DEPARTMENT OF THE ARMY APPLICATION

FORMER LONG BEACH NAVAL COMPLEX INSTALLATION RESTORATION SITE 7 DREDGING PROJECT

Prepared for

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AOEC	Areas of Ecological Concern
AOEC-CE	Areas of Ecological Concern C-East
AOEC-CW	Areas of Ecological Concern C-West
AQMP	Air Quality Management Plan
ARB	Air Resources Board
BRAC	Base Re-alignment and Closure
CAAP	Clean Air Action Plan
CEQA	California Environmental Quality Act
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CO	carbon monoxide
COEC	Chemicals of Ecological Concern
CWA	Clean Water Act
cy	cubic yard
DDT	dichlorodiphenyltrichloroethane
DMMP	Dredged Material Management Program
DPM	diesel particulate matter
DTSC	Department of Toxic Substances Control
EFH	Essential Fish Habitat
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
ESA	Endangered Species Act
FS	Feasibility Study
IR Site 7	Installation Restoration Site 7
LARWQCB	Los Angeles Regional Water Quality Control Board
LBNC	Long Beach Naval Complex
LBNS	Long Beach Naval Shipyard
LIFOC	Lease In-Furtherance of Conveyance
MLLW	mean lower low water
NAVSTA	Naval Station Long Beach
NOx	nitrogen oxides
PAH	polycyclic aromatic hydrocarbon
PCB	polychlorinated biphenyl
PM	particulate matter

Port	Port of Long Beach
RDR	Remedial Design Report
RI	Remedial Investigation
ROD	Record of Decision
SCAG	Southern California Association of Governments
SCAQMD	Southern California Air Quality Management District
SMO	Sediment Management Objective
TSS	total suspended solids
USACE	U.S. Army Corps of Engineers
USEPA	U.S. Environmental Protection Agency
WDR	Waste Discharge Requirement
WQC	Water Quality Certification

1 INTRODUCTION

1.1 Project Background

Installation Restoration Site 7 (IR Site 7) comprises approximately 700 acres of submerged land in the Port of Long Beach's (Port's) West Basin and is adjacent to the former Long Beach Naval Complex (LBNC; Figure 1). Water depths in IR Site 7 range from 0 to -45 feet mean lower low water (MLLW).

Beginning in 1938, the U.S. Navy constructed and operated the LBNC for troop deployment and industrial uses including ship construction and repair. The former LBNC housed two major naval entities, the Long Beach Naval Shipyard (LBNS) and the Naval Station Long Beach (NAVSTA). The LBNC provided logistical support for ships and performed work in connection with construction, conversion, overhaul, repair, alteration, dry-docking and fitting out of ships. From the early 1940s to the mid-1970s, various fuels, oils, and other organic and metal wastes were discharged at IR Site 7. As a result, the sediments within the site contain heavy metals, polycyclic aromatic hydrocarbons (PAHs), and polychlorinated biphenyls (PCBs) at levels predicted to cause ecological risks to the resident benthic communities. After more than 50 years of service, the NAVSTA was closed on September 30, 1994, under the Base Re-alignment and Closure Act (BRAC) II. On September 30, 1997, the LBNS was closed under BRAC IV. Site ownership for the majority of the submerged land within the West Basin was formally reverted to the Port under the BRAC program. Currently, a 100-foot annulus surrounding the West Basin remains under U.S. Navy ownership; however, the U.S. Navy plans to transfer this property to the Port.

In 1998, an Environmental Impact Statement/Environmental Impact Report (EIS/EIR) was prepared jointly by the U.S. Navy and the Port that described the reuse of the entire LBNS complex. The EIS/EIR described the proposed reuses for the various parts of the LBNS complex including the areas adjacent to the proposed dredging areas including a liquid bulk terminal on Pier Echo and a neobulk/breakbulk terminal on the U.S. Navy Mole.

Following certification of the EIS/EIR, a Lease In-furtherance of Conveyance (LIFOC) was prepared to convey the property to the Port and laid out the restrictions under which the property could be transferred. In particular, the Port had the responsibility of performing

all remediation necessary to protect human health and the environment with respect to any hazardous substances, which may exist in the West Basin.

As part of the site closure process, a Remedial Investigation/Feasibility Study (RI/FS), completed by Bechtel, International (Bechtel 2003) for the U.S. Navy pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), investigated potential areas of contamination and evaluated options for remediation in an effort to reduce estimated ecological and human health risks. Investigations at IR Site 7 identified chemically-impacted Areas of Ecological Concern (AOEC) and identified Chemicals of Ecological Concern (COEC) with the potential to produce significant risk to benthic communities (Figure 2). A proposed plan that provides the greatest level of protection to IR Site 7 benthic communities, achieves the remedial action objectives, provides the greatest level of long-term effectiveness and permanence, and is easily implemented was developed. To achieve this end, Sediment Management Objectives (SMOs) were developed. The remedies of the proposed plan are:

- AOEC-A and AOEC-C: removal and discharge of the AOEC sediments at off-site (outside IR Site 7) projects, thereby creating a clean substrate supporting the presence of an ecologically productive and diverse benthic community.
- AOEC-B: no remedial action necessary to protect the environment as chemical concentrations have not resulted in sediment toxicity or adverse effects on the benthic community.
- AOEC-E, AOEC-F, and AOEC-G (Pier AOECs): limited action necessary to implement institutional controls for the purpose of preventing unauthorized or uncontrolled disturbance and/or exposure of beneath-pier chemically impacted sediments.
- AOEC-D was accepted as a no-action area.

A subsequent Record of Decision (ROD) accepting the remedy was prepared and signed September 2007.

In 2007, the Port conducted additional, pre-remedial design sampling to further refine the vertical and horizontal extent of contamination and to aid in providing maximum resolution to engineering design efforts. As part of this effort, AOEC-C was divided into C-East (CE)

and C-West (CW). The Port will separately prepare a Remedial Design Report (RDR) detailing the specific engineering plans and specifications to achieve the remedy.

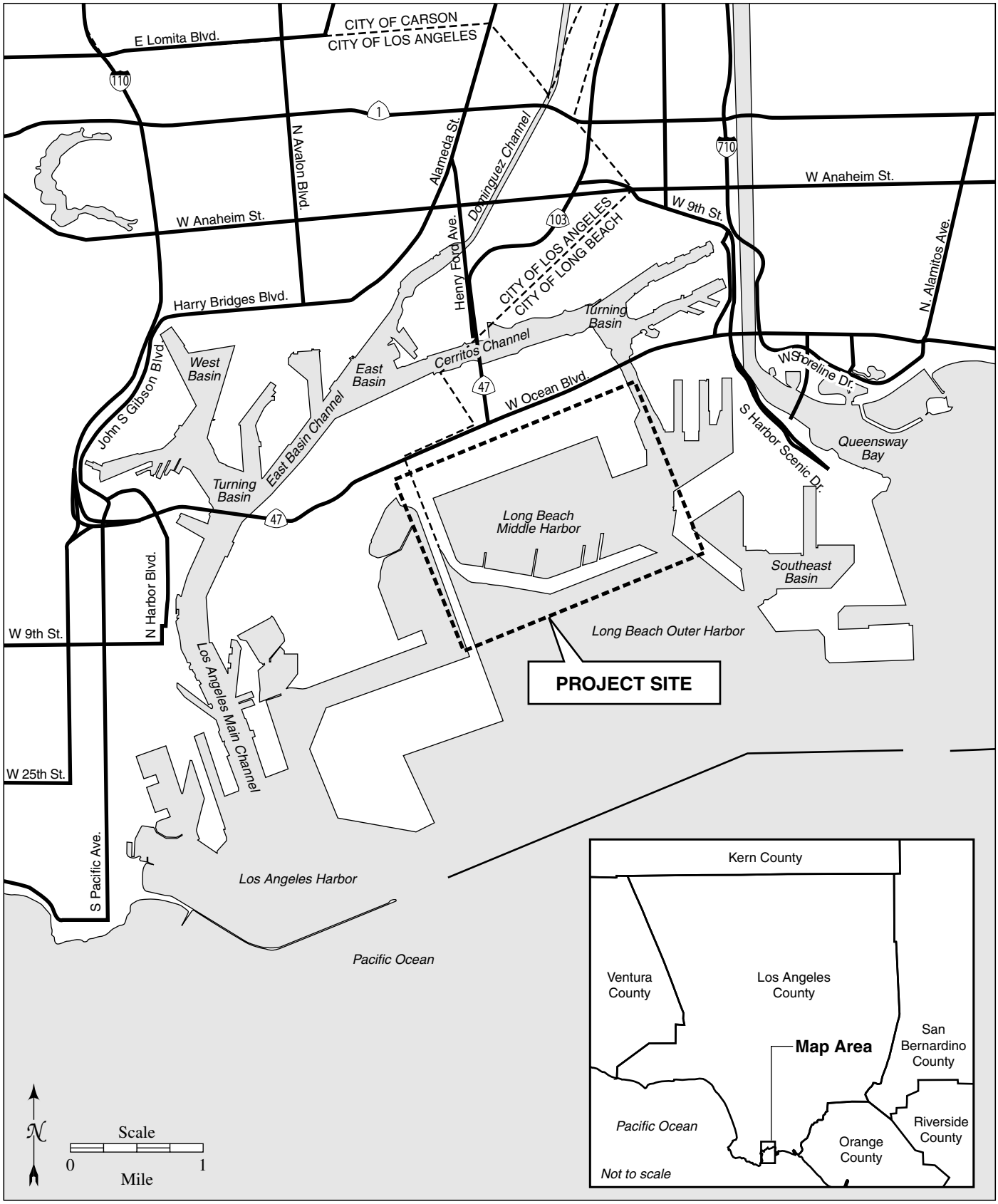
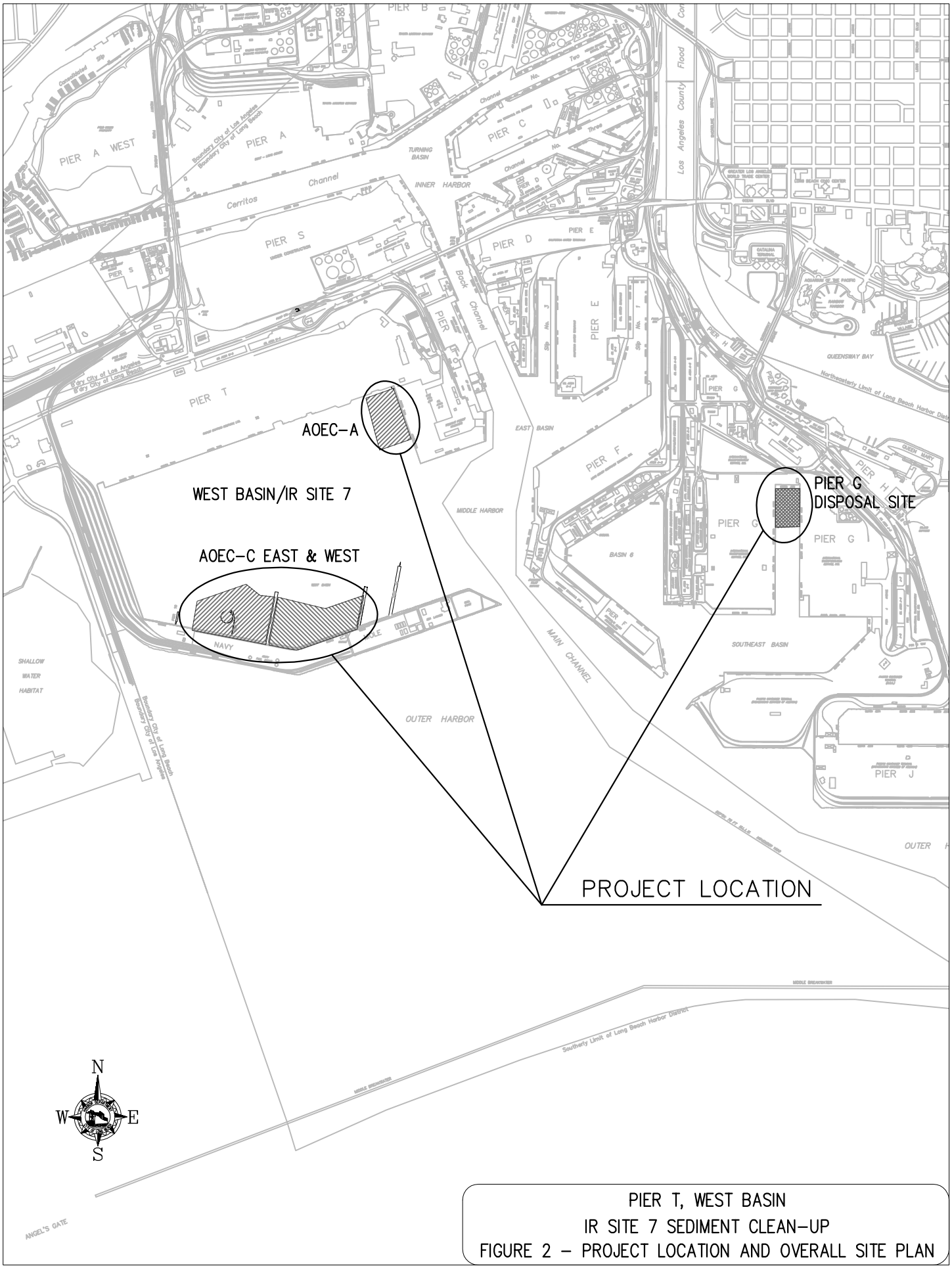


