", or in relation to "a summary of projections contained in an adopted general plan or related planning document" (Cal. Code. Regs, Title 14, § 1506(c) and § 15130(b)(1)(A)(B)). Federal guidelines for implementing the National Environmental Policy Act (NEPA) define a cumulative impact as one that would result from the incremental impact of an action when added to other past, present, and reasonably foreseeable actions (40 C.F.R. § 1508.7).

Using this guidance, cumulative impacts were analyzed in consideration of other reasonable foreseeable projects in the vicinity of project areas. Cumulative projects considered in this analysis included other ongoing or proposed dredge projects; capital improvement or development projects proposed within and

around the proposed project's location. The results of this analysis concluded that significant cumulative impacts regarding air quality would occur as a result of implementing any of the action alternatives, even with the implementation of mitigation measures.

The USACE has concluded that the cumulative impacts of the proposed action when combined with other past, present, and reasonably foreseeable planned and proposed actions, would be highly localized and would not significantly affect the quality of the existing human environments.

Effects Found Not to Be Significant

Resource categories that were brought forward for the proposed Port of Long Beach Deep Draft Navigation Project for further analysis in this Integrated Report included 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. Potential impacts were evaluated against significance criteria for each element in comparison to the no action alternative. Predicted impacts in each of these areas, for all of the action alternatives, were below significance criteria and were determined not to have a long-term significant effects on these elements of the environment. The details of this analysis are provided in Section 5 of this document.

Significant Unavoidable Adverse Effects

As discussed above, this Integrated Report considered the potential impacts of the alternatives, in addition to the No Action Alternative, to several resource categories. Air quality impacts exceeded significance criteria and were determined to be significant for all action alternatives. Despite substantial mitigation efforts, these potential impacts associated with air quality, could not be reduced below the level of significance and have been identified as unavoidable. This is due to the types of equipment that are necessary (hopper dredge, electrified clamshell dredge, barges, etc.) to perform the dredging and placement/disposal activities, and to the durations of use of that equipment that are required for each action alternative. No other significant impacts were identified.

Environmental Commitments

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 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. In the event that 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.

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 treatment and disposition of such remains will be carried out in compliance with the Native American Graves Protection and Repatriation Act (Public Law 101-601; 25 U.S.C. 3001 et seq.) and EP 1130-2-540, Chapter 6.

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

4. The Contractor shall implement a Water Quality Monitoring Plan at the dredge and nearshore placement sites.

5. 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.

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

7. The contractor shall mark the dredge and all associated equipment in accordance with U.S. Coast Guard regulations. The contractor must contact the U.S. Coast Guard 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.

8. The contractor shall move equipment upon request by the U.S. Coast guard and Harbor patrol law enforcement and rescue vessels.

9. Construction equipment shall be properly maintained in order to minimize emissions of air pollutants.

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

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

12. Pre-construction surveys for *Caulerpa taxifolia* will be conducted in the Main Channel, proposed Pier J Channel and Turning Basin, and the Surfside Borrow Site. Construction shall not begin should *Caulerpa taxifolia* be identified until cleared to do so by the National Marine Fisheries Service.

Mitigation Measures include the following:

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.

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.

S.6 The Tentatively Selected Plan

Alternative 3 with 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 MLLW), 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), and the Local Service Facilities provides the greatest contribution to net benefits and has been determined as the National Economic Development (NED) Plan. The NED Plan has also been identified as the Tentatively Selected Plan (TSP).

General Navigation Features of the TSP for liquid bulk vessels includes:

- deepening the Approach Channel to -80 ft MLLW; and
- bend easing within portions of the Main Channel to -76 ft MLLW.

General Navigation Features of the TSP 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; and
- deepening the West Basin to -55 ft MLLW.

The tentatively selected plan includes Local Service Facilities to be constructed by the POLB to fully realize all of the benefits of the General Navigation Features discussed above. Local Service Facilities are constructed by the POLB and thus require appropriate permits from the USACE Regulatory Division. Impacts from construction of Local Service Facilities 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 TSP is comprised of feasible dredging and placement/disposal measures in accordance with Federal and state guidelines, including Port of Long Beach 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.

Approximately 7.1 mcy of dredged material would be placed in a nearshore site as well as 2 EPA-designated offshore disposal sites for the General Navigation Features. **Figure ES-1** shows the location of the General Navigation Features. 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.

Local Service Facilities includes berth dredging within the Pier J South Basin and berth T140 along Pier T to -55 feet MLLW. Approximately 304 kcy of dredged material would be placed in a nearshore site as well as 2 EPA-designated offshore disposal sites for the Local Service Facilities.

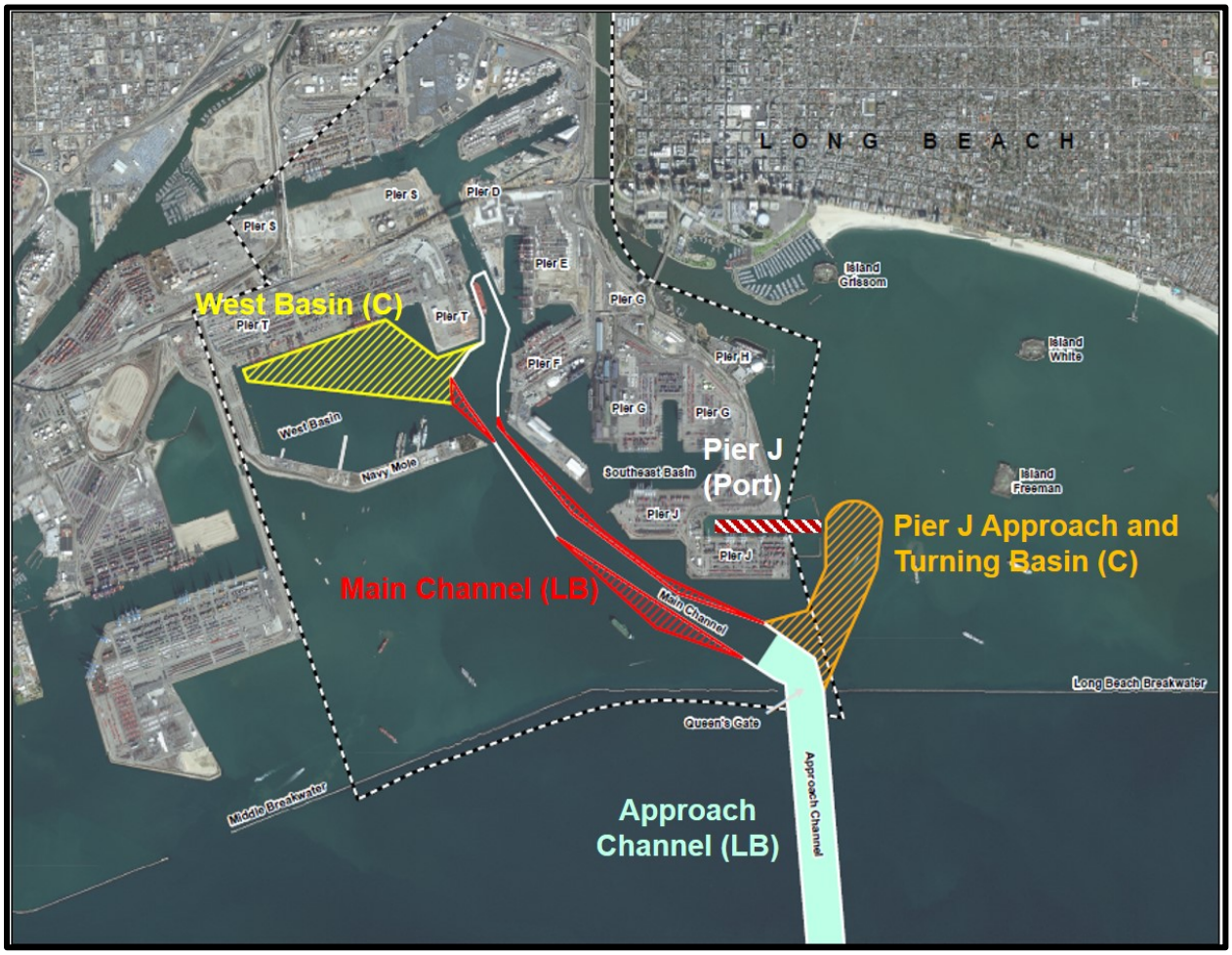


Figure ES-1 Tentatively Selected Plan

As detailed in **Table ES-1**, the TSP plan (Alternative 3) has a project cost of approximately $151 million. Project cost includes project first costs, which include General Navigation Features (GNF), LERR, local service facilities, and aids to navigation. GNF costs are cost shared 50%/50% during construction. An additional 10% of the GNF costs, less the amount of LERR credit afforded to the sponsor for the value of LERR, can be paid by the non-Federal Sponsor over a period not to exceed 30 years with interest. However, in this case, there is no LERR adjustment credit since the sponsor has no related costs. There are costs associated with the Local Service Facilities that are considered project costs but are the responsibility of the non-federal sponsor. A breakout of the approximately $19.45 million of sponsor costs as well as a breakdown of costs by code of accounts is shown in **Table ES-2**. The average annual costs were determined to be approximately $6.43 million for the TSP. The average annual benefit for the TSP is approximately $24.45 million and the average net annual benefit is approximately $18 million, as shown in **Table ES-3**. Therefore, the benefit-to-cost ratio is estimated at 3.8 to 1 for the TSP plan.

Table ES-1-1 Preliminary Cost Apportionment Table (1OCT 2018 Price Level, Rounded)

	Total Cost Allocated	Federal	Non-Federal
Dredging (including mitigation, PED and Construction Management; 50/50 cost sharing)	$131,254,000	$65,6270,000	$65,6270,000
Lands, Easements, Right-of-Ways, Relocations (100% Non-Fed)	$0	$0	$0
Non-Federal Local Service Facilities (100% Non-Fed): Dredging (including PED and Construction Management)	$19,449,000	$0	$19,449,000
Project First Costs	$150,703,000	$65,627,000	$85,076,000
Additional 10% of GNF over time less LERR	$0	($13,125,400)	$13,125,400
Final Distribution of Costs	**$150,703,000**	**$52,501,600**	**$98,201,400**

Table ES-1-2 Detailed Project Costs (1OCT18 Price Level)

	Total Project	General Navigation Features	Local Service Facilities*
Construction Cost	$84,144,000	$73,872,0006	$10,273,000
PED	$12,653,000	$11,080,000	$1,573,000
Construction Management	$6,424,000	$4,949,000	$1,475,000
LERR	$0	$0	$0
Project Cost	$103,221,000	$89,901,000	$13,321,000
Contingency (46%)	$47,482,000	$41,354,000	$6,128,000
Total Project Cost	**$150,703,000**	**$131,254,000**	**$19,449,000**
*** Sponsor Only Costs includes costs for construction of Local Service Facilities and the PED and Construction Management associated with those activities.**			
Note – Some figures may not exactly sum to indicated value due to rounding.			

Table ES-1-3 ER 1105-2-100 Appendix H - Economic Table for the TSP

Equivalent Annual Benefits and Costs FY2019 Price Levels, 50-year Period of Analysis, 2.875% Discount Rate	
	Total
Investment Costs	
Total Project Construction Costs	$150,703,000
Interest During Construction	$5,678,000
Total Investment Cost	$156,382,000
Average Annual Costs	
Interest and Amortization of Initial Investment	$5,934,000
OMRR&R	$500,000
Total Average Annual Costs	$6,434,000

1 INTRODUCTION

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

This feasibility study uses the USACE six step planning process carried out in conjunction with the Sponsors, 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 tentatively selected plan of action for navigation improvements. The Feasibility 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 report is an Integrated Feasibility Report (IFR) and joint Environmental Impact Study/ Environmental Impact Report (EIS/EIR) [Integrated Report]. This Integrated Report 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 feasibility study was conducted in accordance with current USACE regulations and 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 report 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), and USACE NEPA regulations (33 C.F.R. part 230).

This report provides the existing and future without-project (baseline) conditions, formulation and evaluation of alternatives and identification of a tentatively selected plan for the Port of Long Beach Deep Draft Navigation Feasibility Study (Study). This Integrated Report includes a combined draft 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 Integrated Report 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.

Because this Integrated Report contains both the Feasibility Study and EIS/EIR, it appears slightly different in structure and content then stand-alone documents. The required contents of each report are contained in this integrated version. To help the reader navigate this Integrated Report, 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 Port of Long Beach study area for a total of 15 consideration 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: includes conclusions and recommendations, list of preparers, glossary, references, and an index.
- Appendices: There are a total of 12 appendices with more detailed technical information.

1.2 Study Authority

This report 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 Port of Long Beach.

1.3 National Objectives

Federal and Federally-assisted water and related planning activities attempt to achieve increases in National Economic Development (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 study period 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 Draft Integrated Report and the supporting appendices.

1.4 Purpose and Need

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 need for the proposed action is 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[3], lightering[4], 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 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

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

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 (Tentatively Selected Plan for this Draft IFR). 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 Port of Long Beach that could address inefficiencies within the system. No project-induced increases in cargo throughput, based on potential water-based improvements to increase efficiency, are anticipated or forecasted.

1.6 Study Area (Location and Description)

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 1-1** provides a map of the Los Angeles region in which the Project site is located.



Figure 1-1 Location Map

The general area of the Port of Long Beach 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.

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 1-2** below) is 11,150 ft long, Middle Breakwater is 18,500 ft long and the Long Beach Breakwater is 13,350 ft long. The Long Beach Harbor portion of the existing Federal Project (see **Figure 1-2**) includes the Approach Channel through Queens Gate that is about 15,800 ft long, 1200-1300 ft wide and has a depth of 76 ft below Mean Lower Low Water (MLLW). The Main Channel is about 16,700 ft long, with a varying width between 400-1400 ft and an authorized depth of 76 ft below MLLW.



Figure 1-2 Existing Federal Project

1.8 Prior Studies and Reports

There have been numerous studies and projects in the Port of Long Beach by the USACE and other entities.

1.8.1 USACE Studies and Reports

Previous USACE studies, reports and projects are listed below.

1) 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.
2) Port of Long Beach (Main Channel Deepening) Final Feasibility Study Long Beach, California (Sept 1995)—Prepared by the US Army Corps of Engineers
3) 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.
4) 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, Mar. 2013.
5) 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 the Feasibility Study; a comprehensive list may be found in the bibliography.

1) 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
2) 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
3) Final Report Port of Long Beach Piers G and J Terminal Redevelopment Project Environmental Impact Assessment (EA) Final Environmental Impact Report (DEIR), Long Beach, CA (October 2001)
4) Environmental Review (under development) for the Port of Long Beach Cruise Terminal Improvement Project
5) 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.
6) Final 2008 Biological Surveys of Los and Long Beach Harbors. April 2010. Prepared by SAIC for the Ports of Los Angeles and Long Beach.
7) 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.
8) Port Master Plan Update, Draft Program Environmental Impact Report. August 2019.
9) 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. Next dredge event will be 2020, 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 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 will complete in 2020 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 (baseline) and future without project (FWOP) conditions for the project area in order 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 (2077). The existing conditions are used as the baseline to forecast the changes that would be expected without USACE action to address inefficiencies in the Port of Long Beach.

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 Port of Long Beach and to the nation's economy would also not be realized.

2.1 General Setting

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. Today trade valued annually at more than $194 billion moves through the Port of Long Beach, making it the second-busiest seaport in the United States. The Port of Long Beach handles more than 7.5 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, Port of Long Beach 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 500,000 jobs in southern California generate about $30 billion in wages in California that are associated with goods moving through the Port of Long Beach. The Port of Long Beach'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 terminal. The project will quintuple dock rail capacity and is expected to be completed in 2020.
- 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 late 2019.
- 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.

2.3 Throughput

2.3.1 Container Vessels

As noted, the Port of Long Beach currently handles more than 7.5 million TEUs. Everything from clothing and shoes to toys, furniture and consumer electronics arrives at the Port of Long Beach before making their way to store shelves throughout the country.

Historic and Existing Condition

As shown on **Figure 2-1**, from 1995 through 2017, total container throughput at the Port of Long Beach 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%. The decrease in throughput in 2008 and 2009 was due to global recession.

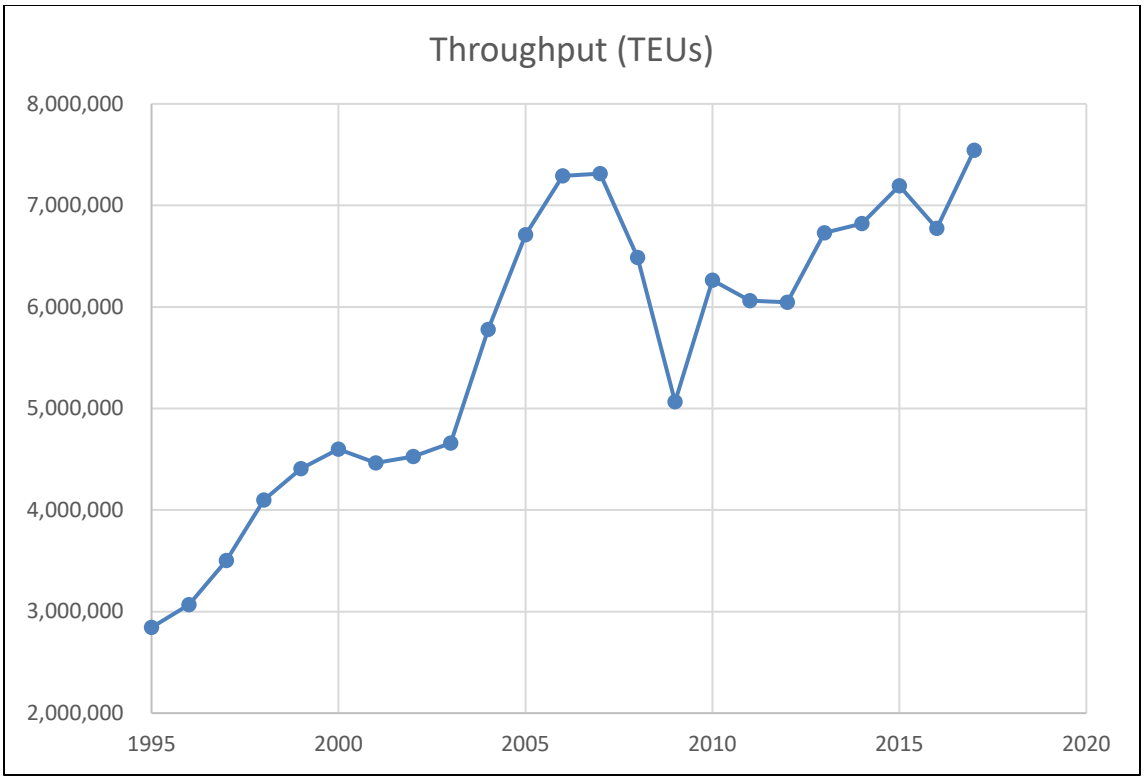


Figure 2-1 Port of Long Beach Historical Container Throughput

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 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). Strong growth in throughput is projected to continue until the Port of Long Beach's facilities reach capacity, which is anticipated in around 2035, as shown in **Figure 2-2**.