Figure 1. Project Vicinity Map



PIER T, WEST BASIN
IR SITE 7 SEDIMENT CLEAN–UP
FIGURE 2 – PROJECT LOCATION AND OVERALL SITE PLAN

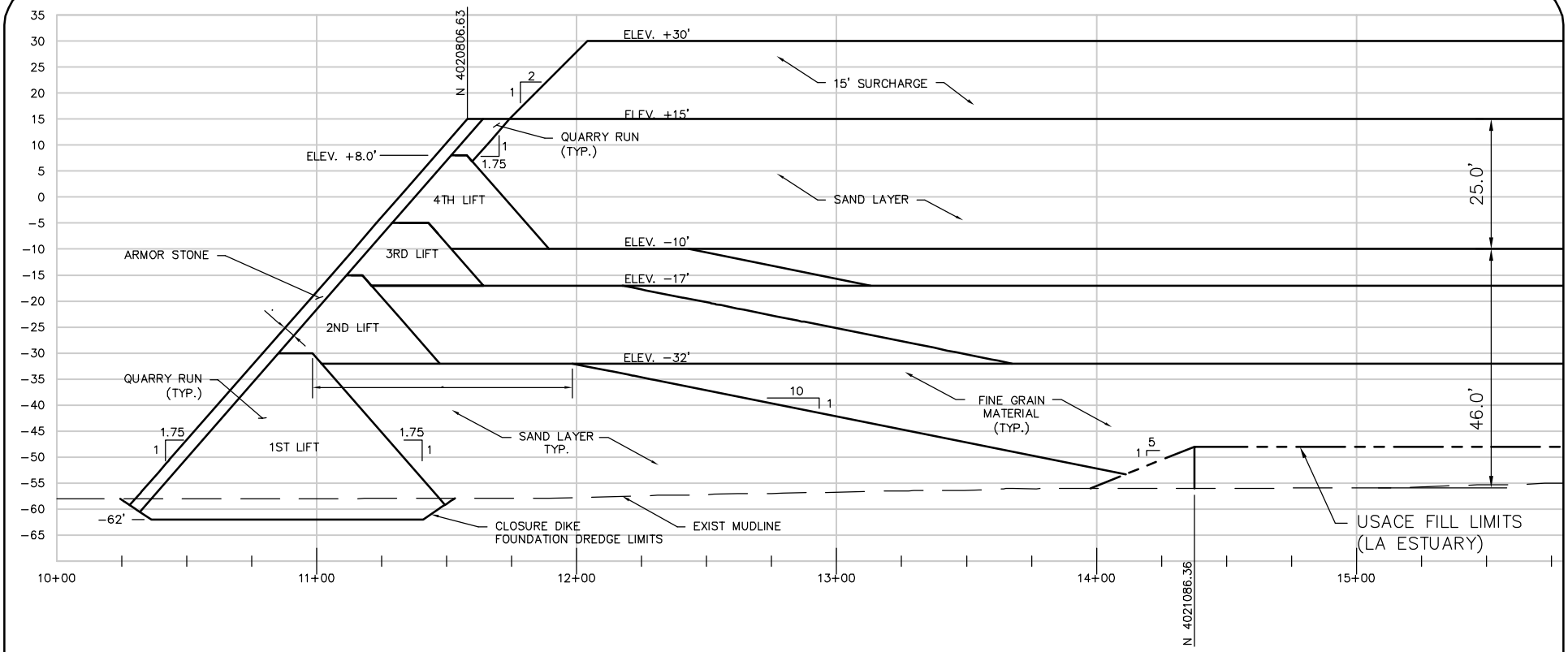
1.2 Project Objective and Need

Prior to redevelopment of the former LBNC by the Port, the Port agreed in the LIFOC to implement the U.S. Navy's cleanup goals for the site (as outlined in the U.S. Navy's ROD), which is the objective of the proposed project. In order to fulfill that purpose, the Port must:

- Dredge, using either mechanical or hydraulic equipment, a sufficient volume of material from AOEC-A and AOEC-C to achieve the mandated target cleanup goals (estimated to be up to 800,000 cubic yards [cy]) and transport that material to the approved Pier G fill site.
- Ensure that the removal of sediments achieves the SMOs for metals and organics as described in the ROD through dredging of the contaminated material.

In addition to the remedies specified in the ROD, to facilitate the project the Port must also remove the abandoned sonar calibration pier from AOEC-CW and remove, abate, and dismantle four sunken barges from AOEC-C.

The proposed project meets a public need for remediation of contaminated sites and enhancement of aquatic resources and the Port's need to implement the terms of the LIFOC.



HORIZONTAL GRAPHICAL SCALE

60' 0' 60' 120'

SCALE: 1''=60'

VERTICAL GRAPHICAL SCALE

30' 0' 30' 60'

SCALE: 1''=30'

VOLUMES (CU.YD)			
LIFT	ROCK	SAND	FINE GRAIN MATERIAL
1ST	37,462	88,169	332,009
2ND	13,356	47,492	270,894
3RD	9,962	17,895	139,205
4TH	12,028	614,570	–
5TH	2,757	–	–
TOTAL	75,565	768,126	742,108
TOTAL CAPACITY	1,585,799		
SURCHARGE	357,756		

PIER G, BERTHS G232 – G233
TERMINAL DEVELOPMENT PROJECT
FIGURE 3 – NORTH SLIP FILL CLOSURE DIKE – SECTION

1.3 Project Location and Existing Conditions

The project site comprises approximately 700 acres of submerged land in the Port's West Basin. The Port is an active commercial and recreational harbor with a multitude of ongoing land uses including marine container, break-bulk, and roll-on roll-off cargo terminals; commercial fishing facilities; military use; commercial satellite launching services; automobile import; and public boat launches.

The dredging and sonar pier demolition sites are located in the West Basin, bordered on the north by the Pier T container terminal, on the south by a U.S. Navy fuel facility and Port uses, to the east the Main Channel, and to the west the Pier 400 causeway.

1.4 Project Description

The proposed project involves dredging up to approximately 800,000 cy of contaminated sediments from AOEC-A, AOEC-CE, and AOEC-CW and placing that material off site in an approved fill site at the Port's Pier G. The location of Pier G in relation to the AOECs is shown in Figure 2. A cross-section of the approved fill site is shown in Figure 3. Table 1.1 depicts the depth below ground surface, including over depth, and volume of removal for each AOEC. Dredged material will be transported to and placed in the previously approved Pier G fill site.

Table 1.1
Volume of Depth Below Ground Surface

Dredge Area	Acreage (acres)	Depth of Remedial Removal (feet)	Allowed Contractor Over-dredge (feet)	Maximum Dredge Volume (cy)
AOEC-A	16.33	4	2	181,000
AOEC-CW	33.20	4	2	371,000
AOEC-CE	33.38	2	2	248,000

The method of dredging will be either mechanical, with dredged material transported via split-hull barge to the landfill, or hydraulic pipeline, with dredged material pumped in slurry form to the disposal site. Dredging would require 62 workdays to complete. Contaminated sediments would be dredged using an electric-powered clamshell dredge drawing power from the regional grid. Dredged material would be loaded into bottom-dump barges and hauled to the Pier G fill site. Emissions during dredging would be

generated by diesel-powered tugboats and support boats. Dredged materials would be placed at the Pier G fill site, which is an in-water site. Bottom-dump barges would drop their loads at the designated location. Dredging plans will be specifically designed to ensure that structures such as the wharf in Pier G are not damaged.

Additionally, the Port intends to demolish the existing abandoned sonar calibration pier located within AOEC-CW (Figure 2). Removal of the dilapidated structure requires abatement of asbestos-wrapped above-water utilities, removal of the timber and steel superstructure, and removal of the concrete piling. Materials would be recycled or disposed of at an approved upland disposal site. The Port also intends to retrieve four sunken barges from AOEC-C and place them upland for hazardous material inspection, abatement, and dismantlement. Demolition would generate an estimated 5,000 cy of debris during a 20-workday period. The pier would be demolished using in-water and on-land equipment, and the debris would be hauled by truck to a yet-to-be-determined existing permitted disposal site. Emissions would be generated by construction equipment at the demolition site, haul trucks taking debris to the disposal site, and commute vehicles. The debris disposal site would be an existing permitted facility; therefore, emissions at the disposal site are not included in this assessment.

The Pier G fill site has been designed to effectively contain chemically impacted materials and to control runoff of decant water from the settling of dredged material at the site. Impacts resulting from the construction and operation of the fill site were previously analyzed and authorized by the Port's Harbor Development Permit 00-007; Los Angeles Regional Water Quality Control Board (LARWQCB) Order No. 01-042, File No. 01-009; and Department of the Army Permit 2001-00395-AOA. Therefore, those impacts are not further considered in this document.

In order to ensure that removal of the sediments achieves the threshold SMOs for metals and organics as described in the ROD and shown in Table 1.2, the Port will implement a confirmation sampling program during construction.

Table 1.2
Sediment Management Objectives

Contaminant	Final SMO
Copper	254 mg/kg
Lead	100 mg/kg
Mercury	0.9 mg/kg
Silver	3.5 mg/kg
Zinc	307 mg/kg
Total PAH	5,400 µg/kg
Total PCBs	570 µg/kg
Total DDT	210 µg/kg

Note:
DDT = dichlorodiphenyltrichloroethane
mg/kg = milligram per kilogram
µg/kg = microgram per kilogram

1.5 Anticipated Permits and Other Approvals

Table 1-3 lists the permits and approvals that the proposed project would require.

Table 1.3
Anticipated Permits and Approvals

Agency	Permit
Port	Harbor Development Permit
U.S. Army Corps of Engineers (USACE)	Rivers and Harbors Act Section 10 Permit and Clean Water Act (CWA) Section 404 Permit
LARWQCB	CWA Section 401 Water Quality Certification (WQC) and Waste Discharge Requirement (WDR) under the Porter-Cologne Act

2 ENVIRONMENTAL FACTORS

2.1 Endangered Species Act

The California least tern *(Sterna antillarum browni)* and California brown pelican *(Pelecanus occidentalis)* are federally and state listed as endangered under the Endangered Species Act (ESA) of 1973. The California least tern nests at a designated site approximately 2 miles away from the project site on Pier 400 in the Port of Los Angeles between April 1 and September 1 and is protected at this site pursuant to an interagency nesting site agreement. Areas in the outer harbor shallower than -6.1 meters (-20 feet) MLLW are considered important feeding sites for the California least tern during their nesting season. The areas to be dredged for the proposed project are all more than 6.1 meters (20 feet) deep and thus would not be considered essential foraging habitat for the California least tern. California brown pelicans use the harbor year-round for resting but do not breed there. They may occasionally perch on structures in the project area.

The peregrine falcon (*Falco peregrinus)* is state listed as endangered and was federally delisted in 1999. This species has recently nested on the Schuyler F. Heim Bridge over the Cerritos Channel. Peregrine falcons could fly or forage over the proposed project area, but this species are not expected to be adversely affected by project activities because disturbances would be short term, disturbances would occur in only a limited area of the harbor, and the falcons are acclimated to harbor activities.

2.2 Essential Fish Habitat

The Port is located within an area designated as an Essential Fish Habitat (EFH) for two Fishery Management Plans, the Coastal Pelagics Plan and the Pacific Groundfish Management Plan. Four coastal pelagic species and two Pacific groundfish species were found in the Port's Inner Harbor in 2000 (MECAS 2002). Of coastal pelagics, only the northern anchovy (*Engraulis mordax*) were abundant. Of groundfish, only Pacific sanddab (*Citharichthys sordidus*) and black rockfish (*Sebastes melanops*) were identified, and both species were found at the southern end of the Back Channel.

Dredging would likely result in temporary increases in turbidity and suspended solids at the dredging site, which could decrease light penetration causing a decline in primary productivity due to decreased photosynthesis by phytoplankton. Any appreciable turbidity

increase may also cause clogging of gills and feeding apparatuses of fish and filter feeders. Direct impacts to benthic organisms include abrasion, entrainment, or mortality from the cutterhead dredge and clamshell bucket. Impacts to biological resources are expected to be minimized due to the localized nature of dredge operations within the West Basin. Chambers (2001) suggests that Southern California harbor dredging projects would probably not generate turbidity levels at 100 meters or more from the dredge site that would have a significant effect on marine organisms. Although fish could be affected by turbidity from dredging activities, studies have shown that large-scale channel dredging and landfill operations in the 1980s and 1990s did not have long-term adverse effects on fish populations (MECAS 1988; SAIC and MECAS 1996), as fish are able to avoid the impact by simply swimming out of the area.

Noise and disturbance associated with project activities could have short-term adverse impacts on aquatic habitat. However, because noise and disturbance from boat traffic and other activities within the Port are part of the ambient conditions and given the temporary nature of the project, impacts on fish in the proposed project area are expected to be temporary and minor. Dredging would remove chemically impacted sediments that were determined to pose an ecological risk. Therefore, while dredging may create adverse short-term impacts to benthic species and local fish populations (such as direct mortality of organisms, burial by settling of suspended sediments, reduced ingestion, or depressed filtration rates), these impacts are offset by the removal of contaminated sediments that pose an ecological risk and an ongoing hindrance to the overall health of the ecosystem in the West Basin. Following dredging of the impacted sediments, the benthic communities would re-colonize beginning immediately and should recover to a state of biomass and diversity that exceeds the pre-project condition. No permanent loss of benthic habitat would occur, and this would constitute a long-term benefit to managed EFH in the proposed project area.

2.3 Water Quality

Potential water column impacts at the dredge site include increased turbidity, increased oxygen demand, and slightly elevated levels of contaminants and nutrients. Dredging would likely result in temporary increases in turbidity and suspended solids at the dredging site.

There is often considerable confusion between the observation of turbidity in the field and the implications of these observations for water quality impacts from suspended sediments and contaminants. Research shows that there is no direct correlation between turbidity and either suspended sediment or contaminant concentrations that applies to all sediments and all dredge operations (Thackston and Palermo 2000). This is because the refractive properties (which reduce light penetration) and chemical concentrations of sediments vary from site to site. Turbidity may be caused by mechanisms other than suspended sediment—for example, high levels of plankton in the water column. Therefore, observations of increased turbidity should not be used as a primary indicator of either suspended sediment or contaminant impacts. Turbidity can be used as a general field indicator of where a plume is centered for the purposes of a wide range of water quality measurements. Furthermore, any exceedances of turbidity limits observed during dredge operations should not be inferred to constitute an impact related to chemical or suspended sediment concentrations unless confirmed through separate water quality analyses. Turbidity can provide a general indication of where suspended sediments and dissolved chemicals are being transported by water currents, but the chemical concentration that might be measured within that plume at two different sites (or even the same site over time) may vary significantly.

It is well understood that as dredging occurs, sediments are suspended in the water column. Usually water quality changes are only measurable in a relatively small area—often less than 20 to 50 meters from the point of dredging (Thackston and Palermo 2000). The magnitude of these water quality changes tends to decrease rapidly with increasing distance from the point of dredging (MBCAES 2000). Thus, increased turbidity may be obvious and pronounced a few meters from the dredge site but difficult to discern at slightly greater distances. Measurable water quality changes are typically for a short duration after dredging activity ceases, with the vast majority of sediments settling back to the bottom within 24 hours (DiGiano et al. 1995).

Suspended particulates would increase turbidity and could reduce dissolved oxygen concentrations in the water column. These effects are all expected to be localized and transient—the length of time it takes for the suspended material to settle combined with the current direction and velocity would determine the size and duration of the turbidity

plume. Chambers (2001) suggests that Southern California harbor dredging projects would probably not generate turbidity levels at 100 meters or more from the dredge site that would have a significant effect on marine organisms. Turbidity can be expected to dissipate in a period of 20 to 30 minutes as was recently demonstrated at the Dredged Material Management Program (DMMP) Pilot Capping Project in Long Beach (USACE 2002).

Dredging would be conducted in accordance with LARWQCB and U.S. Army Corps of Engineers (USACE) permit conditions, which could include:

- Adjusting the rate of dredging; slowing the cycle time reduces the quantity of sediment moving through the water column over a set time, which reduces the amount of total suspended solids (TSS).
- Decreasing velocity with which a mechanical dredge bucket is raised; reducing the speed at which the bucket is raised through the water column can improve water quality conditions; water currents can erode the material within the bucket as it is raised increasing the TSS throughout the water column.
- Controlling the velocity of a mechanical dredge bucket as it impacts sediments; as the bucket approaches the sediment, a pressure wave can occur that can increase the water turbidity near the mudline.
- Pausing a mechanical dredge bucket at the water line to allow drainage of excess water.
- Using a smaller or larger size mechanical dredge bucket or different type of bucket; different buckets may contain sediment within the bucket more effectively
- Washing mechanical dredge buckets out at the barge to clean off cohesive material prior to dropping bucket through the water column.
- Temporarily suspending operations until water quality conditions return to acceptable levels.

2.4 Air

An assessment of the air quality impacts of the proposed project was conducted by Jones and Stones in 2008 (Appendix A). Study analyses were based on the following assumptions regarding construction of the proposed project:

- Approximately 800,000 cy of material would be mechanically or hydraulically dredged and transported from IR Site 7, located in AOEC-A and AOEC-C, to the approved Pier G fill site. Dredging would require 62 workdays to complete.
- Contaminated sediments would be dredged using an electric-powered clamshell dredge drawing power from the regional grid. Dredged material would be loaded into bottom-dump barges and hauled to the Pier G fill site. Emissions during dredging would be generated by diesel-powered tugboats and support boats.
- Dredged materials would be placed at the Pier G fill site, which is an in-water site. Bottom-dump barges would drop their loads at the designated location.
- The sonar calibration pier from the U.S. Navy mole on the southern portion of IR Site 7 would be removed. Demolition would generate an estimated 5,000 cy of debris during a 20-workday period. The pier would be demolished using in-water and on-land equipment, and the debris would be hauled by truck to a yet-to-be-determined existing permitted disposal site. Emissions would be generated by construction equipment at the demolition site, haul trucks taking debris to the disposal site, and commute vehicles. The debris disposal site would be an existing permitted facility; therefore, emissions at the disposal site are not included in this assessment.

The assessment included a discussion of applicable significance criteria and analysis methodologies outlined in the following Southern California Air Quality Management District (SCAQMD) guidance documents:

- CEQA Air Quality Handbook (SCAQMD 2003)
- Localized Significance Threshold Methodology for CEQA Evaluations (SCAQMD 2003a)
- Particulate Matter (PM) 2.5 Significance Thresholds and Calculation Methodology (SCAQMD 2006)
- Off-road 2007 Mobile Source Emission Factors (ARB 2006)
- EMFAC 2007 (v2.3) Emission Factors (On-road)

The CEQA Guidelines also state that the significance criteria established by the applicable air quality management district or air pollution control district may be relied upon to make the determinations above.

Because of SCAQMD's regulatory role in the Port's West Basin, the significance thresholds and analysis methodologies outlined in the SCAQMD's CEQA Air Quality Handbook (SCAQMD 2003), Localized Significance Threshold Methodology for CEQA Evaluations (SCAQMD 2003a), and Final Methodology to Particulate Matter (PM) 2.5 Significance Thresholds and Calculation Methodology (SCAQMD 2006) guidance documents were used in evaluating project impacts.

2.4.1 Findings

- Unmitigated emissions of nitrogen oxides (NOx) during construction would exceed SCAQMD regional thresholds.
- Unmitigated emissions of other air pollutants (i.e., reactive organic compounds, carbon monoxide, and PM) during construction would be less than the CEQA thresholds.
- On-site diesel particulate matter (DPM) emissions that would occur during construction and would not result in a significant health risk to the closest sensitive-receptor locations.
- Temporary emissions of greenhouse gases would be an inconsequentially small fraction of the worldwide total emissions that are foreseen to cause global climate change. Therefore, greenhouse gas emissions would be less than significant.
- The project would be consistent with air quality policies set forth by SCAQMD and the Southern California Association of Governments (SCAG) as presented in the region's most recent Air Quality Management Plan (AQMP).
- Mitigation measures would be used to reduce NOx emissions during construction.

2.4.2 Mitigation Measures

Consistent with San Pedro Bay Ports Clean Air Action Plan (CAAP) the Port will require the contractor to implement the following feasible mitigation measures for harbor crafts, on-road vehicles, and off-road equipment.

Construction Equipment

- **MM-Air-1.** Maintain equipment and vehicle engines in good condition and in proper tune in accordance with manufacturers' specifications.
- **MM-Air-2.** To the extent practicable based on equipment availability, the Port will, for all construction equipment, require construction contractors to use construction equipment with oxidation catalysts and particulate traps instead of gasoline- or diesel-powered engines alone. Diesel-powered equipment that has been retrofitted with after-treatment products reduces NOx by 40 percent. However, where diesel-powered equipment has to be used because there are no practical alternatives, the Port will (to the extent practicable based on equipment availability) require construction contractors to use particulate filters and oxidation catalysts.
- **MM-Air-3.** To the extent practicable based on equipment availability, the Port will require construction contractors to use trucks supplying materials and supplies to the project site be fitted with oxidation catalysts or particulate traps. Demolition would generate an estimated 5,000 cy of debris during a 20-workday period, resulting in an estimated 40 net truck trips over a 62-day construction period. The pier would be demolished using in-water and on-land equipment, and the debris would be hauled by truck to a yet-to-be-determined existing permitted disposal site.
- **MM-Air-4.** Use electricity from power poles instead of temporary diesel- or gasoline-powered generators. Note the dredges proposed for this project will be electrically powered from an existing substation on Pier T.
- **MM-Air-5.** Prohibit heavy-duty construction vehicles from idling in excess of 5 minutes, both on and off site, to be consistent with state law.

Harbor Craft for Temporary Dredging Projects

- **MM-Air-6.** The Port will require dredging contractors to use harbor craft meeting U.S. Environmental Protection Agency (USEPA) Tier-2 standards for harbor crafts, or meet equivalent reductions, as well as require (no later than 5 years or when they first become available) all previously re-powered harbor craft to retrofit with the most effective Air Resources Board (ARB) verified/verifiable NOX and PM emissions reduction technologies.
- **MM-Air-7.** Require low-sulfur fuel in the engines at the following annual participation rates:
  - 2007 to 2009 – use of marine fuel in all main engines with a maximum sulfur content of 0.2 percent

The above mitigation measures would reduce emissions of NO_x, carbon monoxide (CO), and PM_{10}, and $PM_{2.5}$ to less than the SCAQMD CEQA thresholds. Therefore, the air quality impacts caused by the proposed project would be less than significant after mitigation.

3 AVOIDANCE AND MINIMIZATION OF IMPACTS

3.1 Alternatives Considered

During the RI/FS process, a number of alternatives were considered, including:

- No action
- Institutional controls (no dredging)
- Dredging with off-site disposal (outside IR Site 7)
- Dredging with on-site disposal (inside IR Site 7)

The final selected plan was determined to provide the greatest level of protection to IR Site 7 benthic communities, achieve the remedial action objectives, provide the greatest level of long-term effectiveness and permanence, and be easily implemented. The remedies of the proposed plan are:

- AOEC-A and AOEC-C: removal and discharge of the AOEC sediments at off-site (outside IR Site 7) projects, thereby creating a clean substrate supporting the presence of an ecologically productive and diverse benthic community.
- AOEC-B: no remedial action necessary to protect the environment as chemical concentrations have not resulted in sediment toxicity or adverse effects on the benthic community.
- AOEC-E, AOEC-F, and AOEC-G (Pier AOECs): limited action necessary to institute "institutional controls" for the purpose of preventing unauthorized or uncontrolled disturbance and/or exposure of beneath-pier chemically impacted sediments.

A subsequent ROD was prepared accepting the remedy and signed by the US Navy in September of 2007. For a complete description of investigations and operations at the former shipyard, please see the 2003 Final Feasibility Study Report, Installation Restoration Site 7, Naval Station Long Beach, prepared by Bechtel.

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APPENDIX A

AIR QUALITY STUDY

Final Report
Air Quality Assessment Report for Installation Restoration Site 7 Dredging and Demolition Project

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January 2008

Jones & Stokes. 2008. Final Report Air Quality Assessment Report for Installation Restoration Site 7 Dredging and Demolition Project. January. (J&S 01005.07.) Irvine, CA.

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Tables

Acronyms and Abbreviations

$\mu g/m^3$	micrograms per cubic meter
AB 32	Assembly Bill 32
AOEC	Areas of Ecological Concern
AQMP	Air Quality Management Plan
AQMPs	air quality management plans
ARB	California Air Resources Board
Basin	South Coast Air Basin
CAA	Clean Air Act
CAAQS	California Ambient Air Quality Standards
CCAA	California Clean Air Act
CEQA	California Environmental Quality Act
CO	carbon monoxide
CO_2	carbon dioxide
cy	cubic yards
DPM	diesel particulate matter
GHG	greenhouse gas
IR	Installation Restoration
LBNC	Long Beach Naval Complex
LIFOC	Lease in Furtherance of Conveyance
LST	Localized Significance Threshold
MATES II	*Multiple Air Toxics Exposure Study*
MLLW	mean lower low water
MPO	metropolitan planning organization
NAAQS	National Ambient Air Quality Standards
NO_2	nitrogen dioxide
NO_X	nitrogen oxides
O_3	Ozone
Pb	Lead
PM_{10}	inhalable particulate matter
$PM_{2.5}$	fine particulate matter
ppm	parts per million by volume
RCPG	Regional Comprehensive Plan and Guide
ROD	Record of Decision
SCAG	Southern California Association of Governments
SCAQMD	South Coast Air Quality Management District
SIP	State Implementation Plan
SO_2	sulfur dioxide
TAC	toxic air contaminant
USEPA	U.S. Environmental Protection Agency

Final Report
Air Quality Assessment Report for Installation Restoration Site 7 Dredging and Demolition Project

Port of Long Beach
Long Beach, CA

Executive Summary

Findings

This report provides an analysis of potential air quality impacts related to the Port of Long Beach Installation Restoration Site 7 Contaminated Sediment Dredge project, located on the waterfront at the Port of Long Beach.

All analyses have been conducted to comply with the South Coast Air Quality Management District (SCAQMD) requirements for air quality assessments to satisfy California Environmental Quality Act (CEQA) requirements. The analyses findings are as follows.

- Unmitigated emissions of nitrogen oxides (NO_X) during construction would exceed SCAQMD regional thresholds.
- Unmitigated emissions of other air pollutants (reactive organic compounds, carbon monoxide, and particulate matter) during construction would be less than the CEQA thresholds.
- The project's onsite diesel particulate matter (DPM) emissions that would occur during construction would not result in a significant health risk to the closest sensitive-receptor locations.
- The project's temporary emissions of greenhouse gases would be an inconsequentially small fraction of the worldwide total emissions that are foreseen to cause global climate change. Therefore, greenhouse gas emissions would be less than significant.

- The project would be consistent with air quality policies set forth by SCAQMD and the Southern California Association of Governments (SCAG) as presented in the region's most recent Air Quality Management Plan (AQMP).
- Mitigation measures are proposed to reduce NO_X emissions during construction. The Port will require all marine vessels and harbor craft working on the project to be equipped with EPA Tier 2 compliant engines. The mitigation would reduce emissions to less than the SCAQMD CEQA thresholds. Therefore, the air quality impacts caused by the proposed project would be less than significant after mitigation.

Introduction

Purpose

The basic project purpose is sediment remediation. The project meets a public need for remediation of contaminated sites and enhancement of aquatic resources. In 2003, the Navy completed its feasibility study for remediation of Installation Restoration (IR) Site 7 of the formal Long Beach Naval Complex (LBNC). IR Site 7 comprises approximately 700 acres of the Port of Long Beach, with water depths to -45 mean lower low water (MLLW). Under the Lease in Furtherance of Conveyance (LIFOC), executed between the Navy and the Port in August 1998, the Port assumes responsibility for the design and implementation of a suitable remediation for IR Site 7 contaminants of concern.

Project Site Location

The proposed demolition and dredging site is located on the waterfront at the Port of Long Beach. The site location is shown in Figure 1.

Project Description

In order to fulfill the requirements of the LIFOC and the clean-up goals as outlined in the U.S. Navy's Final Record of Decision (ROD) for the property, the Port intends to dredge approximately 600,000 cubic yards (cy) of chemically impacted sediments from the West Basin (IR Site 7) and place that material in the approved Pier G fill site. Specifically, in order to fulfill the project purpose, the Port must:

- Mechanically or hydraulically dredge and transport approximately 600,000 cy of material from IR Site 7 located in Areas of Ecological Concern (AOEC) A and C to the approved Pier G fill site. Dredging would require 62 workdays to complete. Contaminated sediment will be dredged using an

electric-powered clamshell dredge using line power from the regional grid. Dredge spoil will be loaded into bottom-dump barges, and hauled to the Pier G disposal site. Emissions during dredging will be generated by diesel-powered tugs and support boats.

- Drop dredged materials at the Pier G disposal area, which is an in-water site. Bottom-dump barges will drop their loads at the designated location. There would be minimal use of diesel-powered equipment at the disposal site.
- Remove the sonar calibration pier from the Navy mole on the southern portion of IR Site 7. Demolition would generate an estimated 5,000 cubic yards of debris during a 20-workday period. The pier will be demolished using on-water and on-land equipment, and the debris will be hauled by truck to a yet to be determined existing permitted disposal site. Emissions would be generated by construction equipment at the demolition site, haul trucks taking debris to the disposal site, and commute vehicles. The debris disposal site would be an existing permitted facility, so emissions at the disposal site are not included in this assessment.