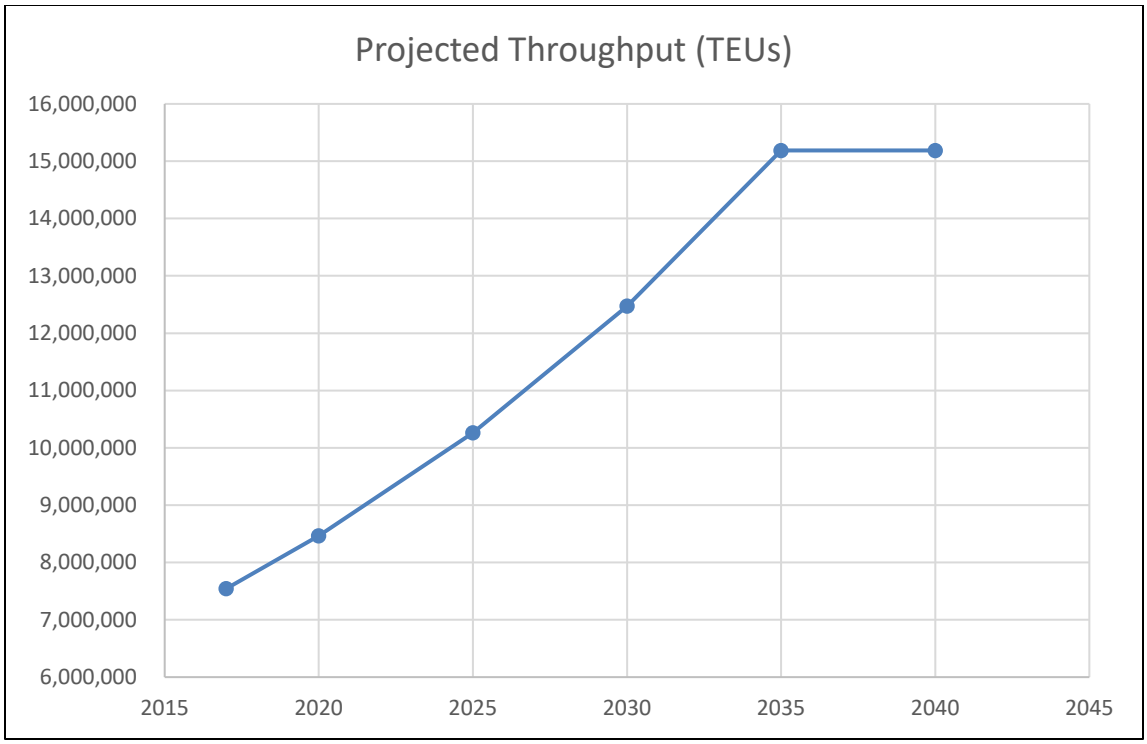


Figure 2-2 Port of Long Beach Projected Container Throughput

2.3.2 Liquid Bulk

Liquid forms of bulk cargo include crude oil, gasoline and miscellaneous chemicals. The primary liquid bulk commodity for the Port of Long Beach 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.

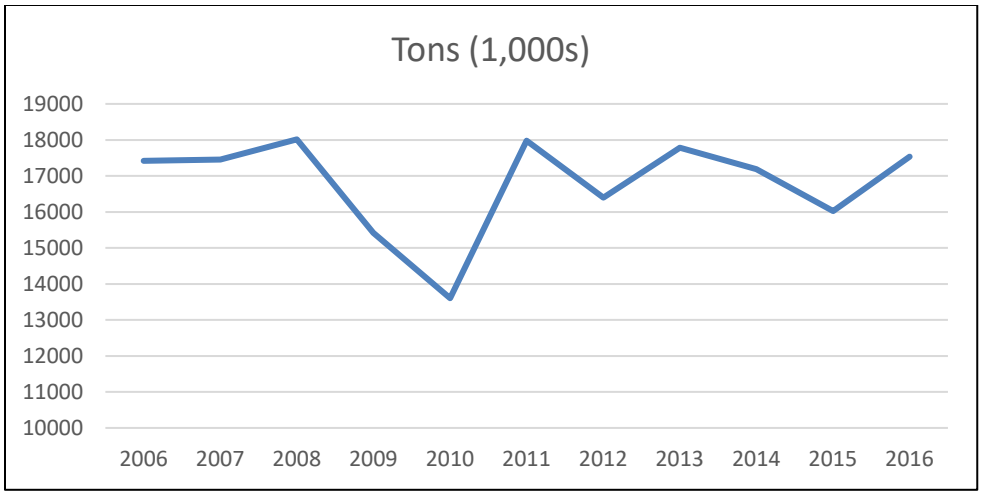


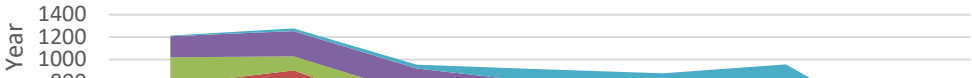
Figure 2-3 Port of Long Beach Historical Crude Oil Imports

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 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 ft
LOA:	1,300 ft
Beam:	193 ft
DWT:	188,000
TEUs:	18,000 - 19,000

Table 2-2 Liquid Bulk Design Vessel

VLCC	
Maximum Draft:	70 ft
LOA:	1,100 ft
Beam:	200-210 ft
DWT:	325,000

2.6 Shipping Operations – Underkeel Clearance

The measure of underkeel clearance (UKC) for economic studies is applied according to 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 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.

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 Port of Long Beach 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 (LAHD). 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 (OGV's) 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 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 twenty-foot equivalent units (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.

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 day-shifts, Monday through Friday; and typically four to five off-peak shifts during week nights and Saturdays.

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 Integrated Report describes the environmental conditions within the project study area for the proposed action with a baseline of 2024 (the anticipated start of construction). Conditions in 2027, the base year, are assumed to be similar. 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 Integrated Report. 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 thus be affected, directly or indirectly, as a consequence of project implementation. For example, aesthetics have a local area of influence confined to the project study area whereas air quality issues have a broader or more regional context. The affected environment provides the existing environmental conditions baseline (i.e., year 2025) against which the potential short term and long term effects of the proposed alternative actions are evaluated.

The potential project area is composed of portions of the POLB complex as shown on **Figure 3-1** 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. **Table 3-1** below summarizes the area of influence for each of the environmental topics/issues. The study area refers to the area being evaluated for potential impacts and is much broader than the project area which is limited to the area of direct impacts, in this case the channels and basins. 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.

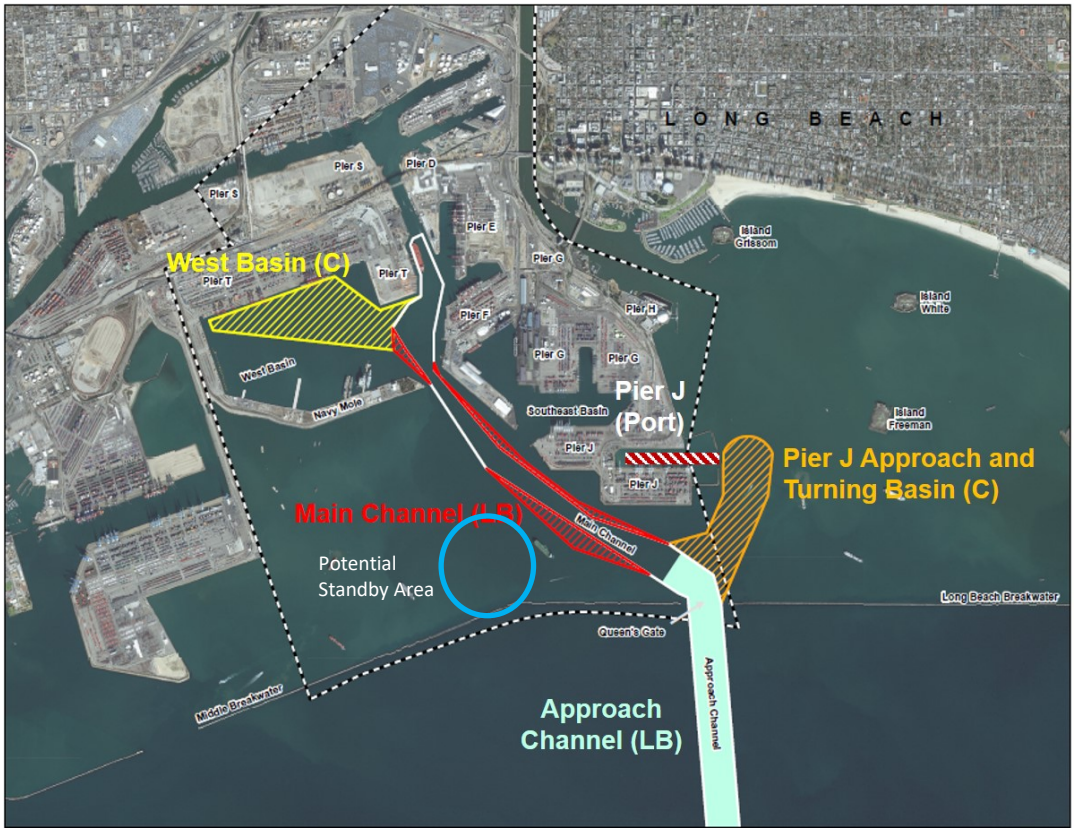


Figure 3-1 Potential Project Area

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
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 project 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 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 background information, 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 sea-shells. The shelf sediment is consistently found across the study area and all of the 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 sea-shells 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 Bay is composed of an 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.

3.1.3 Faulting and Seismicity

All of southern California including the study area is seismically active. The project study is located 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 those, 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 port of Long Beach. Either of these faults are capable of producing a moment magnitude 7 earthquake (BSSA 2019). The Wilmington Blind Thrust Fault also underlies the Port and has recently been upgraded to active status (BSSA, 2019). The size of the fault suggests that it is capable of generating moderate-magnitude earthquakes (Mw 6.3–6.4),

3.1.4 Topography and Bathymetry

Long Beach Harbor is located 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 project 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).

3.2 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.

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). 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.

The low, intermediate, and high scenarios at National Oceanic and Atmospheric Administration (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 3-2** 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 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. SLC could reduce the frequency of future maintenance dredging activities.

The Port of Long Beach developed an extensive Climate Adaptation and Coastal Resiliency Plan (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. This will lead to multiple infrastructure improvements to address future climate change impacts on Port projects.

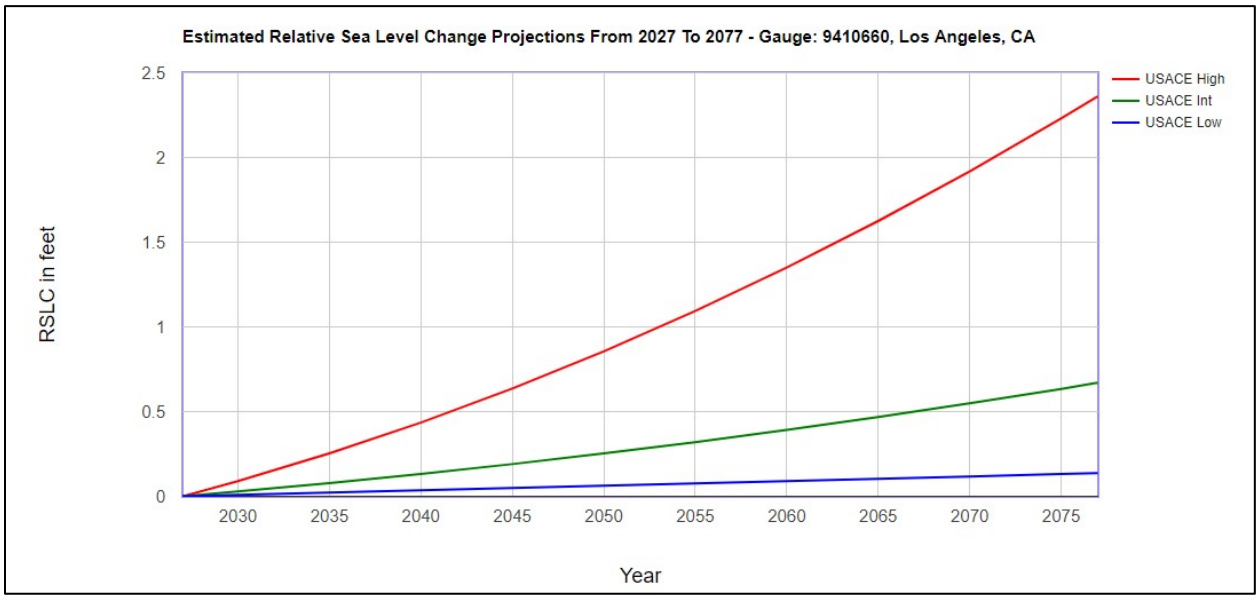


Figure 3-2 Sea Level Rise Projections, Los Angeles, CA, NOAA gage 9410660

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

Estimated Relative Sea Level Change from 2027 To 2077
9410660, Los Angeles, CA
NOAA's 2006 Published Rate: 0.00272 feet/yr
All values are expressed in feet

Year	USACE Low	USACE Int	USACE High
2027	0.00	0.00	0.00
2030	0.01	0.03	0.09
2035	0.02	0.08	0.25
2040	0.04	0.13	0.44
2045	0.05	0.19	0.64
2050	0.06	0.25	0.86
2055	0.08	0.32	1.09
2060	0.09	0.39	1.35
2065	0.10	0.47	1.63
2070	0.12	0.55	1.92
2075	0.13	0.63	2.23
2077	0.14	0.67	2.36

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 dissolved oxygen (DO). **Table 3-4** characterizes the overall water quality parameters for the project site.

Table 3-4 Water Quality Characteristics

Parameters	Project Site
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.

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).

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.

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).

Contaminants

Contaminants in the water column can include metals, particularly cadmium, chromium, copper, lead, mercury, nickel, silver, and zinc; chlorinated pesticides (e.g., DDT and chlordanes); PCBs; and petroleum hydrocarbons, including 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.

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 levels 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' 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 in order 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 being below levels suspected of causing biological effects.

Sediments in the West Basin were subject to several different test programs. 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-1990's. 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.

3.4 Biological Resources

3.4.1 Marine Shoreline and Offshore Habitats

Habitats

Habitats located in the project 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 Port of Long Beach 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 Port of Long Beach, 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 CWA Section 404(b)(1) Guidelines (40 CFR Part 30), and are considered EFH-HAPC by NOAA Fisheries under 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 or adjacent to the project area.

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).

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 Ports 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.

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.

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 National Marine Fisheries Service (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 are considered to be suitable habitat.

Essential Fish Habitat

EFH is managed under the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act). This act protects waters and substrates necessary to fish for spawning, breeding, feeding, or growth to maturity (Magnuson-Stevens Act, 16 U.S.C. 1801 et seq.). 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 two Fishery Management Plans (FMPs): Coastal Pelagics Plan and Pacific Groundfish Management Plan. Some of the species federally managed under these plans are known to occur in the study area and could be affected by the proposed project.

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 ft 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 ft as mapped in the EFH assessment GIS; and
- 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.

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 (CESA) 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 ESA

Species lists from the 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 our 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 project 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 U.S. Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NMFS) for the project 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 are 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 project 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 project 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 project area. Therefore, the species would not occur in the study area.

Turtles

Federal-listed marine turtles occasionally are sighted in warm-water areas of estuaries and bays in the region, but do not occur in the study area. Turtle species listed by NMFS as having the potential to occur in the project area include leatherback sea turtle (*Dermochelys corieacea*- endangered), loggerhead turtle -North Pacific Ocean and South Pacific Ocean DPS(*Caretta caretta*- endangered), olive ridley (*Lepidochelys olivacea*-endangered) and the green sea turtle (*Chelonia mydas*-endangered). All four species have broad, worldwide ranges and are highly migratory. Most nearshore sightings of the green and loggerhead sea turtles appear to be associated with warm-water discharges from electric generating stations. For example, Dynegy's South Bay Power Plant (now closed) in San Diego Bay consistently supported a population of green sea turtles (Lewison, Eguchi and Seminoff 2010). No formal studies have been conducted for the San Pedro Bay Port Complex, although the POLB conducts visual monitoring for green sea turtles during maintenance dredging and pile driving activities, and no anecdotal sightings of green sea turtles have been reported in the Los Angeles or Long Beach Harbors. The nearest green sea turtle sightings were reported south of the ports in the San Gabriel River (associated with the warm-water discharge of an electric generating station) and in Alamitos Bay (MBC, 2003; NPR, 2015; Crear, et al., 2017). None of the four species are expected to occur at the project site.

Marine Mammals

Four species of whales were listed by NMFS as having the potential to occur in the project 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).

3.4.4 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 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 or at Seal Beach National Wildlife Refuge 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).

Osprey 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 project 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 3-3**).

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.