Table 1 lists the diesel-powered equipment to be used for dredging, dredge spoil hauling, pier demolition, and demolition debris hauling. As listed in Table 1, some of the largest pieces of equipment would be powered by line electrical power rather than diesel engines. As described later, Port policy requires that all marine vessels be equipped with engines satisfying EPA's Tier-2 air emission standards.

Table 1. Emission-Generating Construction Equipment

Equipment Type	Number of Pieces	Hours per Day	No. Workdays	Default HP	Default Load Factor
Contaminated Sediment Dredging Equipment					
Electric-Powered Clamshell Dredge Engine	1	12	62	2500	0 (Electric)
Aux Generator on Dredge	1	12	62	75	0.1
Bottom Dump Scow	2	1	62	250	0.05
Tug Boat	1	4	62	4000	0.4
Work Tug	1	2	62	750	0.35
Work Boat	1	2	62	400	0.45
Crew Boat - Small	1	4	62	80	0.5
Crew Commute Vehicles	11-person work force, each commutes 50 miles round trip				
Pier Demolition Equipment					
Electric-Powered Derrick Barge	1	8	20	600	0 (Electric)
Work Tug	1	4	20	750	0.4
Crew Survey Boat - Small	1	4	20	80	0.5
Excavators	1	8	20	428	0.5
Flatbed Truck	1	8	20	230	0.5
End Dump Truck	1	8	20	310	0.45
Debris Hauling	25 truck loads per day for 20 workdays. Each truckload assumed to require a 50 mile round trip to the disposal facility.				
Crew Commute Vehicles	8-person work force, each commutes 50 miles round trip				

Air Quality Assessment

This air quality assessment includes a discussion of applicable significance criteria and analysis methodologies outlined in the following SCAQMD guidance documents:

- CEQA Air Quality Handbook,[1]

[1] SCAQMD. 2003. 2003 Air Quality Management Plan. Adopted August 1.

- Localized Significance Threshold Methodology for CEQA Evaluations,[2]
- Particulate Matter (PM) 2.5 Significance Thresholds and Calculation Methodology,[3]
- Off-Road 2007 Mobile Source Emission Factors,[4] and
- EMFAC 2007 (v2.3) Emission Factors (On-Road).

Based on these above-referenced guidance documents, this assessment evaluates the short-term construction-period impacts on localized and regional air quality that would result with implementation of the proposed project.

Environmental Setting

Regulatory Setting

A number of statutes, regulations, plans, and policies have been adopted that address air quality issues. The proposed project site and vicinity are subject to air quality regulations developed and implemented at the federal, state, and local levels. At the federal level, the U.S. Environmental Protection Agency (USEPA) is responsible for implementation of the federal Clean Air Act (CAA). Some portions of the CAA (e.g., certain mobile-source and other requirements) are implemented directly by the USEPA. Other portions of the CAA (e.g., stationary-source requirements) are implemented by state and local agencies.

Authority for Current Air Quality Planning

A number of plans and policies have been adopted by various agencies that address air quality concerns. Those plans and policies that are relevant to the proposed project are discussed below.

Federal Clean Air Act

The CAA was first enacted in 1955 and has been amended numerous times in subsequent years (1963, 1965, 1967, 1970, 1977, and 1990). The CAA establishes federal air quality standards, known as National Ambient Air Quality Standards (NAAQS), and specifies future dates for achieving compliance. The CAA also mandates that the state submit and implement a State Implementation

[2] SCAQMD. 2003. SCAQMD Air Quality Significance Thresholds. Available: <http://www.aqmd.gov/ceqa/handbook/signthres.doc>

[3] SCAQMD. 2006. Final Methodology to Calculate Particulate Matter (PM) 2.5 and PM 2.5 Significance Thresholds.

[4] ARB. 2006. Combined California ARB and USEPA standards for off-road compression ignition engines. Available: <http://www.arb.ca.gov/msprog/ordiesel/documents/Off-Road%20Diesel%20Stds.xls>.

Plan (SIP) for local areas not meeting those standards. The plans must include pollution control measures that demonstrate how the standards will be met. The City of Long Beach is within the South Coast Air Basin (Basin) and, as such, is in an area designated a nonattainment area for certain pollutants that are regulated under the CAA.

The 1990 amendments to the CAA identify specific emission-reduction goals for areas not meeting the NAAQS. These amendments require both a demonstration of reasonable further progress toward attainment and incorporation of additional sanctions for failure to attain or meet interim milestones. The sections of the CAA that would most substantially affect the development of the proposed project include Title I (Nonattainment Provisions) and Title II (Mobile-Source Provisions).

Title I provisions were established with the goal of attaining the NAAQS for criteria pollutants. Table 1 shows the NAAQS currently in effect for each criteria pollutant. The NAAQS were amended in July 1997 to include an 8-hour standard for ozone (O_3) and adopt a NAAQS for fine particulate matter ($PM_{2.5}$). The Basin fails to meet national standards for O_3, inhalable particulate matter (PM_{10}), and $PM_{2.5}$, and therefore is considered a federal nonattainment area for those pollutants. Table 2 lists each criteria pollutant and their related attainment status.

Emission Standards for Off-road Diesel Engines

To reduce emissions from off-road diesel equipment, USEPA established a series of cleaner emission standards for new off-road diesel engines.[5] Tier 1 standards were phased in from 1996 to 2000 (year of manufacture), depending on the engine horsepower category. Tier 2 standards were phased in from 2001 to 2006. Tier 3 standards will be phased in from 2006 to 2008. Tier 4 standards, which likely will require add-on emission control equipment to attain them, will be phased in from 2008 to 2015. These standards apply to construction and off-road equipment, but not marine vessels.

Emission Standards for Marine Diesel Engines

To reduce emissions from Category 1 (at least 50 horsepower [hp] but less than 5 liters per cylinder displacement) and Category 2 (5 to 30 liters per cylinder displacement) marine diesel engines, USEPA established emission standards for new engines, referred to as Tier 2 marine engine standards. The Tier 2 standards will be phased in from 2004 to 2007 (year of manufacture), depending on the engine size.[6] For the proposed project, this rule is assumed to affect harbor craft but not oceangoing vessel auxiliary engines because the latter would likely be manufactured overseas and, therefore, would be exempt from the rule.

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5 USEPA. 2004. Regulatory Announcement - Clean Air Nonroad Diesel Rule. EPA420-F-04-032. May 2004.

6 USEPA. 1999. Control of Emissions of Air Pollution From New Marine Compression-Ignition Engines at or Above 37 kW; Final Rule. *Federal Register* 64(249):73,300-–73,373.

California Clean Air Act

The California Clean Air Act (CCAA), signed into law in 1988, requires all areas of the state to achieve and maintain the California Ambient Air Quality Standards (CAAQS) by the earliest practical date. The CAAQS incorporate additional standards for most of the NAAQS criteria pollutants and set standards for other pollutants recognized by the state. In general, the California standards are more health protective than the corresponding NAAQS. California has also set standards for sulfates, hydrogen sulfide, vinyl chloride, and visibility-reducing particles. The Basin is in compliance with these California standards for sulfates, hydrogen sulfide, visibility-reducing particles, and vinyl chloride. Table 2 details the current NAAQS and CAAQS, while Table 3 provides the Basin's attainment status with respect to federal and state standards.

Global Warming Solutions Act of 2006 (AB 32)

On June 1, 2005, Governor Arnold Schwarzenegger signed Executive Order S-3-05. The goal of this Executive Order is to reduce California's greenhouse gas (GHG) emissions to: 1) 2000 levels by 2010; 2) 1990 levels by the 2020; and 3) 80% below the 1990 levels by the year 2050. In 2006, this goal was further reinforced with the passage of Assembly Bill 32 (AB 32), the Global Warming Solutions Act of 2006. AB 32 sets the same overall GHG emissions reduction goals while further mandating that the California Air Resources Board (ARB) create a plan, which includes market mechanisms, and implement rules to achieve "real, quantifiable, cost-effective reductions of greenhouse gases." Executive Order S-20-06 further directs state agencies to begin implementing AB 32, including the recommendations made by the state's Climate Action Team.

Table 2. Federal and State Ambient Air Quality Standards

Pollutant	Averaging Time	CAAQS[a]	NAAQS[b]
Ozone (O_3)	1 hour	0.09 ppm[c]	--
	8 hour	0.07 ppm	0.08 ppm
Carbon Monoxide (CO)	1 hour	20 ppm	35 ppm
	8 hour	9.0 ppm	9 ppm
Nitrogen Dioxide (NO_2)	1 hour	0.18 ppm	--
	Annual	0.030 ppm	0.053 ppm
Sulfur Dioxide (SO_2)	1 hour	0.25 ppm	--
	3 hour	--	0.5 ppm
	24 hour	0.04 ppm	0.14 ppm
	Annual	--	0.030 ppm
Inhalable Particulate Matter (PM_{10})	24 hour	50 $\mu g/m^3$[c]	150 $\mu g/m^3$
	Annual	20 $\mu g/m^3$	--
Fine Particulate Matter ($PM_{2.5}$)	24 hour	--	35 $\mu g/m^3$
	Annual	12 $\mu g/m^3$	15 $\mu g/m^3$
Sulfates	24 hour	25 $\mu g/m^3$	--
Lead (Pb)	30 day	1.5 $\mu g/m^3$	--
	Calendar quarter	--	1.5 $\mu g/m^3$
Hydrogen Sulfide	1 hour	0.03 ppm	--
Vinyl Chloride	24 hour	0.01 ppm	--

Notes:

[a] The CAAQS for O_3, CO, SO_2 (1-hour and 24-hour), NO_2, PM_{10}, and $PM_{2.5}$ are values not to be exceeded. All other California standards shown are values not to be equaled or exceeded.

[b] The NAAQS, other than O_3 and those based on annual averages, are not to be exceeded more than once a year. The O_3 standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above the standard is equal to or less than one.

[c] ppm = parts per million by volume; $\mu g/m^3$ = micrograms per cubic meter.

Source: California Air Resources Board, February 22, 2007.

Table 3. Federal and State Attainment Status for South Coast Air Basin

Pollutants	Federal Classification	State Classification
O_3 (1-hour standard)	—	Nonattainment
O_3 (8-hour standard)	Nonattainment, Severe-17	—
PM_{10}	Serious Nonattainment	Nonattainment
$PM_{2.5}$	Nonattainment	Nonattainment
CO	Attainment	Attainment
NO_2	Unclassified/Attainment	Attainment
SO_2	Attainment	Attainment

Source: California Air Resources Board, compiled by Jones & Stokes, September 2007.

Heavy Duty Diesel Truck Idling Regulation

This ARB rule became effective in February 1, 2005, and it prohibits heavy-duty diesel trucks from idling for longer than 5 minutes at a time. Truck idling for longer than 5 minutes while queuing is allowed, however, provided the queue is located beyond 100 feet from any homes or schools.[7]

California Diesel Fuel Regulations

This rule sets sulfur limitations for diesel fuel sold in California for use in on-road and off-road motor vehicles.[8] Harbor craft were originally excluded from the rule, but were later included by a 2004 rule amendment.[9] Under this rule, diesel fuel used in motor vehicles except harbor craft has been limited to 500-ppm sulfur since 1993. The sulfur limit was reduced to 15 ppm beginning September 1, 2006. (A federal diesel rule similarly limited sulfur content nationwide for on-road vehicles to 15 ppm beginning October 15, 2006.) Diesel fuel used in harbor craft in the SCAQMD also was limited to 500 ppm sulfur starting January 1, 2006, and 15 ppm sulfur by September 1, 2006.

Statewide Portable Equipment Registration Program (PERP)

The PERP establishes a uniform program to regulate portable engines and portable engine-driven equipment units.[10] Once registered in the PERP, engines and equipment units may operate throughout California without the need to

[7] ARB. 2006. Commercial Idling Restrictions. Available: <http://www.arb.ca.gov/toxics/idling/idling.htm>.

[8] ARB. 2004. California Diesel Fuel Regulations. Title 13, California Code of Regulations, Sections 2281-2285 and Title 17, California Code of Regulations, Section 93114. August 14, 2004.

[9] ARB. 2005. Final Regulation Order. Proposed Extension of the California Standards for Motor Vehicle Diesel Fuel to Diesel Fuel Used for Intrastate Diesel-Electric Locomotives and Harbor Craft. August 4.

[10] ARB. 2005. Regulation to Establish a Statewide Portable Equipment Registration Program. Effective September 1, 2005.

obtain individual permits from local air districts. The PERP generally would apply to proposed dredging and barge equipment.

South Coast Air Quality Management District

The SCAQMD has jurisdiction over an area of approximately 10,743 square miles. This area includes all of Orange County, all of Los Angeles County except for the Antelope Valley, the nondesert portion of western San Bernardino County, and the western and Coachella Valley portions of Riverside County. The Basin is a subregion of the SCAQMD jurisdiction. While air quality in this area has improved, the Basin requires continued diligence to meet air quality standards.

SCAQMD has adopted a series of air quality management plans (AQMPs) to meet the CAAQS and NAAQS. These plans require, among other emissions-reducing activities, control technology for existing sources; control programs for area sources and indirect sources; a SCAQMD permitting system designed to allow no net increase in emissions from any new or modified (i.e., previously permitted) emission sources; and transportation control measures.

The SCAQMD adopted a comprehensive AQMP update, the 2007 Air Quality Management Plan for the South Coast Air Basin, on June 1, 2007.[11] The Final 2007 AQMP addresses several federal planning requirements and incorporates significant new scientific data, primarily in the form of updated emissions inventories, ambient measurements, new meteorological episodes, and new air quality modeling tools. The 2007 AQMP builds upon the approaches taken in the 2003 Basin AQMP for the attainment of the federal air quality standards. Additionally, the 2007 air plan highlights the significant amount of reductions needed and the urgent need to identify additional strategies, especially in the area of mobile sources, to meet federal criteria pollutant standards within the timeframes allowed under federal CAA. After the 2007 AQMP is received and approved by the ARB, it will be sent to the USEPA for its final approval. Until the 2007 AQMP is approved by the USEPA, the 2003 AQMP remains in effect.

SCAQMD adopts rules and regulations to implement portions of the AQMP. Several of these rules may apply to construction or operation of the project. For example, SCAQMD Rule 403 requires implementing the best available fugitive dust control measures during active operations capable of generating fugitive dust emissions from onsite earth-moving activities, construction/demolition activities, and construction equipment travel on paved and unpaved roads. SCAQMD has published a handbook (CEQA Air Quality Handbook, November 1993) to help local governments analyze and mitigate project-specific air quality impacts. This handbook provides standards, methodologies, and procedures for conducting air quality analyses in environmental impact reports and was used extensively in the preparation of this report. In addition, SCAQMD has

[11] South Coast Air Quality Management District. 2007. Air Quality Management Plans. Last updated: October 2007. Available: < http://www.aqmd.gov/aqmp/AQMPintro.htm>. Accessed: November 8, 2007.

published two additional guidance documents (Localized Significance Threshold Methodology for CEQA Evaluations, June 2003, and Particulate Matter (PM) 2.5 Significance Thresholds and Calculation Methodology, October 2006) that provide guidance in evaluating localized effects from mass emissions during construction. Both were used in the preparation of this analysis.

Through the attainment planning process, the SCAQMD develops the *SCAQMD Rules and Regulations* to regulate sources of air pollution in the South Coast Air Basin.[12] The SCAQMD rules most pertinent to the proposed project are listed below. With the possible exception of dredging equipment during construction, the emission sources associated with the proposed project are considered mobile sources. Therefore, they are not subject to the SCAQMD rules that apply to stationary sources, such as Regulation XIII (New Source Review), Rule 1401 (New Source Review of Toxic Air Contaminants), or Rule 431.2 (Sulfur Content of Liquid Fuels).

SCAQMD Rule 402 – Nuisance. This rule prohibits discharge of air contaminants or other material that 1) cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public; 2) endanger the comfort, repose, health, or safety of any such persons or the public; or 3) cause, or have a natural tendency to cause, injury or damage to business or property.

SCAQMD Rule 403 – Fugitive Dust. This rule prohibits emissions of fugitive dust from any active operation, open storage pile, or disturbed surface area that remains visible beyond the emission source property line. During proposed project construction, best available control measures identified in the rule would be required to minimize fugitive dust emissions from proposed earth-moving and grading activities. These measures would include site pre-watering and re-watering as necessary to maintain sufficient soil moisture content. Additional requirements apply to construction projects on property with 50 or more acres of disturbed surface area, or for any earth-moving operation with a daily earth-moving or throughput volume of 5,000 cubic yards or more three times during the most recent 365-day period. These requirements include submittal of a dust control plan, maintaining dust control records, and designating a SCAQMD-certified dust control supervisor.

SCAQMD Rule 1403 – Asbestos Emissions from Demolition/Renovation Activities. The purpose of this rule is to limit emissions of asbestos, a toxic air contaminant, from structural demolition/renovation activities. The rule requires people to notify the SCAQMD of proposed demolition/renovation activities and to survey these structures for the presence of asbestos-containing materials (ACMs). The rule also includes notification requirements for any intent to disturb ACM; emission control measures; and ACM removal, handling, and disposal techniques. All proposed structural demolition activities associated with

[12] SCAQMD. 2007. South Coast Air Quality Management District Rules and Regulations.

proposed project construction would need to comply with the requirements of Rule 1403.

Regional Comprehensive Plan and Guide

SCAG is the regional planning agency for Los Angeles, Orange, Ventura, Riverside, San Bernardino, and Imperial Counties. It addresses regional issues relating to transportation, economy, community development, and environment. SCAG is the federally designated metropolitan planning organization (MPO) for the majority of the southern California region and is the largest MPO in the nation. With respect to air quality planning, SCAG has prepared the Regional Comprehensive Plan and Guide (RCPG) for the SCAG region, which includes Growth Management and Regional Mobility chapters, which form the basis for the land use and transportation components of the AQMP. These chapters are utilized in the preparation of air quality forecasts and the consistency analysis that is included in the AQMP.

Port of Long Beach Clean Air Policy

The Port of Long Beach has had a Clean Air Program in place since 2001 and began monitoring and measuring air quality in surrounding communities in 2004. Through this process, the Port has been able to identify emission sources and their relative contributions in order to develop effective emissions reduction strategies. The Port's Clean Air Program has included progressive programs such as alternative maritime power (AMP) and use of emulsified fuel and diesel oxidation catalysts (DOCs) in off-road equipment.

The Port, in conjunction with the Port of Los Angeles and with guidance from SCAQMD, ARB, and USEPA, has adopted the San Pedro Bay Ports Clean Air Action Plan (SPBP CAAP) to expand upon existing and develop new emission-reduction strategies. The SPBP CAAP was initiated in response to the Board of Harbor Commissioners. The SPBP CAAP was released as a draft plan for public review on June 28, 2006, and was approved by both the Los Angeles and Long Beach Board of Harbor Commissioners on November 20, 2006. The SPBP CAAP focuses on reducing emissions with two main goals: 1) reduce port-related air emissions in the interest of public health; and 2) accommodate growth in trade. The CAAP includes near-term measures implemented largely through the CEQA/NEPA process, tariffs, and new leases at both ports.

Existing Conditions

Regional Context

The project site is located within the Basin, an approximately 6,745-square-mile area bounded by the Pacific Ocean to the west and the San Gabriel, San Bernardino, and San Jacinto Mountains to the north and east. The Basin includes all of Orange County and the nondesert portions of Los Angeles, Riverside, and San Bernardino Counties, in addition to the San Gorgonio Pass area in Riverside County. The terrain and geographical location determine the

distinctive climate of the Basin, which is a coastal plain with connecting broad valleys and low hills.

The southern California region lies in the semi-permanent high-pressure zone of the eastern Pacific. As a result, the climate is mild, tempered by cool sea breezes. The usually mild climatological pattern is interrupted infrequently by periods of extremely hot weather, winter storms, or Santa Ana winds. The extent and severity of the air pollution problem in the Basin is a function of the area's natural physical characteristics (weather and topography) as well as man-made influences (development patterns and lifestyle). Factors such as wind, sunlight, temperature, humidity, rainfall, and topography all affect the accumulation and dispersion of pollutants throughout the Basin, making it an area of high pollution potential.

The greatest air pollution impacts throughout the Basin occur from June through September. This condition is generally attributed to the large amount of pollutant emissions, light winds, and shallow vertical atmospheric mixing. This frequently reduces pollutant dispersion, thus causing elevated air pollution levels. Pollutant concentrations in the Basin vary with location, season, and time of day. Ozone concentrations, for example, tend to be lower along the coast, higher in the near inland valleys, and lower in the far inland areas of the Basin and adjacent desert. Over the past 30 years, substantial progress has been made in reducing air pollution levels in southern California.

The SCAQMD has published a Basin-wide air toxics study (MATES II, *Multiple Air Toxics Exposure Study*, March 2000). The MATES II study represents one of the most comprehensive air toxics studies ever conducted in an urban environment. The study was aimed at determining the cancer risk from toxic air emissions throughout the Basin by conducting a comprehensive monitoring program, an updated emissions inventory of toxic air contaminants, and a modeling effort to fully characterize health risks for those living in the Basin. The study concluded the average carcinogenic risk in the Basin is approximately 1,400 in one million. Mobile sources (e.g., cars, trucks, trains, ships, aircraft, etc.) represent the greatest contributors. Approximately 70% of all risk is attributed to diesel particulate emissions, approximately 20% to other toxics associated with mobile sources (including benzene, butadiene, and formaldehyde), and approximately 10% of all carcinogenic risk is attributed to stationary sources (which include industries and certain other businesses, such as dry cleaners and chrome plating operations). The SCAQMD is in the process of updating the MATES II study with a MATES III study.

Local Area Conditions

Local Climate

Data from the Western Regional Climate Center's Long Beach climate monitoring station was used to characterize project vicinity climate conditions because it is nearest to the project site. The average project area summer (August) high and low temperatures are 80.6°F and 62.5°F, respectively, while

the average winter (January) high and low temperatures are 65.2°F and 45.6°F, respectively. The average annual rainfall is 12.60 inches.[13]

The wind monitoring station located nearest to the project site is also in Long Beach; therefore, data from the Long Beach wind monitoring station was used to characterize study area wind conditions. Wind patterns in the project vicinity display a nearly unidirectional flow, primarily from the west, at an average speed of 3.2 miles per hour. Calm wind conditions are present 17.5 percent of the time.[14]

Existing Pollutant Levels at Nearby Monitoring Station

The SCAQMD has divided the Basin into air monitoring areas and maintains a network of air quality monitoring stations located throughout the Basin. The project site is located in the South Los Angeles County Coastal Monitoring Area (i.e., Source Receptor Area [SRA] Number 4). This SRA is served by the North Long Beach Monitoring Station, which is located approximately 5 miles north of the port in the city of Long Beach. All criteria pollutants are monitored at the Long Beach Station, including O_3, CO, NO_X, PM_{10}, and $PM_{2.5}$.

Monitoring data, shown in Table 4, show the following pollutant trends: neither state nor national O_3 standards were exceeded during the 3-year period. CO and NO_2 concentrations are low, and also recorded no exceedances during the 3-year reporting period. Particulate (PM_{10} and $PM_{2.5}$) concentrations are largely affected by meteorology and show some variability during the 3-year reporting period. The state 24-hour PM_{10} standard was exceeded four times in 2004, four times in 2005, and five times in 2006, while the national standard not exceeded during the 3-year reporting period. The national $PM_{2.5}$ standard was exceeded once in 2004.

[13] Western Regional Climate Center. 2007. Los Angeles Area, California Climate Summaries. Long Beach, California (045082). Available: <http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?ca5082>. Accessed: October 10, 2007.

[14] South Coast Air Quality Management District. Regional air quality monitoring data. Available: <ftp://ftp.aqmd/pub/metdatalongbch.exe>. Accessed: October 10, 2007.

Table 4. Air Quality Data from North Long Beach Station (ARB 70072)

Pollutant Standards	2004	2005	2006
Ozone (O_3)			
State standard (1-hour average = 0.09 ppm)			
National standard (8-hour average = 0.08 ppm)			
Maximum concentration 1-hour period (ppm)	0.090	0.091	0.081
Maximum concentration 8-hour period (ppm)	0.074	0.069	0.058
Days state 1-hour standard exceeded	0	0	0
Days national 8-hour standard exceeded	0	0	0
Carbon Monoxide (CO)			
State standard (8-hour average = 9 ppm)			
National standard (8-hour average = 9 ppm)			
Maximum concentration 8-hour period (ppm)	3.37	3.51	3.36
Days state/national 8-hour standard exceeded	0	0	0
Nitrogen Dioxide (NO_2)			
State standard (1-hour average = 0.18 ppm)			
Maximum 1-hour concentration	0.121	0.136	0.102
Days state standard exceeded	0	0	0
Suspended Particulates (PM_{10})			
State standard (24-hour average = 50 µg/m^3)			
National standard (24-hour average = 150 µg/m^3)			
Maximum state 24-hour concentration	72.0	66.0	78.0
Maximum national 24-hour concentration	72.0	66.0	78.0
Days exceeding state standard	4	4	5
Days exceeding national standard	0	0	0
Suspended Particulates ($PM_{2.5}$)			
National standard (24-hour average = 35 µg/m^3)			
Maximum 24-hour concentration	66.6	53.8	58.5
Days exceeding national standard[a]	1	0	0

Notes:

[a] Number of exceedances based on NAAQS applicable during period shown (65 µg/m^3). Standard was changed to 35 µg/m^3 in November 2006, to be applied to 2007.

Source: California Air Resources Board, compiled by Jones & Stokes, October 2007.

Existing Health Risk in the Surrounding Area

Because of the local meteorology and the site's vicinity to the coast, the cancer risk of the surrounding area varies substantially from 50 to 750 in one million. According to ARB cancer inhalation risk data, the project area is within a cancer risk zone of approximately 250 to 500 in one million.[15] This is largely due to diesel particulates directly emitted from the ports themselves.

Sensitive Receptors and Locations

The proposed dredging and pier demolition projects are within the heavily industrialized portions of the Port of Long Beach. For this analysis it was assumed *sensitive receptors* include Port tenants working within their leased facilities. The tenant facility nearest the project site is the Hanjin Terminal, north of the project site on Terminal Island. That tenant is approximately 0.5 mile from the project site.

Significance Thresholds

Appendix G of the CEQA Guidelines presents guidance for making significance determinations. Appendix G states that a project would normally have a significant effect on the environment if it would:

- conflict with or obstruct implementation of the applicable air quality management plan;
- violate any air quality standard or contribute substantially to an existing or projected air quality violation;
- result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions that exceed quantitative thresholds for ozone precursors);
- expose sensitive receptors to substantial pollutant concentrations; or,
- create objectionable odors affecting a substantial number of people.

The CEQA Guidelines also state that the significance criteria established by the applicable air quality management district or air pollution control district may be relied upon to make the determinations above.

Because of SCAQMD's regulatory role in the Basin, the significance thresholds and analysis methodologies outlined in the SCAQMD *CEQA Air Quality Handbook*, *Localized Significance Threshold Methodology for CEQA Evaluations*, and *Particulate Matter (PM) 2.5 Significance Thresholds and*

[15] California Air Resources Board. Cancer Inhalation Risk: Local Maps by Category, 2007. Available: <http://www.arb.ca.gov/toxics/cti/hlthrisk/cncrinhl/riskmapviewfull.htm

Calculation Methodology guidance documents were used in evaluating project impacts.

Construction Emissions

According to criteria set forth in the SCAQMD CEQA Air Quality Handbook, Localized Significance Threshold Methodology for CEQA Evaluations, and Particulate Matter (PM) 2.5 Significance Thresholds and Calculation Methodology guidance documents, the project would have a significant impact on construction emissions if any of the following were to occur.

- Regional emissions from both direct and indirect sources (including offsite haul trucks and worker commute vehicles) exceed any of the following SCAQMD prescribed threshold levels: (1) 75 pounds a day for ROC, (2) 100 pounds per day for NO_X, (3) 550 pounds per day for CO, (4) 150 pounds per day for PM_{10} or SO_X, and (5) 55 pounds per day for $PM_{2.5}$.
- For purposes of screening potential ambient air quality impacts at the nearest sensitive receptors, the localized emissions from onsite construction equipment (not including offsite hauling or worker commute vehicles) would be significant if they exceed any of the following SCAQMD prescribed threshold levels: (1) 394 pounds per day for NO_X, (2) 8,924 pounds per day for CO, (3) 46 pounds per day for PM_{10}, and (4) 25 pounds per day for $PM_{2.5}$.[16]

Toxic Air Contaminants

According to guidelines provided in the SCAQMD *CEQA Air Quality Handbook*, the project would have a significant impact from toxic air contaminants if:

- Onsite sources emit carcinogenic or toxic air contaminants that individually or cumulatively exceed the maximum individual cancer risk of 10 in one million (1.0×10^{-5}) or an acute or chronic hazard index of 1.0;[17] or
- Hazardous materials associated with onsite stationary sources result in an accidental release of air toxic emissions or acutely hazardous materials, posing a threat to public health and safety.