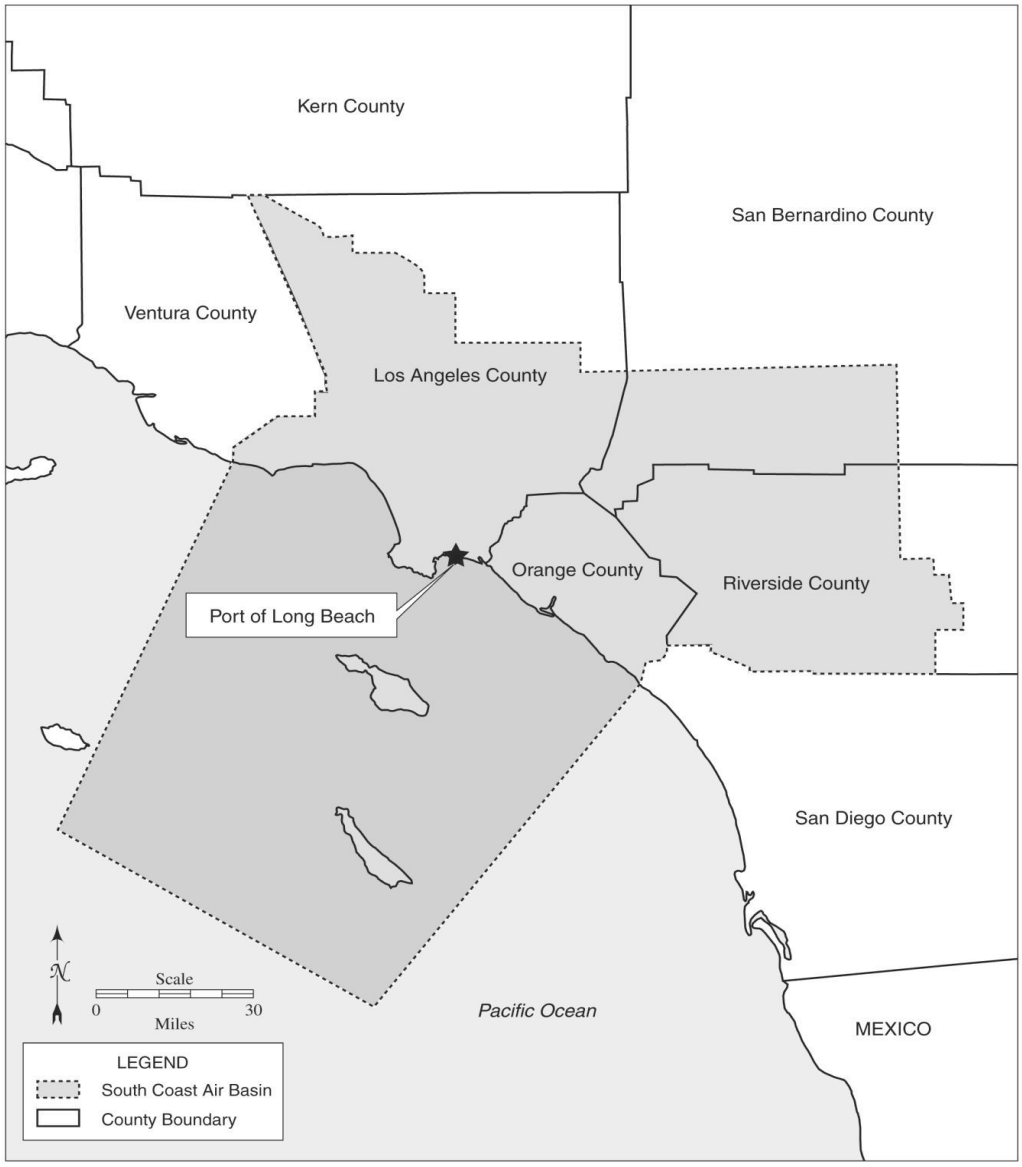


Figure 3-3 South Coast Air Basin

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 EPA, 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 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), and sulfur dioxide (SO_2). 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.

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
$PM_{2.5}$	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 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 PM10 and annual standards in all 3 years. The Gull Park station does not have a filter-based PM2.5 monitor. However, none of the surrounding monitoring stations (Superblock, North Long Beach or South Long Beach) exceeded the PM2.5 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} ($\mu g/m^3$)	24-hour [e]	150	51.2	66.4	56.1
	Annual	--	**25.3**	**27.2**	**24.4**
$PM_{2.5}$ ($\mu g/m^3$)[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 $\mu g/m^3$ is equal to or less than one.

[f] The Gull Park station does not have a filter-based PM2.5 Monitor. None of the surrounding monitoring stations (Superblock, North Long Beach or South Long Beach) exceeded the PM2.5 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% to 63% decrease in cancer risk since 1990 (SCAQMD 2000). The 2008 MATES-III study reported a SCAB-wide decrease of 8% from MATES-II, and the 2015 MATES-IV study reported a SCAB-wide decrease of 57% 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 PM2.5 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 site.

The locations of the sensitive receptors are shown in **Figure 3-4.** 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 site is presented in Table A4.4 in Appendix A4. Individual residences are not listed in the figure or table.

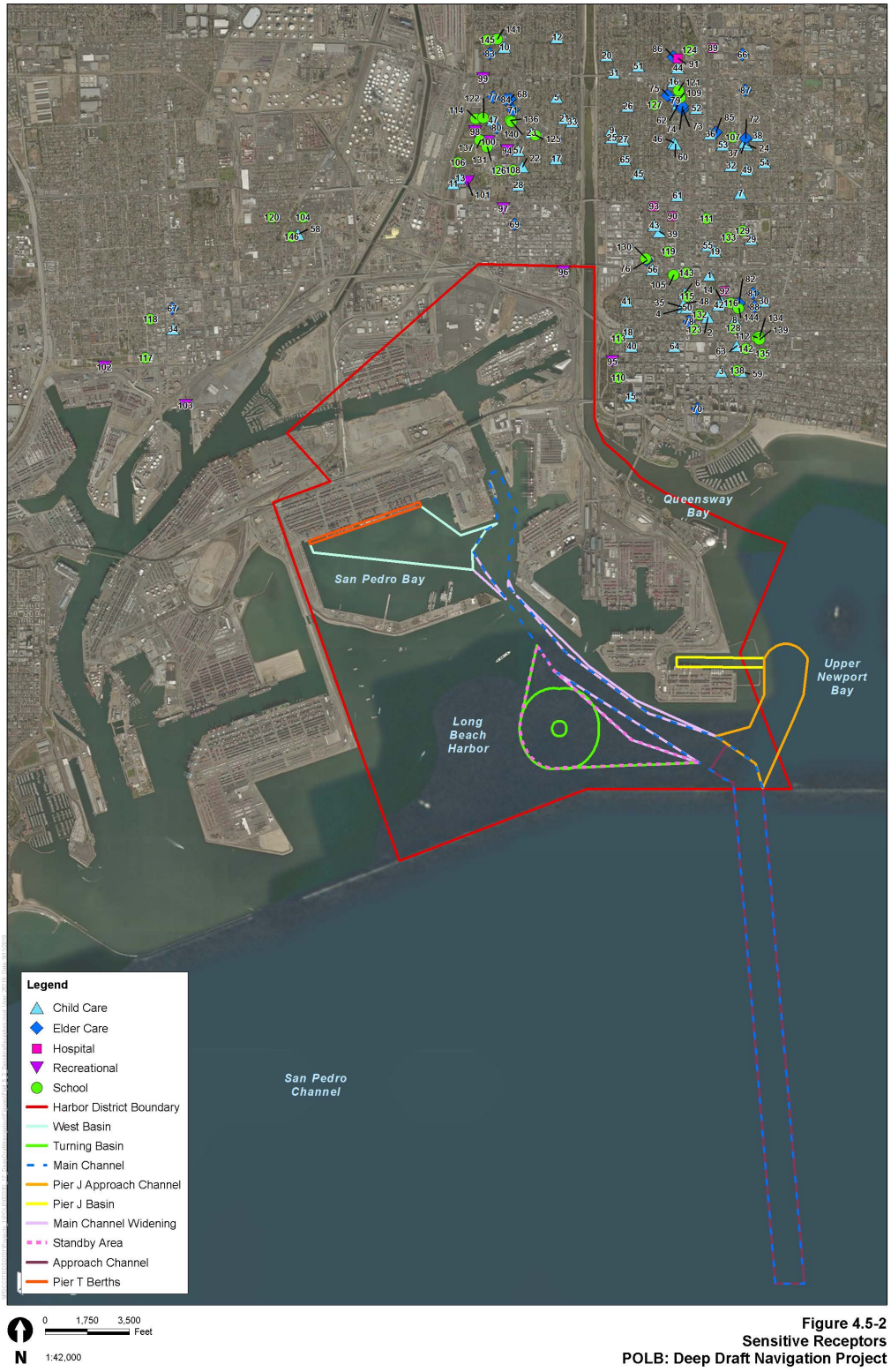


Figure 4.5-2
Sensitive Receptors
POLB: Deep Draft Navigation Project

Figure 3-4 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 (TCP's), 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 Port of Long Beach 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 Port of Long Beach 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 Port of Long Beach 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 (36CFR 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 would include the areas to be dredged under all alternatives, placement/disposal areas, the new electrical substation and associated trenching, Local Service Facilities (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.

The final APE for Section 106 purposes will be further narrowed in consultation with the State Historic Preservation Officer (SHPO) to include just those areas directly impacted by the selected alternative, which will presumably be the tentatively selected plan (TSP).

Cultural Resources within the APE

Only (7) 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 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. Alternately, 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, but a visual inspection of the anomaly was recommended to confirm whether it is of cultural origin. 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.

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" 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 all 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 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 EPA deep ocean placement sites 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 EPA and USACE in 2005 indicates that there are no known shipwrecks within 6kilometers 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 proposed 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 Port of Long Beach 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 disproportionate environmental impacts 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 2018, the City of Long Beach population was 467,354, which represents an increase of 1.1% from the 2010 population of 462,257. This growth rate is significantly greater than that experienced between 2000 and 2010, during which population only increased by about 0.2%. 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
2018	467,354	1.1%
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 Port of Long Beach 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 ranging from 3.5 to 4.7% as of June 2019. The value for the City of Long Beach is the same as the City of Los Angeles's unemployment rate (4.7%). Data for **Table 3-10** 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	237,300	226,100	11,200	4.7%
Los Angeles City	2,055,600	1,960,000	95,700	4.7%

The poverty rate for the City of Long Beach is 19.1%, which is slightly lower than Los Angeles City at 20.4%. Data for **Table 3-10** was obtained from community profile data found on the Census Bureau website for 2017.

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	$58,314	$29,586	19.1%
Los Angeles City	$54,501	$31,563	20.4%

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% each for the City of Long Beach, with those identifying as having two or more races at 5.5%. Hispanic populations for Long Beach and Los Angeles are approximately 42% and 49%, 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	53.1	13.0	13.0	2.1	5.5	42.4
City of Los Angeles	52.4	9.0	11.6	0.9	3.6	48.6
Los Angeles County	71.0	9.1	15.1	1.9	3.0	48.5
Source: U.S. Census (2017)						

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 Project 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 Project site 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 Environmental Impact Report, 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 Project 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. The 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 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 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 CFR 33 Part 165, Subsection 165.1109. In the case of the Los Angeles/Long Beach Harbor, RNA boundaries match the designated Precautionary Area. CFR 33, Part 165, Subsection 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 OSPR, 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 Ports of Los Angeles or Long Beach 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 tug boats 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 mile 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 may 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 ft 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 Port of Long Beach handles more than 7.5 million Twenty-foot Equivalent Units (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. The majority of 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 C.F.R § 1451 [1997]), 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 Act, local governments are encouraged to adopt 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.

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 (California Department of Fish and Game 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 to reaches 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 Port of Los Angeles. Commercial fishing takes place outside the breakwater, with the exception of small bait fish operations. These operations avoid the shipping channels in order to avoid larger cargo vessels that transit into and out of the harbor using the federal navigation channels.

The Coast Guard maintains and operates navigational buoys and lights within the harbor. These are used by vessel operators in order to safely navigate in the harbor. The Coast Guard also has vessels in place to respond to emergency calls with vessels berthed in the neighboring Port of Los Angeles. 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 each reach in 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 Tentatively Selected 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, or Tentatively Selected Plan (TSP), which best meets the stated objectives and constraints of the study.

4.1 Problems, Opportunities and Constraints

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. Constraints are resource, legal, or policy considerations that limit the actions that can be implemented. The identification and development of problems, opportunities, and constraints specific to the Port of Long Beach resulted from internal discussions, external communication with stakeholders and resource agencies, and public meetings.

4.1.1 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 Port of Long Beach 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 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 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 Port of Long Beach 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 Port of Long Beach. This limitation has impacted 5-10% of crude oil imports, or 1-3 million tons per year, historically and the impact has increased to 15% 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 Port of Long Beach'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 Port of Long Beach (seaward side of the breakwaters), resulting in inefficiencies.

4.1.2 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)

4.1.3 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.

4.2 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.

PLANNING OBJECTIVES

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.***

2. ***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 channel deepening that would induce changes in the operations and composition of the future fleet mix at the Port of Long Beach. 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 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.

The outcomes described above can be best put in terms of National Economic Development (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 Port of Long Beach), 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).

4.3 Assumptions

To facilitate analysis and screening, two sets of assumptions were used related to the future without-project conditions for this study: (1) standard USACE deep draft navigation assumptions, and (2) project-specific assumptions.

The assumptions related to the future without-project 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 Coast Guard's 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; and
- 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; and

- 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. Therefore the benefits for that portion of the project are only accrued for 20 years of the period of analysis.

4.4 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 or not 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. The comparison of acceptability is defined as acceptance of the plan to the local sponsors and the concerned public.

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 Port of Long Beach 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 Port of Long Beach.

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.

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

- **EPA 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 (mcy). LA-3 is located 22 miles southeast of Queens Gate--maximum cumulative allowable placement per calendar year from all sources = 2.5 mcy.
- **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.
- **Orange County Surfside-Sunset Borrow Sites:** 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. Approximately 2.5 mcy of sand may be placed here. Still need to investigate the potential to utilize these sites for placement of POLB Deepening material. 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.

Local Service Facilities

Local Service Facilities (LSF) include berth dredging, potential wharf improvements at Piers J and T, and structural improvements to the Pier J breakwaters 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 ft MLLW plus 2 feet of overdredge, depending on the Alternative. Wharf improvements would only be required for Alternative 4 and would be necessary to provide sufficient support to the existing wharf infrastructure to accommodate dredging along the berths. These activities are needed to fully implement the General Navigation Features 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 deepen berths to match the selected channel depths. Eliminating or reducing the scale of the LSF features would not fully enable the POLB to fully realize all project benefits of the project and were not considered. Enhanced measures would result in greater costs with no increase in benefits and were also excluded from consideration.



Figure 4-1 Port of Long Beach

At the entrance to Pier J, the deepened channel would pass adjacent to existing breakwaters. In order 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.

4.4.1 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 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.
  - 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 Study team 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 team 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:

- High-Tide Riding (occurs under without project conditions)
- Light Loading/Lightering (occurs under without project conditions)
- 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

4.4.2 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 Port of Long Beach, through improved operational efficiency and enhanced maneuverability. 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 has 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 Port of Long Beach, through improved operational efficiency and enhanced maneuverability. 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. This measure has support from several stakeholders and could be economically justified.

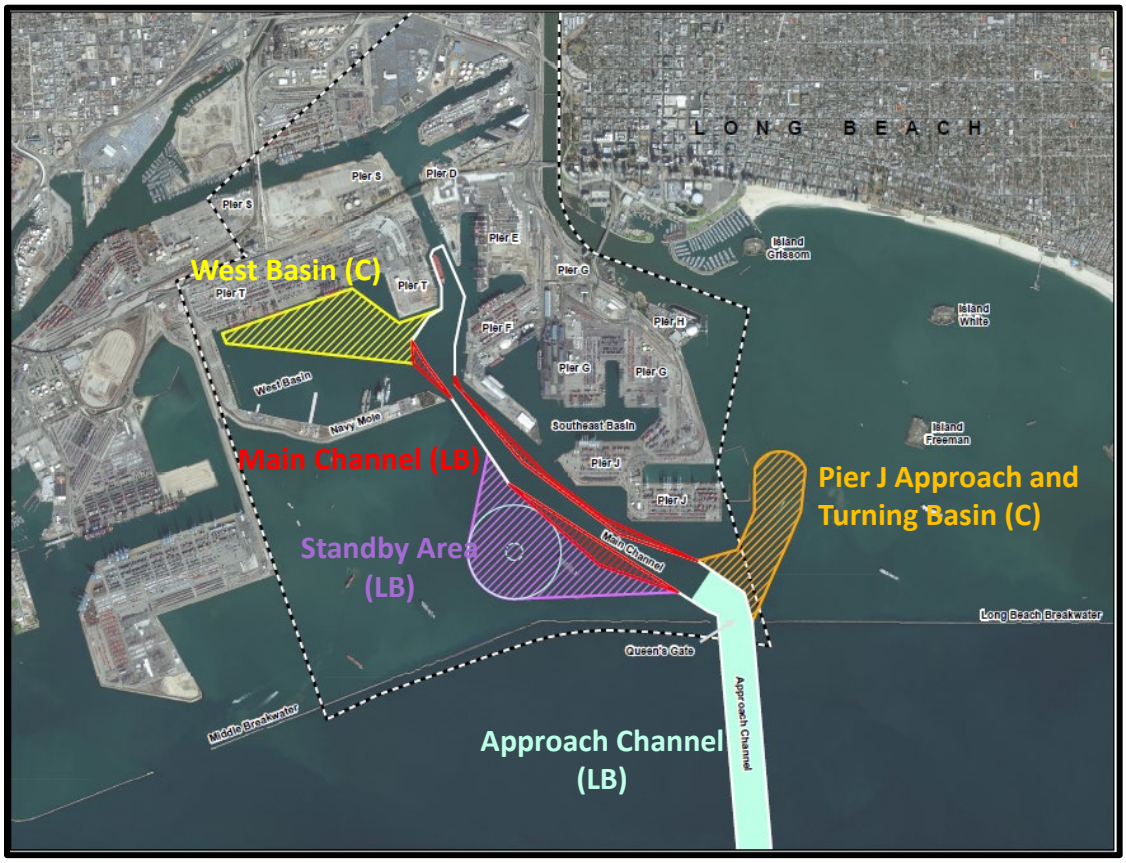


Figure 4-2 Measures Carried Forward

4.4.3 Value Engineering Activities

ER 11-1-321 Change 1 dated 1 January 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 in order 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% design to capture lessons learned
- Complete a Geotechnical Baseline Report (GBR) to aid in the bidding process to better manage risk [PED]
- 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

4.4.4 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. 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.

4.5 Array of Alternatives

The measures carried forward are independent with the exception of 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 National Economic Development (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.

4.5.1 Container Terminal Improvements

The container design vessel drafts approximately -52 ft. Depths being analyzed range from -53 ft to -57 ft mean lower low water (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, operation and maintenance 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 Port master plans) 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 of the 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

Alternative	Avg Annual Benefits Pier J	Ave 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 4-4 Preliminary Economic Benefit/Cost 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

Table 4-5: Container Vessel Measures Preliminary Costs and Benefits

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
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
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 ft scale produces the highest net benefits for both disposal scenarios. Thus, for container vessels, -55 ft scale is the NED depth. Please refer to Appendix E, Economics, for further details.

4.5.2 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 ft to -83 ft 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

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
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
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 ft scale produces the highest net benefits for both disposal scenarios. Thus, for liquid bulk vessels, -80 ft 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 ft to -73 ft MLLW, with a 300-foot-diameter-center anchor placement evaluated at a proposed depth of -79 ft 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

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
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
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
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 ft depth using the hopper dredge with nearshore disposal was marginally not justified.