[16] Derived from SCAQMD Localized Significance Threshold Tables – SRA 4 (South Coastal LA County), 5-acre site, 500-meter receptor distance.

[17] SCAQMD Risk Assessment Procedures for Rules 1401 and 212, November 1998.

Methodology

Construction Emissions

Mass daily tailpipe emissions were estimated based on the equipment inventory listed in Table 1. The equipment inventory and construction schedule were provided by the applicant.[18]

Emission factors for on-road haul trucks and worker commute vehicles were based on SCAQMD EMFAC 2007 emission factors (www.aqmd.gov/ceqa/handbook/onroad/onroad.html), assuming a 2008 construction year. Emission factors for off-road, on-road, and construction equipment were based on SCAQMD's off-road emission factor data[19], using an assumed 2008 construction year.

Uncontrolled tailpipe emission factors for diesel-powered marine tugs and support boats were developed based on USEPA's guidance document "Analysis of Commercial Marine Vessel emissions and Fuel Consumption Data (USEPA 2000).[20] Mitigated tailpipe emission factors for marine vessels were derived by assuming all marine vessels contracted by the Port must satisfy EPA's Tier 2 emission standards (40 CFR Part 89, Control of Emissions of Air Pollution from New Marine Compression-Ignition Engines Above 37 kW).

Fugitive dust PM_{10} emissions generated during demolition of the pier were estimated based on an emission factor of 0.00042 lbs per cubic foot, derived from Table A9-9-H of SCAQMD's 1993 CEQA Handbook.

Toxic Air Contaminants Impacts during Construction

The proposed action consists of a temporary dredging and demolition project using diesel-powered equipment. The dominant toxic air contaminant (TAC) generated by diesel-powered construction equipment is diesel particulate matter (DPM), which is a suspected carcinogen. Particulate emissions from construction equipment tailpipes were estimated using the methodology described previously. For this assessment, it was assumed that all particulate matter emitted by diesel-powered equipment is DPM.

[18] Crouch, Stacey. Port of Long Beach. August 28, 2007—email to Kris Bonner, Jones & Stokes.

19 South Coast Air Quality Management District. 2007. Off-road Mobile Source Emission Factors. Last updated: June 2007. Available: <www.aqmd.gov/ceqa/handbook/offroad/offroad.html>. Accessed: November 8, 2007.

[20] USEPA. 2000. Analysis of Commercial Marine Vessel Emissions and Fuel Consumption Data. EPA Report 4-20-R-08-002. February 2000.

Climate Change/Greenhouse Gas Emissions during Construction

The proposed action consists of a temporary dredging and demolition project using diesel-powered equipment. Project-related GHG emissions were estimated by the following methods:

- The number of horsepower hours per year of construction equipment usage was estimated based on the equipment inventory listed in Table 1.
- The number of gallons of diesel fuel used to operate diesel-powered construction equipment was estimated using a factor of 0.05 gallons per horsepower-hour using USEPA's NONROAD2005 model.[21]
- The number of gallons of gasoline used by worker commute vehicles was estimated assuming an average passenger vehicle fuel economy of 20 miles per gallon.
- The following carbon dioxide emission factors for mobile source fuel combustion were used:[22]
  - Diesel fuel: 22.4 lbs per gallon.
  - Gasoline: 19.6 lbs per gallon.

Air Quality Impact Analysis

Construction Impacts

Regional Construction Emissions

Construction of the proposed project has the potential to create air quality impacts through the use of heavy-duty construction equipment, through on-road haul trucks shipping demolition debris to the local disposal site, and through vehicle trips generated from construction workers commuting to and from the project site. In addition, fugitive dust emissions would result from pier demolition activities.

Overall, construction is anticipated to begin and end during 2008. The total amount of construction, the duration of construction, and the intensity of

[21] USEPA. 2005. User's Guide to Final NONROAD2005 Emission Model. EPA Report EPA/420-R-05-013. Last updated: December 2005. Available: <http://www.epa.gov/otaq/nonrdmdl.htm>. Accessed: June 2007.

[22] Energy Information Agency. 2007. Voluntary Reporting of Greenhouse Gases Program, Fuel and Energy Source Codes and Emission Coefficients. Available: <http://www.eia.gov.oiaf/1605/coefficients.html>. Accessed: June 2007.

construction activity could have a substantial effect upon the amount of construction emissions, the concentrations, and the resulting impacts occurring at any one time. As such, the emission forecasts provided herein reflect a specific set of conservative assumptions based on the expected construction scenario wherein a relatively large amount of construction is occurring in a relatively intensive manner. Because of this conservative assumption, actual emissions could be less than those forecasted. If construction is delayed or occurs over a longer time period, emissions could be reduced because of (1) a more modern and cleaner burning construction equipment fleet mix, and/or (2) a less intensive buildout schedule (i.e., fewer daily emissions occurring over a longer time interval).

Table 5a shows estimated unmitigated regional emissions generated by on-water equipment and worker commute vehicles during dredging, barging, and disposal of contaminated sediment. The uncontrolled emission estimates assume that none of the on-water equipment uses EPA Tier 2-compliant engines. The maximum daily NOx emissions would be 132 pounds per day (lbs/day), which exceeds the SCAQMD regional significance threshold. Forecast unmitigated daily emissions of ROC, CO, PM_{10}, and $PM_{2.5}$ are less than the SCAQMD CEQA thresholds. Mitigation to reduce NOx emissions is warranted based on the exceedance of the SCAQMD threshold. Table 5b shows the mitigated regional emissions for the dredging activity after applying the Port's mitigation measure of requiring all marine vessels to use Tier 2 compliant engines. The mitigated emissions for all pollutants during the dredging activity would be less than the respective SCAQMD CEQA thresholds. Therefore, the air quality impacts during the dredging activity would be less than significant after mitigation.

Table 5a. Unmitigated Regional Construction Emissions during Contaminated Sediment Dredging, Barging, and Disposal (pounds per day)

Project Component	ROC	NO_X	CO	SO_X	PM_{10}[a]	$PM_{2.5}$[a]
On-Water Marine Vessel Emissions	0.9	131	11	11	3	3
Worker Commute Vehicles	0.8	0.6	6	Negligible	0.05	0.05
Maximum Project Emissions	1.7	**132**	17	11	3	3
Regional Significance Threshold	75	100	550	150	150	55
Exceed Threshold?	**No**	**YES**	**No**	**No**	**No**	**No**

Notes:

Emissions calculation worksheets are included in Appendix A.

[a] All particulate matter emitted from marine vessel tailpipes was assumed to consist of PM_{10} and $PM_{2.5}$.

Table 5b. Mitigated Regional Construction Emissions during Contaminated Sediment Dredging, Barging, and Disposal (pounds per day)

Project Component	ROC	NO_X	CO	SO_X	PM_{10}[a]	$PM_{2.5}$[a]
On-Water Marine Vessel Emissions (EPA Tier-2 Emission Standards)	0.9	88	61	11	2.5	2.5
Worker Commute Vehicles	0.8	0.6	6	Negligible	0.05	0.05
Maximum Project Emissions	1.7	89	67	11	2.5	2.5
Regional Significance Threshold	75	100	550	150	150	55
Exceed Threshold?	**No**	**No**	**No**	**No**	**No**	**No**

Notes:

Emissions calculation worksheets are included in Appendix A.

[a] All particulate matter emitted from marine vessel tailpipes was assumed to consist of PM_{10} and $PM_{2.5}$.

Table 6a shows estimated unmitigated regional emissions generated by demolition of the sonar calibration pier. Equipment included in the regional emission estimate includes marine vessels and support boats, on-land construction equipment, on-road highway trucks used to haul demolition debris to the disposal site, and worker commute vehicles. The uncontrolled emission estimates assume that none of the on-water equipment uses EPA Tier 2-compliant engines. The maximum daily NOx emissions would be 105 pounds per day (lbs/day), which exceeds the SCAQMD regional significance threshold. Forecast unmitigated daily emissions of ROC, CO, PM_{10}, and $PM_{2.5}$ are less than the SCAQMD CEQA thresholds. Mitigation to reduce NOx emissions is warranted based on the exceedance of the SCAQMD threshold. Table 6b shows the mitigated regional emissions for the pier demolition activity, after applying the Port's mitigation measure of requiring all marine vessels to use Tier 2 compliant engines. The mitigated emissions for all pollutants during the pier demolition activity would be less than the respective SCAQMD CEQA thresholds. Therefore, the air quality impacts during the pier demolition activity would be less than significant after mitigation.

Table 6a. Unmitigated Regional Construction Emissions during Pier Demolition and Debris Hauling (pounds per day)

Project Component	ROC	NO_X	CO	SO_X	PM_{10}[a]	$PM_{2.5}$[a]
On-Water Demolition Equipment	0.1	23.7	1.9	1.9	0.6	0.6
Demolition Fugitive Dust	0	0	0	0	5	2.5
On-Land Pier Demolition Equipment	2	24	7	0.04	1	1
Demolition Debris Haul Trucks	4	56	17	0.05	3	3
Worker Commute Vehicles	1	1	5	Negligible	0.03	0.03
Maximum Project Emissions	7	**105**	31	2	10	10
Regional Significance Threshold	75	100	550	150	150	55
Exceed Threshold?	**No**	**YES**	**No**	**No**	**No**	**No**

Notes:

Emissions calculation worksheets are included in Appendix A.

[a] Fugitive PM_{10} and $PM_{2.5}$ emissions estimates take into account compliance with SCAQMD Rule 403 requirements for fugitive dust suppression, which require that no visible dust be present beyond the site boundaries.

Table 6b. Mitigated Regional Construction Emissions during Pier Demolition and Debris Hauling (pounds per day)

Project Component	ROC	NO_X	CO	SO_X	PM_{10}[a]	$PM_{2.5}$[a]
On-Water Demolition Equipment (EPA Tier-2 Emission Standards)	0.1	15.9	11	1.9	0.4	0.4
Demolition Fugitive Dust	0	0	0	0	5	2.5
On-Land Pier Demolition Equipment	2	24	7	0.04	1	1
Demolition Debris Haul Trucks	4	56	17	0.05	3	3
Worker Commute Vehicles	1	1	5	Negligible	0.03	0.03
Maximum Project Emissions	7	97	40	2	9	9
Regional Significance Threshold	75	100	550	150	150	55
Exceed Threshold?	**No**	**No**	**No**	**No**	**No**	**No**

Notes:

Emissions calculation worksheets are included in Appendix A.

[a] Fugitive PM_{10} and $PM_{2.5}$ emissions estimates take into account compliance with SCAQMD Rule 403 requirements for fugitive dust suppression, which require that no visible dust be present beyond the site boundaries.

Local Construction Ambient Concentration Impacts

The SCAQMD has developed a set of mass emissions rate look-up tables that can be used to evaluate localized impacts that may result from construction-period emissions. If the onsite emissions from proposed construction activities are below the localized significance threshold (LST) emission levels found in the LST mass rate look-up tables for the project site's SRA, then project emissions would not have the potential to cause a significant localized air quality impact.

When quantifying mass emissions for LST analysis, only emissions that occur *on site* are considered. Consistent with SCAQMD LST guidelines, emissions related to offsite delivery/haul truck activity and employee trips are not considered in the evaluation of localized impacts.

The SCAQMD screening analysis requires consideration of the closest *sensitive receptor*. The proposed dredging and demolition site is within the industrial portion of the Port, surrounded by Port operations and tenant facilities. For this ambient air quality screening analysis, the closest sensitive receptor was defined as the nearest port tenant: the Hanjin Terminal, on Terminal Island approximately 0.5 mile north of the dredging site.

A conservative estimate of the project's construction-period onsite mass emissions is presented in Table 7 (dredging activity) and Table 8 (pier demolition activity). These mitigated emission rates account for the Port's mitigation measure of requiring all marine vessels used for the proposed project to use Tier 2 compliant engines. Forecast mitigated daily emissions of all pollutants are less than the SCAQMD CEQA thresholds for both the dredging activity and the pier demolition activity. Therefore, the ambient air quality impacts at the closest sensitive receptor location would be less than significant after mitigation.

The maximum daily emission rates for CO, PM_{10}, and $PM_{2.5}$ are less than their respective thresholds. Therefore, no mitigation measures are necessary beyond the required compliance with SCAQMD Rule 403, which is integral to the project and not CEQA mitigation, for pollutants other than NO_X.

Table 7. Mitigated, Localized On-Water Dredging Emissions Compared to Ambient Concentration Impact Thresholds (pounds per day)

Project Component	NO_X	CO	PM_{10}	PM_{25}
On-Water Marine Vessel Emissions (EPA Tier-2 Marine Vessels)	88	61	2.5	2.5
Localized Significance Threshold[a]	394	8,924	46	25
Exceed Threshold?	**No**	**No**	**No**	**No**

Notes:

Emissions calculation worksheets are included in Appendix A.

(a) The project site is located in SCAQMD SRA No. 4 (South Central LA County). These LSTs are based on the site location SRA, distance to the nearest sensitive-receptor location from the project site (more than 500 meters), and the project area (5 acres).

Table 8. Mitigated, Localized Pier Demolition Emissions Compared to Ambient Concentration Impact Thresholds (pounds per day)

Project Component	NO_X	CO	PM_{10}[a]	PM_{25}[a]
On-Water Demolition Equipment (EPA Tier-2 Marine Vessels)	16	11	0.4	0.4
Demolition Fugitive Dust	0	0	5	2.5
On-Land Pier Demolition Equipment	24	7	1	1
Maximum Onsite Emissions	40	18	6	4
Localized Significance Threshold[b]	394	8,924	46	25
Exceed Threshold?	**No**	**No**	**No**	**No**

Toxic Air Contaminants

The greatest potential for TAC emissions would be related to diesel particulate emissions associated with heavy equipment operations during site grading activities. The SCAQMD does not consider diesel-related cancer risks from construction equipment to be an issue due to the short-term nature of construction activities. Construction activities associated with the proposed project would be sporadic, transitory, and short term in nature (approximately 80 to 90 days of construction). The assessment of cancer risk is typically based on a 70-year exposure period. The closest sensitive receptors are industrial workers at a Port of Long Beach tenant facility (Hanjin Terminal, approximately 0.5 mile away). Because exposure to diesel exhaust would occur only for durations well below the 70-year exposure period, construction of the proposed project is not anticipated to result in an elevated cancer risk to exposed persons due to the

short-term nature of construction. As such, project-related toxic emission impacts during construction would not be significant.