4.6 Final Array of Alternatives

Four action alternatives were carried forward to meet the Project's needs and objectives. Numerous scenarios were explored to determine the most prudent and practicable designs. The full range of depths

considered for containers, from -53 ft to -57 ft was justified, and same for the liquid bulk, with depths ranging from -78 ft to -83 ft. 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. 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 ft MLLW, which involves widening portions of the Main Channel. Only Alternative 5 includes construction of a Standby Area.

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

4.6.1 Cost and Volume Updates

The assumptions included in the cost estimates and the detailed information can be found in Appendix F, Cost Engineering. The volumes for the alternatives were also refined after the measures were analyzed so they may differ slightly from those presented in the sections above. The volumes also include berth dredging work that is considered part of the Project but is the responsibility of the Port of Long Beach. The updated volumes can be found in **Table 4-10**.

Table 4-10 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 Pier T Berths (POLB responsibility)	202,000	304,000	452,000	304,000
Total Dredge Volume:	**4,881,000**	**7,359,000**	**11,864,000**	**8,398,000**

4.6.2 Local Service Facilities

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 ft MLLW, depending on the action alternative, plus 2 ft of overdredge. The over-dredge, within 20 feet of the concrete face of the wharfs and approximately 15 feet from the fender line, will be limited to -55 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.

4.6.3 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 have the ability to 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-Sunset Borrow Site, which would allow about 17,500 cubic yards 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 all 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 ocean disposal site. 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.

4.6.4 General Description of Construction Activities

Dredging and Placement

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 (**Figure 4-3**). The nearshore placement site (i.e. 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 this project annually.

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.

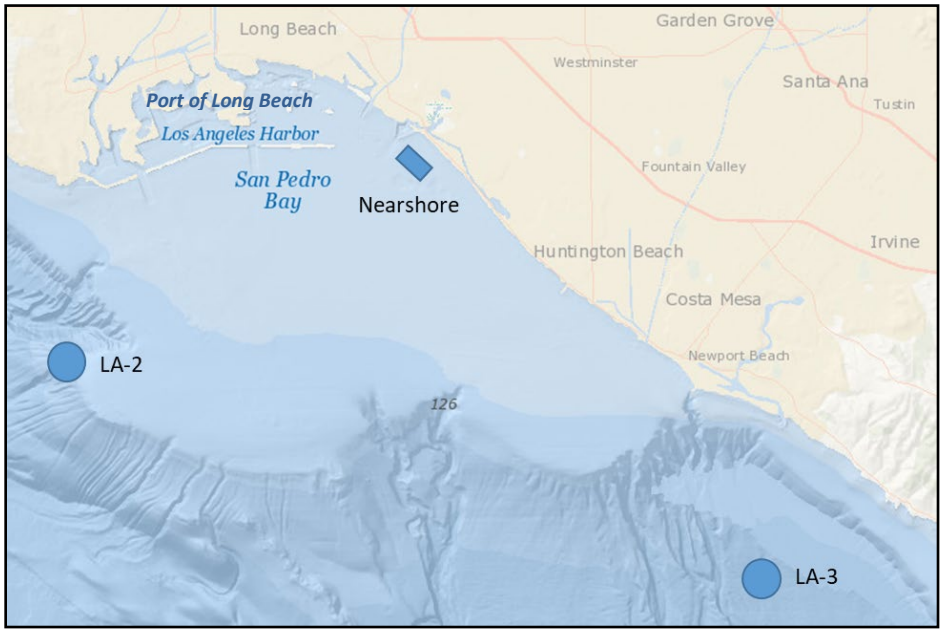


Figure 4-3 Location of Potential Placement Sites

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 4-11** and more details can be found in **Table 4-12**, **Table 4-13**, **Table 4-14**, and **Table 4-15**.

Table 4-11 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 1,000-kV (kVA) capacity 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 of the 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:

a. 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.
b. Laydown areas for equipment such as dredge pipe and spare equipment parts.
c. Parking for land-based vehicles.
d. Staff parking.
e. Maintenance workshop for equipment maintenance.
f. 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 so as to avoid limiting public access via recreational boating activities. There is no other public access to the dredge or placement sites.

Table 4-12 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 4-13 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 4-14 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	900,000	Hopper	15,100	60	
			LA3	1,155,000	Hopper	8,400	138	LA2 & LA3: 2,055,000
2	Approach Channel		LA2	892,000	Hopper	15,100	59	
	Main Channel Widening	1,065,000	LA3	900,000	Clamshell	6,000	150	LA2 & LA3: 2,932,000
			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 4-15 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

4.6.5 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 & T140 would be needed and may require the installation of a steel sheet pile or steel king pile system underwater bulkhead.

The underwater bulkhead systems are further described below:

- **Steel Sheet Pile:** This type of bulk head 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 bulk head. 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. In order 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.

4.7 Comparison of the Final Array of Alternatives

The Planning Principles and Guidelines (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 national economic development (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: regional economic development (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.

4.7.1 National Economic Development

Based on the results presented above, the combination of measures Alternative 3 (Container areas to a depth of -55 ft MLLW and Liquid Bulk areas to a depth of -80 ft MLLW) provides the greatest contribution to net benefits and has been determined as the National Economic Development (NED) Plan. Preliminary analysis assumed that dredged material from the channels and basins would use the nearshore disposal site (Surfside Borrow 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 4-16 summarizes the final array of plans that will be fully analyzed for environmental impacts under NEPA and CEQA, and included in the draft integrated feasibility report and EIS/R. Final Array Alternative 5 was added, which is the same as Alternative 3 (NED Plan), but also includes a -67 ft 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 feature later in the study based upon further evaluations and concurrent review of the Draft Report. The benefit cost analysis shown in **Table 4-16** includes updated 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 4-16: Final Array of Alternatives (1OCT18 Price Level)

	Dredge Volume (cy)	Total Project Cost	Total Annual Cost	Average Annual Benefits	Average Net Annual Benefits	Incremental Net Benefits[2]	B/C
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

4.7.2 Regional Economic Development (RED) 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 in order 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 in 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 TSP 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.

4.7.3 Other Social Effects (OSE) Account

Other Social Effects considerations will be fully evaluated for the Tentatively Selected Plan for the Final Report.

4.7.4 Environmental Quality (EQ) Account

The Environmental Quality (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.

4.8 Plan Selection

As shown in **Table 4-16**, 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 ft MLLW) and liquid bulk vessels (deepening the Approach Channel to -80 ft MLLW, and widening portions of the Main Channel through bend easing 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. The non-federal sponsor has also expressed support for this plan. Accordingly, Alternative 3 has been identified as the Tentatively Selected Plan.

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 were described in Subsection 2.7, and applicable local regulations were described in Section 4 according to relevant technical issue area.

Consistent with federal and state regulations and guidelines (40 C.F.R. § 1508.27; CEQA Guidelines § 15064,15126.2[a]); direct, indirect, and cumulative impacts were evaluated.

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 Local Service Facilities. 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 million cubic yards (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 ft to –53 ft MLLW and the Approach Channel would be deepened to -78 ft MLLW. The Port of Long Beach 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 as a result of dredging in this area. Therefore, impacts associated with changes in bathymetry due to dredging would be less than significant. 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.

Staging Area

Use of potential areas within Port boundaries would have negligible impacts.

Placement/Disposal

Placement of 2.5 mcy at the Surfside Borrow Site would fill in an underwater pit resulting in a flatter, more natural topography. Placement at this site would not result in any short- or long-term impacts to unique geologic or topographic features. Impacts of disposal at the LA-2 and LA-3 ODMDS were addressed in the USEPA authorization of the LA-2 ODMDS and are hereby incorporated by reference (USEPA & USACE, 2005).

Local Service Facilities

Dredging of 202 thousand cubic yards (kcy) of sediments associated with Alternative 2 from the Pier J and Basin would result in negligible alterations of the bottom topography of the harbor. 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 near shore bottom topography.

Significance Determination

Project dredging and the placement of dredged materials would not adversely modify any unique geologic features. Placement of dredged materials into the Surfside Borrow Site would not adversely modify beach or near shore bottom topography. Impacts to Topography, Geology, and Geography would be less than significant.

5.1.4 Alternative 3 (NED)

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 ft to –55 ft MLLW and the Approach Channel would be deepened to -80 ft MLLW. The Port of Long Beach 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 as a result of dredging in this area. Therefore, impacts associated with changes in bathymetry due to dredging would be less than significant. 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.

Staging Area

Use of potential areas within Port boundaries would have negligible impacts.

Placement/Disposal

Placement of 2.5 mcy at the Surfside Borrow Site would fill in an underwater pit resulting in a flatter, more natural topography. Placement at this site would not result in any short- or long-term impacts to unique geologic or topographic features. Impacts of disposal at the LA-2 and LA-3 ODMDS were addressed in the USEPA authorization of the LA-2 ODMDS and are hereby incorporated by reference (USEPA & USACE, 2005).

Local Service Facilities

Dredging of 304 kcy of sediments associated with Alternative 3 from the Pier J Basin berths would result in negligible alterations of the bottom topography of the harbor. 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 near shore bottom topography.

Significance Determination

Project dredging and the placement of dredged materials would not adversely modify any unique geologic features. Placement of dredged materials into the Surfside Borrow Site would not adversely modify beach or near shore 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 ft to –57 ft MLLW and the Approach Channel would be deepened to -83 ft MLLW. The Port of Long Beach 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 as a result of dredging in this area. Therefore, impacts associated with changes in bathymetry due to dredging would be less than significant. 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.

Staging Area

Use of potential areas within Port boundaries would have negligible impacts.

Placement/Disposal

Placement of 2.5 mcy at the Surfside Borrow Site would fill in an underwater pit resulting in a flatter, more natural topography. Placement at this site would not result in any short- or long-term impacts to unique geologic or topographic features. Impacts of disposal at the LA-2 and LA-3 ODMDS were addressed in the USEPA authorization of the LA-2 ODMDS and are hereby incorporated by reference (USEPA & USACE, 2005).

Local Service Facilities

Dredging of 452 kcy 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. Wharf improvements are required for this alternative, but would not result in any impacts to Topography, Geology, and Geography. 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 near shore bottom topography.

Significance Determination

Project dredging and the placement of dredged materials would not adversely modify any unique geologic features. Placement of dredged materials into the Surfside Borrow Site would not adversely modify beach or near shore 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 ft to –55 ft MLLW, the Approach Channel would be deepened to -80 ft MLLW, and construction of Standby Area adjacent to the Main Channel to a depth of -67 ft MLLW with a 300-foot diameter-center anchor placement at a depth of about -79 ft MLLW. The Port of Long Beach 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 as a result of dredging in this area. Therefore, impacts associated with changes in bathymetry due to dredging would be less than significant. 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.

Staging Area

Use of potential areas within Port boundaries would have negligible impacts.

Placement/Disposal

Placement of 2.5 mcy at the Surfside Borrow Site would fill in an underwater pit resulting in a flatter, more natural topography. Placement at this site would not result in any short- or long-term impacts to unique geologic or topographic features. Impacts of disposal at the LA-2 and LA-3 ODMDS were addressed in the USEPA authorization of the LA-2 ODMDS and are hereby incorporated by reference (USEPA & USACE, 2005).

Local Service Facilities

Dredging of 304 kcy of sediments associated with Alternative 5 from the Pier J Basin berths would result in negligible alterations of the bottom topography of the harbor. 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 near shore bottom topography.

Significance Determination

Project dredging and the placement of dredged materials would not adversely modify any unique geologic features. Placement of dredged materials into the Surfside Borrow Site would not adversely modify beach or near shore 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 Local Service Facilities. 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 ft to –53 ft MLLW and the Approach Channel would be deepened to -78 ft MLLW. The extent of deepening is relatively small and is not expected to result in any changes to wave characteristics or currents and would not interfere with sediment transport.

Electrical Substation

Construction of the electrical substation would have negligible impacts.

Staging Area

Use of potential areas within Port boundaries would have negligible impacts.

Placement/Disposal

Placement of 2.5 mcy at the Surfside Borrow Site 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 wave characteristics or currents and would not interfere with sediment transport. Impacts of disposal at the LA-2 and LA-3

ODMDS were addressed in the USEPA authorization of the LA-2 ODMDS and are hereby incorporated by reference (USEPA & USACE, 2005).

Local Service Facilities

Dredging of 202 kcy of sediments associated with Alternative 2 from the Pier J Basin would result in negligible alterations of the bottom topography of the harbor. Wharf improvements are not required for this alternative. 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. 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.

Significance Determination

Project dredging and the placement of dredged materials is not expected to result in any changes to wave characteristics or currents and would not interfere with sediment transport. Impacts to Oceanographic Characteristics and Coastal Processes would be less than significant.

5.2.4 Alternative 3 (NED)

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 ft to –55 ft MLLW and the Approach Channel would be deepened to -80 ft MLLW. The extent of deepening is relatively small and is not expected to result in any changes to wave characteristics or currents and would not interfere with sediment transport.

Electrical Substation

Construction of the electrical substation would have negligible impacts.

Staging Area

Use of potential areas within Port boundaries would have negligible impacts.

Placement/Disposal

Placement of 2.5 mcy at the Surfside Borrow Site 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 wave characteristics or currents and would not interfere with sediment transport. Impacts of disposal at the LA-2 and LA-3 ODMDS were addressed in the USEPA authorization of the LA-2 ODMDS and are hereby incorporated by reference (USEPA & USACE, 2005).

Local Service Facilities

Dredging of 304 kcy of sediments associated with Alternative 3 from the Pier J Basin would result in negligible alterations of the bottom topography of the harbor. Wharf improvements are not required for this alternative. 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. Construction of the electrical substation would have no impacts. 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.

Significance Determination

Project dredging and the placement of dredged materials is not expected to result in any changes to wave characteristics or currents and would not interfere with 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 ft to –57 ft MLLW and the Approach Channel would be deepened to -83 ft MLLW. The extent of deepening is relatively small and is not expected to result in any changes to wave characteristics or currents and would not interfere with sediment transport.

Electrical Substation

Construction of the electrical substation would have negligible impacts.

Staging Area

Use of potential areas within Port boundaries would have negligible impacts.

Placement/Disposal

Placement of 2.5 mcy at the Surfside Borrow Site 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 wave characteristics or currents and would not interfere with sediment transport. Impacts of disposal at the LA-2 and LA-3 ODMDS were addressed in the USEPA authorization of the LA-2 ODMDS and are hereby incorporated by reference (USEPA & USACE, 2005).

Local Service Facilities

Dredging of 452 kcy 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. Wharf improvements are required for this alternative, but would not result in any impacts to Oceanographic

Characteristics and Coastal Processes. 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. Construction of the electrical substation would have no impacts. 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.

Significance Determination

Project dredging and the placement of dredged materials is not expected to result in any changes to wave characteristics or currents and would not 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 ft to –55 ft MLLW, the Approach Channel would be deepened to -80 ft MLLW, and construction of Standby Area adjacent to the Main Channel to a depth of -67 ft MLLW with a 300-foot diameter-center anchor placement at a depth of about -79 ft MLLW. The extent of deepening is relatively small and is not expected to result in any changes to wave characteristics or currents and would not interfere with sediment transport.

Electrical Substation

Construction of the electrical substation would have negligible impacts.

Staging Area

Use of potential areas within Port boundaries would have negligible impacts.

Placement/Disposal

Placement of 2.5 mcy at the Surfside Borrow Site 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 wave characteristics or currents and would not interfere with sediment transport. Impacts of disposal at the LA-2 and LA-3 ODMDS were addressed in the USEPA authorization of the LA-2 ODMDS and are hereby incorporated by reference (USEPA & USACE, 2005).

Local Service Facilities

Dredging of 304 kcy of sediments associated with Alternative 5 from the Pier J Basin would result in negligible alterations of the bottom topography of the harbor. Wharf improvements are not required for this alternative. 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. Construction of the electrical substation would have no impacts. 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.

Significance Determination

Project dredging and the placement of dredged materials is not expected to result in any changes to wave characteristics or currents and would not interfere with 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

An impact would be significant if it would:

1. The project results in the release of toxic substances that would be deleterious to human, fish, or plant life;
2. The project results in substantial impairment of beneficial recreational use of the project site; or
3. Discharges create a pollution, contamination, or nuisance as defined in Section 13050 of the California Water Code.

Water quality monitoring will be conducted at the dredge sites as well as the Surfside Borrow Site. Monitoring will include turbidity, dissolved oxygen, water temperature, salinity, and pH. Additional parameters may be added based on the results of a sediment sampling and testing program to be conducted during the Preconstruction Engineering and Design (PED) Phase.

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 Local Service Facilities. 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 results in substantial impairment of beneficial recreational use of the project site, 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 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. 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 (see below for details), would be conducted to ensure that turbidity increases and/or decreases in dissolved oxygen do not result in significant impacts. Should water quality 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.

Electrical Substation

Construction of the electrical substation would have negligible impacts.

Staging Area

Use of potential areas within Port boundaries would have negligible impacts.

Placement/Disposal

Impacts from ocean disposal at LA-2 and/or LA-3 were addressed in the USEPA authorization of the LA-2 ODMDS and are hereby incorporated by reference. The placement of dredged material in the Surfside Borrow site could create local turbidity impacts and/or reduce levels of dissolved oxygen 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 dissolved oxygen problems do not occur and to allow for implementation of best management practices should problems occur.

Local Service Facilities

Dredging of 202 kcy of sediments associated with Alternative 2 from the Pier J Basin would result in impacts similar to those described above for dredging and ocean 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. Rocks would be quarry-run rocks that are expected to be free of contaminants and/or fine sediments.

Accidental Spills

Accidents resulting in spills of fuel, lubricants, or hydraulic fluid from the equipment used during dredging and disposal could occur during the 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). In such cases, spills would be cleaned up immediately, causing less than significant impacts. A larger spill that could have significant impacts on water quality is not expected to occur, even under reasonable worst-case conditions.

Significance Determination

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 ODMDS. The project would not result in impairment of beneficial recreational use in the project area. Discharges that could create a pollution, contamination, or nuisance would not occur. Impacts to Water and Sediment Quality would be less than significant.

5.3.4 Alternative 3 (NED)

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.

Staging Area

Use of potential areas within Port boundaries would have negligible impacts.

Placement/Disposal

Impacts would be similar to Alternative 2. Placement impacts at the Surfside Borrow Site would be identical to Alternative 2 as the volumes are the same. Impacts from ocean disposal at LA-2 and/or LA-3 were addressed in the USEPA authorization of the LA-2and LA-3 ODMDS and are hereby incorporated by reference.

Local Service Facilities

Dredging of 304 kcy of sediments associated with Alternative 3 from the Pier J Basin would result in impacts similar to those described above for dredging and ocean 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. Rocks would be quarry-run rocks that are expected to be free of contaminants and/or fine sediments.

Accidental Spills

Accidents resulting in spills of fuel, lubricants, or hydraulic fluid from the equipment used during dredging and disposal could occur during the 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). In such cases, spills would be cleaned up immediately, causing less than significant impacts. A larger spill that could have significant impacts on water quality is not expected to occur, even under reasonable worst-case conditions.

Significance Determination

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 ODMDS. The project would not result in impairment of beneficial recreational use in the project area. Discharges that could create a 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.

Staging Area

Use of potential areas within Port boundaries would have negligible impacts.

Placement/Disposal

Impacts would be similar to Alternative 2. Placement impacts at the Surfside Borrow Site would be identical to Alternative 2 as the volumes are the same. Impacts from ocean disposal at LA-2 and/or LA-3 were addressed in the USEPA authorization of the LA-2and LA-3 ODMDS and are hereby incorporated by reference.

Local Service Facilities

Dredging of 452 kcy 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. Rocks would be quarry-run rocks that are expected to be free of contaminants and/or fine sediments.

Accidental Spills

Accidents resulting in spills of fuel, lubricants, or hydraulic fluid from the equipment used during dredging and disposal could occur during the 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). In such cases, spills would be cleaned up immediately, causing less than significant impacts. A larger spill that could have significant impacts on water quality is not expected to occur, even under reasonable worst-case conditions.

Significance Determination

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 ODMDS. The project would not result in impairment of beneficial recreational use in the project area. Discharges that could create a 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.

Staging Area

Use of potential areas within Port boundaries would have negligible impacts.

Placement/Disposal

Impacts would be similar to Alternative 2. Placement impacts at the Surfside Borrow Site would be identical to Alternative as the volumes are the same. Impacts from ocean disposal at LA-2 and/or LA-3 were addressed in the USEPA authorization of the LA-2and LA-3 ODMDS and are hereby incorporated by reference.

Local Service Facilities

Dredging of 304 kcy of sediments associated with Alternative 5 from the Pier J Basin would result in impacts similar to those described above for dredging and ocean 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. Rocks would be quarry-run rocks that are expected to be free of contaminants and/or fine sediments.

Accidental Spills

Accidents resulting in spills of fuel, lubricants, or hydraulic fluid from the equipment used during dredging and disposal could occur during the 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). In such cases, spills would be cleaned up immediately, causing less than significant impacts. A larger spill that could have significant impacts on water quality is not expected to occur, even under reasonable worst-case conditions.

Significance Determination

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 ODMDS. The project would not result in impairment of beneficial recreational use in the project area. Discharges that could create a 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 Water Quality Monitoring Plan

Standard water quality monitoring will be conducted during dredging and nearshore placement. This consists of 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 ft upcurrent of the dredge, 100 ft downcurrent of the dredge, 300 ft downcurrent of the dredge, and a control station located outside of any dredge plume. Monthly water samples will be taken from the station 300 ft 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. 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.

5.3.9 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 a project alternative results in:

- 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) ; and/or

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 Local Service Facilities. 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 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.

5.4.3 Alternative 2

Dredging

Temporary increase in turbidity and suspended solids may decrease the amount of dissolved oxygen 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 once dredging has ceased.

Electrical Substation

Construction of the electrical substation would have negligible impacts.

Staging Area

Use of potential areas within Port boundaries would have negligible impacts.

Placement

The habitat that will be affected directly by the proposed placement of dredged material in the Surfside Borrow Pit 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 were addressed in the USEPA authorization of the LA-2 ODMDS and are hereby incorporated by reference.

Threatened and Endangered Species

ESA

California least tern

The USACE has determined that the proposed project would not effect 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 adverse-affect applies because no direct effects to nesting birds would occur as the nearest know 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, effects would be temporary, and alternative foraging areas are available within the Port complex closer to the nest site, a determination of no adverse-affect is justified. USACE conducted a study (USACE, 2016) that shows that in these conditions, dredging and nearshore placement activities do not effect the foraging of the species and thus supports the no affect determination.

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. 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 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 effect any of the listed whale species.

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 nest 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

Project 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-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 would not have a substantial, adverse impact to any species on the Fishery Management Plan 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, in the area where the Pier J Approach Channel and Turning Basin would be constructed, and the Surfside Borrow Site prior to the start of construction. Construction shall not begin should *Caulerpa taxifolia* be identified until cleared to do so by the National Marine Fisheries Service.

Local Service Facilities

Dredging of 202 kcy of sediments associated with Alternative 2 from the Pier J Basin would result in impacts similar to those described above for dredging and ocean 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 would be utilized in order to reduce impacts to motile marine species, providing them the opportunity to leave the area prior to full sheetpile driving impacts.

Significance Determination

The project would not affect any listed species or their critical habitat, as evidenced by the no effect determination described above. 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. There would not be a substantial adverse impact to EFH as discussed above. Impacts to Water and Sediment Quality would be less than significant.

5.4.4 Alternative 3 (NED)

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.

Staging Area

Use of potential areas within Port boundaries would have negligible impacts.

Placement

Impacts would be similar to Alternative 2. Placement impacts at the Surfside Borrow Site would be identical to Alternative 2 as the volumes are the same. Impacts from ocean disposal at LA-2 and/or LA-3 were addressed in the USEPA authorization of the LA-2 ODMDS and are hereby incorporated by reference.

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.

Local Service Facilities

Dredging of 304 kcy of sediments associated with Alternative 3 from the Pier J Basin would result in impacts similar to those described above for dredging and ocean 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 would be utilized in order to reduce impacts to motile marine species, providing them the opportunity to leave the area prior to full sheetpile driving impacts.

Significance Determination

Impacts to Water and Sediment Quality would be less than significant. Refer to the discussion of significance for Alternative 2 for details.

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.

Staging Area

Use of potential areas within Port boundaries would have negligible impacts.

Placement

Impacts would be similar to Alternative 2. Placement impacts at the Surfside Borrow Site would be identical to Alternative 2 as the volumes are the same. Impacts from ocean disposal at LA-2 and/or LA-3 were addressed in the USEPA authorization of the LA-2 ODMDS and are hereby incorporated by reference.

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.

Local Service Facilities

Dredging of 452 kcy 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 Biological Resources. 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. 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 in order 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.

Significance Determination

Impacts to Water and Sediment Quality would be less than significant. Refer to the discussion of significance for Alternative 2 for details.

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.

Staging Area

Use of potential areas within Port boundaries would have negligible impacts.

Placement

Impacts would be similar to Alternative 2. Placement impacts at the Surfside Borrow Site would be identical to Alternative 2 as the volumes are the same. Impacts from ocean disposal at LA-2 and/or LA-3 were addressed in the USEPA authorization of the LA-2 ODMDS and are hereby incorporated by reference.

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.

Local Service Facilities

Dredging of 304 kcy of sediments associated with Alternative 5 from the Pier J Basin would result in impacts similar to those described above for dredging and ocean 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 would be utilized in order to reduce impacts to motile marine species, providing them the opportunity to leave the area prior to full sheetpile driving impacts.

Significance Determination

Impacts to Water and Sediment Quality would be less than significant. Refer to the discussion of significance for Alternative 2 for details.

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 and existing environmental conditions are described in Section 3.5 (Affected Environment).

5.5.1 Impact Significance Criteria

Disclosure of environmental impacts includes defining or selecting a qualitative or quantitative threshold. The estimated impacts are then compared to the thresholds to determine whether those impacts would be significant. Air quality impacts would be considered significant if:

- **AQ-1: Emissions would result in off-site ambient air pollutant concentrations that exceed the National Ambient Air Quality Standards (NAAQS) in Table 5-1**

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**	

- **AQ-2: Emissions would create an objectionable odor at the nearest sensitive receptor.**
- **AQ-3: 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.**
- **AQ-4: Emissions equal or exceed General Conformity applicability rates in Table 5-2.**

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
$PM_{2.5}$	100

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. Since 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 off-shore 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[5], 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 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 as described in detail in Section 4.5, Affected Environment. 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

[5] 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.

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 site 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.

Since 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 5.5-2, to assess General Conformity applicability under the Clean Air Act. The Clean Air Act General Conformity Analysis for Alternative 3 will be included in Appendix H5 in the Final EIS/EIR.

The federal actions evaluated under AQ-4 include the General Navigation Features and the Local Service Facilities 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..

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 Local Service Facilities. 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 toxic air contaminants, 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[6] 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 Area, LA-2, and/or LA-3. 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.

AQ-1: Construction of Alternative 2 would result in ambient air pollutant concentrations that exceed the NAAQS in Table 5-1, prior to mitigation.

Table 5-3 presents the maximum offsite pollutant concentrations associated with construction of Alternative 2, prior to mitigation. Table 5.5-3 shows that, without mitigation, the total 1-hour NO2 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

[6] Bend easing of the Main Channel is also referred to as widening of the Main Channel in Appendices H1 and H2.

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 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 off-shore 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	100	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	100	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	100	10	100	100	10
Significant?	**No**	**No**	**Yes**	**No**	**No**	**No**

Alternative 3

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 Area, LA-2, and/or LA-3. In addition, 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, 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.

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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	100	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	100	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
Conformity Determination						
Applicability Rates	100	100	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	100	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. In addition, 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.

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	100	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	100	10	100	100	10

Source Category	PM_{10}	$PM_{2.5}$	Ozone (NOx precursor)	NO_2	CO	Ozone (VOC precursor)
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	100	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	100	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	4	3	84	84	47	5
Total Construction Year 2028	4	3	84	84	47	5
Conformity Determination						
Applicability Rates	100	100	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	100	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 Area, LA-2, and/or LA-3. In addition, 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.

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 5.5-12 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.

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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	100	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	100	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	100	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	100	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	1	1	13	13	8	1
Total Construction Year 2028	1	1	13	13	8	1
Conformity Determination						
Applicability Rate	100	100	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 5.5-1, 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 5.5-1, 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.**

Air Quality Impact	Impact Determination without Mitigation
Alternative 4	
• AQ-1. Alternative 4 would result in ambient air pollutant concentrations that exceed the NAAQS in Table 5.5-1, 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 5.5-1, prior to mitigation.	Significant. Mitigation is required.
• 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 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	100	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	100	10	100	100	10
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	100	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	100	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	100	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	100	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	100	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	100	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	100	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	100	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	100	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	2	2	36	36	27	2
Total Construction Year 2028	2	2	36	36	27	2
Conformity Determination						
Applicability Rate	100	100	10	100	100	10
Significant?	**No**	**No**	**Yes**	**No**	**No**	**No**
2029						
Offroad Construction Equipment	0	0	0	0	0	0

Source Category	PM_{10}	$PM_{2.5}$	Ozone (NOx precursor)	NO_2	CO	VOC
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	100	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.

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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	100	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	100	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	100	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	100	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	100	10	100	100	10
Significant?	**No**	**No**	**No**	**No**	**No**	**No**

5.6 Greenhouse Gas Environmental Consequences

This section assesses greenhouse gas (GHG) emissions associated with the No Action and Action Alternatives. Regulatory initiatives and existing conditions are described in Section 4.6 (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 substation[7], structural improvements to

[7] 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

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 CO_2, CH_4 and N_2O. CO_2e 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 Local Service Facilities. 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' 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. 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.

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

a diesel clamshell dredge and no electrical substation construction. The mitigated construction emission calculations assume an electric clamshell dredge and electrical substation construction.

construction GHG emissions were not quantified, as they are expected to have relatively minor GHG benefits.

Table 5-25 Construction GHG Emissions – Alternative 2

Source Category	CO2e Emissions without MM-AQ-1 (MT)	CO2e Emissions with MM-AQ-1 (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.		

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Alternative 3

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, 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. In addition, 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, 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.

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Table 5-26 Construction GHG Emissions – Alternative 3

Source Category	CO_2e Emissions without MM-AQ-1 (MT)	CO_2e Emissions with MM-AQ-1 (MT)
2024		
Off-road Construction Equipment	55	62
On-road Construction Vehicles	14	25

Source Category	CO_2e Emissions without MM-AQ-1 (MT)	CO_2e Emissions with MM-AQ-1 (MT)
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.		

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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, 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. In addition, 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.

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 (MT)	CO_2e Emissions with MM-AQ-1 (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' 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. In addition, 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.

Table 5-28 summarizes the construction GHG emissions associated with Alternative 5, both with and without implementation of MM-AQ-1.

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Table 5-28 Construction GHG Emissions – Alternative 5

Source Category	CO_2e Emissions without MM-AQ-1 (MT)	CO_2e Emissions with MM-AQ-1 (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		
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.		

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5.7 Aesthetics

The purpose of this section is to determine the degree of visual and aesthetic impacts that would be attributable to the proposed action. The Port of Long Beach is an industrial, predominantly disturbed area. The character of the existing visual environment, as described in Section 3.6, was documented through field reconnaissance, photographic records, and aerial photograph interpretation.

5.7.1 Impact Significance Criteria

An impact to visual aesthetics would be considered significant if the action would: significantly impact the aesthetics if a landscape is changed in a manner that permanently and significantly 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 Local Service Facilities. 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.

Staging Area

Use of potential areas within Port boundaries would have negligible impacts.

Placement/Disposal

Placement at the Surfside Borrow Area would involve the hopper dredge transiting from the Approach Channel to the Surfside Borrow Site, 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.

Local Service Facilities

Dredging of 202 kcy 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.

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. Project impacts would be temporary and would not permanently and significantly 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 (NED)

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.

Staging Area

Use of potential areas within Port boundaries would have negligible impacts.

Placement/Disposal

Placement at the Surfside Borrow Area would involve the hopper dredge transiting from the Approach Channel to the Surfside Borrow Site, 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.

Local Service Facilities

Dredging of 304 kcy 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.

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. Project impacts would be temporary and would not permanently and significantly 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.

Staging Area

Use of potential areas within Port boundaries would have negligible impacts.

Placement/Disposal

Placement at the Surfside Borrow Area would involve the hopper dredge transiting from the Approach Channel to the Surfside Borrow Site, 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.

Local Service Facilities

Dredging of 452 kcy 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.

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. Project impacts would be temporary and would not permanently and significantly 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.

Staging Area

Use of potential areas within Port boundaries would have negligible impacts.

Placement/Disposal

Placement at the Surfside Borrow Area would involve the hopper dredge transiting from the Approach Channel to the Surfside Borrow Site, 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.

Local Service Facilities

Dredging of 304 kcy 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.

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. Project impacts would be temporary and would not permanently and significantly 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

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 National Register. 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.

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 Local Service Facilities. 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 Action Alternative2

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 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. Further, 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 ft long trench 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, and berth T140 along Pier T 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 is pursuing a Programmatic Agreement (PA) with the SHPO and the Advisory Council on Historic Preservation (ACHP) to phase any additional underwater inventory that is necessary until after final project design. Final determinations of effects to historic properties will be made in consultation with the SHPO. No effects to historic properties are anticipated as a result of Alternative 2. However, if USACE identifies any adverse effects in the future, the PA would include terms guiding the resolution of those adverse effects. Thus, impacts would be less than significant.

5.8.4 Alternative 3

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.

Associated Impacts

All the activities associated with the placement/disposal of dredged sediment, electric substation, and local service facilities would be similar to Alternative 2. No effect to historic properties is anticipated.

Significance Determination

USACE is pursuing a PA with the SHPO and the ACHP to phase any additional underwater inventory that would be necessary until after final project design. Final determinations of effects to historic properties will be made in consultation with the SHPO. No effects to historic properties are anticipated as a result of Alternative 3. However, if USACE identifies any adverse effects in the future, the PA would include terms guiding the resolution of those adverse effects. Thus, 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 in order 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 local service facilities would be similar to Alternative 2. No effect to historic properties is anticipated.

Significance Determination

USACE is pursuing a PA with the SHPO and the ACHP to phase any additional underwater inventory that would be necessary until after final project design. Final determinations of effects to historic properties will be made in consultation with the SHPO. No effects to historic properties are anticipated as a result of Alternative 4. However, if USACE identifies any adverse effects in the future, the PA would include terms guiding the resolution of those adverse effects. Thus, 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. The wreckage of the Pierpoint Queen is described by some sources to be located within the potential Standby Area, but no wreck is shown on the NOAA charts at this location. If it did sink in this area, 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 as this location. If the Standby Area is selected for implementation, additional information about the anomaly #15 that was noted in the 1989 remote sensing report should be gathered to determine whether it is actually located within the APE and whether it is of cultural origin. If it is found to be of cultural origin, its eligibility for the NRHP should be determined in consultation with the SHPO. Given that any cultural materials would likely have been deposited subsequent to dredging that occurred in the 1960s and the fact that no modern shipwrecks are known in this area, it is likely that only sunken objects/artifacts would be present (not a complete, intact vessel). The removal of these items could likely be mitigated through data recovery. If dredging would have an adverse effect on any historic properties, including this anomaly, the PA would guide the resolution of such adverse effects. Thus, dredging activities associated with Alternative 5 could have an adverse effect on historic properties, but all adverse effects could likely be mitigated.

Associated Impacts

All other activities associated with placement/disposal, the electric substation, and local service facilities would be similar to Alternative 2. No effect to historic properties is anticipated.

Significance Determination

USACE is pursuing a PA with the SHPO and the ACHP to phase any additional underwater inventory that is necessary until after final project design. Final determinations of effects to historic properties will be made in consultation with the SHPO. Alternative 5 could result in adverse effects to cultural resources, particularly if the subsurface anomaly is found to be within the area to be dredged and is determined to be a historic property. If USACE identifies any adverse effects in the future, the PA would include terms guiding the resolution of those adverse effects. Thus, impacts would be less than significant.

Mitigation Measures

In the event that previously unknown cultural resources are discovered during the project, all ground-disturbing activities must immediately cease within the area of the discovery until USACE has met the requirement of 36 CFR 800.13 regarding post-review discoveries or followed the procedure defined in any PA that may have been executed. 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 must 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 treatment and disposition of such remains will be carried out in compliance with the Native American Graves Protection and Repatriation Act (Public Law 101-601; 25 U.S.C. 3001 et seq.) and EP 1130-2-540, Chapter 6.

5.9 Noise

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.

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 Local Service Facilities. 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:

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 ft 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 occurring in a highly developed part of the Port.

Staging Area

Use of potential areas within Port boundaries would have negligible impacts.

Placement/Disposal

Placement at the Surfside Borrow site will be far enough offshore that noise levels will be indistinguishable at the beach from ambient noises.

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. Night time 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 ft 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. Noise levels would return to ambient conditions upon project completion; therefore impacts would not be significant.

5.9.4 Alternative 3 (NED)

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 occurring in a highly developed part of the Port.

Staging Area

Use of potential areas within Port boundaries would have negligible impacts.

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 ft 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 either from dredging or placement of sediments at Surfside Borrow Site. 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 occurring in a highly developed part of the Port.