Climate Change/Greenhouse Gas Emissions

Because the emission sources associated with the proposed project are internal combustion engines, the predominant greenhouse gas emitted by the project would be carbon dioxide (CO_2). Table 9 presents the estimated fuel usage and the estimated construction emissions of CO_2. The GHG emissions listed in Table 9 would occur only during the brief construction period. The proposed project would not include any operational emissions.

Because quantitative GHG guidelines including thresholds have not been developed by the SCAQMD, these emissions are provided for information purposes only. According to a recent white paper by the Association of Environmental Professionals, "an individual project does not generate enough GHG emissions to significantly influence global climate change. Global climate change is a cumulative impact; a project participates in this potential impact through its incremental contribution combined with the cumulative increase of all other sources of GHG emissions." The temporary GHG emissions generated by the proposed construction project would be an inconsequentially small fraction of the worldwide GHG emissions during the brief construction period. Therefore, project-related impacts are expected to be less than significant because climate change would not occur directly from project emissions.

Table 9. Estimate of Regional Operational Greenhouse Gas Emissions (Tons, total project)

Project Component	Project Total Gallons of Fuel	Project Total CO_2 Emissions (Tons)
On-water diesel equipment	23,000	260
On-land diesel construction equipment	1,400	41
On-road diesel haul trucks	5,000	56
On-road worker commute vehicles (gasoline)	2,100	21
Total Project	**31,500**	**378**
SCAQMD Significance Threshold		No current threshold
Exceed Significance Threshold?		**NA**

Objectionable Odors

Operation of the proposed project would increase air pollutants due to the combustion of diesel fuel. Some individuals may feel that diesel combustion emissions are objectionable, although quantifying the odorous impacts of these emissions to the public is difficult. The mobile nature of most project emission sources would help disperse proposed project emissions. Additionally, the distance between proposed project emission sources and the nearest residents is expected to be far enough to allow for adequate dispersion of these emissions to below objectionable odor levels.

Project Consistency with Regional AQMP

SCAG is the regional planning agency for Los Angeles, Orange, Ventura, Riverside, San Bernardino, and Imperial Counties, and addresses regional issues relating to transportation, economy, community development, and environment. With regard to air quality planning, SCAG has prepared the RCPG, which includes Growth Management and Regional Mobility chapters that form the basis for the land use and transportation control portions of the AQMP. These documents are utilized in the preparation of the air quality forecasts and consistency analysis included in the AQMP. Both the RCPG and AQMP are based, in part, on projections originating with County and City General Plans.[23]

The proposed project is one component of the Port of Long Beach's long-term development strategy. SCAG included the operations of regional marine terminals, including the Port of Long Beach, in its regional emission estimates for the RCPG. To be consistent with the recently approved SPBP CAAP and the regional air quality plan, the air quality analysis assumes proposed project compliance with the SPBP CAAP. Project mitigation measures applied to reduce air emissions and public health impacts are largely consistent with, and in some cases exceed, the emission-reduction strategies of the SPBP CAAP. Therefore, it is concluded the proposed project is consistent with the AQMP.

Cumulative Impacts

Cumulative impacts to air quality could occur as a result of air pollutant emissions from mobile, area, and stationary sources attributed to the proposed project's temporary construction emissions in combination with other cumulative projects throughout the Basin. However, cumulative thresholds for air quality are the same as those used when considering a project-specific air quality impact because the thresholds are related to a project's contribution to the regional air

[23] SCAG serves as the federally designated metropolitan planning organization (MPO) for the Southern California region.

quality baseline (as determined by SCAQMD's modeling that considers general plan land use designations for the jurisdictions within its borders). If a project would result in exceedances of daily regional emission limits, then it can be considered to contribute to cumulatively considerable air quality impacts.

The proposed mitigation measures would reduce construction emissions for all pollutants to less than the SCAQMD CEQA thresholds. Therefore, the cumulative air quality impacts would be less than significant after mitigation.

Mitigation Measures

Consistent with SPBP CAAP, the lead agency will require the contractor to implement the following feasible mitigation measures for harbor craft, on-road vehicles, and off-road equipment.

Construction Equipment and Trucks

- Maintain equipment and vehicle engines in good condition and in proper tune as per manufacturers' specifications.
- To the extent practicable based on equipment availability, the Port will, for all construction equipment, require construction contractors to use construction equipment with oxidation catalysts and particulate traps instead of gasoline- or diesel-powered engines. Diesel-powered equipment that has been retrofitted with after-treatment products reduces NO_X by 40%. However, where diesel equipment has to be used because there are no practical alternatives, the Port will (to the extent practicable based on equipment availability) require construction contractors to use particulate filters and oxidation catalysts.
- To the extent practicable based on equipment availability, the Port will require construction contractors to use trucks supplying materials and supplies to the project site be fitted with oxidation catalysts or particulate traps.
- Use electricity from power poles instead of temporary diesel- or gasoline-powered generators. Note the clamshell dredge proposed for this project will be electrical powered.
- Prohibit heavy-duty construction vehicles from idling in excess of 5 minutes, both on and off site, to be consistent with state law.
- Reroute construction trucks away from congested streets.

Off-road equipment

- For off-road equipment, implement control strategy consistent with CAAP CHE-1.

Harbor craft for temporary dredging projects

- The Port will require dredging contractors to use harbor craft meeting USEPA Tier-2 standards for harbor craft or meet equivalent reductions, as well as require no later than 5 years or when they first become available, all previously re-powered harbor craft to retrofit with the most effective ARB verified/verifiable NO_X and PM emissions reduction technologies.
- Require low-sulfur fuel in the engines at the following annual participation rates:
  - 2007 to 2009 – use of marine fuel in all main engines with a maximum sulfur content of 0.2%.
  - 2010 and after – use of marine fuel in all main engines with a maximum sulfur content of 0.1%.
- Implement vessel speed reductions of 12 knots within the port.

The above mitigation measures would reduce emissions of NO_X, CO, PM_{10} and $PM_{2.5}$ to less than the SCAQMD CEQA thresholds. Therefore, the air quality impacts caused by the proposed project would be less than significant after mitigation.

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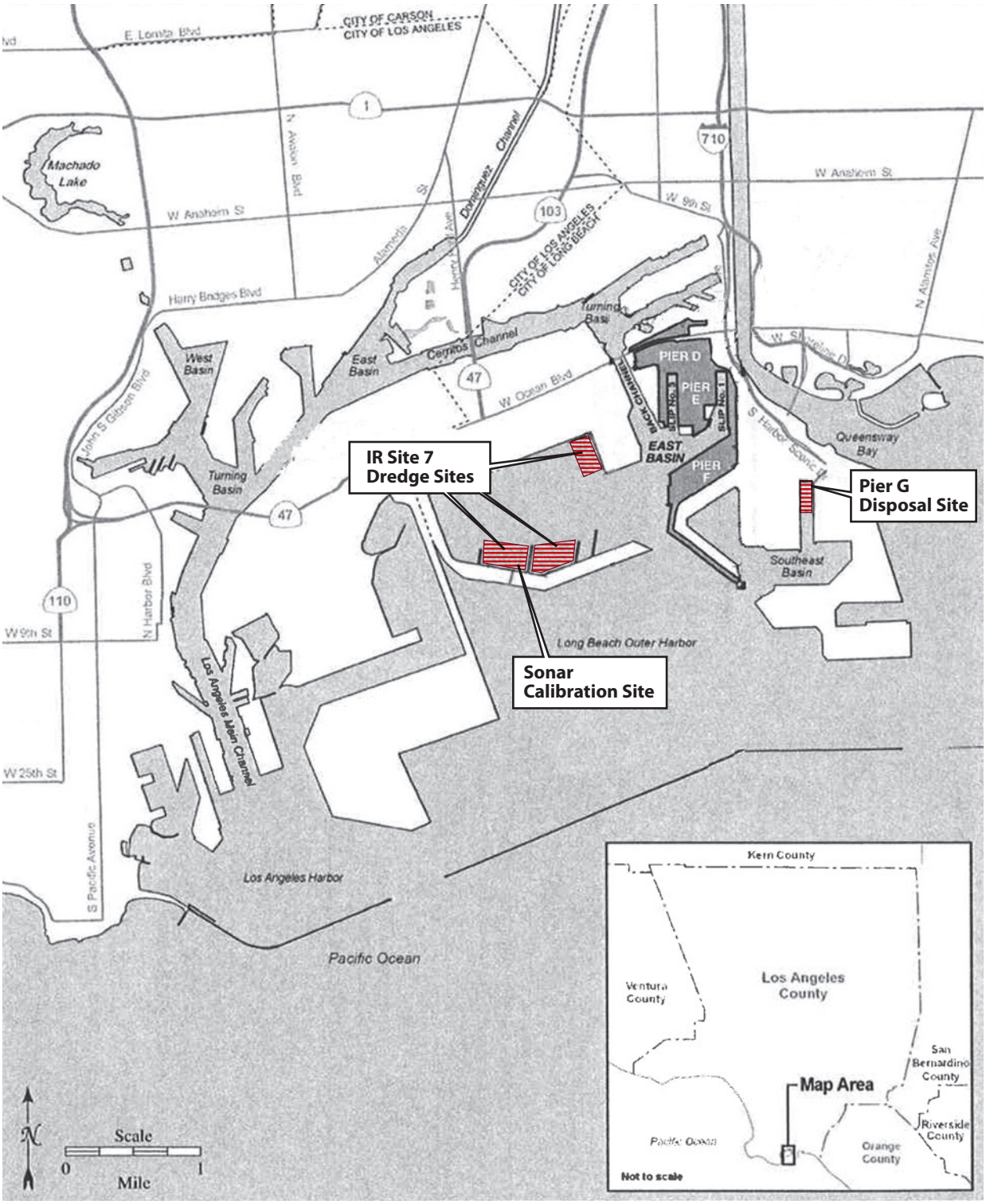

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Jones & Stokes

Figure 1
Vicinity Map

Appendix A

Emission Calculation Worksheets

Port of Long Beach IR Site 7; Dredging Max-Daily Emissions for Unregulated (Tier-0) Marine Diesel Engines: (SCAQMD EFs) DAILY

Construction Site Fugitive PM-10 Emission Factors

Construction days/year	==>	1	
Fugitive Dust Emmission Factor From Soil Loading & Dumping (lbs/ton)	==>	0.011	AP-42 for material dumping (50% reduction for large rock size)
Earthwork Volume/year (cys/day)	==>	0	cy/day
Average Daily Acres of Construction	==>	0.00	Applies SCAQMD fugitive dust factor of 10 lbs/acre/day (Jones & Stokes 2003)
Dozer Hours/Year for Fugitive Dust Calcs		0	Applies AP-42 fugitive dust factor
Building volume to be demolished, cubic feet		0	Applies SCAQMD emission factor of 0.00042 lbs PM10/cf

In-Water Dredging Exhaust Emission Factors (SCAQMD Efs for Non-Road; EPA Efs for Marine Diesel)

		Number of	Hours	No.	Default	Default	2008 SCAQMD EF (gm/bhp-hr)				
Equipment Type		Vehicles	per Day	of days	HP	Load Factor	VOC	CO	NOx	PM10	Total HP
Electric Clamshell Dredge Engine	==>	1	12	1	2500	0	0.22	0.87	2.38	0.075	2500
Aux Generator on Dredge	==>	1	12	1	75	0.1	0.59	1.94	3.75	0.29	75
Bottom Dump Scow	==>	2	1	1	250	0.05	0.05	0.62	7.89	0.19	500
Tug Boat	==>	1	4	1	4000	0.4	0.05	0.62	7.89	0.19	4000
Work tug	==>	1	2	1	750	0.35	0.05	0.62	7.89	0.19	750
Work Boat	==>	1	2	1	400	0.45	0.05	0.62	7.89	0.19	400
	==>	0	0	1	400	0.3	0.05	0.62	7.89	0.19	0
Crew Boat - Small	==>	1	4	1	80	0.5	0.05	0.62	7.89	0.19	80
		8	Total Equip		8305	Total HP	0.46				

HP-hr	Gallons (0.05 gal/hp-hr)	Fuel S ppm	lbs SO2
0	0	0	0.000
90	5	15	0.001
25	1	2000	0.035
6400	320	2000	8.960
525	26	2000	0.735
360	18	2000	0.504
0	0	2000	0.000
160	8	2000	0.224
7560	**378**		**10.4589**

Port of Long Beach IR Site 7; Dredging Max-Daily Emissions for Unregulated (Tier-0) Marine Diesel Engines: (SCAQMD EFs)

Worker Commute Tailpipe Emissions

Miles/round trip	==>	50
trips/day	==>	11
Number of Light Duty Trucks	==>	1
Number of Days	==>	1

	ROG	CO	NOx	PM10
EMFAC EFs (grams/mile)	0.49	4.8	0.499	0.039
Start Emission Rate (grams/trip)	1.8	22.88	0.84	0.02
Hot Soak (grams/trip)	0.22			
Evaporative Running Loss (grams/mile)	0.09			

	Emissions (lbs/day)				
Daily Emissions	VOC	CO	NOx	PM10	SO2
Construction Vehicle Exhaust Emissions	0.9	10.6	131	3.2	10.5
Worker Commute Tailpipe Emissions	0.752	6.4	0.63	0.048	
Total Daily Emissions (lbs/day)	**1.7**	**17.0**	**131**	**3.2**	**10.5**

C:\PC01087\JMW Temp\POLB-Dredge_10-07\Dec-2007-Calcs\[POLB-Dredge-Tier-0_Daily- Emission_Dec2007.xls]Dredging In-Water

Port of Long Beach IR Site 7; Dredging Max-Daily Emissions for Mitigated (EPA Tier-2) Marine Diesel Engines

DAILY

Construction Site Fugitive PM-10 Emission Factors

Construction days/year	==>	1	
Fugitive Dust Emmission Factor From Soil Loading & Dumping (lbs/ton)	==>	0.011	AP-42 for material dumping (50% reduction for large rock size)
Earthwork Volume/year (cys/day)	==>	0	cy/day
Average Daily Acres of Construction	==>	0.00	Applies SCAQMD fugitive dust factor of 10 lbs/acre/day (Jones & Stokes 2003)
Dozer Hours/Year for Fugitive Dust Calcs		0	Applies AP-42 fugitive dust factor
Building volume to be demolished, cubic feet		0	Applies SCAQMD emission factor of 0.00042 lbs PM10/cf

In-Water Dredging Exhaust Emission Factors (SCAQMD Efs for Non-Road; EPA EFs for Tier-2-Controlled Marine Diesel)

		Number of	Hours	No.	Default	Default	Tier-2 EF (gm/bhp-hr)				
Equipment Type		Vehicles	per Day	of days	HP	Load Factor	VOC	CO	NOx	PM10	Total HP
Electric Clamshell Dredge Engine	==>	1	12	1	2500	0	0.22	0.87	2.38	0.075	2500
Aux Generator on Dredge	==>	1	12	1	75	0.1	0.59	1.94	3.75	0.29	75
Bottom Dump Scow	==>	2	1	1	250	0.05	0.22	0.87	2.38	0.075	500
Tug Boat	==>	1	4	1	4000	0.4	0.05	3.70	5.30	0.148	4000
Work tug	==>	1	2	1	750	0.35	0.05	3.70	5.30	0.148	750
Work Boat	==>	1	2	1	400	0.45	0.05	3.70	5.30	0.148	400
	==>	0	0	1	400	0.3	0.05	3.70	5.30	0.148	0
Crew Boat - Small	==>	1	4	1	80	0.5	0.05	3.70	5.30	0.148	80
		8	Total Equip		8305	Total HP	0.47				

HP-hr	Gallons (0.05 gal/hp-hr)	Fuel S ppm	lbs SO2
0	0	0	0.000
90	5	15	0.001
25	1	2000	0.035
6400	320	2000	8.960
525	26	2000	0.735
360	18	2000	0.504
0	0	2000	0.000
160	8	2000	0.224
7560	**378**		**10.4589**

Port of Long Beach IR Site 7; Dredging Max-Daily Emissions for Mitigated (EPA Tier-2) Marine Diesel Engines

Worker Commute Tailpipe Emissions

Miles/round trip	==>	50
trips/day	==>	11
Number of Light Duty Trucks	==>	1
Number of Days	==>	1

	ROG	CO	NOx	PM10
EMFAC EFs (grams/mile)	0.49	4.8	0.499	0.039
Start Emission Rate (grams/trip)	1.8	22.88	0.84	0.02
Hot Soak (grams/trip)	0.22			
Evaporative Running Loss (grams/mile)	0.09			

	Emissions (lbs/day)				
Daily Emissions	VOC	CO	NOx	PM10	SO2
Construction Vehicle Exhaust Emissions	0.9	61.2	88	2.5	10.5
Worker Commute Tailpipe Emissions	0.752	6.4	0.63	0.048	
Total Daily Emissions (lbs/day)	**1.7**	**67.5**	**88**	**2.5**	**10.5**

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Port of Long Beach IR Site 7; Demolition Uncontrolled (Tier-0) In-Water Max-Daily Construction Emissions: (SCAQMD EFs) DAILY

Construction Site Fugitive PM-10 Emission Factors

Construction days/year	==>	1	
Fugitive Dust Emmission Factor From Soil Loading & Dumping (lbs/ton)	==>	0.011	AP-42 for material dumping (50% reduction for large rock size)
Earthwork Volume/year (cys/day)	==>	0	cy/day
Average Daily Acres of Construction	==>	0.00	Applies SCAQMD fugitive dust factor of 10 lbs/acre/day (Jones & Stokes 2003)
Dozer Hours/Year for Fugitive Dust Calcs		0	Applies AP-42 fugitive dust factor
Building volume to be demolished, cubic feet		0	Applies SCAQMD emission factor of 0.00042 lbs PM10/cf

In-Water Dredging Exhaust Emission Factors (SCAQMD Efs for Non-Road; EPA Efs for Marine Diesel)

		Number of	Hours	No.	Default	Default	2008 SCAQMD EF (gm/bhp-hr)				
Equipment Type		Vehicles	per Day	of days	HP	Load Factor	VOC	CO	NOx	PM10	Total HP
Electric-Powered Derrick Barge	==>	1	8	1	600	0	0.05	0.62	7.89	0.19	600
Work Tug	==>	1	4	1	750	0.4	0.05	0.62	7.89	0.19	750
Crew Survey Boat - Small	==>	1	4	1	80	0.5	0.05	0.62	7.89	0.19	80
		3	Total Equip		1430	Total HP	0.47				

HP-hr	Gallons (0.05 gal/hp-hr)	Fuel S ppm	lbs SO2
0	0	2000	0.000
1200	60	2000	1.680
160	8	2000	0.224
1360	**68**		**1.9040**

Port of Long Beach IR Site 7; Demolition Uncontrolled (Tier-0) In-Water Max-Daily Construction Emissions: (SCAQMD EFs)

	Emissions (lbs/day)				
Daily Emissions	VOC	CO	NOx	PM10	SO2
Construction Vehicle Exhaust Emissions	0.1	1.9	23.7	0.6	1.9
Worker Commute Tailpipe Emissions	0.0	0.0	0.0	0.00	
Total Daily Emissions (lbs/day)	**0.1**	**1.9**	**23.7**	**0.6**	**1.9**

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Port of Long Beach IR Site 7; Demolition, Mitigated (Tier-2) In-Water Equipment Max-Daily Emissions: (EPA Tier-2 EFs)

DAILY

Construction Site Fugitive PM-10 Emission Factors

Construction days/year	==>	1	
Fugitive Dust Emmission Factor From Soil Loading & Dumping (lbs/ton)	==>	0.011	AP-42 for material dumping (50% reduction for large rock size)
Earthwork Volume/year (cys/day)	==>	0	cy/day
Average Daily Acres of Construction	==>	0.00	Applies SCAQMD fugitive dust factor of 10 lbs/acre/day (Jones & Stokes 2003)
Dozer Hours/Year for Fugitive Dust Calcs		0	Applies AP-42 fugitive dust factor
Building volume to be demolished, cubic feet		0	Applies SCAQMD emission factor of 0.00042 lbs PM10/cf

In-Water Dredging Exhaust Emission Factors (EPA Controlled Tier-2 EFs for Marine Diesel)

		Number of	Hours	No.	Default	Default	Tier-2 EF (gm/bhp-hr)				
Equipment Type		Vehicles	per Day	of days	HP	Load Factor	VOC	CO	NOx	PM10	Total HP
Electric-Powered Derrick Barge	==>	1	8	1	600	0	0.05	3.70	5.30	0.15	600
Work Tug	==>	1	4	1	750	0.4	0.05	3.70	5.30	0.15	750
Crew Survey Boat - Small	==>	1	4	1	80	0.5	0.05	3.70	5.30	0.15	80
		3	Total Equip		1430	Total HP	0.47				

HP-hr	Gallons (0.05 gal/hp-hr)	Fuel S ppm	lbs SO2
0	0	2000	0.000
1200	60	2000	1.680
160	8	2000	0.224
1360	**68**		**1.9040**

Port of Long Beach IR Site 7; Demolition, Mitigated (Tier-2) In-Water Equipment Max-Daily Emissions: (EPA Tier-2 EFs)

	Emissions (lbs/day)				
Daily Emissions	VOC	CO	NOx	PM10	SO2
Construction Vehicle Exhaust Emissions	0.1	11.1	15.9	0.4	1.9
Worker Commute Tailpipe Emissions	0.0	0.0	0.0	0.00	
Total Daily Emissions (lbs/day)	**0.1**	**11.1**	**15.9**	**0.4**	**1.9**

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POLB IR-7 Dredging: Annual Mitigated (Tier-2) In-Water Equipment (EPA Tier-2 EFs)

Construction Site Fugitive PM-10 Emission Factors

Construction days/year	==>	62	
Fugitive Dust Emmission Factor From Soil Loading & Dumping (lbs/ton)	==>	0.011	AP-42 for material dumping (50% reduction for large rock size)
Earthwork Volume/year (cys/yr)	==>	0	
Average Daily Acres of Construction	==>	0.00	Applies SCAQMD fugitive dust factor of 10 lbs/acre/day (Jones & Stokes 2003)
Dozer Hours/Year for Fugitive Dust Calcs		0	Applies AP-42 fugitive dust factor
Building volume to be demolished, cubic feet		0	Applies SCAQMD emission factor of 0.00042 lbs PM10/cf

Construction Vehicle Exhaust Emission Factors (EPA Tier-2)

Equipment Type		Number of Vehicles	Hours per Day	No. of days	Default HP	Default Load Factor	2008 SCAQMD and Tier-2 EF (gm/bhp-hr) VOC	CO	NOx	PM10	SO2	Total HP	HP-hr	Gallons (0.05 gal/hp-hr)	Fuel S ppm	lbs SO2
Electric-Poowered Clamshell Dredge Engine	==>	1	12	62	2500	0	0.22	0.87	2.38	0.075	0.76	2500	0	0	15	0.000
Aux Generator on Dredge	==>	1	12	62	75	0.1	0.59	1.94	3.75	0.29	0.85	75	5580	279	15	0.059
Bottom Dump Scow	==>	2	1	62	250	0.05	0.05	3.70	5.30	0.148	0.76	500	1550	78	15	0.016
Tug Boat	==>	1	4	62	4000	0.4	0.05	3.70	5.30	0.148	0.76	4000	396800	19840	15	4.166
Work tug	==>	1	2	62	750	0.35	0.05	3.70	5.30	0.148	0.76	750	32550	1628	15	0.342
Work Boat	==>	1	2	62	400	0.45	0.05	3.70	5.30	0.148	0.76	400	22320	1116	15	0.234
Crew Boat - Big	==>	1	0	62	400	0.3	0.05	3.70	5.30	0.148	0.76	400	0	0	15	0.000
Crew Boat - Small	==>	1	4	62	80	0.5	0.05	3.70	5.30	0.148	0.76	80	9920	496	15	0.104
		9	Total Equip		8705	Total HP	0.46				0.80		**468720**	**23436**		**4.9216**

POLB IR-7 Dredging: Annual Mitigated (Tier-2) In-Water Equipment (EPA Tier-2 EFs)

Worker Commute Tailpipe Emissions

Miles/round trip	==>	50
trips/day	==>	11
Number of Light Duty Trucks	==>	1
Number of Days	==>	62

	ROG	CO	NOx	PM10
EMFAC EFs (grams/mile)	0.49	4.8	0.499	0.039
Start Emission Rate (grams/trip)	1.8	22.88	0.84	0.02
Hot Soak (grams/trip)	0.22			
Evaporative Running Loss (grams/mile)	0.09			

	Emissions (tpy)				
Annual Emissions	VOC	CO	NOx	PM10	SO2
Construction Vehicle Exhaust Emissions	0.0	1.9	2.7	0.1	0.002
Worker Commute Tailpipe Emissions	0.023	0.20	0.019	0.001	
Total Emissions (tpy)	**0.1**	**2.1**	**2.7**	**0.1**	**0.00**

Citation: Software Uer's guid, URBEMIS2002 with Enhanced Construction Module. Prepared for Yolo-Solano AQMD. Jones & Stokes Stokes, Sacramento CA, 2003.

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POLB Pier-11 Demolition: Annual In-Water Mitigated (Tier-2) Equipment (SCAQMD EFs)

Construction Site Fugitive PM-10 Emission Factors

Construction days/year	==>	20	
Fugitive Dust Emmission Factor From Soil Loading & Dumping (lbs/ton)	==>	0.011	AP-42 for material dumping (50% reduction for large rock size)
Earthwork Volume/year (cys/yr)	==>	0	
Average Daily Acres of Construction	==>	0.00	Applies SCAQMD fugitive dust factor of 10 lbs/acre/day (Jones & Stokes 2003)
Dozer Hours/Year for Fugitive Dust Calcs		0	Applies AP-42 fugitive dust factor
Building volume to be demolished, cubic feet		0	Applies SCAQMD emission factor of 0.00042 lbs PM10/cf

Marine Vessel Exhaust Emission Factors (EPA Tier-2)

		Number of	Hours	No.	Default	Default	(Tier-2) EF (gm/bhp-hr)					
Equipment Type		Vehicles	per Day	of days	HP	Load Factor	VOC	CO	NOx	PM10	SO2	Total HP
Electric-Powered Derrick Barge	==>	1	8	20	600	0	0.05	3.70	5.30	0.148	0.76	600
Work Tug	==>	1	4	20	750	0.4	0.05	3.70	5.30	0.148	0.76	750
Crew Survey Boat - Small	==>	1	4	20	80	0.5	0.05	3.70	5.30	0.148	0.76	80
		3	Total Equip		1430	Total HP	0.46				0.80	

HP-hr	Gallons (0.05 gal/hp-hr)	Fuel S ppm	lbs SO2
0	0	15	0.000
24000	1200	15	0.252
3200	160	15	0.034
27200	**1360**		**0.2856**

POLB Pier-11 Demolition: Annual In-Water Mitigated (Tier-2) Equipment (SCAQMD EFs)

	Emissions (tpy)				
Annual Emissions	VOC	CO	NOx	PM10	SO2
Construction Vehicle Exhaust Emissions	0.0	0.1	0.2	0.0	0.000
Demolition Fugitive Dust	---	---	---	0.0	
General Construction Fugitive Dust	---	---	---	0.0	
Soil Loading & Dumping (Double-handled)	---	---	---	0.0	
Dozer Work	---	---	---	0.0	
Unpaved Road Fugitive PM-10	---	---	---	0.0	
Paving Off-Gas	0.00	---	---	---	
Architectural Painting (VOC = 500 g/L)	0.0	---	---	---	
Dump Truck Tailpipe Emissions	0.0	0.0	0.0	0.0	0.000
Worker Commute Tailpipe Emissions	0.000	0.00	0.000	0.000	
Total Emissions (tpy)	**0.001**	**0.111**	**0.159**	**0.00**	**0.0001**

Citation: Software Uer's guid, URBEMIS2002 with Enhanced Construction Module. Prepared for Yolo-Solano AQMD. Jones & Stokes Stokes, Sacramento CA, 2003.

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