Staging Area

Use of potential areas within Port boundaries would have negligible impacts.

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. Night time 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 ft 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 either from dredging, placement of sediments at Surfside Borrow Site, or wharf improvements. 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 occurring in a highly developed part of the Port.

Staging Area

Use of potential areas within Port boundaries would have negligible impacts.

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 ft 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 either from dredging or placement of sediments at Surfside Borrow Site. 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 4.10, 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.

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
- Disproportionately high and adverse impacts on minorities, low-income residences

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 Local Service Facilities. 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, impacts on employment would be less than significant. 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 as a result of Project construction would be less than significant. The project would not create a demand for housing through population growth.

Significance Determination

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, impacts on employment would be less than significant. 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 as a result of Project construction would be less than significant. The project would not create a demand for housing through population growth.

5.10.4 Alternative 3 (NED)

Impacts 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.

5.10.5 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 result in a significant demand on area construction resources.

Significance Determination

Impacts would not be significant for reasons discussed above for Alternative 2.

5.10.6 Alternative 5

Impacts 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 Summary of Potential Impacts to socioeconomics/environmental justice

No significant unavoidable impacts were identified.

5.10.8 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.

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 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/Port of Long Beach define traffic level of service thresholds as follows:

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

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 Local Service Facilities. 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 million cubic yards (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 dredger 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 will 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 site.

The City of Long Beach considers Level of Service (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 addition project traffic would result in less than significant impacts 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 estimate 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 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.

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, per the impact significance criteria.

Placement/Disposal

The construction vehicular and vessel traffic associated with placement of 2.5 mcy at the Surfside Borrow Site is included in the analysis above. Placement at this site would not result in any significant ground or

marine transportation impacts. Impacts of disposal at the LA-2 and LA-3 ODMDS were addressed in the USEPA authorization of the LA-2 ODMDS and are hereby incorporated by reference (USEPA & USACE, 2005).

Local Service Facilities

Dredging of 202 thousand cubic yards (kcy) 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, impacts would be less than described above, and would be less than significant.

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 Level of Service 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 (NED)

Dredging

Impacts would be similar to Alternative 2, except that dredging of approximately 7.4 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 clam shell 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 would be identical to Alternative 2 as the volumes are the same. Impacts from ocean disposal at LA-2 and/or LA-3 were addressed in the USEPA authorization of the LA-2and LA-3 ODMDS and are hereby incorporated by reference.

Local Service Facilities

Impacts from vehicle and vessel traffic would be similar to Alternative 2. Dredging of 304 kcy 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, impacts would be less than significant.

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 Level of Service 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 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 would be identical to Alternative 2 as the volumes are the same. Impacts from ocean disposal at LA-2 and/or LA-3 were addressed in the USEPA authorization of the LA-2and LA-3 ODMDS and are hereby incorporated by reference.

Local Service Facilities

Impacts from vehicle and vessel traffic would be similar to Alternative 2. Dredging of 456 kcy 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. Thus, the traffic impacts from the local features would be less than the dredging operations, and would therefore be less than significant.

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 Level of Service 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 would be identical to Alternative 2 as the volumes are the same. Impacts from ocean disposal at LA-2 and/or LA-3 were addressed in the USEPA authorization of the LA-2and LA-3 ODMDS and are hereby incorporated by reference.

Local Service Facilities

Impacts from vehicle and vessel traffic would be similar to Alternative 2. Dredging of 304 kcy 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, impacts would be less than significant.

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 Level of Service 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 (i.e., dredging, beach replenishment, and/or notch fills) 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 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 Local Service Facilities. 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 Coast Guard 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 other than from an aesthetic aspect.

Electrical Substation

Construction of the electrical substation would have negligible impacts.

Staging Area

Use of potential areas within Port boundaries would have negligible impacts.

Placement/Disposal

Recreational vessel usage of the Surfside Borrow Site 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.

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.

Significance Determination

There would be no permanent loss of recreational uses as a result of the proposed project. Therefore, impacts would not be significant.

5.13.4 Alternative 3 (NED)

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.

Staging Area

Use of potential areas within Port boundaries would have negligible impacts.

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.

Significance Determination

There would be no permanent loss of recreational uses as a result of the proposed project. Therefore, impacts would not be 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

Construction of the electrical substation would have negligible impacts.

Staging Area

Use of potential areas within Port boundaries would have negligible impacts.

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.

Significance Determination

There would be no permanent loss of recreational uses as a result of the proposed project. Therefore, impacts would not be 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

Construction of the electrical substation would have negligible impacts.

Staging Area

Use of potential areas within Port boundaries would have negligible impacts.

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.

Significance Determination

There would be no permanent loss of recreational uses as a result of the proposed project. Therefore, impacts would not be 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. The majority of the dredging would be accomplished by electric clamshell dredges reducing the emission of air toxics to insignificant levels. Dredges and support vessels would display lights and day shapes required by Coast Guard regulations and would not create a navigation hazard.

Electrical Substation

Construction of the electrical substation would have negligible impacts.

Staging Area

Use of potential areas within Port boundaries would have negligible impacts.

Placement/Disposal

Placement at the Surfside Borrow Site would not create either a health or navigation hazard.

Local Service Facilities

Berth dredging would be in confined wharf areas that would not create either a health or navigation hazard. 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.

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 not be significant.

5.14.4 Alternative 3 (NED)

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.

Staging Area

Use of potential areas within Port boundaries would have negligible impacts.

Placement/Disposal

Impacts would be the same as for Alternative 2.

Local Service Facilities

Berth dredging would be in confined wharf areas that would not create either a health or navigation hazard. 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.

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 not be 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

Construction of the electrical substation would have negligible impacts.

Staging Area

Use of potential areas within Port boundaries would have negligible impacts.

Placement/Disposal

Impacts would be the same as for Alternative 2.

Local Service Facilities

Berth dredging would be in confined wharf areas that would not create either a health or navigation hazard. Wharf improvements are required for this alternative, but would not create or expose people to any health or navigation hazards. Placement of a submerged sheet pile structure with associated rock protection to stabilize the Pier J breakwaters would have negligible impacts.

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 not be 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

Construction of the electrical substation would have negligible impacts.

Staging Area

Use of potential areas within Port boundaries would have negligible impacts.

Placement/Disposal

Impacts would be the same as for Alternative 2.

Local Service Facilities

Berth dredging would be in confined wharf areas that would not create either a health or navigation hazard. 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.

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 not be 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 Green House 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. All of the cumulative projects that have been identified would be subject to Federal, state, and local reviews that include some level of consideration and protection for cultural resources that would lessen any impacts. To the extent that other cumulative projects have caused or may cause cultural resource impacts, NEPA requires consideration of mitigation for significant cultural impacts. After application of the mitigation measures identified in Section 5.6.8, the project impacts would be less than significant. With adoption of these measures, the project's contribution to the cumulative impacts is rendered less than cumulatively considerable, and cumulative cultural resources impacts are less than significant.

6.2.8 Noise

Cumulative impacts over the short-term are not expected to be significant because the other projects considered in the cumulative assessment are not located in the same immediate vicinity and/or are not likely to be constructed concurrently with the Proposed Project. Listed cumulative projects are expected to result in similar short-term and temporary noise increases during construction, but not contribute any permanent or long-term increase in noise. Furthermore, all construction would be subject to the requirements specified under the applicable Municipal Code. With the implementation of appropriate reduction measures, no long-term, permanent significant cumulative noise impacts are expected 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. 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 U.S. Coast Guard Local Notice to Mariners. 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 6.1-1, no adverse cumulative impacts to public safety would occur.

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 Integrated Feasibility Report 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. Issues that were found to be significant and require mitigation measures to reduce impacts below a level of significance included air quality. The analysis determined that the proposed action 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.

In other instances, consequences of the proposed project were found to be beneficial, such as the improved overall conditions for vessel operations and safety resulting in decreased future shipping operations and associated air emissions.

8 UNAVOIDABLE SIGNIFICANT IMPACTS

This 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. 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 TENTATIVELY SELECTED PLAN

This section provides a detailed description of the TSP that was developed and selected through the plan formulation process. The details discussed in this chapter 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 TSP 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 TSP 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.

9.1 Description of the Tentatively Selected Plan (TSP)

This section provides details of the TSP.

9.1.1 General Navigation Features

General Navigation Features of the TSP for liquid bulk vessels includes:

- deepening the Approach Channel to -80 ft MLLW; and
- widening parts of the Main Channel through bend easing to -76 ft MLLW.

General Navigation Features of the TSP for container ships includes:

- constructing an Approach Channel to Pier J South to -55 ft MLLW;
- constructing a turning basin outside of Pier J; and
- deepening the West Basin to -55 ft MLLW.

Approximately 7.1 mcy of dredged material would be placed in a nearshore site as well as 2 EPA-designated offshore disposal sites for the General Navigation Features. **Figure 9-1** shows the location of the General Navigation Features. To support dredging at the Pier J berth, the approach channel and turning basin, an additional dredge electric substation is required as a mitigation measure for air quality impacts.

Local Service Facilities includes berth dredging within the Pier J South Slip and berth T140 along Pier T to -55 feet MLLW. Approximately 304 kcy of dredged material would be placed in a nearshore site as well as 2 EPA-designated offshore disposal sites for the Local Service Facilities.

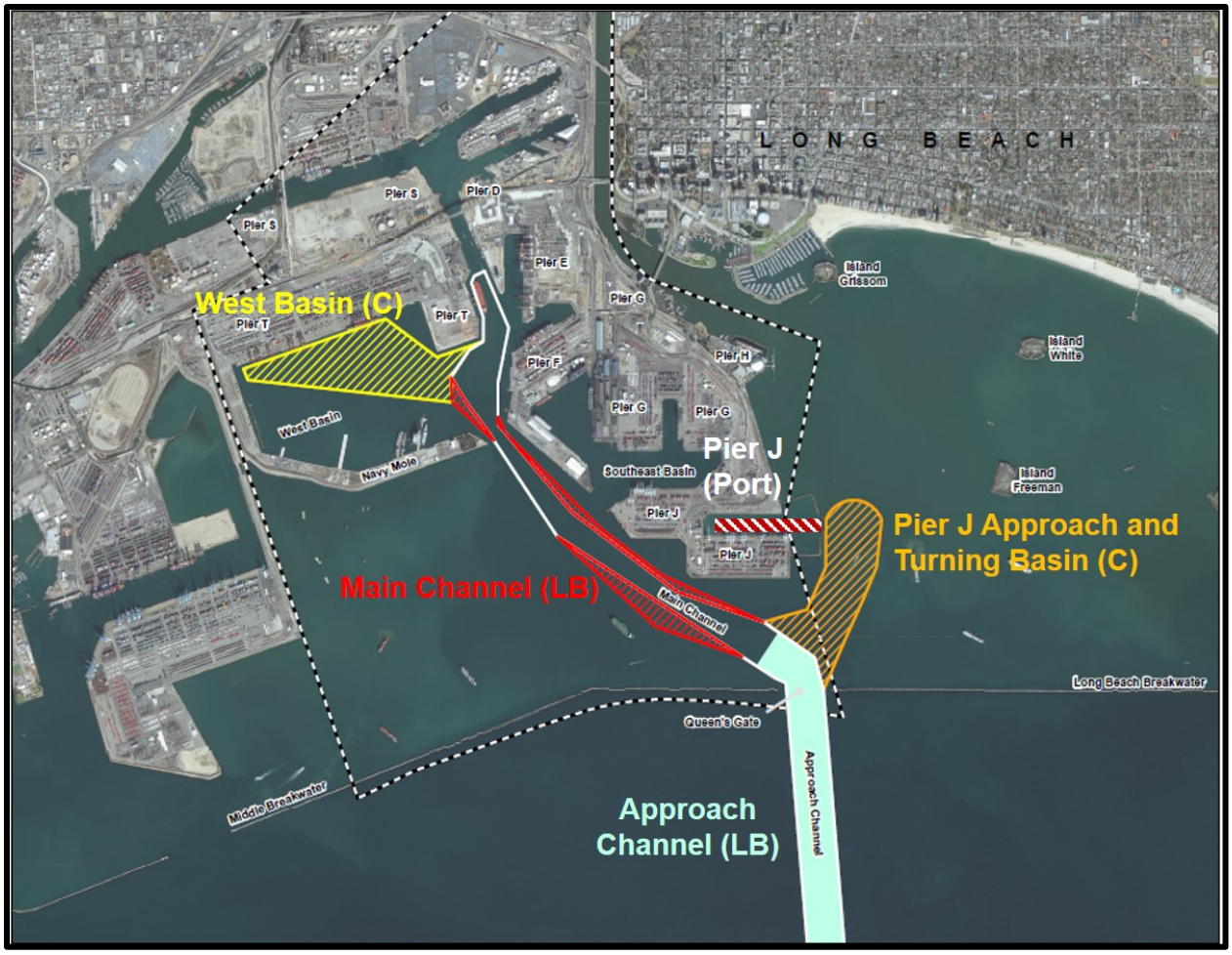


Figure 9-1 Tentatively Selected Plan

9.2 Dredging and Dredged Material Management

9.2.1 Dredging Volumes

Total dredging is approximately 7,359,000 cubic yards (cy). **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 (Port Responsibility)	-55	304,000
Total Dredge Volume:		**7,359,000**

9.2.2 Dredged Material Placement Locations

Dredged material will be disposed of in a nearshore placement site (i.e. Surfside Borrow Site) 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 million cubic yards (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.

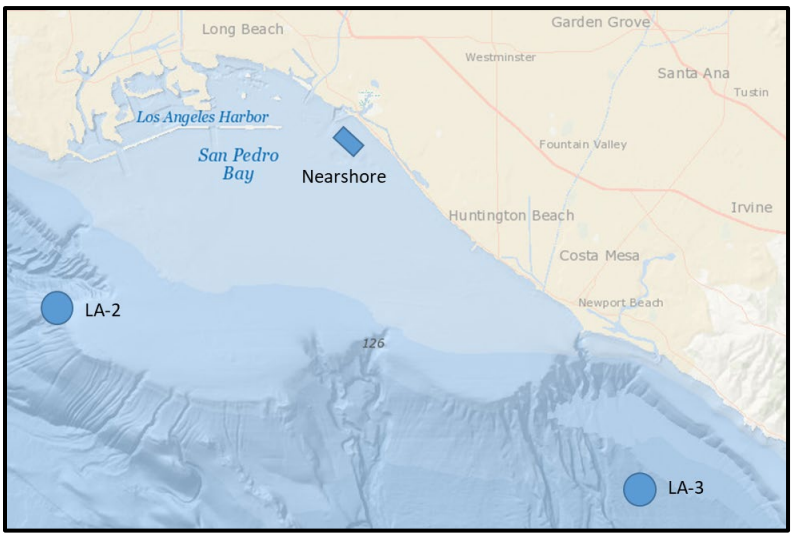


Figure 9-2 Dredged Material Placement Locations

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 disposal sites LA-2 and LA-3, due to their yearly disposal capacity. Another is the production rate that the clamshell dredge can achieve.

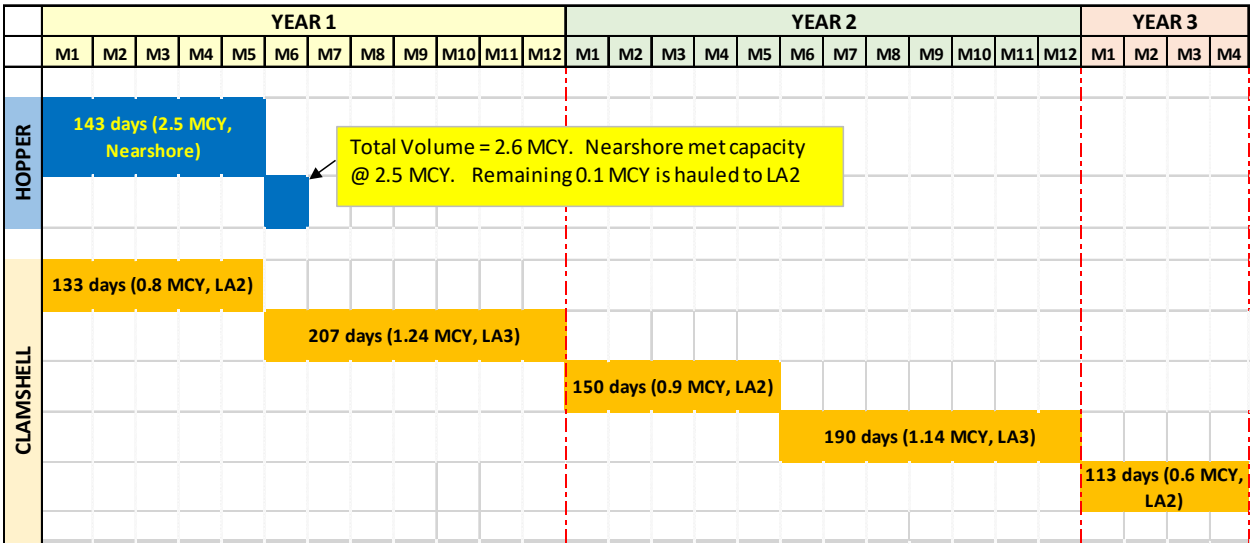


Figure 9-3 Construction Sequence

9.3 Lands Easements Rights of Way and Relocation Considerations

The requirements for Lands, Easements, Rights-of-Way, Relocations and Disposal Areas (LERRD) 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. 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 ODMDSs are designated EPA 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 area shown in Figure 6. 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.

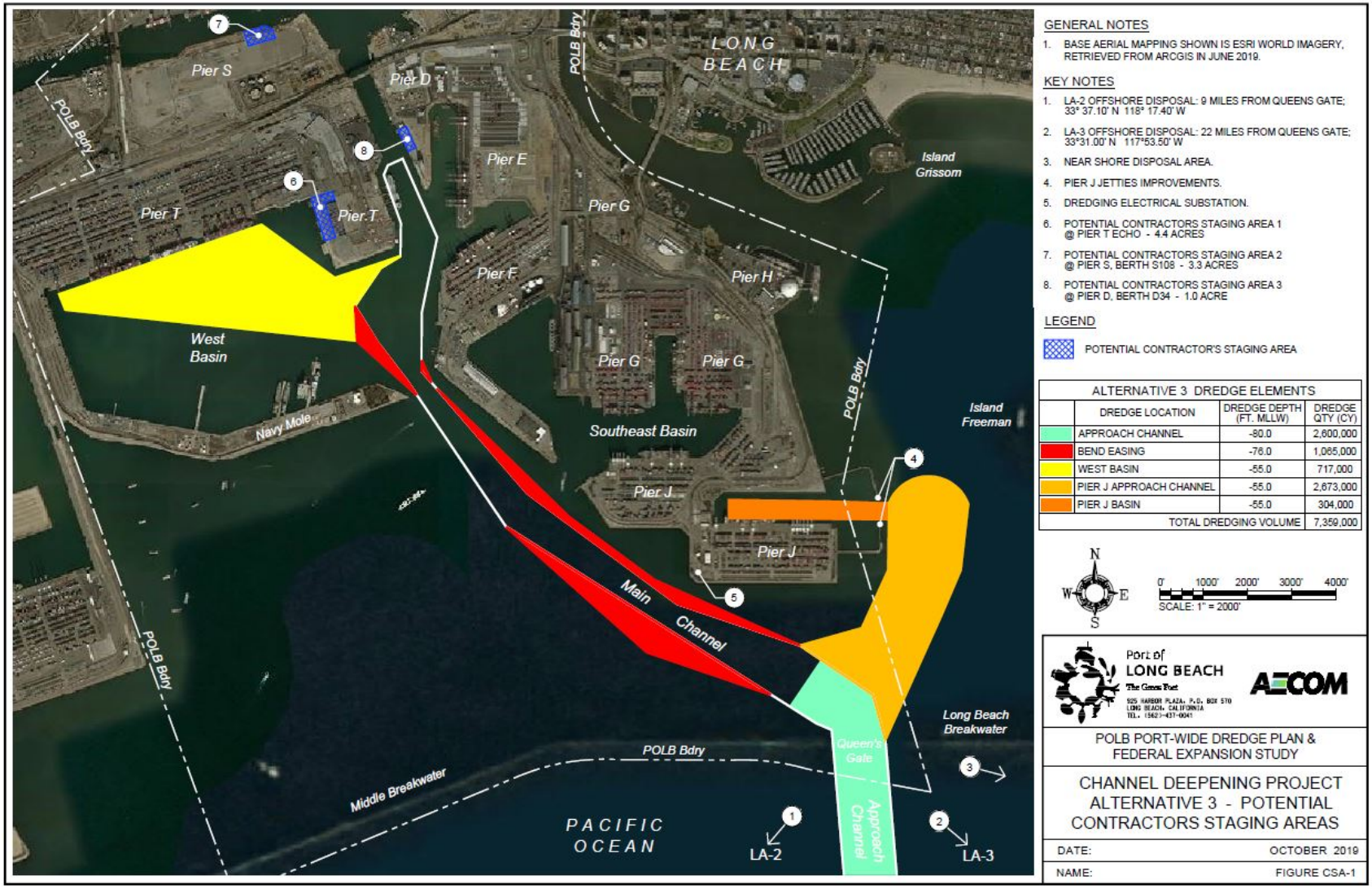


Figure 9-4 Proposed Staging Area

9.4 Detailed Cost Estimates and Benefits

This section presents the Federal and non-Federal responsibilities for implementing the tentatively selected plan. This includes Federal and non-Federal project cost sharing requirements and the division of responsibilities between the Federal government and the Non-Federal Sponsor, the POLB. It also lists the steps toward project approval, and a schedule of the major milestones for the design and construction of the tentatively selected plan.

The Cost Appendix (Appendix F) contains detailed information on project costs, cost assumptions, and the associate risks that factored in the contingency. The Economics Appendix (Appendix E) includes detailed discussions of the benefits analysis.

9.4.1 Project Costs and Cost Apportionment for the Tentatively Selected Plan

Table 9-2 shows the project cost sharing guidelines and **Table 9-3** the preliminary cost apportionment, respectively. The estimates used for the cost sharing tables 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 regulations require 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 general navigation features (GNF) with both federal and non-Federal Sponsor in-kind contributions as applicable, LERR values, and contingencies determined through the Abbreviated Risk Analysis. A Cost and Schedule Risk Analysis (CSRA) will be completed after review of the Tentatively Selected Plan. The Total Project Cost will also be developed, which is the Constant Dollar Cost fully funded with escalation to the estimated midpoint of construction.

As detailed in **Table 9-3**, the TSP plan (Alternative 3) has a project cost of approximately $151 million. Project cost includes project first costs, which include General Navigation Features (GNF), LERR, local service facilities, and aids to navigation. GNF costs are cost shared 50%/50% during construction. An additional 10% of the GNF costs, less the amount of LERR credit afforded to the sponsor for the value of LERR, can be paid by the non-Federal Sponsor over a period not to exceed 30 years with interest. However, in this case, there is no LERR adjustment credit since the sponsor has no related costs. There are costs associated with the Local Service Facilities that are considered project costs but are the responsibility of the non-federal sponsor. A breakout of the approximately $19.45 million of sponsor costs as well as a breakdown of costs by code of accounts is shown in **Table 9-4**. The average annual costs were determined to be approximately $6.43 million for the TSP. The average annual benefit for the TSP is approximately $24.45 million and the average net annual benefit is approximately $18 million, as shown in **Table 9-5**. Therefore, the benefit-to-cost ratio is estimated at 3.8 to 1 for the TSP plan.

Contingencies for Project Costs were determined through Abbreviated Risk Analysis (ARA) workshops with the PDT and applied to the construction costs using the Cost MCX ARA template. Overall calculated project contingencies range from 43% to 50% based on the results of the ARA. Individual contingencies for each measure of a given alternative were calculated during the ARA workshop. Contingency calculations are based on the likelihood and potential impact of an identified risk. The contingency for both the cost and schedule will be established at the 80% confidence level using a risk based Monte Carlo simulation will be calculated for the NED Plan for the Final Report.

The detailed cost estimate for the TSP, as well as the other alternatives in the Final Array, can be found in Appendix F, Cost Engineering.

Table 9-2 Cost Sharing for Project Depths > 45 ft

Construction	Federal	Non-Federal
General Navigation Features (GNF)	50%	50 +10%[1]
Aids to Navigation	100%	0%
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 over a period of 30 years, at an interest rate determined pursuant to Section 106 of WRDA 86. The value of LERR shall be credited toward the additional 10% payment.		

Table 9-3 Preliminary Cost Apportionment Table (1OCT 2018 Price Level, Rounded)

	Total Cost Allocated	Federal	Non-Federal
Dredging (including mitigation, PED and Construction Management; 50/50 cost sharing)	$131,254,000	$65,6270,000	$65,6270,000
Lands, Easements, Right-of-Ways, Relocations (100% Non-Fed)	$0	$0	$0
Non-Federal Local Service Facilities (100% Non-Fed): Dredging (including PED and Construction Management)	$19,449,000	$0	$19,449,000
Project First Costs	$150,703,000	$65,627,000	$85,076,000
Additional 10% of GNF over time less LERR	$0	($13,125,400)	$13,125,400
Final Distribution of Costs	**$150,703,000**	**$52,501,600**	**$98,201,400**

Table 9-4 Detailed Project Costs (1OCT18 Price Level)

	Total Project	General Navigation Features	Local Service Facilities*
Construction Cost	$84,144,000	$73,872,0006	$10,273,000
PED	$12,653,000	$11,080,000	$1,573,000
Construction Management	$6,424,000	$4,949,000	$1,475,000
LERR	$0	$0	$0
Project Cost	$103,221,000	$89,901,000	$13,321,000
Contingency (46%)	$47,482,000	$41,354,000	$6,128,000
Total Project Cost	**$150,703,0009**	**$131,254,000**	**$19,449,000**
*** Sponsor Only Costs includes costs for construction of Local Service Facilities and the PED and Construction Management associated with those activities.**			
Note – Some figures may not exactly sum to indicated value due to rounding.			

Table 9-5 ER 1105-2-100 Appendix H - Economic Table for the TSP

Equivalent Annual Benefits and Costs FY2019 Price Levels, 50-year Period of Analysis, 2.875% Discount Rate	
	Total
Investment Costs	
Total Project Construction Costs	$150,703,000
Interest During Construction	$5,678,000
Total Investment Cost	$156,382,000
Average Annual Costs	
Interest and Amortization of Initial Investment	$5,934,000
OMRR&R	$500,000
Total Average Annual Costs	$6,434,000
Average Annual Benefits	$24,447,000
Net Average Annual Benefits	$18,012,602
Benefit-Cost Ratio	3.8

9.4.2 Project Schedule and Interest during Preconstruction Engineering and Design (PED)/Construction

Table 9-6 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 a 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 TSP 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 2019 fiscal year federal discount rate of 2.875 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 9-6** summarizes the PED and construction activities for the TSP.

Table 9-6 Approximate PED and construction duration used to compute IDC

Description	Duration in Months	Cumulative Months
Divisions Engineer's Transmittal (S=PED Start)	0	S
Design Agreement	3	S+3
Plans and Specifications	18	S+21
Project Partnership Agreement initiated	4	S+25
Advertise Contract (contingent upon funding)	2	S+27
Award Contract	3	S+30
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 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 Water Quality Control Board for maintenance dredging, which is renewed every five years (most recently in 2018). From 2014-2018 POLB authority dredging amounted to only 170,000 cubic yards, the majority of which was placed in LA-2. O&M for the Approach Channel is maintained 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 (5 years), there has been no sedimentation within the channel requiring maintenance. For the Approach Channel, since navigation improvements completed in 2001 (18 years), there is presently only a small 40,000 cubic yard shoal within authorized channel limits, which does not impact navigability. O&M dredging of the federal channels included in the TSP is anticipated to occur every 10 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 Tentatively Selected Plan. The increase in average annual O&M costs has been preliminarily estimated at $500k. However, this estimate is considered conservative and will be refine during feasibility level analysis for the Final Report.

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 non-federal sponsors 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 non-federal sponsor's statement of financial capability, the non-federal sponsor's financing plan, and an assessment of the sponsor's financial capability.

9.4.5 View of Non-Federal Sponsor

The Port of Long Beach, the non-federal sponsor, 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 national economic development (NED), environmental quality (EQ), regional economic development (RED), and other social effects (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 TSP were evaluated under the environmental quality account and are detailed in Section 5. The economic analysis evaluated the NED benefits and costs of the TSP. The economic analysis also evaluated the RED impacts of the TSP. Other Social Effects considerations will be fully evaluated for the Tentatively Selected Plan for the Final Report.

The NED account displays changes in the economic value of the national output of goods and services. Under this account, the TSP generates average annual equivalent (AAEQ) net benefits of about $24.45 million with a benefit-cost ratio (BCR) of 3.8.

9.4.7 Risk and Uncertainty

Risk and uncertainty exists 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.

The project is largely comprised of dredging operations, which USACE and the Port have significant experience with at the POLB. This gives us a level of confidence that the cost estimates are reasonable. Cost contingencies and incremental costs are discussed in Appendix F (Cost Engineering).

9.4.8 With-Project Sea Level Change

The tentatively selected 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 the Final Integrated Report and then be part of construction and operation of the Tentatively Selected 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 tentatively selected 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 Draft Integrated Report 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 Integrated Report are briefly reviewed in the following subsections. Applicable local regulations are presented in Section 4 of this document, 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 (et seq) and the Council on Environmental Quality (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).. NEPA requires that agencies of the Federal Government shall implement an environmental impact analysis program in order to evaluate "major federal actions significantly affecting the quality of the human environment." A "major federal action" may include projects financed, assisted, conducted, regulated, or approved by a federal agency. NEPA regulations are followed in the preparation of this EIS.

Coastal Zone Management Act of 1972 (16 U.S.C. 1451 et seq.) and California Coastal Act of 1976

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. This Integrated Report will act as the Coastal Consistency Determination (CCD) to the CCC, in satisfaction of CZMA requirements, Section 106(d), to certify consistency to the maximum extent practicable with an approved State Coastal Zone Management Plan. In addition to Coastal Act policies, the local ordinances of the City of Long Beach are included in this Integrated Report and in the analysis of environmental resources. This Integrated Report serves as the coordination with the CCC and this Integrated Report will serve as the CCD, and the USACE will submit this Integrated Report to the CCC for their review. The USACE has determined, based on the evaluation of potential impacts in this Integrated Report, that the project is consistent to the maximum extent practicable with the CZMA. The USACE will obtain concurrence from the CCC prior to construction.

Clean Water Act (33 U.S.C. §1251 et seq.)

The Clean Water Act (CWA) governs discharge of dredge or fill materials into the waters of the United States and it governs pollution control and water quality of waterways throughout the U.S. Its intent, in part, is to restore and maintain the biological integrity of the nation's waters. The goals and standards of the CWA are enforced through permit provisions. Sections 404 and 401 of the CWA pertain directly to the proposed project. Section 404 outlines the permit program required for filling the nation's waterways.

The USACE does not issue itself a permit for civil works projects, but must perform an equivalent evaluation of the project impacts on waters of the US, or seek an exemption from Congress. Therefore, a Section 404(b)(1) evaluation is prepared and included in this Integrated Report as Appendix D. Section 404(b)(1) evaluates project related impacts to the waters of the U.S. and provides appropriate mitigation measures to minimize impacts. Section 230.10(a)(2) of the 404(b)(1) guidelines states that "an alternative is practicable if it is available and capable of being done after taking into consideration costs, existing

technology and logistics in light of overall project purposes. Impacts to waters of the United States related to initial construction activities and future operation and maintenance are identified in this Integrated Report. Mitigation measures for initial construction activities and operation and maintenance for the life of the project are included in this Integrated Report. USACE has determined that full compliance with CWA Section 404 is met.

Rivers and Harbors Act (33 U.S.C. 403)

Section 10 of the Rivers and Harbors 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 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 Harbors 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 Fish and Wildlife Coordination Act is ongoing. In response to the requirements of this Act, USACE is coordinating with the U.S. Fish and Wildlife Service (USFWS) and the California Department of Fish and Game (CDFG) during the initial and current stages of planning. The USACE has coordinated extensively with the USFWS, National Oceanographic and Atmospheric Administration (NOAA) Fisheries (formerly NMFS), and CDFG in the development of the proposed alternatives, environmental commitments, and potential mitigation measures. USACE and will continue to coordinate with NOAA Fisheries throughout the NEPA process. The USFWS prepared and submitted a Planning Aid Report (PAR) in accordance with the Act. A copy of the PAR is attached to this document in Appendix I. The USFWS is in the process of preparing a draft Coordination Act Report for this project.

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 10, 2003, however, USFWS did not respond to the request. However, the USFWS responded to the NOI, stating that Federal endangered and threatened species were in the vicinity of the project area, and that development of this Integrated Report has considered the impacts of this project to Federal endangered and threatened species (Subsection 5.4). Additional and more recent ongoing coordination with respect to Federal endangered and threatened species has occurred with both USFWS and NOAA Fisheries in the development of this Integrated Report. Federally endangered or threatened species that inhabit the project area are listed and discussed in Section 3.4 and Section 5.4.

USACE has determined that the project would not affect any listed species or designated critical habitat.

Magnuson-Stevens Fishery Management and Conservation Act (16 U.S.C 1801 et seq.)

Federal agencies must consult with NOAA Fisheries 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." NOAA Fisheries encourages streamlining the consultation process using review procedures under NEPA, Fish and Wildlife Coordination Act, CWA, and/or FESA 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. Description and evaluation of EFH for the coastal zone is included in this Integrated Report in Subsection 5.4.

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 Integrated Report in Subsection 5.4.

Migratory Bird Treaty Act (MBTA) (16 USC 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 Integrated Report in Subsection 5.4.

Executive Order 11990

This 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 Order was considered in the development of alternatives. The action will have no permanent adverse effect on wetlands.

Executive Order 11991

This Order is related to protection and enhancement of environmental quality. Section 1 of this 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 Integrated Report.

National Historic Preservation Act (16 U.S.C. § 479)

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. Coordination is ongoing with SHPO.

Clean Air Act (42 U.S.C. §7401 et seq)

The Clean Air Act (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 U.S. Environmental Protection Agency- (USEPA) approved or promulgated State Implementation Plans (SIPs). This Act was considered in the evaluation of consequences of the alternatives. CAA Conformity Analysis is addressed for this action (Subsection 5.5).

Executive Order 12898

This Executive Order requires that the EIS/EIR analyze the impacts of federal actions on minority and low-income populations and provides opportunities for input on the EIS/EIR by affected communities (Subsection 5.9). During EIS/EIR scoping, all interested members of the public, including minority communities and low-income populations, were invited to participate in the environmental process for this action. The alternatives developed for this Integrated Report were based on a set of criteria that did not discriminate on the basis of race, color, or national origin. The proposed action would not have an impact on minority communities or low income populations and therefore it is in compliance with this Order.

Executive Order 12898. Environmental Justice. E.O. 12898 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 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 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% 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 or not 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%, 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% of the total population in the city, and 63% of the total population in the affected area. The aggregate population percentage in the affected area does exceed 50%. The affected area minority population percentage is not greater than the minority population percentage in the state of California as a whole which is approximately 62% or the city of Long Beach which is 72%. The minority population in the project area exceeds 50%, therefore we have a minority population in the project area.

As shown in the table above, 0% of the individuals in the affected area are considered below the poverty level. This percentage in the affected area does not exceed 50%. In addition, the affected area low-income

population percentage is not greater than the low income population in the city, which is 42% or the state of California which is 35%. Therefore, the affected area does not contain a high concentration of low-income population.

The project area does constitute an EJ community. However, project impacts are restricted to construction impacts. Construction impacts are located 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 assess, for example, was prepared by the POLB. It shows that there would be no increase in health risks to the minority population as a result of the project. Therefore, there would be no disproportionately high and adverse human health or environmental impacts of the project on minority populations.

Executive Order 13045

This Order addresses "Environmental Health and Safety Risks to Children." This 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.

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.

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 yard (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.

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 Endangered Species Act (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 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 (CAA)

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 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 State Implementation Plan (SIP), detailing how the State will attain the NAAQS within mandated timeframes. In response to this requirement, SCAQMD develops the Air Quality Management Plan (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% 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%, 1-hour ozone levels by close to 60%, and annual PM2.5 levels by close to 55% 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 Clean Air Action Plan (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 (GHG) 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.

The U.S. Supreme Court decision in Massachusetts et al. v. USEPA, 549 U.S. 497 (2007), gave USEPA authority to regulate GHGs as air pollutants under the federal CAA. 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.

Council on Environmental Quality Guidance

In 2019, the Council on Environmental Quality (CEQ) published draft guidance on how NEPA analysis and documentation should address greenhouse gas (GHG) emissions. This *Draft National Environmental Policy Act Guidance on Consideration of Greenhouse Gas Emissions* (CEQ, 2019), if finalized, would replace CEQ's 2016 guidance that was rescinded in 2017. The draft 2019 guidance states that a projection of a proposed action's direct and reasonably foreseeable indirect GHG emissions may be used as a proxy for assessing potential climate effects. Agencies should attempt to quantify a proposed action's projected direct and reasonably foreseeable indirect GHG emissions when the amount of those emissions is substantial enough to warrant quantification, and when it is practicable to quantify them using available data and GHG quantification tools. Where GHG inventory information is available, an agency may also reference local, regional, national, or sector-wide emission estimates to provide context for understanding the relative magnitude of a proposed action's GHG emissions. This approach, together with a qualitative summary discussion of the effects of GHG emissions based on an appropriate literature review, allows an agency to present the environmental impacts of a proposed action in clear terms and with sufficient information to make a reasoned choice among the alternatives. Such a discussion satisfies NEPA's requirement that agencies analyze the cumulative effects of a proposed action because the potential effects of GHG emissions are inherently a global cumulative effect. Therefore, a separate cumulative effects analysis is not required (CEQ, 2019).

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 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 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.

Federal Laws

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.

United States Coast Guard (USCG)

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.

US Army Corps of Engineers (USACE)

The USACE is responsible for reviewing all aspects of a project that could affect navigation and waters of the United States. The Corps' 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. No historic properties have as yet been identified within the APE. USACE is pursuing a PA with the SHPO and the Advisory Council on Historic Preservation (ACHP) that would phase any additional underwater inventory that is necessary after final project design is completed.

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:

a) Physical destruction, damage, or alteration of all or part of the property.
b) Removal of the property from its historic location.

c) Change of the character of the property's use or physical features within the property's setting that contribute to its historic significance.
d) Introduction of visual, audible, or atmospheric elements that are out of character with the property or alter its setting.
e) 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. The execution of the PA that USACE is pursuing would evidence the agency's compliance with Section 106 of the NHPA. Mitigation measures defined in an agreement document could include data recovery or photographic documentation and archival research for historic resources.

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 Commitments

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 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. In the event that 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.

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 treatment and disposition of such remains will be carried out in compliance with the Native American Graves Protection and Repatriation Act (Public Law 101-601; 25 U.S.C. 3001 et seq.) and EP 1130-2-540, Chapter 6.

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

4. The Contractor shall implement a Water Quality Monitoring Plan at the dredge and nearshore placement sites.

5. 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.

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

7. The contractor shall mark the dredge and all associated equipment in accordance with U.S. Coast Guard regulations. The contractor must contact the U.S. Coast Guard 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.

8. The contractor shall move equipment upon request by the U.S. Coast guard and Harbor patrol law enforcement and rescue vessels.

9. Construction equipment shall be properly maintained in order to minimize emissions of air pollutants.

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

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

12. Pre-construction surveys for *Caulerpa taxifolia* will be conducted in the Main Channel, proposed Pier J Channel and Turning Basin, and the Surfside Borrow Site. Construction shall not begin should *Caulerpa taxifolia* be identified until cleared to do so by the National Marine Fisheries Service.

Mitigation Measures include the following:

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.

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.

11 OTHER NEPA REQUIRED ANALYSES

This section addresses other topics required by NEPA in this Integrated Feasibility Report. These include the relationship between local short-term uses of the environmental and long-term productivity (NEPA); the identification of any irreversible and irretrievable commitments of resources (NEPA and CEQA); a discussion of Executive Order 13045 (Environmental Health and Safety Risk to Children, 62 Fed. Reg. 19885 (1997)); and a discussion of issue related to Executive Order 12898 (Environmental Justice, 59 Fed. Reg. 7629 (1994)).

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 Protection of Children from Environmental Health Risks and Safety Risks

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.

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 ft MLLW (with a 2-ft overdredge allowance) for cargo vessels, constructing a turning basin outside the Pier J slip, deepening the Approach Channel to -80 ft MLLW, bend easing portions of the Main Channel to match the currently authorized depth in the Main Channel of -76 ft MLLW, to accommodate liquid bulk vessels, deepening berths at Pier J and Pier T to -55 ft MLLW, and constructing structural improvements to the Pier J breakwaters.

The proposed Project would involve dredging approximately 7.4 million cubic yards of sediments, of which 2.5 million cubic yards 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 39 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 end of construction at the point at which all benefits are fully realized. For this project, that is the year 2027.

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 12-12-1 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/m^3	150 µg/m^3	Increased respiratory disease, lung damage, cancer, premature death
	Annual	20 µg/m^3	—	
$PM_{2.5}$	24-hour [3]	—	35 µg/m^3	Increased respiratory disease, lung damage, cancer, premature death
	Annual	12 µg/m^3	12 µg/m^3	
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/m^3 = 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 12-12-2 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 12-12-3 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 (CAA)

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 State Implementation Plan (SIP), detailing how the State will attain the NAAQS within mandated timeframes. In response to this requirement, SCAQMD develops the Air Quality Management Plan (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% 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%, 1-hour ozone levels by close to 60%, and annual PM2.5 levels by close to 55% 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 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.

State Implementation Plan

For areas that do not attain a NAAQS, the CAA requires preparation of a State Implementation Plan (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 Air Quality Management Plan (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 Clean Air Action Plan (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 Portrelated 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/m³)
1-hour average (federal)	0.100 ppm (188 µg/m³)
Annual average (state)	0.030 (57 µg/m³)
Annual average (federal)	0.0534 (100 µg/m³)
PM_{10}	
24-hour average (construction)	10.4 µg/m³
Annual average	1.0 µg/m³
$PM_{2.5}$	
24-hour average (construction)	10.4 µg/m³
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/m³ = 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/m³) 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

Source Category	PM_{10} (lb/day)	$PM_{2.5}$ (lb/day)	NOX (lb/day)	SOX (lb/day)	CO (lb/day)	VOC (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 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 (lb/day)	PM2.5 (lb/day)	NOX (lb/day)	SOX (lb/day)	CO (lb/day)	VOC (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. Tables 12-8 and 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/m³)	Background Concentration (ug/m³)	Total Concentration (ug/m³)	Significance Threshold (AAQS) (ug/m³)	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 PM10 and PM2.5

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 $\mu g/m^3$ (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 South Coast Air Quality Management District (SCAQMD). The San Pedro Bay ports of Los Angeles and Long Beach, in cooperation with the U.S. Environmental Protection Agency (EPA), 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 Air Quality Management Plan (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 Essential Fish Habitat (EFH) under those FMPs.

Four species of sea turtles are federally listed as threatened or endangered, but all are considered very rare visitors to the project area.

Invasive/Non-Native Species

A number of non-native plant, 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 Endangered Species Act, the California Endangered Species Act, the Migratory Bird Treaty Act, and the Marine Mammal Protection Act, administered by the U.S. Fish and Wildlife Service (USFWS, NOAA Fisheries, and California Department of fish and Wildlife (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 U.S. Army Corps of Engineers (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.

Sea turtles very rarely stray into the harbor area and would be able to avoid construction areas. Impacts from ocean disposal at the LA-2 and LA-3 disposal sites were addressed in the USEPA authorization of the LA-2 ODMDS and are hereby incorporated by reference. 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, proposed Pier J Channel and Turning Basin, and the Surfside Borrow Site 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 Essential Fish Habitat 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 20th 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, but 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 million cubic yards 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 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}[8] 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.

[8] 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.

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 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%.

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% 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%, 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%, while the minority population in the area of project influence comprises about 63%.

The aggregate population percentage in the area of influence and in the City of Long Beach do exceed 50%. 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%, but lower than the percentage in the City of Long Beach which is 72%. Therefore, the area of project influence and the City of Long Beach area constitute minority populations.

As shown in Table 10-1, 0% of the population in the area of project influence and 42% in the City of Long Beach are considered below the poverty level. The percentages in these areas do not exceed 50%. The area of project influence low-income population percentage is not greater than the low-income population in the City of Long Beach (42%) or the State of California, which is 35%. 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%, is higher than the state percentage of 35%. 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 California Environmental Protection Agency (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 U.S. Environmental Protection Agency, 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 South Coast Air Quality Management District (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, U.S. Coast Guard, U.S. Department of Homeland Security, U.S. Customs and Border Protection, Federal Bureau of Investigation, and California Department of Fish and Wildlife. The Coast Guard 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, U.S. Coast Guard, 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.

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 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 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 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 greenhouse gas (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**

Source Category	Emissions CO_2e (mty)
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.

1
2 **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 targets: 1) Year 2000 levels by 2010 and 2) 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 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 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.

Plan or Policy	Applicability	Evaluation of Project and Build Alternatives
		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.

Plan or Policy	Applicability	Evaluation of Project and Build Alternatives
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 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.

Plan or Policy	Applicability	Evaluation of Project and Build Alternatives
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 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 Clean Air Action Plan. 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 General Navigation Features 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 (+)
Vessel 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
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 ft MLLW; would widen the Main Channel to the design depth (-76 ft MLLW); and would deepen the Approach Channel to -78 ft MLLW (Figure 4-2). Approximately 4.9 million cubic yards of sediment would be dredged and disposed of (Table 4-8). 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 4-10, the nearshore site is expected to receive approximately 2.5 million cubic yards of material from the Approach Channel,

Main Channel, and West Basin dredging and the two ocean disposal sites would receive the remaining 2.4 million cubic yards 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 million cubic yards versus 7.4 million cubic yards), 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-6, 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 ft MLLW; would widen the Main Channel to the design depth (-76 ft MLLW); and would deepen the Approach Channel to -80 ft MLLW (Figure 4-2). Approximately 11.9 million cubic yards of sediment would be dredged and disposed of (Table 4-8). 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 ft 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 4-12, the nearshore site is expected to receive approximately 2.5 million cubic yards of material from the Approach Channel dredging, and the two ocean disposal sites would receive the remaining 9.4 million cubic yards 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 million cubic yards versus 7.4 million cubic yards), 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-6, 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 ft MLLW; would widen the Main Channel to the design depth (-76 ft MLLW); and would deepen the Approach Channel to -80 ft MLLW (Figure 4-2). A Standby Area adjacent to the Main Channel would be created by dredging to -67 ft MLLW with a 300-ft-diameter area in the center dredged to -73 ft MLLW. Approximately 8.4 million cubic yards of sediment would be dredged and disposed of (Table 4-8). 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 4-13, the nearshore site is expected to receive approximately 2.5 million cubic yards of material from the Approach Channel dredging, and the two ocean disposal sites would receive the remaining 5.9 million cubic yards 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 million cubic yards versus 7.4 million cubic yards), 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-6, 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 National Economic Development (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/responsible agency for CEQA. This Integrated Feasibility Report is prepared as a joint document. The implementation or construction phase of the proposed action will be cost-shared with the non-federal sponsor, the City of Long Beach (acting through the Port of Long Beach). 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 Integrated Feasibility Report 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 information 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 Coordination Act Report process. A summary of coordination is provided in the following paragraphs.

13.1.1 ESA Preliminary Consultation

Preliminary consultation 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 I. 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, as a result of a modification to the study area. Copies of this correspondence are also included in Appendix I. Species lists were used to provide initial input to Chapter 3 to discuss potential listed species present in the study area.

This draft IFR will be used as the basis for informal consultations with the USFWS and NMFS. Preparation of a Biological Assessment is not necessary based on preliminary effects determinations made by the USACE.

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 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 Draft CAR is currently under preparation by the USFWS and will be incorporated into the Final IFR when received early in 2020.

The PAR included six recommendations for the study. We are not able to include any of the recommendations provided for reasons discussed below. The recommendation will be provided first, followed by the USACE response.

> 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.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.

Recommendations 1 & 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.

> 3. USACE should implement a construction schedule for the project that avoids the least tern breeding season, if feasible.

This 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.

> 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.

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.

> 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.

As discussed in Section 5.4, the USACE has made a determination that the proposed project would not effect 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.

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.

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.

13.1.3 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 and the Coastal Commission. Membership includes the USFWS 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 preliminary engineering design phase.

13.1.4 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 Local Service Facilities, including berth dredging and wharf upgrades. The USACE Regulatory Division would use the IFR to support its permit actions. Coordination with USACE Regulatory Division is on-going. The USACE does not issue itself a 404 permit for the non- Local Service Facilities, but must comply with the CWA. The USACE has completed a 404(b)(1) analysis (Appendix D) to ensure project compliance with the CWA.

13.1.5 South Coast Air Quality Management District

POLB staff has been consulting with the South Coast Air Quality Management District (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 Section 5.5 for details.

13.1.6 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 Coastal Consistent Determination (CCD) 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. It is the responsibility of the USACE to determine if a proposed federal activity affects the coastal use of resources in a manner that is not consistent with the California Coastal Management Plan (CCMP) that California has adopted and implemented.

13.1.7 Regional Water Quality Control Board

To satisfy requirements of the Federal Clean Water Act (CWA), the USACE would submit this Draft IFR, a Section 401 certification application, and appropriate technical documentation to the Los Angeles Regional Water Quality Control Board (RWQCB), tasked with implementing the CWA within the region, for their review for CWA Section 401 certification, pursuant to 33 CFG 336.1(a)(1). Upon review of the submittal, the RWQCB would issue a 401-water quality certification. The USACE will continue to coordinate with the RWQCB throughout the CWA process and construction activities.

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) was published in the Federal Register on January 5, 2016. The Notice of Preparation (NOP) was distributed separately from the NOI and has been approved by the lead CEQA agency. The original NOP was distributed on November 3, 2016. An amended NOP was filed by the POLB on January 29, 2019. The notice also announced a public scoping meeting, where the public were given the opportunity to comment. A copy of the NOI, NOP, and amended NOP, the distribution list and copies of all letters received in response to the NOP are provided in Appendix A.

A 45-day public review of the Draft EIS/EIR is scheduled for October 25, 2019 through December 9, 2019. There will be a public hearing on the document during the public review period. Individual jurisdictions

may have public meetings and utilize the Final Integrated Feasibility Report for local discretionary actions such as issuing coastal consistency determinations, water quality certification, or noise variances.

14 DRAFT RECOMMENDATION

I concur with the findings presented in this report. The Recommended Plan (RP) 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. Aids to navigation would be provided at 100% federal cost. For the purpose of calculating the Section 902 limit, the estimated first cost of the project is $150,700,000 including an estimated federal share of $52,500,000 and an estimated non-federal share of $98,200,000 (FY19 Price Level). The average annual costs are $6,434,000 and the average annual benefits are $24,447,000 with net average annual benefits of $18,013,000 and a benefit to cost ratio of 3.8.

The RP 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. Aids to navigation 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, during the periods of design and construction, funds necessary to make its total contribution for commercial navigation equal to:
    (1) 50 percent of the cost of design and construction of the general navigation features (GNFs) and mitigation (including mitigation LERR) attributable to dredging to a depth in excess of -45 feet MLLW but not in excess of -50 feet MLLW, plus
    (2) 100 percent of the costs of GNFs and mitigation (including mitigation LERR) attributable to dredging to a depth over -50 feet MLLW;
b. Provide all lands, easements, rights-of-way, relocations, and disposal areas (LERRs), 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. Provide and maintain during the authorized life of the project the mitigation lands (0 acres) determined required for mitigation due to wetland impacts for the project.
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 the GNFs less the amount of credit afforded by the Government for the value of the LERR is provided by the sponsor for the GNFs. If the amount of credit afforded by the Government for the value of LERR, and relocations, including utility relocations, provided by the sponsor equals or exceeds 10 percent of the total cost of construction of the GNFs, the sponsor shall not be required to make any contribution under this paragraph, nor shall it be entitled to any refund for the value of LERR 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 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 federal government.

e. Provide 100 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 of a depth in excess of the NED plan.

f. Accomplish all removals determined necessary by the federal government other than those removals specifically assigned to the federal government;

g. Give the federal government a right to enter, at reasonable times and in a reasonable manner, upon property that the Sponsor owns or controls for access to the project for the purpose of completing, inspecting, operating and maintaining the GNFs.

h. 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.

i. Keep, and maintain books, records, documents, and other evidence pertaining to costs and expenses incurred pursuant to the project, for a minimum of 3 years after completion of the accounting for which such books, records, documents, and other evidence are required, to the extent and in such detail as will properly reflect total cost of the project, and in accordance with the standards for financial management systems set forth in the Uniform Administrative Requirements for Grants and Cooperative Agreements to State and local governments at 32 CFR, Section 33.20.

j. Perform, or ensure performance of, any investigations for hazardous substances that 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 LERR 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 Government determines to be subject to the navigation servitude, only the Government shall perform such investigations unless the federal government provides the sponsor with prior specific written direction, in which case the sponsor shall perform such investigations in accordance with such written direction.

k. Assume complete financial responsibility, as between the federal government and the sponsor, for all necessary cleanup and response costs of any hazardous substances regulated under CERCLA that are located in, on, or under LERR that the federal government determines to be necessary for the construction or operation and maintenance of the project.

l. Agree, as between the federal Government and the non-Federal Sponsor, that the non-Federal Sponsor shall be considered the operator of the local service facilities for the purpose of CERCLA liability.

m. To the maximum extent practicable, perform its obligations in a manner that will not cause liability to arise under CERCLA.

n. Comply with Section 221 of Public Law 91-611, Flood Control Act of 1970, as amended, (42 U.S.C. 1962d-5b) and Section 101(e) of the WRDA 86, Public Law 99-662, as amended, (33 U.S.C. 2211(e)) which provide that the Secretary of the Army shall not commence the construction of any water resources project or separable element thereof, until the sponsor has entered into a written agreement to furnish its required cooperation for the project or separable element.

o. 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 Part 24, in acquiring lands, easements, 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.

p. Comply with all applicable federal and state laws and regulations, including, but not limited to: Section 601 of the Civil Rights Act of 1964, Public Law 88-352 (42 U.S.C. 2000d), and Department of Defense Directive 5500.11 issued pursuant thereto; Army Regulation 600-7, entitled "Nondiscrimination on the Basis of Handicap in Programs and Activities Assisted or Conducted by the Department of the Army"; and all applicable federal labor standards requirements including, but not limited to, 40 U.S.C. 3141-3148 and 40 U.S.C. 3701-3708 (revising, codifying and enacting without substantive change the provisions of the Davis-Bacon Act (formerly 40 U.S.C. 276a et seq.), the Contract Work Hours and Safety Standards Act (formerly 40 U.S.C. 327 et seq.), and the Copeland Anti-Kickback Act (formerly 40 U.S.C. 276c)).

q. Provide the non-federal share of that portion of the costs of mitigation and data recovery activities associated with historic preservation, that are in excess of 1 percent of the total amount authorized to be appropriated for the project.

r. Not use funds from other federal programs, including any non-federal contribution required as a matching share therefore, to meet any of the sponsor's obligations for the project unless the federal agency providing the federal portion of such funds verifies in writing that such funds are authorized to be used to carry out the project.

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.

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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
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
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 ft
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 ft 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
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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